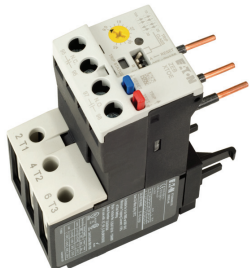


IEC Contactors and Starters



1.1 XT IEC Power Control

|                                            |           |
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| EMS—Electronic Motor Starter .....         | V5-T1-232 |
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# Revision notes

## Volume 5—Motor Control and Protection, CA08100006E

### Tab 1—IEC Contactors and Starters

| Revision date | Section | Change page(s)       | Description                                    |
|---------------|---------|----------------------|------------------------------------------------|
| 04/27/2018    | 1.1     | V5-T1-128, V5-T1-128 | Insert new product XTSE, repaginate tab to end |



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### Description

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## Product Overview

The **XT** line of IEC power control offers starting and protection solutions ideal for control panels.

Innovations in the design and development allow users to reduce material costs, reduce installation effort, and enhance panel safety and performance all in a compact design. Some of these key innovations include:

- Toolless assembly of manual motor controllers and reversing contactors
- Low coil consumption
- Front accessibility to coil terminations
- Built-in surge suppression on electronic coils
- Built-in auxiliary contact for contactors up to 32A in a 45 mm frame
- Finger-safe and back-of-hand proof ratings
- Direct PLC control on 185A–2000A contactors

The **XT** line includes a large offering of power control components and accessories that cover a broad range of applications and ratings:

- Three-pole contactors to 2000A
- Four-pole contactors to 200A
- Capacitor contactors to 680 kVAR
- Mini contactors to 9A
- Relays to 16A
- Thermal overload relays to 630A
- Electronic overload relays to 1500A
- Manual motor protectors to 65A
- Manual motor controllers and combination motor controllers to 65A

## Relays and Timers



## Relays and Timers

## Product Description

Eaton's new line of **XT** relays and timers includes mini and standard frame control relays and auxiliary contacts, mini electronic on-delay and multi-function timers and an electronic star-delta (wye-delta) timer for use in star-delta (wye-delta) combinations. Because **XT** meets UL®, CSA® and CE standards, it is the perfect product solution for IEC applications all over the world. The compact, space saving and easy to install **XT** line of IEC contactors and starters is the efficient and effective solution for customer applications.

## Features

- For use with mini and standard frame size contactors and starters
- Control relays
  - AC control from 12V to 550V 50 Hz, 600V 60 Hz
  - DC control from 12V to 220V
- On-delay and multi-function timers
  - 24–240 Vac/Vdc control
- Available with screw or spring cage terminals
- Four-pole configurations
- IP20 finger and back-of-hand proof
- Large ambient temperature range: –25° to 50°C [–13° to 122°F]
- The XTRE control relays have positively driven contacts between the relay and the auxiliary contact modules as well as within the auxiliary contact modules

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## Description

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## Standards and Certifications

- IEC EN 60947
- CE approved
- UL
- CSA



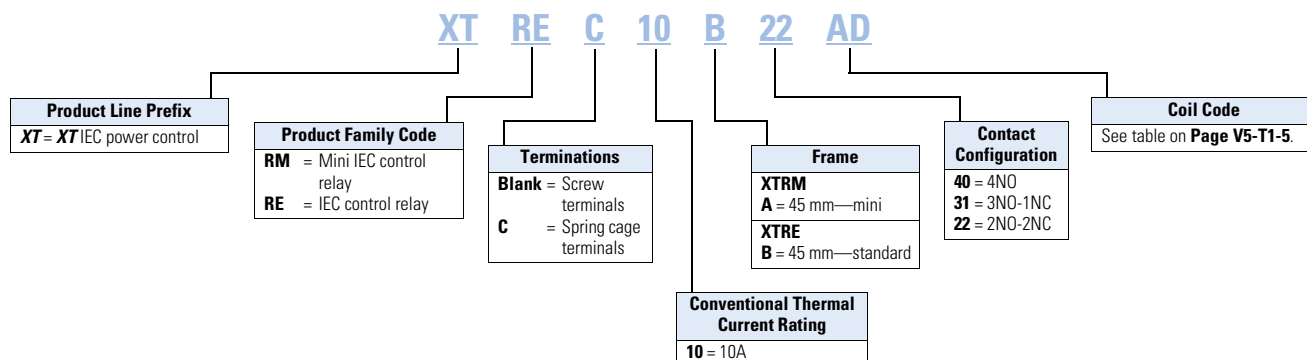
## Instructional Leaflets

|          |                                                         |
|----------|---------------------------------------------------------|
| Pub51219 | XTRM Mini Control Relays                                |
| Pub51210 | XTRE Control Relays                                     |
| Pub51244 | XTTR Electronic Star-Delta (Wye-Delta) Timer            |
| Pub51245 | XTMT Mini Electronic On-Delay and Multi-Function Timers |

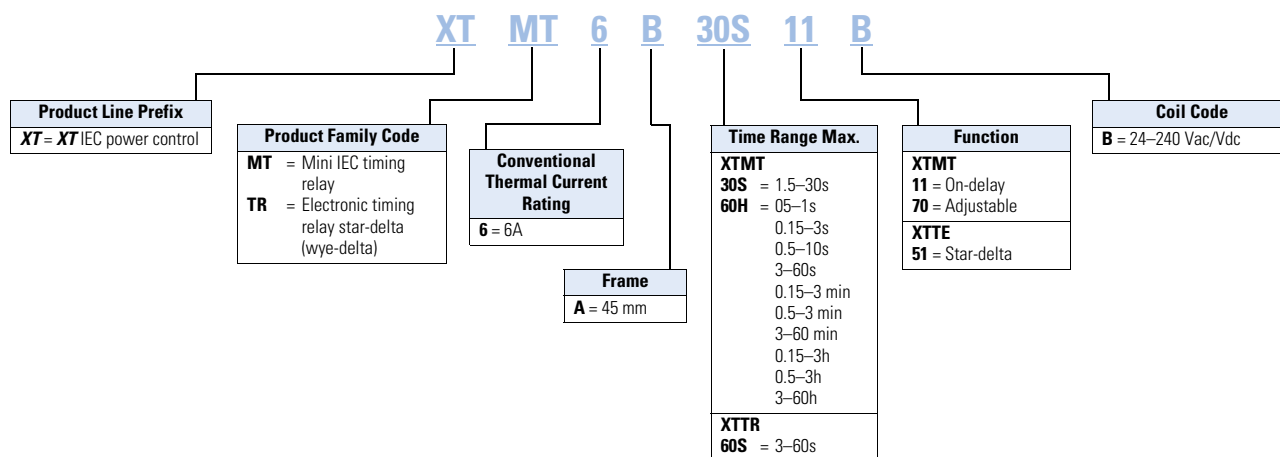
## 1

## Catalog Number Selection

## XT—Relays



## XT—Timers



## Product Selection

### When Ordering

- Orders must be placed in multiples of the package quantity listed
- DC operated control relays have a built-in suppressor circuit
- Contact terminal numbers to EN50011
- Coil terminal numbers to EN50005

#### XTRM10A\_



### Mini Control Relays

| Conventional Thermal Current $I_{th}$ (A) | Contact Configuration | Rated Operational Current AC-15 $I_e$ (A) |          |      | Circuit Symbol | Screw Terminal Catalog Number <sup>①</sup> |
|-------------------------------------------|-----------------------|-------------------------------------------|----------|------|----------------|--------------------------------------------|
|                                           |                       | 220–240V                                  | 380–415V | 500V |                |                                            |
| 10                                        | 4NO                   | 6                                         | 3        | 1.5  |                | XTRM10A40_                                 |
| 10                                        | 3NO-1NC               | 6                                         | 3        | 1.5  |                | XTRM10A31_                                 |
| 10                                        | 2NO-2NC               | 6                                         | 3        | 1.5  |                | XTRM10A22_ <sup>②</sup>                    |

#### XTREC10\_



### Control Relays

| Conventional Thermal Current Open at 60°C $I_{th}$ (A) | Contact Configuration | Rated Operational Current AC-15 $I_e$ (A) |          |      | Circuit Symbol | Screw Terminal Catalog Number <sup>①</sup> | Spring Cage Terminal Catalog Number <sup>①</sup> |
|--------------------------------------------------------|-----------------------|-------------------------------------------|----------|------|----------------|--------------------------------------------|--------------------------------------------------|
|                                                        |                       | 220–240V                                  | 380–415V | 500V |                |                                            |                                                  |
| 16                                                     | 4NO                   | 6                                         | 4        | 1.5  |                | XTRE10B40_                                 | XTREC10B40_                                      |
| 16                                                     | 3NO-1NC               | 6                                         | 4        | 1.5  |                | XTRE10B31_                                 | XTREC10B31_                                      |
| 16                                                     | 2NO-2NC               | 6                                         | 4        | 1.5  |                | XTRE10B22_ <sup>③</sup>                    | XTREC10B22_ <sup>③</sup>                         |

### Coil Voltage Suffix

| Coil Voltage           | Suffix Code | Coil Voltage           | Suffix Code | Coil Voltage           | Suffix Code | Coil Voltage | Suffix Code |
|------------------------|-------------|------------------------|-------------|------------------------|-------------|--------------|-------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    | 415V 50 Hz, 480V 60 Hz | <b>C</b>    | 380V 50 Hz, 440V 60 Hz | <b>L</b>    | 120 Vdc      | <b>AD</b>   |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    | 550V 50 Hz, 600V 60 Hz | <b>D</b>    | 380V 60 Hz             | <b>P</b>    | 220 Vdc      | <b>BD</b>   |
| 230V 50 Hz             | <b>F</b>    | 208V 60 Hz             | <b>E</b>    | 12V 50/60 Hz           | <b>R</b>    | 12 Vdc       | <b>RD</b>   |
| 24V 50/60 Hz           | <b>T</b>    | 190V 50 Hz, 220V 60 Hz | <b>G</b>    | 42V 50 Hz, 48V 60 Hz   | <b>W</b>    | 48 Vdc       | <b>WD</b>   |
| 24 Vdc                 | <b>TD</b>   | 240V 50 Hz, 277V 60 Hz | <b>H</b>    | 48V 50 Hz              | <b>Y</b>    |              |             |

### Notes

- <sup>①</sup> Underscore (\_) indicates magnet coil suffix required. See Coil Voltage Suffix table above.
- <sup>②</sup> DC operated control relays XTRM(C)10A22\_ cannot be used with front mount auxiliary contacts.
- <sup>③</sup> DC operated control relays XTRE(C)10B22\_ can only be combined with two-pole auxiliary contacts.

## Accessories

## Auxiliary Contacts

XTMCXF\_



## Front-Mount Auxiliary Contacts for Use with XTRM Mini Control Relays

| Conventional<br>Thermal Current,<br>I <sub>th</sub> Open (A) | Rated Operational Current<br>AC-15 I <sub>a</sub> (A) |                      |      | Contact<br>Configuration                      | Contact Sequence | Pkg.<br>Qty. ① | Screw Terminal<br>Catalog Number |
|--------------------------------------------------------------|-------------------------------------------------------|----------------------|------|-----------------------------------------------|------------------|----------------|----------------------------------|
|                                                              | 220V<br>230V<br>240V                                  | 380V<br>400V<br>415V | 500V |                                               |                  |                |                                  |
| 10                                                           | 4                                                     | 2                    | 1.5  | 2NC                                           |                  | 5              | XTMCXFA02                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 1NO-1NC                                       |                  | 5              | XTMCXFA11                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 2NO                                           |                  | 5              | XTMCXFA20                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 4NC                                           |                  | 5              | XTMCXFA04                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 1NO-3NC                                       |                  | 5              | XTMCXFA13                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 2NO-2NC                                       |                  | 5              | XTMCXFA22                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 3NO-1NC                                       |                  | 5              | XTMCXFA31                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 4NO                                           |                  | 5              | XTMCXFA40                        |
| 10                                                           | 4                                                     | 2                    | 1.5  | 1NO-1NC<br>1NO <sub>E</sub> -1NC <sub>L</sub> |                  | 5              | XTMCXFA122 ②                     |

## Notes

- ① Orders must be placed in multiples of package quantity listed.  
 ② One early-make contact (NO<sub>E</sub>), one late-break contact (NC<sub>L</sub>).

Front-Mount Auxiliary Contacts for Use with XTRE Control Relays <sup>①</sup>

|                                                                                                       | Conventional Thermal Current, $I_{th}$ (A), Open at 60°C | Poles | Rated Operational Current AC-15 $I_e$ (A) |                      |      | Contact Configuration                         | Circuit Symbol                                                                        | Pkg. Qty. <sup>②</sup> | Screw Terminal Catalog Number |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------|-------------------------------------------|----------------------|------|-----------------------------------------------|---------------------------------------------------------------------------------------|------------------------|-------------------------------|
|                                                                                                       |                                                          |       | 220V<br>230V<br>240V                      | 380V<br>400V<br>415V | 500V |                                               |                                                                                       |                        |                               |
| <b>Two-Pole</b><br>  | 16                                                       | 2     | 6                                         | 3                    | 1.5  | 2NO                                           |    | 5                      | XTCEXFAC20                    |
|                                                                                                       | 16                                                       | 2     | 6                                         | 3                    | 1.5  | 1NO-1NC                                       |    | 5                      | XTCEXFAC11 <sup>③</sup>       |
|                                                                                                       | 16                                                       | 2     | 6                                         | 3                    | 1.5  | 2NC                                           |    | 5                      | XTCEXFAC02                    |
|                                                                                                       | 16                                                       | 2     | 6                                         | 3                    | 1.5  | 1NO <sub>E</sub> -1NC <sub>L</sub>            |    | 5                      | XTCEXFALC11 <sup>④</sup>      |
| <b>Four-Pole</b><br> | 16                                                       | 4     | 6                                         | 3                    | 1.5  | 4NO                                           |    | 5                      | XTCEXFAC40 <sup>③</sup>       |
|                                                                                                       | 16                                                       | 4     | 6                                         | 3                    | 1.5  | 3NO-1NC                                       |    | 5                      | XTCEXFAC31 <sup>③</sup>       |
|                                                                                                       | 16                                                       | 4     | 6                                         | 3                    | 1.5  | 2NO-2NC                                       |    | 5                      | XTCEXFAC22 <sup>③</sup>       |
|                                                                                                       | 16                                                       | 4     | 6                                         | 3                    | 1.5  | 1NO-3NC                                       |   | 5                      | XTCEXFAC13                    |
|                                                                                                       | 16                                                       | 4     | 6                                         | 3                    | 1.5  | 4NC                                           |  | 5                      | XTCEXFAC04                    |
|                                                                                                       | 16                                                       | 4     | 6                                         | 3                    | 1.5  | 1NO-1NC<br>1NO <sub>E</sub> -1NC <sub>L</sub> |  | 5                      | XTCEXFALC22 <sup>④</sup>      |

**Notes**

- <sup>①</sup> Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO<sub>E</sub> and NC<sub>L</sub> contacts) and between the auxiliary contacts and built-in contacts of the XTRE control relays.
- <sup>②</sup> Orders must be placed in multiples of package quantity listed.
- <sup>③</sup> Catalog number is shown with screw type terminal. For spring cage, add a "C" before the last 2 digits. For example, to order a spring cage version of the XTCEXFAC22, change the catalog number to XTCEXFACC22.
- <sup>④</sup> One early-make contact (NO<sub>E</sub>), one late-break contact (NC<sub>L</sub>).



**Suppressors**

For AC operated contactors 50–60 Hz. On DC operated contactor relays and on XTRE10B, the suppressor circuit is built-in. Note dropout delay.

**Varistor Suppressor**<sup>①②</sup>**XTCEXVSB\_****Varistor Suppressor for XTRE**

| Voltage | For Use with... | Contact Sequence | Pkg. Qty. ③ | Catalog Number    |
|---------|-----------------|------------------|-------------|-------------------|
| 24–48   | XTRE(C)10B      |                  | 10          | <b>XTCEXVSBW</b>  |
| 48–130  |                 |                  | 10          | <b>XTCEXVSB A</b> |
| 130–240 |                 |                  | 10          | <b>XTCEXVSB B</b> |
| 240–500 |                 |                  | 10          | <b>XTCEXVSB C</b> |

**XTMCXVS\_****Varistor Suppressor for XTRM**

| Voltage | For Use with...    | Circuit Symbol | Pkg. Qty. ③ | Catalog Number  |
|---------|--------------------|----------------|-------------|-----------------|
| 24–48   | XTRM6A_<br>XTRM9A_ |                | 10          | <b>XTMCXVSW</b> |
| 48–130  | XTRM6A_<br>XTRM9A_ |                | 10          | <b>XTMCXVSA</b> |
| 110–250 | XTRM6A_<br>XTRM9A_ |                | 10          | <b>XTMCXVSB</b> |
| 380–415 | XTRM6A_<br>XTRM9A_ |                | 10          | <b>XTMCXVSN</b> |

**XTRM Relay with Installed Suppressor****Varistor Suppressor with Integrated LED**<sup>①②</sup>**XTCEXVSLB\_****Varistor Suppressor for XTRE**

| Voltage | For Use with... | Contact Sequence | Pkg. Qty. ③ | Catalog Number    |
|---------|-----------------|------------------|-------------|-------------------|
| 24–48   | XTRE(C)10B      |                  | 10          | <b>XTCEXVSLBW</b> |
| 130–240 |                 |                  | 10          | <b>XTCEXVSLBB</b> |

**RC Suppressor**<sup>①②</sup>**XTCEXRSB\_****RC Suppressor for XTRE**

| Voltage | For Use with... | Contact Sequence | Pkg. Qty. ③ | Catalog Number   |
|---------|-----------------|------------------|-------------|------------------|
| 24–48   | XTRE(C)10B      |                  | 10          | <b>XTCEXRSBW</b> |
| 48–130  |                 |                  | 10          | <b>XTCEXRSBA</b> |
| 110–240 |                 |                  | 10          | <b>XTCEXRSBB</b> |
| 240–500 |                 |                  | 10          | <b>XTCEXRSBC</b> |

**Notes**

① Note dropout delay.

② For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.

③ Orders must be placed in multiples of package quantity listed.

**RC Suppressor** <sup>①②</sup>

XTMCXRS\_

XTRM Relay with  
Installed Suppressor**RC Suppressor for XTRM** <sup>③</sup>

| Voltage | For Use with...    | Circuit Symbol | Pkg. Qty. <sup>④</sup> | Catalog Number  |
|---------|--------------------|----------------|------------------------|-----------------|
| 24–48   | XTRM6A_<br>XTRM9A_ |                | 10                     | <b>XTMCXRSW</b> |
| 48–130  | XTRM6A_<br>XTRM9A_ |                | 10                     | <b>XTMCXRSA</b> |
| 110–250 | XTRM6A_<br>XTRM9A_ |                | 10                     | <b>XTMCXRSB</b> |

**Free-Wheel Diode Suppressor**

In addition to the built-in suppressor circuit for DC actuated contactors. Prevents negative breaking voltage when contactors are used in combination with a safety PLC.

XTCEXVSLBB

**Free-Wheel Diode Suppressor for XTRE**

| Voltage | For Use with... | Pkg. Qty. <sup>④</sup> | Catalog Number    |
|---------|-----------------|------------------------|-------------------|
| 130–240 | XTRE10B         | 10                     | <b>XTCEXVSLBB</b> |

**Connector** <sup>⑤</sup>**Connector**

|                                                                                     | For Use with... | Pkg. Qty. <sup>④</sup> | Catalog Number  |
|-------------------------------------------------------------------------------------|-----------------|------------------------|-----------------|
| <b>XTCEXCNC</b>                                                                     | XTRE(C)10B      | 50                     | <b>XTCEXCNC</b> |
|  |                 |                        |                 |
| <b>XTMCXCNC</b>                                                                     | XTRM10A         | 50                     | <b>XTMCXCNC</b> |
|  |                 |                        |                 |

**Mechanical Interlock** <sup>⑥</sup>**Mechanical Interlock**

|                                                                                      | For Use with... | Pkg. Qty. <sup>④</sup> | Catalog Number  |
|--------------------------------------------------------------------------------------|-----------------|------------------------|-----------------|
| <b>XTCEXMLB</b>                                                                      | XTRE10B_        | 5                      | <b>XTCEXMLB</b> |
|  |                 |                        |                 |
| <b>XTMCXML</b>                                                                       | XTRM10A_        | 5                      | <b>XTMCXML</b>  |
|  |                 |                        |                 |

**Notes**

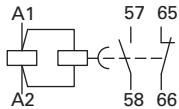
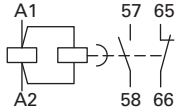
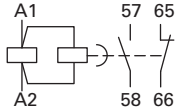
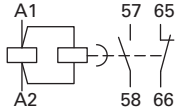
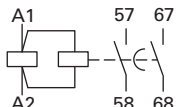
- ① Note dropout delay.
- ② For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
- ③ For AC operated contactors, 50/60 Hz. Note dropout delay.
- ④ Orders must be placed in multiples of package quantity listed.
- ⑤ For mechanically arranging contactors in combinations. Distance between contactors is 0 mm.
- ⑥ For two contactors with AC or DC operated magnet system that are horizontally or vertically mounted.  
For Frame B, mechanical lifespan is  $2.5 \times 10^6$  operations and the distance between contactors is 0 mm.

**Electronic Timer Modules**

Front- (top-) mounted timer modules for use with XTRE10B control relays. Can not be combined with top-mount auxiliary contacts, XTCEXF\_.

XTCEXT\_

**Electronic Timer Modules for XTRE**

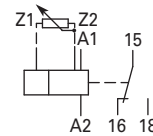
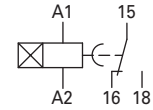
| Voltage                                                                             | Contact Sequence                                                                           | Timing Range | For Use with...                    | Pkg. Qty. ① | Catalog Number         |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------|------------------------------------|-------------|------------------------|
| <b>On-Delay</b>                                                                     |                                                                                            |              |                                    |             |                        |
| 24 Vac/Vdc                                                                          |           | 0.05–1s      | XTRE10B_                           | 1           | <b>XTCEXTEEC11T</b>    |
| 100–130 Vac                                                                         |                                                                                            | 0.5–10s      |                                    |             | <b>XTCEXTEEC11A</b>    |
| 200–240 Vac                                                                         |                                                                                            | 15–100s      |                                    |             | <b>XTCEXTEEC11B</b>    |
| <b>Off-Delay</b>                                                                    |                                                                                            |              |                                    |             |                        |
| 24 Vac/Vdc                                                                          |           | 0.05–1s      | XTRE10B_                           | 1           | <b>XTCEXTED1C11T</b>   |
| 100–130 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTED1C11A</b>   |
| 200–240 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTED1C11B</b>   |
| 24 Vac/Vdc                                                                          |           | 0.5–10s      | XTRE10B_                           | 1           | <b>XTCEXTED10C11T</b>  |
| 100–130 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTED10C11A</b>  |
| 200–240 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTED10C11B</b>  |
| 24 Vac/Vdc                                                                          |           | 5–100s       | XTRE10B_                           | 1           | <b>XTCEXTED100C11T</b> |
| 100–130 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTED100C11A</b> |
| 200–240 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTED100C11B</b> |
| <b>Star-Delta</b>                                                                   |                                                                                            |              |                                    |             |                        |
| 24 Vac/Vdc                                                                          |          | 1–30s        | XTRE10B_                           | 1           | <b>XTCEXTEYC20T</b>    |
| 100–130 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTEYC20A</b>    |
| 200–240 Vac                                                                         |                                                                                            |              |                                    |             | <b>XTCEXTEYC20B</b>    |
| <b>Sealable Shroud</b>                                                              |                                                                                            |              |                                    |             |                        |
|  | Transparent sealable shroud used to protect electronic timer modules from unwanted access. |              | XTCEXTEE,<br>XTCEXTED,<br>XTCEXTEY | 1           | <b>XTCEXTESHRD</b>     |

**Note**

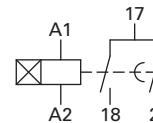
① Orders must be placed in multiples of package quantity listed.

**Mini Electronic Timers****XTMT6A****Mini Electronic On-Delay Timers**

| Conventional Thermal Current<br>$I_e$ (A) | Rated Operational Current<br>$I_o$ AC-11 Amps |              | Time Range | Function                                                                                                                  | Terminal Marking According to EN 50042                                                                       | Catalog Number |
|-------------------------------------------|-----------------------------------------------|--------------|------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------|
| 6                                         | 220/230/240V                                  | 380/400/440V | 3          | 1.5–30 sec                                                                                                                | Fixed, on-delay                                                                                              | XTMT6A30S11B   |
| 6                                         | 220/230/240V                                  | 380/400/440V | 3          | 0.05–1 sec<br>0.15–3 sec<br>0.5–10 sec<br>3–60 sec<br>0.15–3 min<br>0.5–10 min<br>3–60 min<br>0.15–3h<br>0.5–10h<br>3–60h | Adjustable:<br>on-delay;<br>fleeting contact<br>on energization;<br>flashing; pulse<br>generating;<br>ON-OFF | XTMT6A60H70B   |

**Electronic Star-Delta (Wye-Delta) Timers****XTTR6A60S51****Electronic Star-Delta (Wye-Delta) Timers**

| Conventional Thermal Current<br>$I_e$ (A) | Rated Operational Current<br>$I_o$ AC-11 Amps |      | Time Range | Function | Terminal Marking According to EN 50042 | Catalog Number |
|-------------------------------------------|-----------------------------------------------|------|------------|----------|----------------------------------------|----------------|
| 6                                         | 230V                                          | 400V | 3          | 3–60 sec | Fixed, star-delta                      | XTTR6A60S51B   |

**Actuating Voltage**

24–240 50/60 Hz  
24–240 Vdc

**Admissible Cable Length**

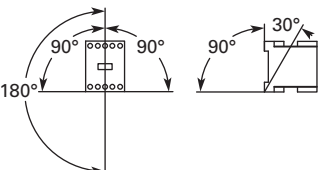
Cable unscreened, with cable cross-section 0.5–1.5 mm<sup>2</sup>  
Two-core cable  
Two-core cable in the same cable duct with the main cable, 50/60 Hz

**Connection to**

Y1/Y2, Z1/Z2  
M250  
M50

## Technical Data and Specifications

### Relays and Timers

| Description                                                                                                               | XTRE                                                                              | XTCEXFAC_                             | XTCEXTE_                                           | XTRM                                  | XTMCXFA_                                                 |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------------|---------------------------------------|----------------------------------------------------------|
| <b>General</b>                                                                                                            |                                                                                   |                                       |                                                    |                                       |                                                          |
| Standards                                                                                                                 | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA                                             | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA | DIN EN 61812,<br>IEC/EN 60947,<br>VDE 060, UL, CSA | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA                    |
| Lifespan, mechanical—operations                                                                                           |                                                                                   |                                       |                                                    |                                       |                                                          |
| AC operated                                                                                                               | 20,000,000                                                                        | 10,000,000                            | 3,000,000                                          | 10,000,000                            | 10,000,000                                               |
| DC operated                                                                                                               | 20,000,000                                                                        | 10,000,000                            | 3,000,000                                          | 20,000,000                            | 20,000,000                                               |
| Maximum operating frequency (ops/hr)                                                                                      | 9000                                                                              | 9000                                  | —                                                  | 9000                                  | 9000                                                     |
| Climatic proofing                                                                                                         | ①                                                                                 | ①                                     | ①                                                  | ①                                     | ①                                                        |
| Ambient temperature                                                                                                       |                                                                                   |                                       |                                                    |                                       |                                                          |
| Open (°C, min./max.)                                                                                                      | –25/60                                                                            | –25/60                                | –40/80                                             | –25/50                                | –25/50                                                   |
| Enclosed (°C, min./max.)                                                                                                  | –25/40                                                                            | –25/40                                | –25–60                                             | –25/40                                | –25/40                                                   |
| Ambient temperature for storage (°C, min./max.)                                                                           | –40/80                                                                            | –40/80                                | –25–40                                             | —                                     | —                                                        |
| Mounting position                                                                                                         |  |                                       |                                                    | As required,<br>not suspended         | As required, except<br>vertically A1/A2 at<br>the bottom |
| Mechanical shock resistance (IEC/EN 60068-2-27)<br>Half-sinusoidal shock 10 ms<br>Base unit with auxiliary contact module |                                                                                   |                                       |                                                    |                                       |                                                          |
| Make contact                                                                                                              | 7g                                                                                | 7g                                    | 6g                                                 | 10g                                   | 10g                                                      |
| Break contact                                                                                                             | 5g                                                                                | 5g                                    | 6g                                                 | 8g                                    | 8g                                                       |
| Degree of protection                                                                                                      | IP20                                                                              | IP20                                  | IP20                                               | IP20                                  | IP20                                                     |
| Protection against direct contact from the front<br>when actuated by a perpendicular test finger (IEC 536)                | Finger and<br>back-of-hand proof                                                  | Finger and<br>back-of-hand proof      | Finger and<br>back-of-hand proof                   | Finger and<br>back-of-hand proof      | Finger and<br>back-of-hand proof                         |
| Weight                                                                                                                    |                                                                                   |                                       |                                                    |                                       |                                                          |
| AC operated (kg)                                                                                                          | 0.23                                                                              | 0.05                                  | 0.08                                               | 0.17                                  | —                                                        |
| DC operated (kg)                                                                                                          | 0.28                                                                              | 0.05                                  | 0.08                                               | 0.20                                  | —                                                        |
| Terminal capacity                                                                                                         |                                                                                   |                                       |                                                    |                                       |                                                          |
| Screw terminals                                                                                                           |                                                                                   |                                       |                                                    |                                       |                                                          |
| Solid (mm <sup>2</sup> )                                                                                                  | 1 x (0.75–4)<br>2 x (0.75–2.5)                                                    | 1 x (0.75–4)<br>2 x (0.75–2.5)        | 1 x (0.75–2.5)<br>2 x (0.75–1.5)                   | 1 x (0.75–2.5)<br>2 x (0.75–2.5)      | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                         |
| Flexible with ferrule (mm <sup>2</sup> )                                                                                  | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                  | 1 x (0.75–2.5)<br>2 x (0.75–2.5)      | 1 x (0.75–1.5)<br>2 x (0.75–1.5)                   | 1 x (0.75–1.5)<br>2 x (0.75–1.5)      | 1 x (0.75–1.5)<br>2 x (0.75–1.5)                         |
| Solid or stranded (AWG)                                                                                                   | 18–14                                                                             | —                                     | 18–14                                              | 18–14                                 | —                                                        |
| Terminal screw                                                                                                            | M3.5                                                                              | M3.5                                  | M3.5                                               | M3.5                                  | M3.5                                                     |
| Pozidriv screwdriver                                                                                                      | Size 2                                                                            | Size 2                                | Size 2                                             | Size 2                                | Size 2                                                   |
| Standard screwdriver (mm)                                                                                                 | 0.8 x 5.5<br>1 x 6                                                                | 0.8 x 5.5<br>1 x 6                    | 0.8 x 5.5<br>1 x 6                                 | 0.8 x 5.5<br>1 x 6                    | 0.8 x 5.5<br>1 x 6                                       |
| Max. tightening torque (Nm)                                                                                               | 1.2                                                                               | 1.2                                   | 1.2                                                | 1.2                                   | 1.2                                                      |
| Spring cage terminals                                                                                                     |                                                                                   |                                       |                                                    |                                       |                                                          |
| Solid (mm <sup>2</sup> )                                                                                                  | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                  | 1 x (0.75–2.5)<br>2 x (0.75–2.5)      | —<br>—                                             | 1 x (0.75–2.5)<br>2 x (0.75–2.5)      | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                         |
| Flexible with or without ferrule DIN 46228 (mm <sup>2</sup> )                                                             | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                  | 1 x (0.75–2.5)<br>2 x (0.75–2.5)      | —<br>—                                             | 1 x (0.75–2.5)<br>2 x (0.75–2.5)      | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                         |
| Solid or stranded (AWG)                                                                                                   | 18–14                                                                             | 18–14                                 | —                                                  | 18–14                                 | 18–14                                                    |
| Standard screwdriver (mm)                                                                                                 | 0.6 x 3.5                                                                         | 0.6 x 3.5                             | —                                                  | 0.6 x 3.5                             | 0.6 x 3.5                                                |

#### Note

① Damp heat, constant, to IEC 60068-2-78; damp heat, cyclical, to IEC 60068-2-30.

## Relays and Timers, continued

| Description                                                                             | XTRE                                                             | XTCEXFAC_ | XTCEXTE_       | XTRM                                                             | XTMCXFA_ |
|-----------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------|----------------|------------------------------------------------------------------|----------|
| <b>Contacts</b>                                                                         |                                                                  |           |                |                                                                  |          |
| Interlocked opposing contacts to ZH 1/457, including auxiliary contact module           | Yes                                                              | Yes       | No             | Yes                                                              | Yes      |
| Rated impulse withstand voltage ( $U_{imp}$ ) Vac                                       | 6000                                                             | 6000      | 6000           | 6000                                                             | 6000     |
| Overtoltage category/pollution degree                                                   | III/3                                                            | III/3     | III/3          | III/3                                                            | III/3    |
| Rated insulation voltage ( $U_i$ ) Vac                                                  | 690                                                              | 690       | 600            | 690                                                              | 690      |
| Rated operational voltage ( $U_o$ ) Vac                                                 | 690                                                              | 500       | 400            | 600                                                              | 600      |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1                                     |                                                                  |           |                |                                                                  |          |
| Between coil and auxiliary contacts (Vac)                                               | 400                                                              | 400       | 250            | 300                                                              | 300      |
| Between the auxiliary contacts (Vac)                                                    | 400                                                              | 400       | 250            | 300                                                              | 300      |
| Rated operational current                                                               |                                                                  |           |                |                                                                  |          |
| AC-15 220/240V $I_o$                                                                    | 6                                                                | 6         | Please inquire | 6                                                                | 4        |
| 380/415V $I_o$                                                                          | 4                                                                | 3         | Please inquire | 3                                                                | 2        |
| 500V $I_o$                                                                              | 1.5                                                              | —         | —              | 1.5                                                              | 1.5      |
| DC-13 ①                                                                                 |                                                                  |           |                |                                                                  |          |
| DC13 L/R ≤15 ms                                                                         |                                                                  |           |                |                                                                  |          |
| Contacts in series—voltage:                                                             |                                                                  |           |                |                                                                  |          |
| 1—24V                                                                                   | 10                                                               | 10        | —              | 2.5                                                              | 2.5      |
| 1—60V                                                                                   | 6                                                                | 6         | —              | —                                                                | —        |
| 2—60V                                                                                   | 10                                                               | 10        | —              | 2.5                                                              | 2.5      |
| 1—110V                                                                                  | 3                                                                | 3         | —              | —                                                                | —        |
| 3—110V                                                                                  | 6                                                                | 6         | —              | 1.5                                                              | 1.5      |
| 1—220V                                                                                  | 1                                                                | 1         | —              | —                                                                | —        |
| 3—220V                                                                                  | 5                                                                | 5         | —              | 0.5                                                              | 0.5      |
| DC13 L/R ≤50 ms                                                                         |                                                                  |           |                |                                                                  |          |
| Contacts in series—voltage:                                                             |                                                                  |           |                |                                                                  |          |
| 3—24V                                                                                   | 4                                                                | —         | —              | —                                                                | —        |
| 3—60V                                                                                   | 4                                                                | —         | —              | —                                                                | —        |
| 3—110V                                                                                  | 2                                                                | —         | —              | —                                                                | —        |
| 3—220V                                                                                  | 1                                                                | —         | —              | —                                                                | —        |
| Control circuit reliability<br>(at $U_o = 24$ Vdc, $U_{min} = 17$ , $I_{min} = 5.4$ mA) | Failure rate = $<10^{-8}$ , <1 failure in 100 million operations |           | —              | Failure rate = $<10^{-8}$ , <1 failure in 100 million operations |          |
| Conventional thermal current ( $I_{th}$ )                                               | 16                                                               | 16        | 6              | 10                                                               | 10       |
| Short-circuit rating without welding                                                    |                                                                  |           |                |                                                                  |          |
| Maximum overcurrent protective device                                                   |                                                                  |           |                |                                                                  |          |
| 220/240V—XTPR Frame B                                                                   | 4                                                                | —         | —              | 4                                                                | 4        |
| 380/415V—XTPR Frame B                                                                   | 4                                                                | —         | —              | 4                                                                | 4        |
| Short-circuit protection, max. fuse                                                     |                                                                  |           |                |                                                                  |          |
| 500V (A gG/gL)                                                                          | 10                                                               | 10        | 6              | 6                                                                | 6        |
| 500V (A fast)                                                                           | —                                                                | —         | —              | 10                                                               | 10       |
| Current heat losses at load of $I_{th}$                                                 |                                                                  |           |                |                                                                  |          |
| AC operated (W)                                                                         | 0.3                                                              | 0.3       | —              | 0.2                                                              | 0.2      |
| DC operated (W)                                                                         | 0.3                                                              | 0.3       | —              | 0.3                                                              | 0.3      |

**Note**

① Making and breaking conditions to DC13, time constant as stated.

## Relays and Timers, continued

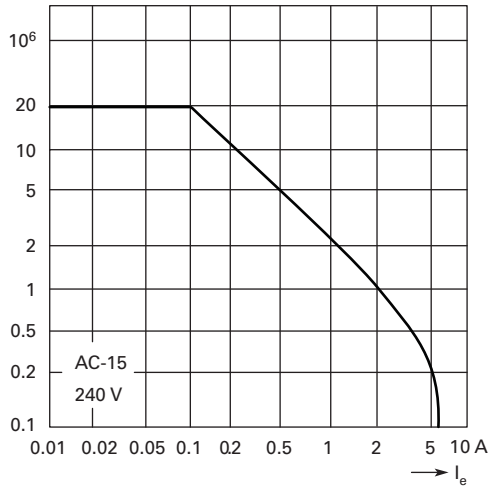
| Description                                                                    | XTRE    | XTCEXFAC_ | XTCEXTE_ | XTRM     | XTMCXFA_ |
|--------------------------------------------------------------------------------|---------|-----------|----------|----------|----------|
| <b>Magnet Systems</b>                                                          |         |           |          |          |          |
| Pickup and dropout values                                                      |         |           |          |          |          |
| AC operated                                                                    |         |           |          |          |          |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz (pickup x $U_c$ ) | 0.8–1.1 | —         | 0.85–1.1 | 0.8–1.1  | —        |
| Dual-frequency coil 50/60 Hz (pickup x $U_c$ )                                 | 0.8–1.1 | —         | —        | 0.85–1.1 | —        |
| DC operated <sup>①</sup>                                                       |         |           |          |          |          |
| Pickup voltage (pickup x $U_c$ )                                               | 0.8–1.1 | —         | 0.7–1.2  | 0.85–1.3 | —        |
| At 24V: without auxiliary contact module (40°C) (pickup x $U_c$ )              | 0.7–1.3 | —         | —        | 0.7–1.3  | —        |
| Power consumption                                                              |         |           |          |          |          |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz                   |         |           |          |          |          |
| Pickup VA                                                                      | 24      | —         | —        | 25       | —        |
| Pickup W                                                                       | 19      | —         | —        | 22       | —        |
| Sealing VA                                                                     | 3.4     | —         | 2        | 4.6      | —        |
| Sealing W                                                                      | 1.2     | —         | 1.8      | 1.3      | —        |
| Dual-frequency coil 50/60 Hz at 50 Hz                                          |         |           |          |          |          |
| Pickup VA                                                                      | 27      | —         | —        | 30       | —        |
| Pickup W                                                                       | 22      | —         | —        | 26       | —        |
| Sealing VA                                                                     | 4.2     | —         | —        | 5.4      | —        |
| Sealing W                                                                      | 1.4     | —         | —        | 1.6      | —        |
| Dual-frequency coil 50/60 Hz at 60 Hz                                          |         |           |          |          |          |
| Pickup VA                                                                      | 25      | —         | —        | 29       | —        |
| Pickup W                                                                       | 21      | —         | —        | 24       | —        |
| Sealing VA                                                                     | 3.3     | —         | —        | 3.9      | —        |
| Sealing W                                                                      | 1.2     | —         | —        | 1.2      | —        |
| DC operated                                                                    |         |           |          |          |          |
| Pull-in = sealing (W)                                                          | 3       | —         | —        | 2.6      | —        |
| Duty factor (% DF)                                                             | 100     | —         | 100      | 100      | —        |
| Switching times at 100% $U_c$ (approximate values)                             |         |           |          |          |          |
| AC operated closing delay (ms)                                                 | ≤21     | —         | —        | 14–21    | —        |
| AC operated NO contact opening delay (ms)                                      | ≤18     | —         | —        | 8–18     | —        |
| AC operated with auxiliary contact module, max. closing delay (ms)             | —       | —         | —        | 45       | 45       |
| DC operated closing delay (ms)                                                 | ≤31     | —         | —        | 26–35    | —        |
| DC operated NO contact opening delay (ms)                                      | ≤12     | —         | —        | 15–25    | —        |
| DC operated with auxiliary contact module, max. closing delay (ms)             | —       | —         | —        | 70       | 70       |

**Note**

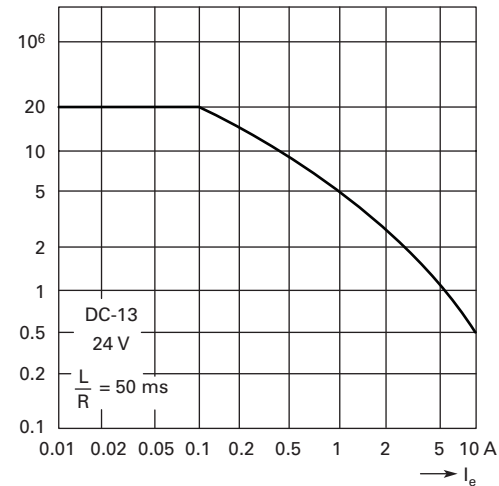
<sup>①</sup> Smoothed DC or three-phase bridge rectifier.

**Control Relays—Characteristic Curves****XTRE (AC-15)**

Component lifespan (operations)  
 $I_e$  = Rated operational current

**XTRE (DC-13) ①**

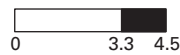
Component lifespan (operations)  
 $I_e$  = Rated operational current



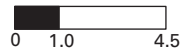
The diagrams show the closing and opening travel of the contact of the contactor relays and auxiliary contacts at no load. Tolerances are not taken into consideration.

**Contact Travel Diagrams****XTRE****XTRE\_ — AC Operation**

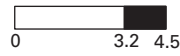
Normally open contact



Normally closed contact

**XTCEXFAC\_ — AC Operation**

Normally open contact



Normally closed contact

**XTCEXFALC\_ — AC Operation**

Normally open contact (early make)



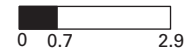
Normally closed contact (late make)

**XTRE — DC Operation**

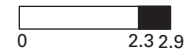
Normally open contact



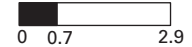
Normally closed contact

**XTCEXFAC\_ — DC Operation**

Normally open contact



Normally closed contact

**XTCEXFALC\_ — DC Operation**

Normally open contact (early make)

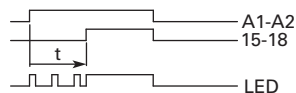
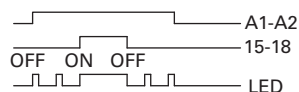
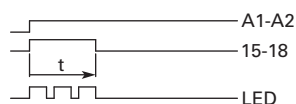
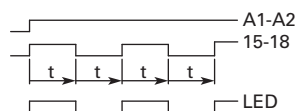
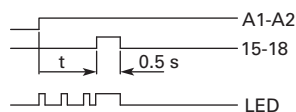
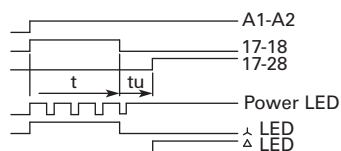


Normally closed contact (late make)

**Note**

① Making and breaking conditions to DC-13, time constant as stated.

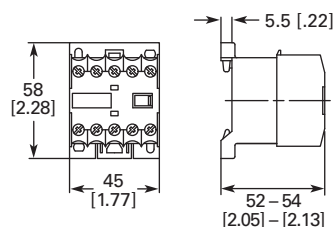
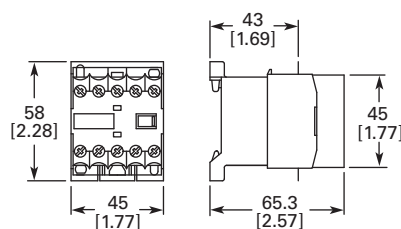
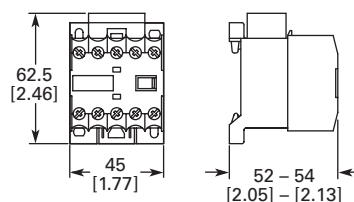
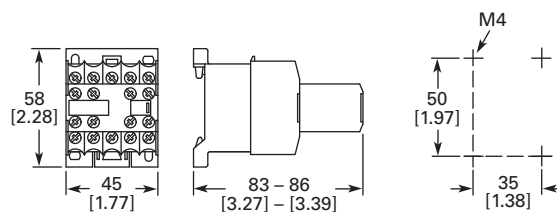


**Flow Diagrams—Electronic Timers, XTMT Mini Timers****On-Delay****ON-OFF Function****Fleeting Contact on Energization****Flashing, Pulse Initiating****Pulse Generating****Star-Delta (Wye-Delta) Timer****Star-Delta****Rating Data****Rating Data for Approved Types**

| Pilot Duty                 | General Use                 |
|----------------------------|-----------------------------|
| <b>Control Relays—XTMR</b> |                             |
| A600, P300                 | 10A–600 Vac<br>0.5A–250 Vdc |
| <b>Timers—XTMT, XTTR</b>   |                             |
| B300                       | 6A–250 Vac                  |

**Dimensions**

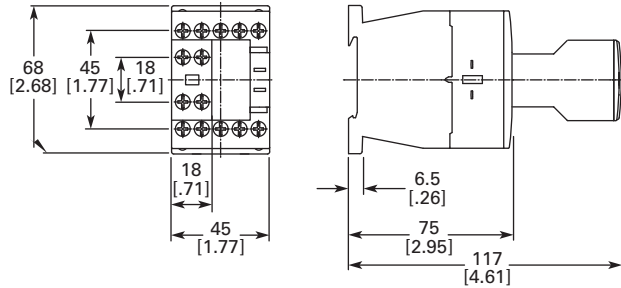
Approximate Dimensions in mm [in.]

**Mini Contactor Relays****Mini Control Relay XTRM****XTRM Mini Control Relay with IP40 XTMCX Shroud****XTRM Mini Control Relay with RC or Varistor Suppressor****XTRM Mini Control Relay with XTMCXFA Auxiliary Contact**

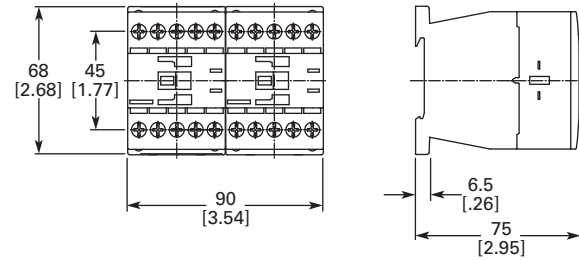
Approximate Dimensions in mm [in.]

### Control Relays

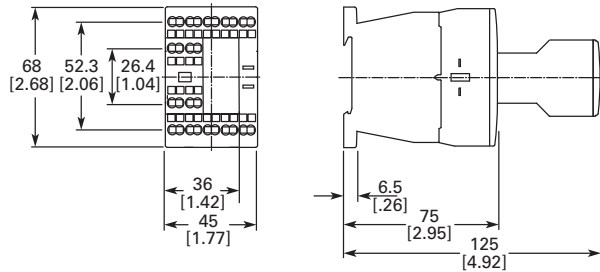
#### Control Relay XTRE with XTCEXFA Auxiliary Contact



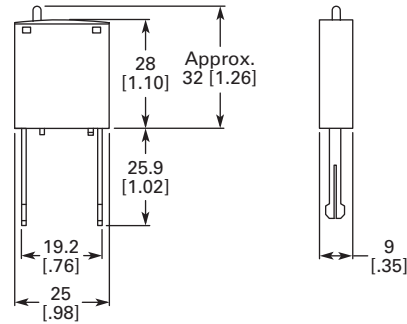
#### Control Relay XTRE with XTCEXMLB Mechanical Interlock



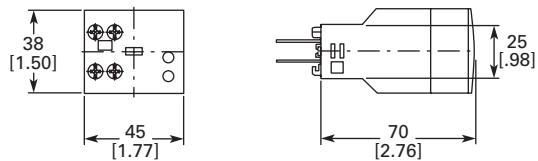
#### Control Relay with Spring Cage Terminals XTREC with XTCEXFA Auxiliary Contact



#### Coil Suppressors for Use with XTRE Control Relays



#### Electronic Timer Module XTCEXTE



## XTMC Miniature Contactor



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## Miniature Controls

## Product Description

Eaton's new line of **XT** miniature controls includes non-reversing and reversing mini contactors, mini overload relays and snap-on accessories. A wide range of applications is possible, including small electrical motors from fractional to 5 hp (460 Vac) or up to 4 kW (400 Vac).

## Application Description

Due to its compact size, the **XT** line of mini controls is best suited to be applied in light-duty loads, such as hoisting, packaging, material handling, heating, lighting and automation systems. **XT** mini contactors are a particularly compact, economic and environmentally friendly solution wherever control of small motors or loads is required.

## Features

**Mini Contactors—Types XTMC and XTMF, 6–9A**

- AC control from 12V to 550V 50 Hz, 600V 60 Hz
- DC control from 12V to 220V
- Reversing or non-reversing
- Three- and four-pole configurations
  - Three-pole XTMC
  - Four-pole XTMF
- Panel or DIN rail mounting
- IP20 finger and back-of-hand proof
- Low noise operation
- High degree of climatic proofing
- Large ambient temperature range –25° to 50°C [–13° to 122°F]

**Mini Overload Relays—Bimetallic Type XTOM**

- Phase failure sensitivity
- Direct mount to XTMC and XTMF mini contactors
- Trip Class 10
- 11 settings to cover 0.1 to 12A
- Ambient temperature compensated –5° to 50°C [23° to 122°F]
- Manual and automatic reset by selector switch
- One make (NO) or one break (NC) auxiliary contact as standard
- Test/Off button
- Trip-free release

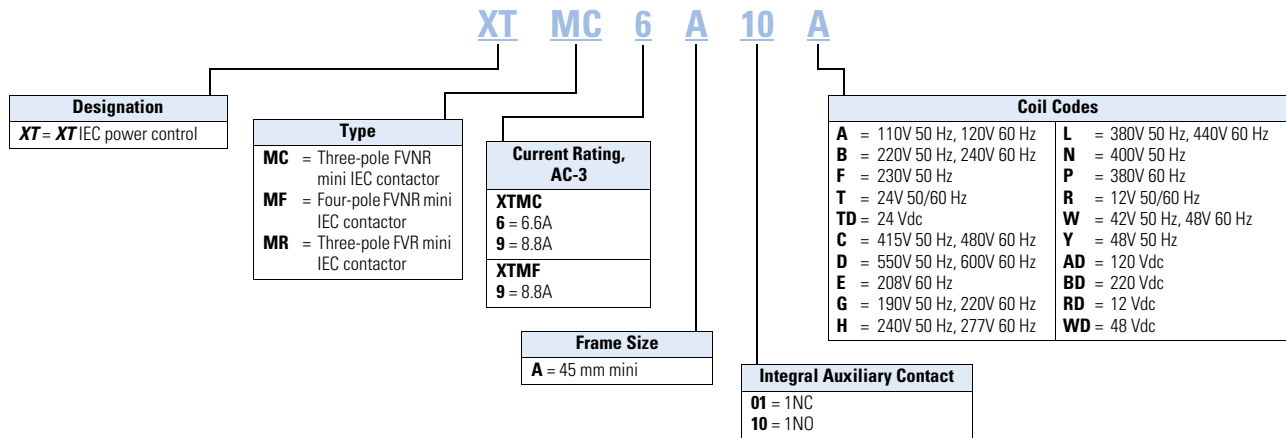
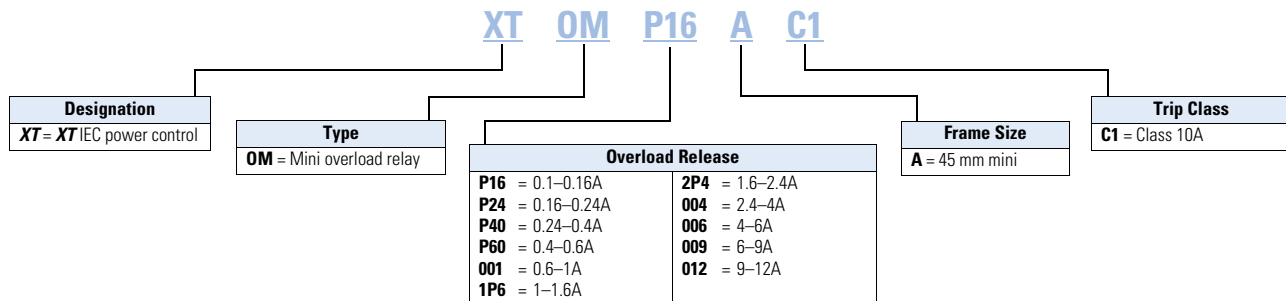
## Standards and Certifications

- IEC EN 60947
- CE approved
- UL
- CSA
- CCC



**Instructional Leaflets**

|             |                                                                     |
|-------------|---------------------------------------------------------------------|
| Pub51219    | XTMC, XTMF Mini Contactors, XTRM Mini Control Relay and Accessories |
| Pub51243    | XTOM Mini Overload Relays                                           |
| Pub51206    | Mini Reversing Link Kits                                            |
| MN03402002E | XTOM Mini Overload Relays Installation and User Manual              |

**Catalog Number Selection****XT IEC Miniature Contactors****XT IEC Miniature Overload Relays**

## Product Selection

## Full Voltage Non-Reversing Miniature Contactors

XTMC\_



## Maximum UL Ratings—Single-Phase and Three-Phase

## Horsepower Ratings

| Single-Phase |      | Three-Phase |       |      |      |      | Number of Power Poles | Auxiliary Contacts | Screw Terminal Catalog Number <sup>①</sup> |
|--------------|------|-------------|-------|------|------|------|-----------------------|--------------------|--------------------------------------------|
| 115V         | 200V | 230V        | 200V  | 230V | 460V | 575V |                       |                    |                                            |
| 1/4          | 3/4  | 1           | 1-1/2 | 2    | 3    | 3    | 3                     | 1NO                | XTMC6A10_                                  |
| 1/4          | 3/4  | 1           | 1-1/2 | 2    | 3    | 3    | 3                     | 1NC                | XTMC6A01_                                  |
| 1/2          | 1    | 1-1/2       | 2     | 3    | 5    | 5    | 3                     | 1NO                | XTMC9A10_                                  |
| 1/2          | 1    | 1-1/2       | 2     | 3    | 5    | 5    | 3                     | 1NC                | XTMC9A01_                                  |
| 1/2          | 1    | 1-1/2       | 2     | 3    | 5    | 5    | 4                     | —                  | XTMF9A00_                                  |

## Maximum IEC Ratings AC-3

| Operational Current<br>AC-3 Amp Rating<br>380/400V | Conventional Free<br>Air Thermal Current<br>AC-1 at 50°C | Three-Phase Motors 50–60 Hz |          |      |          | Number of Power Poles | Auxiliary Contacts | Screw Terminal Catalog Number <sup>①</sup> |
|----------------------------------------------------|----------------------------------------------------------|-----------------------------|----------|------|----------|-----------------------|--------------------|--------------------------------------------|
|                                                    |                                                          | 220–240V                    | 380–400V | 550V | 660/690V |                       |                    |                                            |
| 6.6                                                | 20                                                       | 1.5                         | 3        | 3    | 3        | 3                     | 1NO                | XTMC6A10_                                  |
| 6.6                                                | 20                                                       | 1.5                         | 3        | 3    | 3        | 3                     | 1NC                | XTMC6A01_                                  |
| 8.8                                                | 20                                                       | 2.2                         | 4        | 4    | 4        | 3                     | 1NO                | XTMC9A10_                                  |
| 8.8                                                | 20                                                       | 2.2                         | 4        | 4    | 4        | 3                     | 1NC                | XTMC9A01_                                  |
| 8.8                                                | 20                                                       | 2.2                         | 4        | 4    | 4        | 4                     | —                  | XTMF9A00_                                  |

## Magnet Coil Suffix

| Coil Voltage           | Suffix Code            | Coil Voltage           | Suffix Code           | Coil Voltage         | Suffix Code           | Coil Voltage | Suffix Code |
|------------------------|------------------------|------------------------|-----------------------|----------------------|-----------------------|--------------|-------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>               | 415V 50 Hz, 480V 60 Hz | <b>C</b>              | 380V 60 Hz           | <b>P</b>              | 120 Vdc      | <b>AD</b>   |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>               | 550V 50 Hz, 600V 60 Hz | <b>D</b> <sup>③</sup> | 12V 50/60 Hz         | <b>R</b> <sup>③</sup> | 220 Vdc      | <b>BD</b>   |
| 230V 50 Hz             | <b>F</b>               | 208V 60 Hz             | <b>E</b>              | 42V 50 Hz, 48V 60 Hz | <b>W</b>              | 12 Vdc       | <b>RD</b>   |
| 24V 50/60 Hz           | <b>T</b>               | 190V 50 Hz, 220V 60 Hz | <b>G</b>              | 48V 50 Hz            | <b>Y</b>              | 48 Vdc       | <b>WD</b>   |
| 24 Vdc                 | <b>TD</b> <sup>②</sup> | 240V 50 Hz, 277V 60 Hz | <b>H</b>              | —                    | —                     | —            | —           |
| —                      | —                      | 380V 50 Hz, 440V 60 Hz | <b>L</b>              | —                    | —                     | —            | —           |

## Notes

IEC Utilization Categories, see **Page V5-T1-249**.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel cage motors—starting, switching of motors during running.

AC-4: Squirrel cage motors—starting, plugging, inching.

<sup>①</sup> Underscore ( \_ ) indicates magnetic coil suffix required.<sup>②</sup> With DC operation: Integrated diode resistor combination, coil rating 2.6W.<sup>③</sup> XTMF four-pole contactor not available with “D” or “R” coil voltage suffix.

**Full Voltage Reversing Miniature Contactors**

XTMR\_

**Maximum UL Ratings—Single-Phase and Three-Phase****Horsepower Ratings****Single-Phase****115V 200V 230V****Three-Phase****200V 230V 460V 575V****Spare Auxiliary Contacts****K1M K2M****Catalog Number <sup>①②</sup>**

|     |     |       |       |   |   |   |                     |                     |           |
|-----|-----|-------|-------|---|---|---|---------------------|---------------------|-----------|
| 1/4 | 3/4 | 1     | 1-1/2 | 2 | 3 | 3 | —<br>163<br>—<br>64 | —<br>163<br>—<br>64 | XTMR6A21_ |
| 1/2 | 1   | 1-1/2 | 2     | 3 | 5 | 5 | —<br>163<br>—<br>64 | —<br>163<br>—<br>64 | XTMR9A21_ |

**Maximum IEC Ratings AC-3****Three-Phase Motors 50–60 Hz****Operational Current  
AC-3 Amp Rating  
380/400V****Conventional Free  
Air Thermal Current  
AC-1 at 50°C**

6.6

20

1.5

3

3

3

**Spare Auxiliary Contacts****K1M K2M****Catalog Number <sup>①②</sup>**

|     |    |     |   |   |   |                     |                     |           |
|-----|----|-----|---|---|---|---------------------|---------------------|-----------|
| 6.6 | 20 | 1.5 | 3 | 3 | 3 | —<br>163<br>—<br>64 | —<br>163<br>—<br>64 | XTMR6A21_ |
| 8.8 | 20 | 2.2 | 4 | 4 | 4 | —<br>163<br>—<br>64 | —<br>163<br>—<br>64 | XTMR9A21_ |

**Magnet Coil Suffix**

| Coil Voltage           | Suffix Code            | Coil Voltage           | Suffix Code           | Coil Voltage         | Suffix Code           | Coil Voltage | Suffix Code |
|------------------------|------------------------|------------------------|-----------------------|----------------------|-----------------------|--------------|-------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>               | 415V 50 Hz, 480V 60 Hz | <b>C</b>              | 380V 60 Hz           | <b>P</b>              | 120 Vdc      | <b>AD</b>   |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>               | 550V 50 Hz, 600V 60 Hz | <b>D</b> <sup>③</sup> | 12V 50/60 Hz         | <b>R</b> <sup>③</sup> | 220 Vdc      | <b>BD</b>   |
| 230V 50 Hz             | <b>F</b>               | 208V 60 Hz             | <b>E</b>              | 42V 50 Hz, 48V 60 Hz | <b>W</b>              | 12 Vdc       | <b>RD</b>   |
| 24V 50/60 Hz           | <b>T</b>               | 190V 50 Hz, 220V 60 Hz | <b>G</b>              | 48V 50 Hz            | <b>Y</b>              | 48 Vdc       | <b>WD</b>   |
| 24 Vdc                 | <b>TD</b> <sup>②</sup> | 240V 50 Hz, 277V 60 Hz | <b>H</b>              | —                    | —                     | —            | —           |
| —                      | —                      | 380V 50 Hz, 440V 60 Hz | <b>L</b>              | —                    | —                     | —            | —           |

**Notes**IEC Utilization Categories, see **Page V5-T1-249**.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel cage motors—starting, switching of motors during running.

AC-4: Squirrel cage motors—starting, plugging, inching.

<sup>①</sup> Underscore ( \_ ) indicates magnetic coil suffix required. See Magnet Coil Suffix table above.<sup>②</sup> The factory-installed reversing mini contactor includes (2) XTMC...01 contactors, (2) XTMCXFA20 2NO front-mount auxiliary contacts

(1) XTMCXRL reversing link kit and (1) XTMCXML mechanical interlock.

<sup>③</sup> XTMF four-pole contactor not available with "D" or "R" coil voltage suffix.

## Star-Delta (Wye-Delta) Miniature Contactors

XTMC\_



## Maximum Current UL Ratings—Single-Phase and Three-Phase ①

## Horsepower Ratings

| Single-Phase |      |       | Three-Phase |      |      | Maximum<br>Changeover<br>Time (sec.) | Spare Auxiliary Contacts<br>K1M | Component<br>Description | Catalog Number ②      |              |
|--------------|------|-------|-------------|------|------|--------------------------------------|---------------------------------|--------------------------|-----------------------|--------------|
| 115V         | 200V | 230V  | 200V        | 230V | 460V |                                      |                                 |                          |                       | 575V         |
| 1/2          | 1    | 1-1/2 | 2           | 3    | 5    | 7-1/2                                | 30                              |                          |                       |              |
|              |      |       |             |      |      |                                      |                                 | 21 31 53                 | K1M main contactor    | XTMC9A10_    |
|              |      |       |             |      |      |                                      |                                 | 22 32 54                 | K1M auxiliary contact | XTMCXFC22    |
|              |      |       |             |      |      |                                      |                                 |                          | K5M delta contactor   | XTMC9A01_    |
|              |      |       |             |      |      |                                      |                                 |                          | K3M star contactor    | XTMC9A10_    |
|              |      |       |             |      |      |                                      |                                 |                          | K3M auxiliary contact | XTMCXFC02    |
|              |      |       |             |      |      |                                      |                                 |                          | K1T timing relay      | XTTR6A60S51B |

## Maximum IEC Ratings AC-3 ①

## Horsepower Ratings

| Three-Phase Motors 50–60 Hz |              |      | Maximum<br>Changeover<br>Time (sec.) | Spare Auxiliary Contacts<br>K1M               | Component<br>Description | Catalog Number ② |
|-----------------------------|--------------|------|--------------------------------------|-----------------------------------------------|--------------------------|------------------|
| 220/230/240V                | 380/400/440V | 500V |                                      |                                               |                          |                  |
| 4                           | 5.5          | 5.5  | 30                                   | <div><div>213153</div><div>223254</div></div> | K1M main contactor       | XTMC9A10_        |
|                             |              |      |                                      |                                               | K1M auxiliary contact    | XTMCXFC22        |
|                             |              |      |                                      |                                               | K5M delta contactor      | XTMC9A01_        |
|                             |              |      |                                      |                                               | K3M star contactor       | XTMC9A10_        |
|                             |              |      |                                      |                                               | K3M auxiliary contact    | XTMCXFC02        |
|                             |              |      |                                      |                                               | K1T timing relay         | XTTR6A60S51B     |

## Mini Overload Relay Settings (A)

| Setting                                                                            | Starting      |
|------------------------------------------------------------------------------------|---------------|
| <b>A:</b> $I_N \times 0.58$<br>Motor protection in the Y and delta configurations. | $\leq 15$ sec |
| <b>B:</b> $I_N \times 1$<br>Only partial motor protection in star position         | 15–40 sec     |
| <b>C:</b> $I_N \times 0.58$<br>Motor not protected in star position.               | $> 40$ sec    |
| Timing relay set to approximately 10 sec.                                          |               |

## Notes

Depending on the coordination type required (that is, Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

① Operating frequency: 30 starts/hour. See Magnet Coil Suffix table on following page.

② Underscore ( ) indicates magnet coil suffix required.

## Magnet Coil Suffix

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz             | <b>F</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24 Vdc                 | <b>TD</b> ① |
| —                      | —           |

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 550V 50 Hz, 600V 60 Hz | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>    |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>    |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>    |

| Coil Voltage         | Suffix Code |
|----------------------|-------------|
| 400V 50 Hz           | <b>N</b>    |
| 380V 60 Hz           | <b>P</b>    |
| 12V 50/60 Hz         | <b>R</b>    |
| 24V 50 Hz            | <b>U</b>    |
| 42V 50 Hz, 48V 60 Hz | <b>W</b>    |
| 48V 50 Hz            | <b>Y</b>    |

| Coil Voltage | Suffix Code |
|--------------|-------------|
| 120 Vdc      | <b>AD</b>   |
| 220 Vdc      | <b>BD</b>   |
| 12 Vdc       | <b>RD</b>   |
| 48 Vdc       | <b>WD</b>   |
| —            | —           |
| —            | —           |

## Mini Overload Relays

XTOM\_

## Mini Overload Relays ②③



| Overload Release I <sub>n</sub> | Trip Class | Contact Sequence | Contact Configuration | Short-Circuit Protection (A) |                            | Circuit Breaker | CEC/NEC Fuse | Catalog Number    |
|---------------------------------|------------|------------------|-----------------------|------------------------------|----------------------------|-----------------|--------------|-------------------|
|                                 |            |                  |                       | Type 1 Coordination, gG/gL   | Type 2 Coordination, gG/gL |                 |              |                   |
| 0.1–0.16A                       | 10A        |                  | 1NO-1NC               | 20                           | 0.5                        | 15              | —            | <b>XTOMP16AC1</b> |
| 0.16–0.24A                      | 10A        |                  | 1NO-1NC               | 20                           | 1                          | 15              | —            | <b>XTOMP24AC1</b> |
| 0.24–0.4A                       | 10A        |                  | 1NO-1NC               | 20                           | 2                          | 15              | —            | <b>XTOMP40AC1</b> |
| 0.4–0.6A                        | 10A        |                  | 1NO-1NC               | 20                           | 2                          | 15              | —            | <b>XTOMP60AC1</b> |
| 0.6–1A                          | 10A        |                  | 1NO-1NC               | 20                           | 4                          | 15              | 3            | <b>XTOM001AC1</b> |
| 1–1.6A                          | 10A        |                  | 1NO-1NC               | 20                           | 6                          | 15              | 6            | <b>XTOM1P6AC1</b> |
| 1.6–2.4A                        | 10A        |                  | 1NO-1NC               | 20                           | 6                          | 15              | 6            | <b>XTOM2P4AC1</b> |
| 2.4–4A                          | 10A        |                  | 1NO-1NC               | 20                           | —                          | 15              | 15           | <b>XTOM004AC1</b> |
| 4–6A                            | 10A        |                  | 1NO-1NC               | 20                           | —                          | 15              | 20           | <b>XTOM006AC1</b> |
| 6–9A                            | 10A        |                  | 1NO-1NC               | 20                           | —                          | 15              | 35           | <b>XTOM009AC1</b> |
| 9–12A                           | 10A        |                  | 1NO-1NC               | —                            | —                          | —               | 45           | <b>XTOM012AC1</b> |

## Notes

- ① With DC operation: Integrated diode resistor combination, coil rating 2.6W.
- ② Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402002E for more information.
- ③ When fitted directly to the contactor, a clearance of at least 5 mm is required between the overload relays.

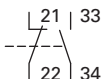
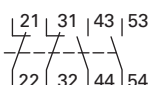
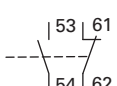
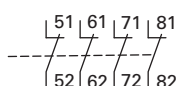
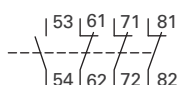
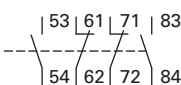
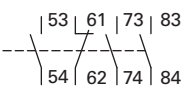
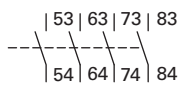
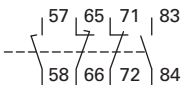


## Accessories

**Auxiliary Contacts**

Front-mounted snap-on auxiliary contacts for mini contactors are available with screw terminals in a variety of contact configurations. Auxiliary contact modules are standard with interlocked opposing contacts, except in the case of early-make or late-break contacts.

**Front-Mount Auxiliary Contacts for Use with Mini Contactors**

| Conventional Free Air Thermal Current, $I_{th} = I_e$ , AC-1 in Amps | Contact Configuration                         | Contact Sequence                                                                    | Pkg. Qty. ① | Screw Terminal Catalog Number |
|----------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------------------|-------------|-------------------------------|
| 10                                                                   | 2NC                                           |    | 5           | <b>XTMCXFC02</b>              |
| 10                                                                   | 1NO-1NC                                       |    | 5           | <b>XTMCXFD11</b>              |
| 10                                                                   | 2NO-2NC                                       |    | 5           | <b>XTMCXFC22</b>              |
| 10                                                                   | 2NC                                           |    | 5           | <b>XTMCXFA02</b>              |
| 10                                                                   | 1NO-1NC                                       |   | 5           | <b>XTMCXFA11</b>              |
| 10                                                                   | 2NO                                           |  | 5           | <b>XTMCXFA20</b>              |
| 10                                                                   | 4NC                                           |  | 5           | <b>XTMCXFA04</b>              |
| 10                                                                   | 1NO-3NC                                       |  | 5           | <b>XTMCXFA13</b>              |
| 10                                                                   | 2NO-2NC                                       |  | 5           | <b>XTMCXFA22</b>              |
| 10                                                                   | 3NO-1NC                                       |  | 5           | <b>XTMCXFA31</b>              |
| 10                                                                   | 4NO                                           |  | 5           | <b>XTMCXFA40</b>              |
| 10                                                                   | 1NO-1NC<br>1NO <sub>E</sub> -1NC <sub>L</sub> |  | 5           | <b>XTMCXFA22 ②</b>            |

**Notes**

① Orders must be placed in multiples of package quantity listed.

② One early-make contact (NO<sub>E</sub>), one late-break contact (NC<sub>L</sub>).

**Suppressors**

XTMCXR\_

XTMC Relay with  
Installed Suppressor**RC Suppressor** ①

| Voltage | For Use with...    | Circuit Symbol | Pkg. Qty. ② | Catalog Number  |
|---------|--------------------|----------------|-------------|-----------------|
| 24–48   | XTMC6A_<br>XTMC9A_ |                | 10          | <b>XTMCXRSW</b> |
| 48–130  | XTMC6A_<br>XTMC9A_ |                | 10          | <b>XTMCXRSA</b> |
| 110–250 | XTMC6A_<br>XTMC9A_ |                | 10          | <b>XTMCXRSB</b> |

XTMCX\_

XTMC Relay with  
Installed Suppressor**Varistor Suppressor** ③

| Voltage | For Use with...    | Circuit Symbol | Pkg. Qty. ② | Catalog Number  |
|---------|--------------------|----------------|-------------|-----------------|
| 24–48   | XTMC6A_<br>XTMC9A_ |                | 10          | <b>XTMCXVSW</b> |
| 48–130  | XTMC6A_<br>XTMC9A_ |                | 10          | <b>XTMCXVSA</b> |
| 110–250 | XTMC6A_<br>XTMC9A_ |                | 10          | <b>XTMCXVSB</b> |
| 380–415 | XTMC6A_<br>XTMC9A_ |                | 10          | <b>XTMCXVSN</b> |

**Mechanical Interlock**

XTMCXML

**Mechanical Interlock**

| Description          | Pkg. Qty. ② | Catalog Number |
|----------------------|-------------|----------------|
| Mechanical interlock | 5           | <b>XTMCXML</b> |

**Notes**

For two contactors with AC or DC operated magnet system that are horizontally or vertically mounted, the distance between contactors is 0 mm and the mechanical lifespan is  $2.5 \times 10^6$  operations.

① For AC operated contactors, 50/60 Hz. Note dropout delay.

② Orders must be placed in multiples of package quantity listed.

③ For AC operated contactors, 50/60 Hz. DC operated contactors have integrated varistor suppressors.

**Additional Accessories****XTMCXRL****Reversing Link Kit** <sup>①②</sup>

| Description                                               | Pkg. Qty. <sup>③</sup> | Catalog Number |
|-----------------------------------------------------------|------------------------|----------------|
| Main current wiring for reversing contactors and starters | 1                      | <b>XTMCXRL</b> |

**XTMCXSDL****Star-Delta (Wye-Delta) Link Kit** <sup>④⑤</sup>

| Description                                                                                 | Pkg. Qty. <sup>③</sup> | Catalog Number  |
|---------------------------------------------------------------------------------------------|------------------------|-----------------|
| Main current wiring for star-delta (wye-delta) combinations. Includes the star-delta bridge | 1                      | <b>XTMCXSDL</b> |

**XTMCXC�****Connector**

| Description                                                             | Pkg. Qty. <sup>③</sup> | Catalog Number              |
|-------------------------------------------------------------------------|------------------------|-----------------------------|
| For mechanically arranging contactors and timing relays in combinations | 50                     | <b>XTMCXC�</b> <sup>⑥</sup> |

**XTMCXSHROUD****IP40 Sealable Transparent Shroud**

| Description                                                      | Pkg. Qty. <sup>③</sup> | Catalog Number     |
|------------------------------------------------------------------|------------------------|--------------------|
| IP40 sealable transparent shroud, snap fitting on mini contactor | 1                      | <b>XTMCXSHROUD</b> |

**Notes**

- ① The following control cables are integrated as part of the electrical interlock: K1M: A1–K2M: 21; K1M: 21–K2M: A1
- ② Reversing link kit does not include mechanical interlock. See Mechanical Interlock.
- ③ Orders must be placed in multiples of package quantity listed.
- ④ The following control cables are integrated in addition to the electrical interlock: K3M: A1–K5M: 21; K3M: 21–K5M: A1; K3M: A2–K5M: A2
- ⑤ When combined with overload relay, use separate mounting.
- ⑥ 0 mm distance between contactors.

## Technical Data and Specifications

### XT Miniature Controls—General

| Description                                          | XTMC6A_<br>AC Coils                        | DC Coils                                   | XTMC9A_<br>AC Coils                        | DC Coils                                   | XTMF9A_<br>AC Coils                        | DC Coils                                   |
|------------------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| <b>Physical and Electrical</b>                       |                                            |                                            |                                            |                                            |                                            |                                            |
| Standards                                            | IEC/EN 60947,<br>VDE 0660, CSA,<br>UL, CCC | IEC/EN 60947,<br>VDE 0660, CSA,<br>UL, CCC | IEC/EN 60947,<br>VDE 0660, CSA,<br>UL, CCC | IEC/EN 60947,<br>VDE 0660, CSA,<br>UL, CCC | IEC/EN 60947,<br>VDE 0660, CSA,<br>UL, CCC | IEC/EN 60947,<br>VDE 0660, CSA,<br>UL, CCC |
| Weights in kg [lb]                                   | 0.2 [0.44]                                 | 0.17 [0.37]                                | 0.2 [0.44]                                 | 0.17 [0.34]                                | 0.2 [0.44]                                 | 0.17 [0.37]                                |
| Mechanical life—operations                           | 10,000,000                                 | 20,000,000                                 | 10,000,000                                 | 20,000,000                                 | 10,000,000                                 | 10,000,000                                 |
| Mechanical life—coil at 50 Hz                        | 7                                          | —                                          | 7                                          | —                                          | 7                                          | —                                          |
| Maximum mechanical operating frequency (ops/hr)      | 9000                                       | 9000                                       | 9000                                       | 9000                                       | 9000                                       | 9000                                       |
| Insulation voltage (U <sub>i</sub> ) Vac             | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac    | 6000                                       | 6000                                       | 6000                                       | 6000                                       | 6000                                       | 6000                                       |
| Operational Voltage (U <sub>e</sub> ) Vac            | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1  |                                            |                                            |                                            |                                            |                                            |                                            |
| Between coil and contacts (Vac)                      | 300                                        | 300                                        | 300                                        | 300                                        | 300                                        | 300                                        |
| Between contacts (Vac)                               | 300                                        | 300                                        | 300                                        | 300                                        | 300                                        | 300                                        |
| Making capacity (amps)                               | 110                                        | 110                                        | 110                                        | 110                                        | 110                                        | 110                                        |
| Breaking capacity (amps)                             |                                            |                                            |                                            |                                            |                                            |                                            |
| 220/230V                                             | 90                                         | 90                                         | 90                                         | 90                                         | 90                                         | 90                                         |
| 380/400V                                             | 90                                         | 90                                         | 90                                         | 90                                         | 90                                         | 90                                         |
| 500V                                                 | 64                                         | 64                                         | 64                                         | 64                                         | 64                                         | 64                                         |
| 660/690V                                             | 54                                         | 54                                         | 54                                         | 54                                         | 54                                         | 54                                         |
| Short-circuit protection rating maximum fuse (gL/gG) |                                            |                                            |                                            |                                            |                                            |                                            |
| Type 2 coordination (A)                              | 10                                         | 10                                         | 10                                         | 10                                         | 10                                         | 10                                         |
| Type 1 coordination (A)                              | 20                                         | 20                                         | 20                                         | 20                                         | 20                                         | 20                                         |
| Degree of protection                                 | IP20                                       | IP20                                       | IP20                                       | IP20                                       | IP20                                       | IP20                                       |
| Flexible with ferrule (mm <sup>2</sup> )             | 1 x (0.75–1.5)<br>2 x (0.75–1.5)           | 1 x (0.75–1.5)<br>2 x (0.75–1.5)           | 1 x (0.75–1.5)<br>2 x (0.75–1.5)           | 1 x (0.75–1.5)<br>2 x (0.75–1.5)           | 1 x (0.75–1.5)<br>2 x (0.75–1.5)           | 1 x (0.75–1.5)<br>2 x (0.75–1.5)           |
| Solid or stranded (AWG)                              | 18–14                                      | 18–14                                      | 18–14                                      | 18–14                                      | 18–14                                      | 18–14                                      |
| Terminal screw                                       | M3.5                                       | M3.5                                       | M3.5                                       | M3.5                                       | M3.5                                       | M3.5                                       |
| Pozidriv screwdriver                                 | Size 2                                     | Size 2                                     | Size 2                                     | Size 2                                     | Size 2                                     | Size 2                                     |
| Standard screwdriver (mm)                            | 0.8 x 5.5<br>1 x 6                         | 0.8 x 5.5<br>1 x 6                         | 0.8 x 5.5<br>1 x 6                         | 0.8 x 5.5<br>1 x 6                         | 0.8 x 5.5<br>1 x 6                         | 0.8 x 5.5<br>1 x 6                         |
| Max. tightening torque                               |                                            |                                            |                                            |                                            |                                            |                                            |
| Nm                                                   | 1.2                                        | 1.2                                        | 1.2                                        | 1.2                                        | 1.2                                        | 1.2                                        |
| Lb-in                                                | 10.6                                       | 10.6                                       | 10.6                                       | 10.6                                       | 10.6                                       | 10.6                                       |
| Terminal capacity of spring cage main terminals      |                                            |                                            |                                            |                                            |                                            |                                            |
| Solid (mm <sup>2</sup> )                             | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 |
| Flexible with ferrule (mm <sup>2</sup> )             | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 | 1 x (1–2.5)<br>2 x (1–2.5)                 |
| Standard screwdriver (mm)                            | 0.6 x 3.5                                  | 0.6 x 3.5                                  | 0.6 x 3.5                                  | 0.6 x 3.5                                  | 0.6 x 3.5                                  | 0.6 x 3.5                                  |
| Mounting position                                    | ①                                          | ①                                          | ①                                          | ①                                          | ①                                          | ①                                          |

#### Note

① As required, except vertical with terminals A1/A2 at the bottom.



## XT Miniature Controls—General, continued

| Description                                     | XTMC6A_<br>AC Coils             | DC Coils                        | XTMC9A_<br>AC Coils             | DC Coils                        | XTMF9A_<br>AC Coils             | DC Coils                        |
|-------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>Environmental</b>                            |                                 |                                 |                                 |                                 |                                 |                                 |
| Ambient temperature                             | –25° to 50°C<br>[–13° to 122°F] | –25° to 50°C<br>[–13° to 122°F] | –25° to 50°C<br>[–13° to 122°F] | –25° to 50°C<br>[–13° to 122°F] | –25° to 50°C<br>[–13° to 122°F] | –25° to 50°C<br>[–13° to 122°F] |
| Mechanical shock resistance (IEC/EN 60068-2-27) |                                 |                                 |                                 |                                 |                                 |                                 |
| Half-sinusoidal shock 10 ms                     |                                 |                                 |                                 |                                 |                                 |                                 |
| Contactor without auxiliary contact module      |                                 |                                 |                                 |                                 |                                 |                                 |
| Main contact—make contact                       | 10g                             | 10g                             | 10g                             | 10g                             | 10g                             | 10g                             |
| Main contact—break/make contact                 | 10/8g                           | 10/8g                           | 10/8g                           | 10/8g                           | —                               | —                               |
| Contactor with auxiliary contact module         |                                 |                                 |                                 |                                 |                                 |                                 |
| Main contact—make contact                       | 10g                             | 10g                             | 10g                             | 10g                             | 10g                             | 10g                             |
| Main contact—make/break contact                 | 20/20g                          | 20/20g                          | 20/20g                          | 20/20g                          | 20/20g                          | 20/20g                          |
| Climatic proofing                               | ①                               | ①                               | ①                               | ①                               | ①                               | ①                               |
| Pollution degree                                | III/3                           | III/3                           | III/3                           | III/3                           | III/3                           | III/3                           |

**Note**

① Damp heat, constant, to IEC 60 068-2-78; damp heat, cyclic, to IEC 60 068-2-30.

## XT Miniature Controls—Magnet Systems

| Description                                                  | XTMC6A_<br>AC Coils | DC Coils | XTMC9A_<br>AC Coils | DC Coils | XTMF9A_<br>AC Coils | DC Coils |
|--------------------------------------------------------------|---------------------|----------|---------------------|----------|---------------------|----------|
| <b>Voltage Tolerance</b>                                     |                     |          |                     |          |                     |          |
| Pickup (x U <sub>c</sub> )                                   |                     |          |                     |          |                     |          |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz | 0.8–1.1             | —        | 0.8–1.1             | —        | 0.8–1.1             | —        |
| Dual frequency coil 50/60 Hz                                 | 0.85–1.1            | —        | 0.85–1.1            | —        | 0.85–1.1            | —        |
| DC operated <sup>①</sup>                                     | —                   | 0.8–1.1  | —                   | 0.8–1.1  | —                   | 0.85–1.1 |
| <b>Power Consumption</b>                                     |                     |          |                     |          |                     |          |
| AC operation                                                 |                     |          |                     |          |                     |          |
| Pickup VA                                                    |                     |          |                     |          |                     |          |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz | 25                  | —        | 25                  | —        | 25                  | —        |
| Dual frequency coil 50/60 Hz at 50 Hz                        | 30                  | —        | 30                  | —        | 30                  | —        |
| Dual frequency coil 50/60 Hz at 60 Hz                        | 29                  | —        | 29                  | —        | 29                  | —        |
| Pickup W                                                     |                     |          |                     |          |                     |          |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz | 22                  | —        | 22                  | —        | 22                  | —        |
| Dual frequency coil 50/60 Hz at 50 Hz                        | 26                  | —        | 26                  | —        | 26                  | —        |
| Dual frequency coil 50/60 Hz at 60 Hz                        | 24                  | —        | 24                  | —        | 24                  | —        |
| Sealing VA                                                   |                     |          |                     |          |                     |          |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz | 4.6                 | —        | 4.6                 | —        | 4.6                 | —        |
| Dual frequency coil 50/60 Hz at 50 Hz                        | 5.4                 | —        | 5.4                 | —        | 5.4                 | —        |
| Dual frequency coil 50/60 Hz at 60 Hz                        | 3.9                 | —        | 3.9                 | —        | 3.9                 | —        |
| Sealing W                                                    |                     |          |                     |          |                     |          |
| Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz | 1.3                 | —        | 1.3                 | —        | 1.3                 | —        |
| Dual frequency coil 50/60 Hz at 50 Hz                        | 1.6                 | —        | 1.6                 | —        | 1.6                 | —        |
| Dual frequency coil 50/60 Hz at 60 Hz                        | 1.1                 | —        | 1.1                 | —        | 1.1                 | —        |
| DC operated <sup>①</sup>                                     |                     |          |                     |          |                     |          |
| Power consumption pickup = sealing (VA/W)                    | —                   | 2.6      | —                   | 2.6      | —                   | 2.6      |
| Duty factor (%)                                              | 100                 | 100      | 100                 | 100      | 100                 | 100      |
| <b>Switching Time at 100% U<sub>c</sub></b>                  |                     |          |                     |          |                     |          |
| Make contact                                                 |                     |          |                     |          |                     |          |
| Closing delay min. (ms)                                      | 14                  | 26       | 14                  | 26       | 14                  | 26       |
| Closing delay max. (ms)                                      | 21                  | 35       | 21                  | 35       | 21                  | 35       |
| Opening delay min. (ms)                                      | 8                   | 15       | 8                   | 15       | 8                   | 15       |
| Opening delay max. (ms)                                      | 18                  | 25       | 18                  | 25       | 18                  | 25       |
| Closing delay with top-mounting auxiliary contact (ms)       | Max. 45             | Max. 70  | Max. 45             | Max. 70  | Max. 45             | Max. 70  |
| <b>Reversing Contactors</b>                                  |                     |          |                     |          |                     |          |
| Changeover time at 100% U <sub>c</sub>                       |                     |          |                     |          |                     |          |
| Minimum (ms)                                                 | 16                  | 40       | 16                  | 40       | 16                  | 40       |
| Maximum (ms)                                                 | 21                  | 50       | 21                  | 50       | 21                  | 50       |
| Arcing time at 690 Vac (ms)                                  | Max. 12             | Max. 12  | Max. 12             | Max. 12  | Max. 12             | Max. 12  |

**Note**

<sup>①</sup> Smoothed DC or three-phase bridge rectifier.

## XT Miniature Controls

| Description                                                               | XTMC6A_<br>AC Coils | DC Coils | XTMC9A_<br>AC Coils | DC Coils | XTMF9A_<br>AC Coils | DC Coils |
|---------------------------------------------------------------------------|---------------------|----------|---------------------|----------|---------------------|----------|
| <b>AC-1 Operation</b>                                                     |                     |          |                     |          |                     |          |
| Conventional free air thermal current, three-pole, 50–60 Hz (A)           |                     |          |                     |          |                     |          |
| at 40°C ( $I_{th}$ )                                                      | 22                  | 22       | 22                  | 22       | 22                  | 22       |
| at 50°C ( $I_{th}$ )                                                      | 20                  | 20       | 20                  | 20       | 20                  | 20       |
| at 55°C ( $I_{th}$ )                                                      | 19                  | 19       | 19                  | 19       | 19                  | 19       |
| Conventional free air thermal current, single-pole ( $I_{th}$ )           | 50                  | 50       | 50                  | 50       | 60                  | 60       |
| <b>AC-3 Operation</b>                                                     |                     |          |                     |          |                     |          |
| Rated operational current, 50/60 Hz <sup>①</sup> ( $I_b$ ) in amperes (A) |                     |          |                     |          |                     |          |
| 220/230V                                                                  | 6.6                 | 6.6      | 9.0                 | 9.0      | 9.0                 | 9.0      |
| 240V                                                                      | 6.6                 | 6.6      | 9.0                 | 9.0      | 9.0                 | 9.0      |
| 380/400V                                                                  | 6.6                 | 6.6      | 9.0                 | 9.0      | 9.0                 | 9.0      |
| 415V                                                                      | 6.6                 | 6.6      | 9.0                 | 9.0      | 9.0                 | 9.0      |
| 440V                                                                      | 6.6                 | 6.6      | 9.0                 | 9.0      | 9.0                 | 9.0      |
| 500V                                                                      | 5.0                 | 5.0      | 6.4                 | 6.4      | 6.4                 | 6.4      |
| 660/690V                                                                  | 3.5                 | 3.5      | 4.8                 | 4.8      | 4.8                 | 4.8      |
| Rated power (P) in kilowatts (kW)                                         |                     |          |                     |          |                     |          |
| 220/230V                                                                  | 1.5                 | 1.5      | 2.2                 | 2.2      | 2.2                 | 2.2      |
| 240V                                                                      | 1.8                 | 1.8      | 2.5                 | 2.5      | 2.5                 | 2.5      |
| 380/400V                                                                  | 3.0                 | 3.0      | 4.0                 | 4.0      | 4.0                 | 4.0      |
| 415V                                                                      | 3.1                 | 3.1      | 4.3                 | 4.3      | 4.3                 | 4.3      |
| 440V                                                                      | 3.3                 | 3.3      | 4.6                 | 4.6      | 4.6                 | 4.6      |
| 500V                                                                      | 3.0                 | 3.0      | 4.0                 | 4.0      | 4.0                 | 4.0      |
| 660/690V                                                                  | 3.0                 | 3.0      | 4.0                 | 4.0      | 4.0                 | 4.0      |
| <b>AC-4 Operation</b>                                                     |                     |          |                     |          |                     |          |
| Rated operational current, 50/60 Hz <sup>①</sup> ( $I_b$ ) in amperes (A) |                     |          |                     |          |                     |          |
| 220/230V                                                                  | 5.0                 | 5.0      | 6.6                 | 6.6      | 6.6                 | 6.6      |
| 240V                                                                      | 5.0                 | 5.0      | 6.6                 | 6.6      | 6.6                 | 6.6      |
| 380/400V                                                                  | 5.0                 | 5.0      | 6.6                 | 6.6      | 6.6                 | 6.6      |
| 415V                                                                      | 5.0                 | 5.0      | 6.6                 | 6.6      | 6.6                 | 6.6      |
| 440V                                                                      | 5.0                 | 5.0      | 6.6                 | 6.6      | 6.6                 | 6.6      |
| 500V                                                                      | 3.7                 | 3.7      | 5.0                 | 5.0      | 5.0                 | 5.0      |
| 660/690V                                                                  | 2.9                 | 2.9      | 3.4                 | 3.4      | 3.4                 | 3.4      |
| Rated power (P) in kilowatts (kW)                                         |                     |          |                     |          |                     |          |
| 220/230V                                                                  | 1.1                 | 1.1      | 1.5                 | 1.5      | 1.5                 | 1.5      |
| 240V                                                                      | 1.3                 | 1.3      | 1.8                 | 1.8      | 1.8                 | 1.8      |
| 380/400V                                                                  | 2.2                 | 2.2      | 3.0                 | 3.0      | 3.0                 | 3.0      |
| 415V                                                                      | 2.3                 | 2.3      | 3.1                 | 3.1      | 3.1                 | 3.1      |
| 440V                                                                      | 2.4                 | 2.4      | 3.3                 | 3.3      | 3.3                 | 3.3      |
| 500V                                                                      | 2.2                 | 2.2      | 3.0                 | 3.0      | 3.0                 | 3.0      |
| 660/690V                                                                  | 2.2                 | 2.2      | 3.0                 | 3.0      | 3.0                 | 3.0      |
| <b>DC-1 Operation <sup>②</sup></b>                                        |                     |          |                     |          |                     |          |
| 12V                                                                       | 20                  | 20       | 20                  | 20       | —                   | —        |
| 24V                                                                       | 20                  | 20       | 20                  | 20       | —                   | —        |
| 60V                                                                       | 20                  | 20       | 20                  | 20       | —                   | —        |
| 110V                                                                      | 20                  | 20       | 20                  | 20       | —                   | —        |
| 220V                                                                      | 20                  | 20       | 20                  | 20       | —                   | —        |

**Notes**

① At maximum permissible ambient temperature.

② Rated operation current ( $I_b$ ) in amperes, at maximum permissible ambient temperature.

## XT Miniature Controls, continued

| Description                                             | XTMC6A_<br>AC Coils | DC Coils | XTMC9A_<br>AC Coils | DC Coils | XTMF9A_<br>AC Coils | DC Coils |
|---------------------------------------------------------|---------------------|----------|---------------------|----------|---------------------|----------|
| <b>DC-3 Operation</b> <sup>①</sup>                      |                     |          |                     |          |                     |          |
| 12V                                                     | 6                   | 6        | 8                   | 8        | —                   | —        |
| 24V                                                     | 6                   | 6        | 8                   | 8        | —                   | —        |
| 60V                                                     | 3                   | 3        | 4                   | 4        | —                   | —        |
| 110V                                                    | 2                   | 2        | 3                   | 3        | —                   | —        |
| 220V                                                    | —                   | —        | —                   | —        | 1.0                 | 1.0      |
| <b>DC-4 Operation</b> <sup>①</sup>                      |                     |          |                     |          |                     |          |
| 12V                                                     | 1.8                 | 1.8      | 2.5                 | 2.5      | —                   | —        |
| 24V                                                     | 1.8                 | 1.8      | 2.5                 | 2.5      | —                   | —        |
| 60V                                                     | 1.8                 | 1.8      | 2.5                 | 2.5      | —                   | —        |
| 110V                                                    | 1.1                 | 1.1      | 1.5                 | 1.5      | 2.5                 | 2.5      |
| 220V                                                    | 0.2                 | 0.2      | 0.3                 | 0.3      | 1.0                 | 1.0      |
| <b>Current Heat Loss (Three- or Four-Pole) in Watts</b> |                     |          |                     |          |                     |          |
| at $I_{th}$                                             | 2.0                 | 3.5      | 2.0                 | 3.5      | 2.7                 | 4.7      |
| at $I_e$ to AC-3/400V                                   | 0.3                 | 0.4      | 0.5                 | 0.7      | —                   | —        |

## XT Miniature Controls—Auxiliary Contacts

| Description                                                                            | Built-In Auxiliary<br>XTMC                               | Add-On Auxiliary<br>XTMCXF_                              |
|----------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| Interlocked opposing contacts to ZH1/457, including auxiliary contact module           | Yes                                                      | Yes                                                      |
| Rated impulse withstand voltage, $U_{imp}$ (Vac)                                       | 6000                                                     | 6000                                                     |
| Overvoltage category/pollution degree                                                  | III/3                                                    | III/3                                                    |
| Rated insulation voltage, $U_i$ (Vac)                                                  | 690                                                      | 690                                                      |
| Rated operational voltage, $U_e$ (Vac)                                                 | 600                                                      | 600                                                      |
| Safe isolation to VDE 0106 Part 101 and Part 101(A) in Vac                             |                                                          |                                                          |
| Between coil and auxiliary contacts                                                    | 300                                                      | 300                                                      |
| Between the auxiliary contacts                                                         | 300                                                      | 300                                                      |
| Rated operational current                                                              |                                                          |                                                          |
| AC-15, $I_e$                                                                           |                                                          |                                                          |
| 220/240V                                                                               | 6A                                                       | 4A                                                       |
| 380/415V                                                                               | 3A                                                       | 2A                                                       |
| 500V                                                                                   | 1.5A                                                     | 1.5A                                                     |
| DC-13 (contacts in series)                                                             |                                                          |                                                          |
| 1: 24V                                                                                 | 2.5A                                                     | 2.5A                                                     |
| 2: 60V                                                                                 | 2.5A                                                     | 2.5A                                                     |
| 3: 100V                                                                                | 1.5A                                                     | 1.5A                                                     |
| 3: 220V                                                                                | 0.5A                                                     | 0.5A                                                     |
| Conventional thermal current, $I_{th}$                                                 | 10A                                                      | 10A                                                      |
| Control circuit reliability (at $U_e = 24$ Vdc, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)  | <10 <sup>-8</sup> , <1 failure at 100 million operations | <10 <sup>-8</sup> , <1 failure at 100 million operations |
| Component lifespan at $U_e = 240$ V                                                    |                                                          |                                                          |
| AC-15, operations x 10 <sup>6</sup>                                                    | 0.2                                                      | 0.2                                                      |
| DC-13 L/R = 50 ms: 2 contacts in series at $I_e = 0.5$ A, operations x 10 <sup>6</sup> | 0.15                                                     | 0.15                                                     |
| Short-circuit rating without welding                                                   |                                                          |                                                          |
| Short-circuit protection rating maximum fuse, 500V gG/gL                               | 6A                                                       | 6A                                                       |
| Short-circuit protection rating maximum fuse, 500V fast                                | 10A                                                      | 10A                                                      |
| Current heat loss at conventional free air thermal current $I_{th}$ per contact, W     | 0.2                                                      | 0.2                                                      |

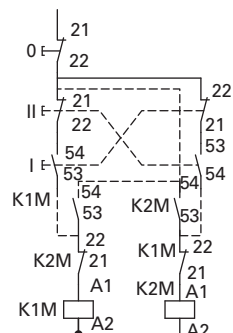
**Note**

<sup>①</sup> Rated operation current ( $I_e$ ) in amperes, at maximum permissible ambient temperature.

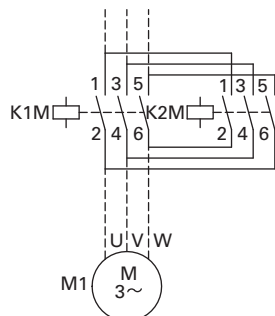


## Wiring Diagrams

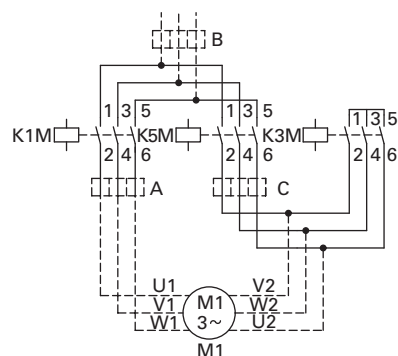
XTMR Reversing Contactor Control Circuit



XTMR Reversing Contactor Power Circuit

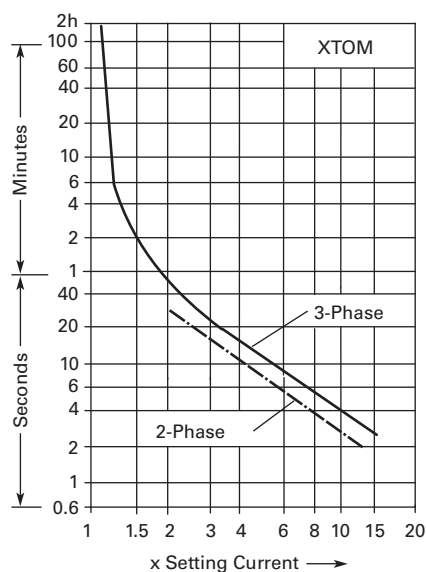


XT Mini Star-Delta (Wye-Delta) Contactor Power Circuit



## Tripping Characteristics

Tripping Characteristics Chart



These tripping characteristics are mean values of the spread at 20°C ambient temperature in a cold state. Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approximately 25% of the read off value. Specific characteristics for each individual setting range can be found on **Page V5-T1-33**.

**Electrical Switching Operation Charts**

Squirrel cage motors

Operating characteristics

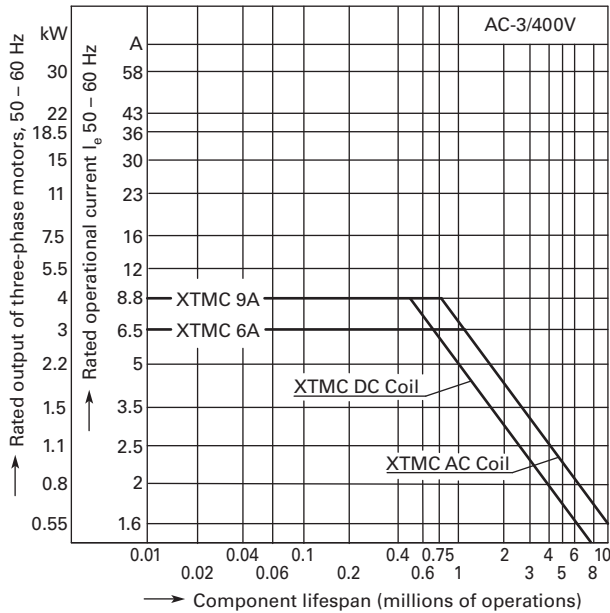
Starting: from rest

Stopping: after attaining a full running speed

Electrical characteristics

Make (NO): Up to 6x rated motor current

Breaking (NC): 1x rated motor current

**Normal Switching Duty—AC-3/400V**

Squirrel cage motors

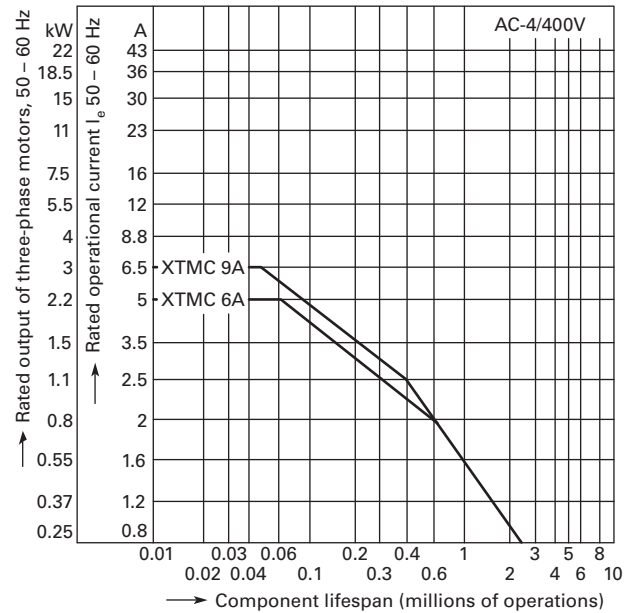
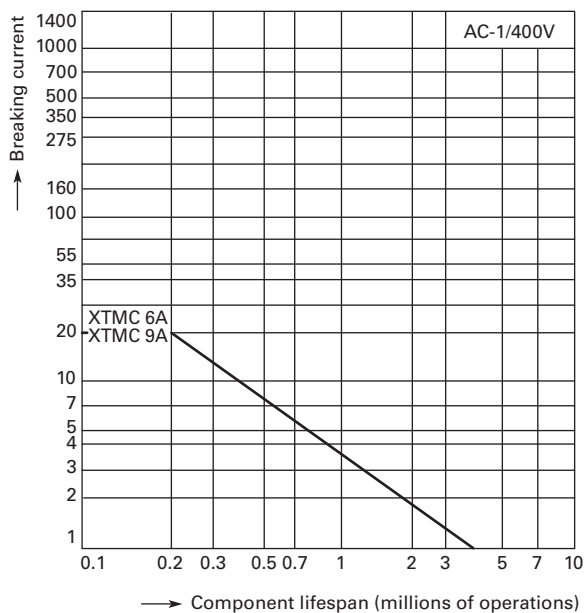
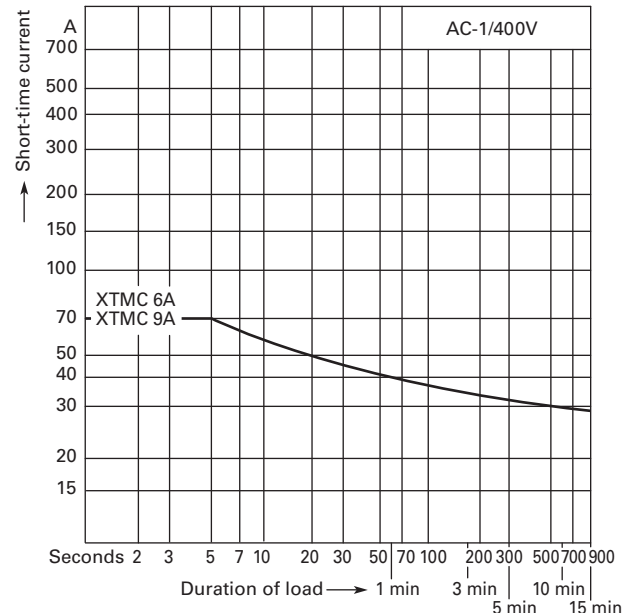
Operating characteristics

Jogging, plugging, reversing

Electrical characteristics

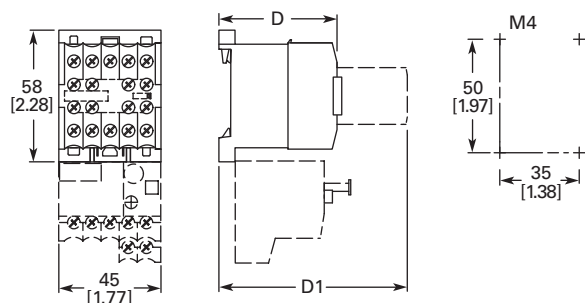
Make (NO): 6x rated motor current

Breaking (NC): 6x rated motor current

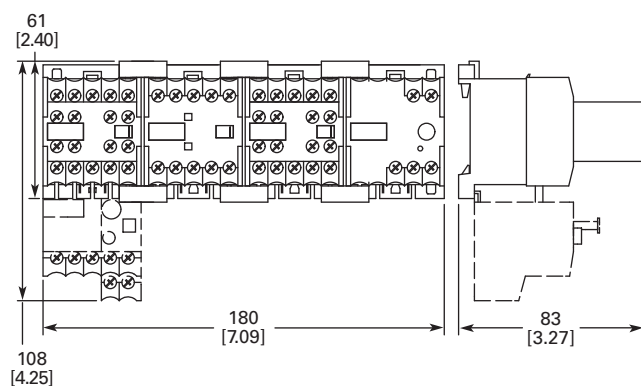
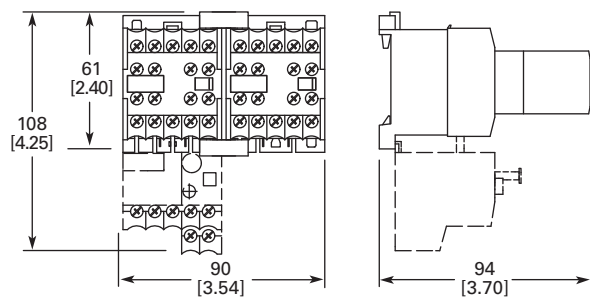
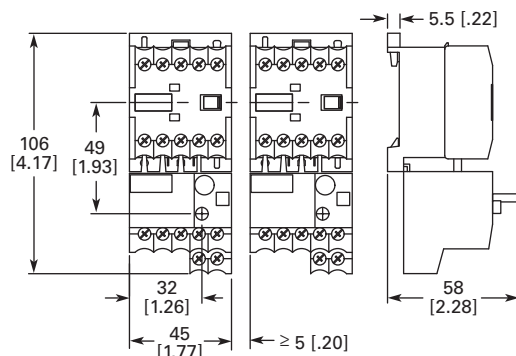
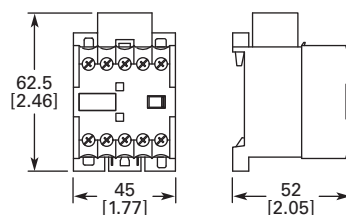
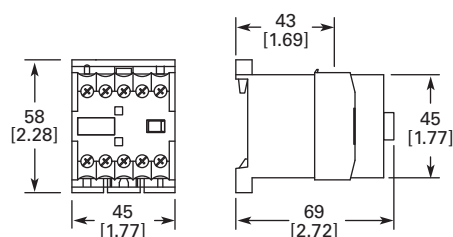
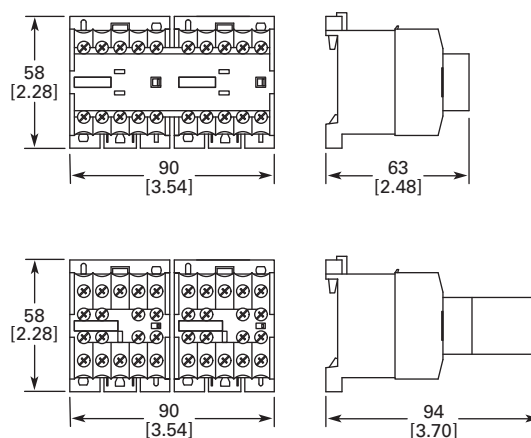
**Extreme Switching Duty—AC-4/400V****Switching Duty for Non-Motor Loads, Three- and Four-Pole—AC-1/400V****Short Time Loading, Three-Pole—AC-1/400V (time interval between two loading cycles: 15 minutes)**

**Dimensions**

Approximate Dimensions in mm [in.]

**Non-Reversing Mini Contactor**

|    | XTMC      | XTMCC     |
|----|-----------|-----------|
| D  | 52 [2.05] | 54 [2.13] |
| D1 | 83 [3.27] | 86 [3.39] |

**Star-Delta Starter Combinations****Reversing Mini Contactor****Non-Reversing Mini Contactor with Overload Relay****XTMCXRSA, XTMCXVSA Mini Suppressors****XTMCXTSA Mini Sealable Shroud****XTMCXML Mechanical Interlock**

## XT Family of Contactors



## Contactors and Starters

## Product Description

The Eaton **XT** contactors and starters includes non-reversing and reversing contactors, overload relays and a variety of related accessories. Because **XT** meets IEC, UL®, CSA® and CE standards, it is the perfect product solution for IEC applications all over the world. The compact, space saving and easy to install **XT** line of IEC contactors and starters is the efficient and effective solution for customer applications from 7A to 2450A.

## Application Description

The **XT** line of IEC power control was engineered to provide highly effective control and protection for a variety of loads, including motors, compressors, pumps, resistive, capacitor banks, isolation, and others. **XT** also includes IEC ratings for lighting applications as well.

**XT** contactors can be used in safety applications according to EN 954-1, EN ISO 13849-1 and IEC 62061 up to Category 4, PL e and SIL 3. Information concerning safety related characteristics (B10 and B10d values) is available online. The auxiliary contact modules and built-in auxiliary contacts meet IEC EN 60947-5-1 Annex L (positively driven) and IEC EN 60947-4-1 Annex F (mirror contacts).

## Reference

Refer to **Volume 10—Enclosed Control**, CA08100012E, Tab 3, section 3.1 for additional product information on IEC Non-Metallic Enclosed Contactors and Starters.

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## Description

|                                   | Page      |
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| Miniature Controls                | V5-T1-18  |
| Contactors and Starters           |           |
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| Dimensions                        | V5-T1-114 |



An Eaton  
Green Solution

|                                             |           |
|---------------------------------------------|-----------|
| Thermal Overload Relays                     | V5-T1-130 |
| C440/ <b>XT</b> Electronic Overload Relay   | V5-T1-143 |
| Manual Motor Protectors                     | V5-T1-159 |
| Combination Motor Controllers               | V5-T1-193 |
| <b>XT</b> Electronic Manual Motor Protector | V5-T1-219 |
| EMS—Electronic Motor Starter                | V5-T1-232 |
| <b>XT</b> DC Contactors                     | V5-T1-234 |
| Reference Data                              | V5-T1-236 |

## Features and Benefits

- AC control from 12V to 600V 50/60 Hz
- DC control from 12V to 220V
- Available with screw or spring cage terminals
- Reversing or non-reversing contactors and starters
- AC-3 contactor ratings to 1000A and AC-1 contactor ratings to 2000A
- Non-reversing starters to 650A
- Panel or DIN rail mounting to 65A
- IP20 finger and back-of-hand proof
- Large ambient temperature range, -25 to 50°C [-13 to 122°F]
- AC and DC controlled contactors in the same compact frame
- Low power consumption AC and DC coils
- Built-in NO or NC auxiliary contacts to 32A
- Plug-in accessories for reduced installation time
- Coil replacement on Frames C–N (18–820A)
- Contact replacement on Frames D–N (40 –820A)
- Integrated suppressor 7–150A DC operated contactors and 185–2000A AC and DC operated contactors

## Standards and Certifications

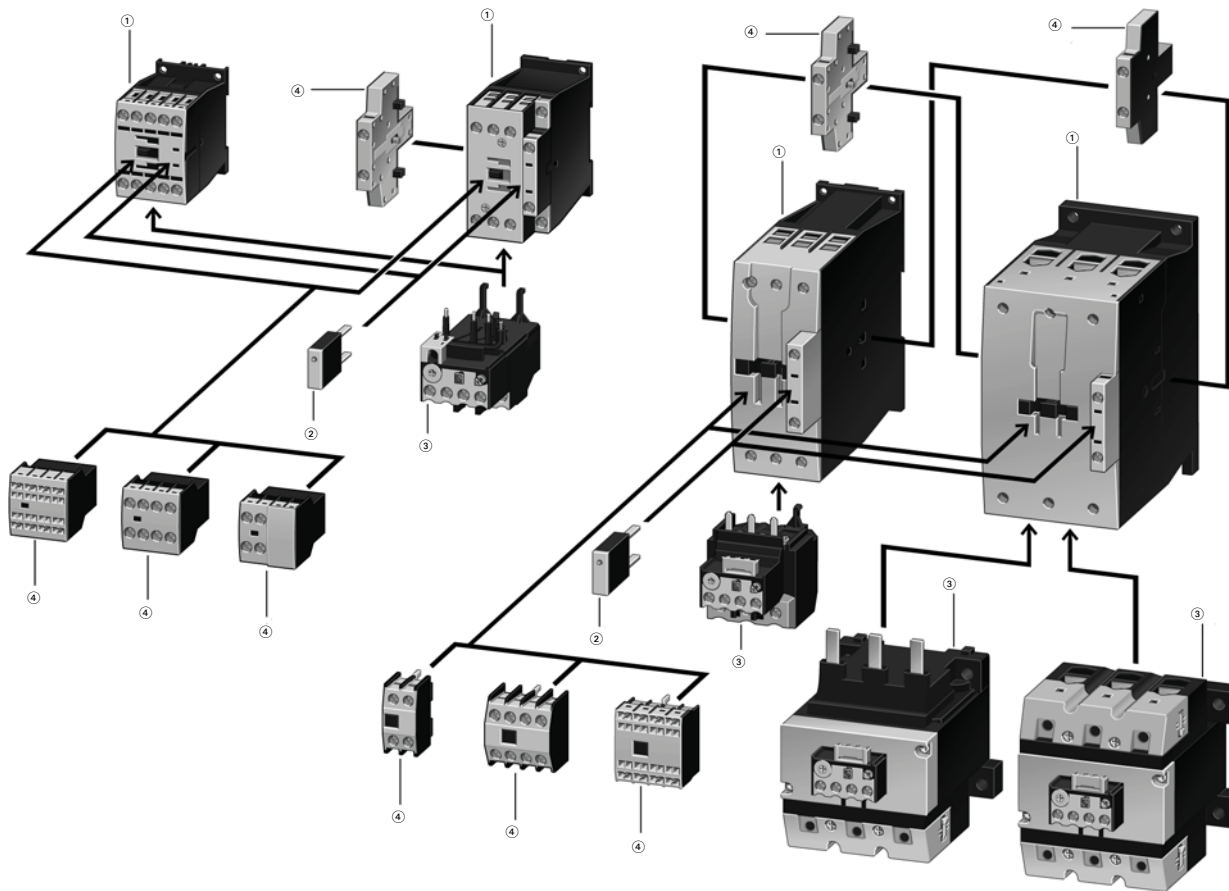
- IEC EN 60947
- CE approved
- UL
- CSA
- RoHS



**Note:** For Type 2 Coordination, see **Page V5-T1-237**.

## Product Identification

## XTCE007B to XTCE170G (7 to 170A) Contactors



## Notes

## ① Contactor up to 170A AC-3 (see Page V5-T1-39)

AC: 12–600V, 50, 60, 50/60 Hz  
 0.8–1.1 x  $U_c$ )

DC: 12–250V

XTCE...B\_ (7–15A): 0.8–1.1 x  $U_c$

XTCE...C\_–XTCE...G\_ (18–150A): 0.7–1.2 x  $U_c$

24V: 0.7–1.3 x  $U_c$  at 40°C without additional auxiliary contacts  
 Coils for special voltages

"Safe Isolation" to IEC 536 between coil and contacts

## ② Suppressors (see Page V5-T1-71)

RC suppressor

Varistor suppressor

Free-wheel diode suppressor

## ③ Overload Relays (see Page V5-T1-132)

Can be mounted directly

Separate mounting, possible

Protection of EEx e-motors

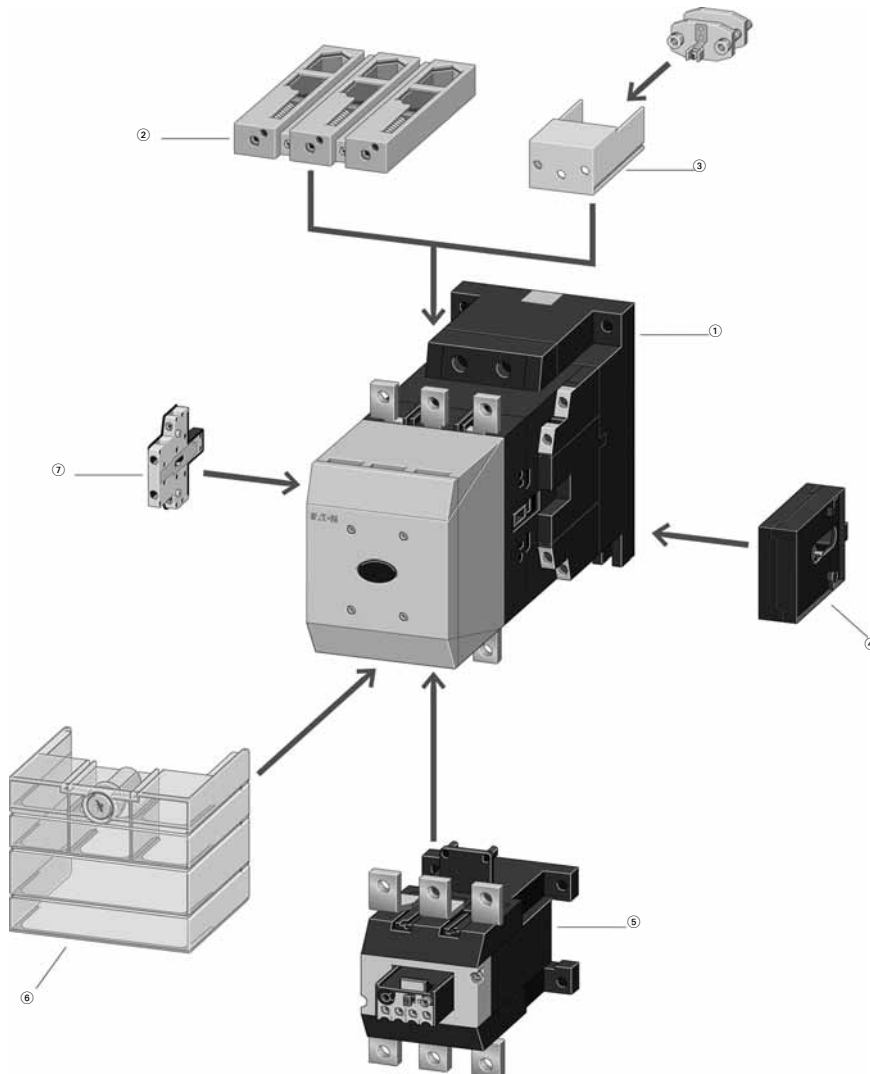
## ④ Auxiliary Contact Modules (see Page V5-T1-24)

Two-pole, plug-in type

Four-pole, plug-in type

Overlapping contacts

Two-pole, side-mounting

**XTCE185–XTCE20 Contactors****Notes**

① **XTCE Contactors for 185–2000A**  
(see [Page V5-T1-46](#))

Multi-voltage coils:  
24–48 Vdc  
48–110 Vac/Vdc  
110–250 Vac/Vdc  
250–500 Vac  
0.7–1.15 ×  $U_c$

Actuation options:

Directly  
From the PLC  
With low-consumption contact

**XTCS Contactors for 185–570A AC-3**  
(see [Page V5-T1-42](#))

Control voltages:  
110–120V 50/60 Hz  
220–240V 50/60 Hz  
Conventional operation

② **Cable Terminal Block**  
(see [Page V5-T1-97](#))

One or two conductors per phase  
Round and flat conductor connectable  
Finger-proof

③ **Flat Strip Conductor Terminals**  
(see [Page V5-T1-97](#))

One or two strips per phase  
Control circuit terminal  
Cover for fingerproofing

④ **Mechanical Interlock**  
(see [Page V5-T1-73](#))

Fits between contactors

⑤ **Overload Relays**  
(see [Page V5-T1-132](#))

Can be mounted directly  
Separate mounting, possible  
Protection of EEx e-motors  
PTB certificate

⑥ **Terminal Shroud**  
(see [Page V5-T1-75](#))

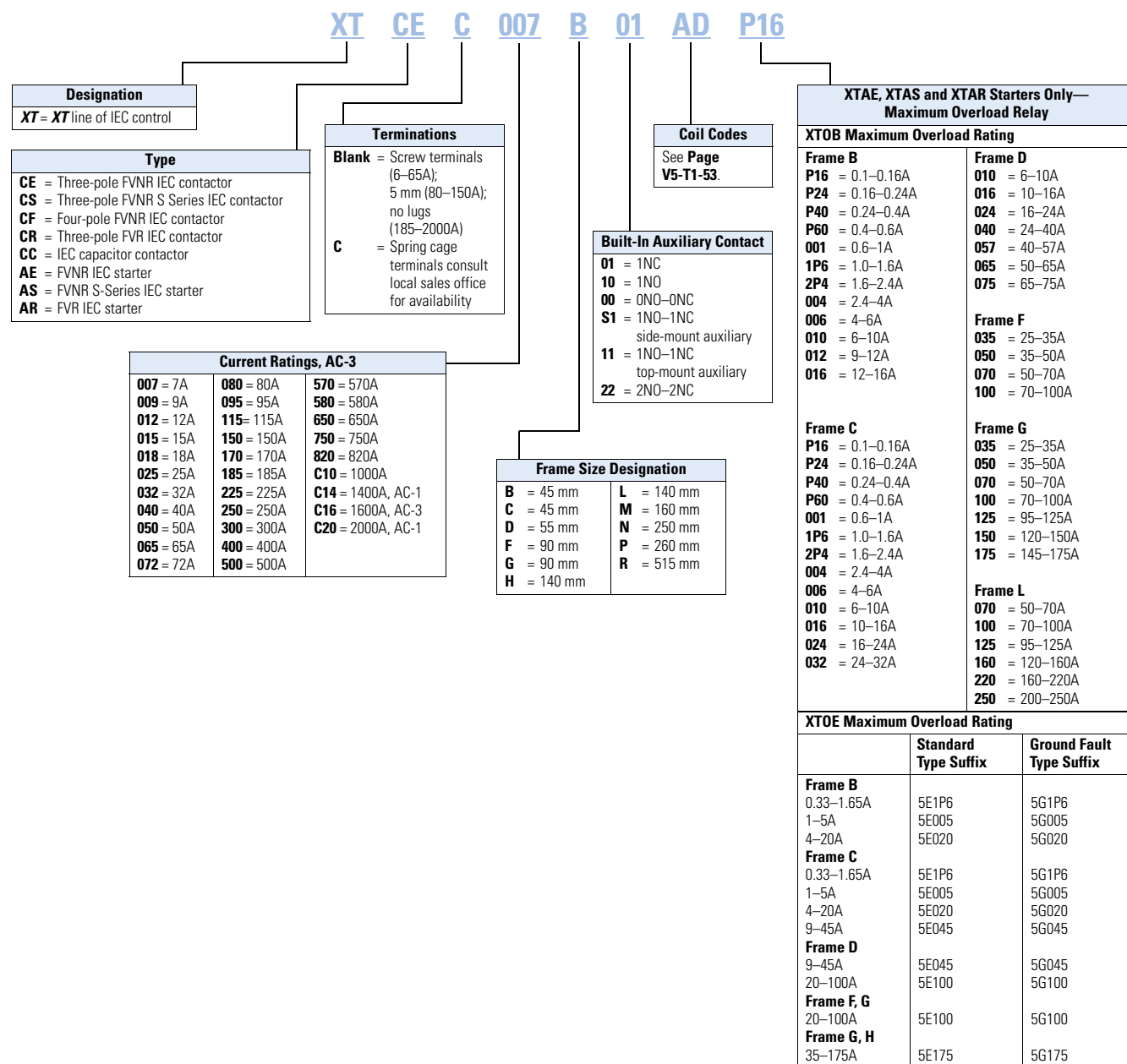
Finger-proof

⑦ **Auxiliary Contact Modules**  
(see [Page V5-T1-24](#))

Two-pole, side-mounting

## Catalog Number Selection

## XT IEC Contactors and Starters



## Product Selection

## Full Voltage, Non-Reversing Contactors

## Frame B



## Three-Pole Contactors, Frame B—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Single-Phase hp Ratings |      |       | Three-Phase hp Ratings |      |                 |       | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|-------------------------------------|-------------------------|------|-------|------------------------|------|-----------------|-------|-----------------------|------------------------------------------------|
|                                     | 115V                    | 200V | 230V  | 200V                   | 230V | 460V            | 575V  |                       |                                                |
| 20                                  | 1/4                     | 3/4  | 1     | 1-1/2                  | 2    | 3               | 5     | 1NO                   | XTCE007B10_                                    |
| 20                                  | 1/4                     | 3/4  | 1     | 1-1/2                  | 2    | 3               | 5     | 1NC                   | XTCE007B01_                                    |
| 20                                  | 1/2                     | 1    | 1-1/2 | 3                      | 3    | 5               | 7-1/2 | 1NO                   | XTCE009B10_                                    |
| 20                                  | 1/2                     | 1    | 1-1/2 | 3                      | 3    | 5               | 7-1/2 | 1NC                   | XTCE009B01_                                    |
| 20                                  | 1                       | 2    | 2     | 3                      | 3    | 10 <sup>③</sup> | 10    | 1NO                   | XTCE012B10_                                    |
| 20                                  | 1                       | 2    | 2     | 3                      | 3    | 10 <sup>③</sup> | 10    | 1NC                   | XTCE012B01_                                    |
| 20                                  | 1                       | 2    | 3     | 5                      | 5    | 10 <sup>③</sup> | 10    | 1NO                   | XTCE015B10_                                    |
| 20                                  | 1                       | 2    | 3     | 5                      | 5    | 10 <sup>③</sup> | 10    | 1NC                   | XTCE015B01_                                    |

## Three-Pole Contactors, Frame B—IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|----------|-----------------------|------------------------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V |                       |                                                |
| 7                          | 22                                                  | 2.2                                                 | 3        | 4    | 3.5      | 1NO                   | XTCE007B10_                                    |
| 7                          | 22                                                  | 2.2                                                 | 3        | 4    | 3.5      | 1NC                   | XTCE007B01_                                    |
| 9                          | 22                                                  | 2.5                                                 | 4        | 5.5  | 4.5      | 1NO                   | XTCE009B10_                                    |
| 9                          | 22                                                  | 2.5                                                 | 4        | 5.5  | 4.5      | 1NC                   | XTCE009B01_                                    |
| 12                         | 22                                                  | 3.5                                                 | 5.5      | 7    | 6.5      | 1NO                   | XTCE012B10_                                    |
| 12                         | 22                                                  | 3.5                                                 | 5.5      | 7    | 6.5      | 1NC                   | XTCE012B01_                                    |
| 15.5                       | 22                                                  | 4                                                   | 7.5      | 8    | 7        | 1NO                   | XTCE015B10_                                    |
| 15.5                       | 22                                                  | 4                                                   | 7.5      | 8    | 7        | 1NC                   | XTCE015B01_                                    |

## Notes

The 7–32A XTCE contactors have positively driven contacts between the integrated auxiliary contact and the auxiliary contact module as well as within the auxiliary contact modules.

DC operated contactors (Frames B–G, 7–150A) have a built-in suppressor circuit.

① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.

② For spring cage terminals, insert **C** after the fourth digit of the catalog number. Example: XTCE**C**007B10A.

For 7–12A XTCEC contactors, the power, auxiliary and coil terminals are spring cage.

For 18–32A XTCEC contactors, the auxiliary and coil terminals are spring cage.

For 40–150A XTCEC contactors, the coil terminals only are spring cage.

③ For electrical life contactor application data. See **Page V5-T1-45**.



Frame C



## Three-Pole Contactors, Frame C—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Single-Phase hp Ratings |      |      | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|-------------------------------------|-------------------------|------|------|------------------------|------|------|------|-----------------------|------------------------------------------------|
|                                     | 115V                    | 200V | 230V | 200V                   | 230V | 460V | 575V |                       |                                                |
| 40                                  | 2                       | 2    | 3    | 5                      | 5    | 10   | 15   | 1NO                   | XTCE018C10_                                    |
| 40                                  | 2                       | 2    | 3    | 5                      | 5    | 10   | 15   | 1NC                   | XTCE018C01_                                    |
| 40                                  | 2                       | 3    | 5    | 7-1/2                  | 10   | 15   | 20   | 1NO                   | XTCE025C10_                                    |
| 40                                  | 2                       | 3    | 5    | 7-1/2                  | 10   | 15   | 20   | 1NC                   | XTCE025C01_                                    |
| 40                                  | 3                       | 5    | 5    | 10                     | 10   | 20   | 25   | 1NO                   | XTCE032C10_                                    |
| 40                                  | 3                       | 5    | 5    | 10                     | 10   | 20   | 25   | 1NC                   | XTCE032C01_                                    |
| 40                                  | 3                       | 5    | 5    | 10                     | 10   | 25   | 30   | 1NO                   | XTCE038C10_                                    |
| 40                                  | 3                       | 5    | 5    | 10                     | 10   | 25   | 30   | 1NC                   | XTCE038C01_                                    |

## Three-Pole Contactors, Frame C—IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|----------|-----------------------|------------------------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V |                       |                                                |
| 18                         | 40                                                  | 5                                                   | 7.5      | 10   | 11       | 1NO                   | XTCE018C10_                                    |
| 18                         | 40                                                  | 5                                                   | 7.5      | 10   | 11       | 1NC                   | XTCE018C01_                                    |
| 25                         | 45                                                  | 7.5                                                 | 11       | 14.5 | 14       | 1NO                   | XTCE025C10_                                    |
| 25                         | 45                                                  | 7.5                                                 | 11       | 14.5 | 14       | 1NC                   | XTCE025C01_                                    |
| 32                         | 45                                                  | 10                                                  | 15       | 18   | 17       | 1NO                   | XTCE032C10_                                    |
| 32                         | 45                                                  | 10                                                  | 15       | 18   | 17       | 1NC                   | XTCE032C01_                                    |
| 38                         | 45                                                  | 11                                                  | 18.5     | 18.5 | 21       | 1NO                   | XTCE038C10_                                    |
| 38                         | 45                                                  | 11                                                  | 18.5     | 18.5 | 21       | 1NC                   | XTCE038C01_                                    |

Frame D



## Three-Pole Contactors, Frame D—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Single-Phase hp Ratings |       |       | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|-------------------------------------|-------------------------|-------|-------|------------------------|------|------|------|-----------------------|------------------------------------------------|
|                                     | 115V                    | 200V  | 230V  | 200V                   | 230V | 460V | 575V |                       |                                                |
| 63                                  | 3                       | 5     | 7-1/2 | 10                     | 15   | 30   | 40   | —                     | XTCE040D00_                                    |
| 63                                  | 3                       | 5     | 7-1/2 | 10                     | 15   | 30   | 40   | 1NO-1NC               | XTCE040DS1_                                    |
| 80                                  | 3                       | 7-1/2 | 10    | 15                     | 20   | 40   | 50   | —                     | XTCE050D00_                                    |
| 80                                  | 3                       | 7-1/2 | 10    | 15                     | 20   | 40   | 50   | 1NO-1NC               | XTCE050DS1_                                    |
| 88                                  | 5                       | 10    | 15    | 20                     | 25   | 50   | 60   | —                     | XTCE065D00_                                    |
| 88                                  | 5                       | 10    | 15    | 20                     | 25   | 50   | 60   | 1NO-1NC               | XTCE065DS1_                                    |
| 88                                  | 5                       | 10    | 15    | 20                     | 25   | 50   | 60   | —                     | XTCE072D00_                                    |
| 88                                  | 5                       | 10    | 15    | 20                     | 25   | 50   | 60   | 1NO-1NC               | XTCE072DS1_                                    |

## Three-Pole Contactors, Frame D—IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|----------|-----------------------|------------------------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V |                       |                                                |
| 40                         | 60                                                  | 12.5                                                | 18.5     | 24   | 23       | —                     | XTCE040D00_                                    |
| 40                         | 60                                                  | 12.5                                                | 18.5     | 24   | 23       | 1NO-1NC               | XTCE040DS1_                                    |
| 50                         | 80                                                  | 15.5                                                | 22       | 30   | 30       | —                     | XTCE050D00_                                    |
| 50                         | 80                                                  | 15.5                                                | 22       | 30   | 30       | 1NO-1NC               | XTCE050DS1_                                    |
| 65                         | 98                                                  | 20                                                  | 30       | 39   | 35       | —                     | XTCE065D00_                                    |
| 65                         | 98                                                  | 20                                                  | 30       | 39   | 35       | 1NO-1NC               | XTCE065DS1_                                    |
| 72                         | 98                                                  | 22                                                  | 37       | 41   | 35       | —                     | XTCE072D00_                                    |
| 72                         | 98                                                  | 22                                                  | 37       | 41   | 35       | 1NO-1NC               | XTCE072DS1_                                    |

## Notes

The 7–32A XTCE contactors have positively driven contacts between the integrated auxiliary contact and the auxiliary contact module as well as within the auxiliary contact modules.

The 40–65A XTCE contactors have positively driven contacts within the auxiliary contact module.

Six auxiliary contacts are possible with a combination of side-mounted and front-mount auxiliary contacts.

DC operated contactors (Frames B–G, 7–150A) have a built-in suppressor circuit.

① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.

② For spring cage terminals, insert **C** after the fourth digit of the catalog number. Example: XTCEC007B10A.

For 7–12A XTCEC contactors, the power, auxiliary and coil terminals are spring cage.

For 18–32A XTCEC contactors, the auxiliary and coil terminals are spring cage.

For 40–150A XTCEC contactors, the coil terminals only are spring cage.

Frame F



## Three-Pole Contactors, Frame F—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Single-Phase hp Ratings |      |      | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|-------------------------------------|-------------------------|------|------|------------------------|------|------|------|-----------------------|------------------------------------------------|
|                                     | 115V                    | 200V | 230V | 200V                   | 230V | 460V | 575V |                       |                                                |
| 125                                 | 7-1/2                   | 15   | 15   | 25                     | 30   | 60   | 75   | —                     | XTCE080F00_                                    |
| 125                                 | 7-1/2                   | 15   | 15   | 25                     | 30   | 60   | 75   | 1NO-1NC               | XTCE080FS1_                                    |
| 125                                 | 7-1/2                   | 15   | 15   | 25                     | 40   | 75   | 100  | —                     | XTCE095F00_                                    |
| 125                                 | 7-1/2                   | 15   | 15   | 25                     | 40   | 75   | 100  | 1NO-1NC               | XTCE095FS1_                                    |

## Three-Pole Contactors, Frame F—IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|----------|-----------------------|------------------------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V |                       |                                                |
| 80                         | 110                                                 | 25                                                  | 37       | 48   | 63       | —                     | XTCE080F00_                                    |
| 80                         | 110                                                 | 25                                                  | 37       | 48   | 63       | 1NO-1NC               | XTCE080FS1_                                    |
| 95                         | 130                                                 | 30                                                  | 45       | 57   | 75       | —                     | XTCE095F00_                                    |
| 95                         | 130                                                 | 30                                                  | 45       | 57   | 75       | 1NO-1NC               | XTCE095FS1_                                    |

Frame G



## Three-Pole Contactors, Frame G—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Single-Phase hp Ratings |      |      | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|-------------------------------------|-------------------------|------|------|------------------------|------|------|------|-----------------------|------------------------------------------------|
|                                     | 115V                    | 200V | 230V | 200V                   | 230V | 460V | 575V |                       |                                                |
| 160                                 | 10                      | 25   | 25   | 40                     | 50   | 100  | 100  | —                     | XTCE115G00_                                    |
| 160                                 | 10                      | 25   | 25   | 40                     | 50   | 100  | 100  | 1NO-1NC               | XTCE115GS1_                                    |
| 180                                 | 10                      | 25   | 30   | 40                     | 60   | 125  | 125  | —                     | XTCE150G00_                                    |
| 180                                 | 10                      | 25   | 30   | 40                     | 60   | 125  | 125  | 1NO-1NC               | XTCE150GS1_                                    |
| 180                                 | 10                      | 25   | 30   | 40                     | 60   | 125  | 125  | —                     | XTCE170G00_                                    |
| 180                                 | 10                      | 25   | 30   | 40                     | 60   | 125  | 125  | 1NO-1NC               | XTCE170GS1_                                    |

## Three-Pole Contactors, Frame G—IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Screw Terminal<br>Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|----------|-----------------------|------------------------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V |                       |                                                |
| 115                        | 160                                                 | 37                                                  | 55       | 70   | 90       | —                     | XTCE115G00_                                    |
| 115                        | 160                                                 | 37                                                  | 55       | 70   | 90       | 1NO-1NC               | XTCE115GS1_                                    |
| 150                        | 190                                                 | 48                                                  | 75       | 91   | 96       | —                     | XTCE150G00_                                    |
| 150                        | 190                                                 | 48                                                  | 75       | 91   | 96       | 1NO-1NC               | XTCE150GS1_                                    |
| 170                        | 225                                                 | 52                                                  | 90       | 100  | 96       | —                     | XTCE170G00_                                    |
| 170                        | 225                                                 | 52                                                  | 90       | 100  | 96       | 1NO-1NC               | XTCE170GS1_                                    |

## Notes

The 40–65A XTCE contactors have positively driven contacts within the auxiliary contact module.  
Six auxiliary contacts are possible with a combination of side-mounted and front-mount auxiliary contacts.

DC operated contactors (Frames B–G, 7–150A) have a built-in suppressor circuit.

① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.

② For spring cage terminals, insert **C** after the fourth digit of the catalog number. Example: XTCEC007B10A.

For 7–12A XTCEC contactors, the power, auxiliary and coil terminals are spring cage.

For 18–32A XTCEC contactors, the auxiliary and coil terminals are spring cage.

For 40–150A XTCEC contactors, the coil terminals only are spring cage.

## Frame H



## Three-Pole Contactors, Frame H (Electronic Coil) — UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog<br>Number <sup>①②③</sup> |
|-------------------------------------|------------------------|------|------|------|-----------------------|----------------------------------|
|                                     | 200V                   | 240V | 480V | 600V |                       |                                  |
| 250                                 | 50                     | 60   | 125  | 150  | 2NO-2NC               | XTCE185H22_                      |
| 250                                 | 60                     | 75   | 150  | 200  | 2NO-2NC               | XTCE225H22_                      |

## Three-Pole Contactors, Frame H (Electronic Coil) — IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |                       |                    | Auxiliary<br>Contacts | Catalog<br>Number <sup>①②③</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|-----------------------|--------------------|-----------------------|----------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 660/690V <sup>④</sup> | 1000V <sup>④</sup> |                       |                                  |
| 185                        | 337                                                 | 55                                                  | 90       | 140                   | 108                | 2NO-2NC               | XTCE185H22_                      |
| 225                        | 386                                                 | 70                                                  | 110      | 215                   | 108                | 2NO-2NC               | XTCE225H22_                      |

## Frame L



## Three-Pole Contactors, Frame L — UL/CSA Ratings

| UL General Purpose<br>Ampere Rating             | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog<br>Number <sup>①②</sup> |
|-------------------------------------------------|------------------------|------|------|------|-----------------------|---------------------------------|
|                                                 | 200V                   | 230V | 460V | 575V |                       |                                 |
| Standard Coil (110/120V, 230/240 Vac Coil Only) |                        |      |      |      |                       |                                 |
| 300                                             | 75                     | 100  | 200  | 250  | 2NO-2NC               | XTCS250L22_                     |
| 350                                             | 100                    | 125  | 250  | 300  | 2NO-2NC               | XTCS300L22_                     |
| Electronic Coil                                 |                        |      |      |      |                       |                                 |
| 300                                             | 75                     | 100  | 200  | 250  | 2NO-2NC               | XTCE250L22_                     |
| 350                                             | 100                    | 125  | 250  | 300  | 2NO-2NC               | XTCE300L22_                     |

## Three-Pole Contactors, Frame L — IEC Ratings

| AC-3<br>I <sub>e</sub> (A)                      | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |                       |                    | Auxiliary<br>Contacts | Catalog<br>Number <sup>①②</sup> |
|-------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|-----------------------|--------------------|-----------------------|---------------------------------|
|                                                 |                                                     | 220/230V                                            | 380/400V | 660/690V <sup>④</sup> | 1000V <sup>④</sup> |                       |                                 |
| Standard Coil (110/120V, 230/240 Vac Coil Only) |                                                     |                                                     |          |                       |                    |                       |                                 |
| 250                                             | 429                                                 | 75                                                  | 132      | 240                   | 108                | 2NO-2NC               | XTCS250L22_                     |
| 300                                             | 490                                                 | 90                                                  | 160      | 195                   | 132                | 2NO-2NC               | XTCS300L22_                     |
| Electronic Coil                                 |                                                     |                                                     |          |                       |                    |                       |                                 |
| 250                                             | 429                                                 | 75                                                  | 132      | 240                   | 108                | 2NO-2NC               | XTCE250L22_                     |
| 300                                             | 490                                                 | 90                                                  | 160      | 195                   | 132                | 2NO-2NC               | XTCE300L22_                     |

## Notes

- ① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**. Terminals not included. See **Page V5-T1-75** for terminal accessories.
- ② Does not include lugs.
- ③ Add “-S730” to the end of the catalog number after the coil voltage to configure as extended H frame model. Extended H frame will align with L frame contactor for interlocks and mounting height. Consult Vista/Eaton care for availability of extended base models
- ④ For 185–500A contactors at 660/690V or 1000V: Do not reverse directly.

## Frame M



## Three-Pole Contactors, Frame M—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating             | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog<br>Number ①② |
|-------------------------------------------------|------------------------|------|------|------|-----------------------|----------------------|
|                                                 | 200V                   | 230V | 460V | 575V |                       |                      |
| Standard Coil (110/120V, 230/240 Vac Coil Only) |                        |      |      |      |                       |                      |
| 450                                             | 125                    | 150  | 300  | 400  | 2NO-2NC               | XTCS400M22_          |
| 550                                             | 150                    | 200  | 400  | 500  | 2NO-2NC               | XTCS500M22_          |
| Electronic Coil                                 |                        |      |      |      |                       |                      |
| 450                                             | 125                    | 150  | 300  | 400  | 2NO-2NC               | XTCE400M22_          |
| 550                                             | 150                    | 200  | 400  | 500  | 2NO-2NC               | XTCE500M22_          |

## Three-Pole Contactors, Frame M—IEC Ratings

| AC-3<br>I <sub>e</sub> (A)                      | AC-1 (40°C)<br>I <sub>e</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |                       |                    | Auxiliary<br>Contacts | Catalog<br>Number <sup>①②</sup> |
|-------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|-----------------------|--------------------|-----------------------|---------------------------------|
|                                                 |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V <sup>③</sup> | 1000V <sup>③</sup> |                       |                                 |
| Standard Coil (110/120V, 230/240 Vac Coil Only) |                                                     |                                                     |          |      |                       |                    |                       |                                 |
| 400                                             | 612                                                 | 125                                                 | 200      | 240  | 344                   | 132                | 2NO-2NC               | XTCS400M22_                     |
| 500                                             | 800                                                 | 155                                                 | 250      | 300  | 344                   | 132                | 2NO-2NC               | XTCS500M22_                     |
| Electronic Coil                                 |                                                     |                                                     |          |      |                       |                    |                       |                                 |
| 400                                             | 612                                                 | 125                                                 | 200      | 240  | 344                   | 132                | 2NO-2NC               | XTCE400M22_                     |
| 500                                             | 800                                                 | 155                                                 | 250      | 300  | 344                   | 132                | 2NO-2NC               | XTCE500M22_                     |

**Notes**

① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**. Terminals not included. See **Page V5-T1-75** for terminal accessories.

② Does not include lugs.

③ For 185–500A contactors at 660/690V or 1000V: Do not reverse directly.

## Frame N



## Three-Pole Contactors, Frame N (Electronic Coil)—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog Number <sup>①②</sup> |
|-------------------------------------|------------------------|------|------|------|-----------------------|------------------------------|
|                                     | 200V                   | 230V | 460V | 575V |                       |                              |
| 630                                 | 200                    | 200  | 400  | 600  | 2NO-2NC               | XTCE580N22_ <sup>③</sup>     |
| 700                                 | 200                    | 250  | 500  | 600  | 2NO-2NC               | XTCE650N22_ <sup>③</sup>     |
| 800                                 | 250                    | 300  | 600  | 700  | 2NO-2NC               | XTCE750N22_ <sup>③</sup>     |
| 850                                 | 290                    | 350  | 700  | 860  | 2NO-2NC               | XTCE820N22_ <sup>③</sup>     |
| 1100                                | 350                    | 420  | 850  | 980  | 2NO-2NC               | XTCEC10N22_ <sup>③</sup>     |

## Three-Pole Contactors, Frame N (Electronic Coil)—IEC Ratings

| AC-3<br>I <sub>b</sub> (A) | AC-1 (40°C)<br>I <sub>b</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |                       |                    | Auxiliary<br>Contacts | Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|-----------------------|--------------------|-----------------------|------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V <sup>④</sup> | 1000V <sup>④</sup> |                       |                              |
| 580                        | 980                                                 | 185                                                 | 315      | 348  | 560                   | 600                | 2NO-2NC               | XTCE580N22_ <sup>③</sup>     |
| 650                        | 1041                                                | 205                                                 | 355      | 390  | 630                   | 600                | 2NO-2NC               | XTCE650N22_ <sup>③</sup>     |
| 750                        | 1102                                                | 240                                                 | 400      | 455  | 720                   | 800                | 2NO-2NC               | XTCE750N22_ <sup>③</sup>     |
| 820                        | 1225                                                | 260                                                 | 450      | 500  | 750                   | 800                | 2NO-2NC               | XTCE820N22_ <sup>③</sup>     |
| 1000                       | 1225                                                | 315                                                 | 560      | 610  | 1000                  | 1000               | 2NO-2NC               | XTCEC10N22_ <sup>③</sup>     |

## Frame P



## Three-Pole Contactors, Frame P (Electronic Coil)—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog Number <sup>①②</sup> |
|-------------------------------------|------------------------|------|------|------|-----------------------|------------------------------|
|                                     | 200V                   | 230V | 460V | 575V |                       |                              |
| 1400                                | —                      | —    | —    | —    | 2NO-2NC               | XTCEC14P22_ <sup>③</sup>     |

## Three-Pole Contactors, Frame P (Electronic Coil)—IEC Ratings

| AC-3<br>I <sub>b</sub> (A) | AC-1 (40°C)<br>I <sub>b</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |                       |                    | Auxiliary<br>Contacts | Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|-----------------------|--------------------|-----------------------|------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V <sup>④</sup> | 1000V <sup>④</sup> |                       |                              |
| —                          | 1714                                                | —                                                   | —        | —    | —                     | —                  | 2NO-2NC               | XTCEC14P22_ <sup>③</sup>     |

## Frame R



## Three-Pole Contactors, Frame R (Electronic Coil)—UL/CSA Ratings

| UL General Purpose<br>Ampere Rating | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog Number <sup>①②</sup> |
|-------------------------------------|------------------------|------|------|------|-----------------------|------------------------------|
|                                     | 200V                   | 230V | 460V | 575V |                       |                              |
| 1600                                | 560                    | 640  | 1200 | 1300 | 2NO-2NC               | XTCEC16R22_ <sup>③</sup>     |
| 2000                                | —                      | —    | —    | —    | 2NO-2NC               | XTCEC20R22_ <sup>③</sup>     |

## Three-Pole Contactors, Frame R (Electronic Coil)—IEC Ratings

| AC-3<br>I <sub>b</sub> (A) | AC-1 (40°C)<br>I <sub>b</sub> = I <sub>th</sub> (A) | Maximum kW Ratings AC-3/Three-Phase Motors 50–60 Hz |          |      |                       |                    | Auxiliary<br>Contacts | Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------|------|-----------------------|--------------------|-----------------------|------------------------------|
|                            |                                                     | 220/230V                                            | 380/400V | 415V | 660/690V <sup>④</sup> | 1000V <sup>④</sup> |                       |                              |
| 1600                       | 2200                                                | 500                                                 | 900      | 900  | 1600                  | 1700               | 2NO-2NC               | XTCEC16R22_ <sup>③</sup>     |
| —                          | 2450                                                | —                                                   | —        | —    | —                     | —                  | 2NO-2NC               | XTCEC20R22_ <sup>③</sup>     |

## Notes

- ① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**. Terminals not included. See **Page V5-T1-75** for terminal accessories.
- ② Does not include lugs.
- ③ When operating the 580–2000A XTCE contactors with frequency inverters, the suppressor on the load side must be removed. The load side suppressor must also be removed when performing a high-voltage test—see Pub51204, Pub51209.
- ④ For 185–500A contactors at 660/690V or 1000V: do not reverse directly.

### Contactor Application Data <sup>①②</sup>

| Catalog Prefix | Electrical Life (Operations) for 10 hp, 480V (14.2A) Applications |
|----------------|-------------------------------------------------------------------|
| XTCE012B       | 1 million                                                         |
| XTCE015B       | 1.2 million                                                       |
| XTCE018C       | 2 million                                                         |

### Full Voltage Non-Reversing Three-Pole Contactors—Contact Sequence (Circuit Symbols)—Standard Offering

| Contactor Frame | Auxiliary Contacts | Contact Sequence |
|-----------------|--------------------|------------------|
| B-C             | 1NO                |                  |
| B-C             | 1NC                |                  |
| D-G             | —                  |                  |
| L-R             | 2NO-2NC            |                  |

### Four-Pole Contactors with Screw Terminals—Maximum UL/CSA Motor Ratings

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |      |      |      | Auxiliary Contacts | Contact Sequence | Catalog Number <sup>③</sup> |
|-------------------------|------|------------------------|------|------|------|--------------------|------------------|-----------------------------|
| 115V                    | 230V | 200V                   | 230V | 460V | 575V |                    |                  |                             |
| 1                       | 2    | 3                      | 3    | 10   | 10   | —                  |                  | XTCF020B00_                 |
| —                       | —    | 7.5                    | 7.5  | 10   | 15   | 1NO                |                  | XTCF032C10_                 |
| —                       | —    | 7.5                    | 10   | 15   | 20   | 1NO                |                  | XTCF045C10_                 |
| —                       | —    | 10                     | 15   | 30   | 40   | —                  |                  | XTCF063D00_                 |
| —                       | —    | 15                     | 20   | 40   | 50   | —                  |                  | XTCF080D00_                 |
| —                       | —    | 25                     | 30   | 60   | 75   | —                  |                  | XTCF125G00_                 |
| —                       | —    | 25                     | 40   | 75   | 100  | —                  |                  | XTCF160G00_                 |
| —                       | —    | 40                     | 50   | 100  | 125  | —                  |                  | XTCF200G00_                 |

### Four-Pole Contactors with Screw Terminals—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | AC-1<br>(40°C) | Three-Phase hp Ratings |      |      |      | Auxiliary Contacts | Contact Sequence | Catalog Number <sup>③</sup> |
|----------------------------|----------------|------------------------|------|------|------|--------------------|------------------|-----------------------------|
|                            |                | 200V                   | 230V | 460V | 575V |                    |                  |                             |
| 12                         | 22             | 3                      | 3    | 10   | 10   | —                  |                  | XTCF020B00_                 |
| 12                         | 22             | 3.5                    | 5.5  | 7    | 6.5  | —                  |                  | XTCF020B00_                 |
| 18                         | 32             | 5                      | 7.5  | 10   | 11   | 1NO                |                  | XTCF032C10_                 |
| 25                         | 45             | 7.5                    | 11   | 14.5 | 14   | 1NO                |                  | XTCF045C10_                 |
| 40                         | 63             | 12.5                   | 18.5 | 24   | 23   | —                  |                  | XTCF063D00_                 |
| 50                         | 80             | 15.5                   | 22   | 30   | 30   | —                  |                  | XTCF080D00_                 |
| 80                         | 125            | 25                     | 37   | 48   | 63   | —                  |                  | XTCF125G00_                 |
| 95                         | 160            | 30                     | 45   | 57   | 75   | —                  |                  | XTCF160G00_                 |
| 115                        | 200            | 37                     | 55   | 70   | 90   | —                  |                  | XTCF200G00_                 |

#### Notes

- ① See **Page V5-T1-111** for electrical life curves.  
 ② AC and DC operated contactors have a built-in suppressor circuit (Frames L-R, 185–2000A).  
 ③ Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.



**Full Voltage, Reversing Contactors****Frame B****Contactors with Screw Terminals, Frame B—Maximum UL/CSA Ratings**

| Single-Phase hp Ratings |       | Three-Phase hp Ratings |      |      |       | Spare Auxiliary Contacts         |                                  | Catalog Number <sup>①</sup> |
|-------------------------|-------|------------------------|------|------|-------|----------------------------------|----------------------------------|-----------------------------|
| 115V                    | 230V  | 200V                   | 230V | 460V | 575V  | K1M                              | K2M                              |                             |
| 1/4                     | 1     | 1-1/2                  | 2    | 3    | 5     | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR007B21_                 |
| 1/2                     | 1-1/2 | 3                      | 3    | 5    | 7-1/2 | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR009B21_                 |
| 1/2                     | 2     | 3                      | 3    | 10   | 10    | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR012B21_                 |

**Contactors with Screw Terminals, Frame B—Maximum IEC Ratings**

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          | Spare Auxiliary Contacts         |                                  | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|----------|----------------------------------|----------------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V | K1M                              | K2M                              |                             |
| 7                          | 2.2                         | 3        | 4    | 3.5      | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR007B21_                 |
| 9                          | 2.5                         | 4        | 5.5  | 4.5      | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR009B21_                 |
| 12                         | 3.5                         | 5.5      | 7    | 6.5      | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR012B21_                 |

**Frame C****Contactors with Screw Terminals, Frame C—Maximum UL/CSA Ratings**

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |      |      |      | Spare Auxiliary Contacts         |                                  | Catalog Number <sup>①</sup> |
|-------------------------|------|------------------------|------|------|------|----------------------------------|----------------------------------|-----------------------------|
| 115V                    | 230V | 200V                   | 230V | 460V | 575V | K1M                              | K2M                              |                             |
| 2                       | 3    | 5                      | 5    | 10   | 15   | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR018C21_                 |
| 2                       | 5    | 7-1/2                  | 10   | 15   | 20   | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR025C21_                 |
| 3                       | 5    | 10                     | 10   | 20   | 25   | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR032C21_                 |

**Contactors with Screw Terminals, Frame C—Maximum IEC Ratings**

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          | Spare Auxiliary Contacts         |                                  | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|----------|----------------------------------|----------------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V | K1M                              | K2M                              |                             |
| 18                         | 5                           | 7.5      | 8    | 11       | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR018C21_                 |
| 25                         | 7.5                         | 11       | 14.5 | 14       | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR025C21_                 |
| 32                         | 10                          | 15       | 18   | 17       | $\frac{1}{63}$<br>$\frac{1}{64}$ | $\frac{1}{63}$<br>$\frac{1}{64}$ | XTCR032C21_                 |

**Note**

<sup>①</sup> Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.



## Frame D



## Contactors with Screw Terminals, Frame D—Maximum UL/CSA Ratings

| Single-Phase hp Ratings |       | Three-Phase hp Ratings |      |      |      | Spare Auxiliary Contacts |     | Catalog Number <sup>①</sup> |
|-------------------------|-------|------------------------|------|------|------|--------------------------|-----|-----------------------------|
| 115V                    | 230V  | 200V                   | 230V | 460V | 575V | K1M                      | K2M |                             |
| 3                       | 7-1/2 | 10                     | 15   | 30   | 40   | —                        | —   | XTCR040D11_                 |
| 3                       | 10    | 15                     | 20   | 40   | 50   | —                        | —   | XTCR050D11_                 |
| 5                       | 15    | 20                     | 25   | 50   | 60   | —                        | —   | XTCR065D11_                 |

## Contactors with Screw Terminals, Frame D—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          | Spare Auxiliary Contacts |     | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|----------|--------------------------|-----|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V | K1M                      | K2M |                             |
| 40                         | 12.5                        | 18.5     | 24   | 23       | —                        | —   | XTCR040D11_                 |
| 50                         | 15.5                        | 22       | 30   | 30       | —                        | —   | XTCR050D11_                 |
| 65                         | 20                          | 30       | 39   | 35       | —                        | —   | XTCR065D11_                 |

## Frame F



## Contactors with Screw Terminals, Frame F—Maximum UL/CSA Ratings

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |      |      |      | Spare Auxiliary Contacts |     | Catalog Number <sup>①</sup> |
|-------------------------|------|------------------------|------|------|------|--------------------------|-----|-----------------------------|
| 115V                    | 230V | 200V                   | 230V | 460V | 575V | K1M                      | K2M |                             |
| 7-1/2                   | 15   | 25                     | 30   | 60   | 75   | —                        | —   | XTCR080F11_                 |
| 7-1/2                   | 15   | 25                     | 40   | 75   | 100  | —                        | —   | XTCR095F11_                 |

## Contactors with Screw Terminals, Frame F—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          | Spare Auxiliary Contacts |     | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|----------|--------------------------|-----|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V | K1M                      | K2M |                             |
| 80                         | 25                          | 37       | 48   | 63       | —                        | —   | XTCR080F11_                 |
| 95                         | 30                          | 45       | 57   | 75       | —                        | —   | XTCR095F11_                 |

## Frame G



## Contactors with Screw Terminals, Frame G—Maximum UL/CSA Ratings

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |      |      |      | Spare Auxiliary Contacts |     | Catalog Number <sup>①</sup> |
|-------------------------|------|------------------------|------|------|------|--------------------------|-----|-----------------------------|
| 115V                    | 230V | 200V                   | 230V | 460V | 575V | K1M                      | K2M |                             |
| 10                      | 25   | 40                     | 50   | 100  | 100  | —                        | —   | XTCR115G11_                 |
| 15                      | 30   | 40                     | 60   | 100  | 100  | —                        | —   | XTCR150G11_                 |

## Contactors with Screw Terminals, Frame G—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          | Spare Auxiliary Contacts |     | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|----------|--------------------------|-----|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V | K1M                      | K2M |                             |
| 115                        | 37                          | 55       | 70   | 90       | —                        | —   | XTCR115G11_                 |
| 150                        | 48                          | 75       | 91   | 96       | —                        | —   | XTCR150G11_                 |

**Note**

<sup>①</sup> Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.

## XTCR Reversing Contactor Components

| Quantity | Frame                | B           | C           | D           | F           | G           |
|----------|----------------------|-------------|-------------|-------------|-------------|-------------|
| 2        | Contactors           | XTCE...B01_ | XTCE...C01_ | XTCE...D00_ | XTCE...F00_ | XTCE...G00_ |
| 2        | Auxiliary contact    | XTCEXFAC20  | XTCEXFAC20  | XTCEXFBG11  | XTCEXFBG11  | XTCEXFBG11  |
| 1        | Mechanical interlock | XTCEXMLB    | XTCEXMLC    | XTCEXMLD    | XTCEXMLG    | XTCEXMLG    |
| 1        | Reversing link kit   | XTCEXRLB    | XTCEXRLC    | XTCEXRLD    | XTCEXRLG    | XTCEXRLG    |

## Magnet Coil Suffix

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| <b>Frames A–B</b>      |             |
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz             | <b>F</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24 Vdc                 | <b>TD</b>   |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 600V 60 Hz             | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>    |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>    |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>    |
| 400V 50 Hz             | <b>N</b>    |
| 380V 60 Hz             | <b>P</b>    |
| 12V 50/60 Hz           | <b>R</b>    |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>    |
| 48V 50 Hz              | <b>Y</b>    |
| 120 Vdc                | <b>AD</b>   |
| 220 Vdc                | <b>BD</b>   |
| 12 Vdc                 | <b>RD</b>   |
| 48 Vdc                 | <b>WD</b>   |

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| <b>Frames C–F</b>      |             |
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz             | <b>F</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24–27 Vdc              | <b>TD</b>   |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 600V 60 Hz             | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>    |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>    |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>    |
| 400V 50 Hz             | <b>N</b>    |
| 380V 60 Hz             | <b>P</b>    |
| 12V 50/60 Hz           | <b>R</b>    |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>    |
| 48V 50 Hz              | <b>Y</b>    |
| 110–130 Vdc            | <b>AD</b>   |
| 200–240 Vdc            | <b>BD</b>   |
| 48–60 Vdc              | <b>WD</b>   |

| Coil Voltage      | Suffix Code |
|-------------------|-------------|
| <b>Frame G</b>    |             |
| 100–120V 50/60 Hz | <b>A</b>    |
| 190–240V 50/60 Hz | <b>B</b>    |
| 24V 50/60 Hz      | <b>T</b>    |
| 24–27 Vdc         | <b>TD</b>   |
| 480–500V 50/60 Hz | <b>C</b>    |
| 380–440V 50/60 Hz | <b>L</b>    |
| 42–48V 50/60 Hz   | <b>W</b>    |
| 110–130 Vdc       | <b>AD</b>   |
| 200–240 Vdc       | <b>BD</b>   |
| 48–60 Vdc         | <b>WD</b>   |
| <b>Frame H</b>    |             |
| 100–120V 50/60 Hz | <b>A</b>    |
| 190–240V 50/60 Hz | <b>B</b>    |
| 480–500V 50/60 Hz | <b>C</b>    |
| 380–440V 50/60 Hz | <b>L</b>    |
| 24V 50/60Hz       | <b>T</b>    |
| 42–48V 50/60Hz    | <b>W</b>    |
| 110–130 Vdc       | <b>AD</b>   |
| 200–240 Vdc       | <b>BD</b>   |
| 24–27 Vdc         | <b>TD</b>   |
| 48–60 Vdc         | <b>WD</b>   |

| Coil Voltage                | Suffix Code |
|-----------------------------|-------------|
| <b>Frames L–N</b>           |             |
| 110–250 Vdc 40–60 Hz        | <b>A</b>    |
| 250–500V 40–60 Hz           | <b>C</b>    |
| 48–110 Vdc 40–60 Hz         | <b>Y</b>    |
| 24–48 Vdc                   | <b>TD</b> ① |
| <b>Frames L–M, S-Series</b> |             |
| 110–120V 50/60 Hz           | <b>A</b>    |
| 220–240V 50/60 Hz           | <b>B</b>    |
| <b>Frames P–R</b>           |             |
| 230–250 Vdc 50–60 Hz        | <b>B</b>    |

**Note**

① Frames L–M only.

**Full Voltage, Non-Reversing Starters, with Bimetallic or Electronic Overload****Frame B****Three-Pole Starters, Frame B—Maximum UL/CSA Ratings ①**

| Single-Phase hp Ratings |       | Three-Phase hp Ratings |      |      |       | Auxiliary<br>Contacts | Catalog Number ②③ |
|-------------------------|-------|------------------------|------|------|-------|-----------------------|-------------------|
| 115V                    | 230V  | 200V                   | 230V | 460V | 575V  |                       |                   |
| 1/4                     | 1     | 1-1/2                  | 2    | 3    | 5     | 1NO                   | XTAE007B10_       |
| 1/4                     | 1     | 1-1/2                  | 2    | 3    | 5     | 1NC                   | XTAE007B01_       |
| 1/2                     | 1-1/2 | 3                      | 3    | 5    | 7-1/2 | 1NO                   | XTAE009B10_       |
| 1/2                     | 1-1/2 | 3                      | 3    | 5    | 7-1/2 | 1NC                   | XTAE009B01_       |
| 1                       | 2     | 3                      | 3    | 10 ④ | 10    | 1NO                   | XTAE012B10_       |
| 1                       | 2     | 3                      | 3    | 10 ④ | 10    | 1NC                   | XTAE012B01_       |
| 1                       | 3     | 5                      | 5    | 10 ④ | 10    | 1NO                   | XTAE015B10_       |
| 1                       | 3     | 5                      | 5    | 10 ④ | 10    | 1NC                   | XTAE015B01_       |

**Three-Pole Starters, Frame B—Maximum IEC Ratings ①**

| AC-3<br>I <sub>e</sub> (A) | AC-1 | Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Catalog Number ②③ |
|----------------------------|------|-----------------------------|----------|------|----------|-----------------------|-------------------|
|                            |      | 220/230V                    | 380/400V | 415V | 660/690V |                       |                   |
| 7                          | 20   | 2.2                         | 3        | 4    | 3.5      | 1NO                   | XTAE007B10_       |
| 7                          | 20   | 2.2                         | 3        | 4    | 3.5      | 1NC                   | XTAE007B01_       |
| 9                          | 20   | 2.5                         | 4        | 5.5  | 4.5      | 1NO                   | XTAE009B10_       |
| 9                          | 20   | 2.5                         | 4        | 5.5  | 4.5      | 1NC                   | XTAE009B01_       |
| 12                         | 20   | 3.5                         | 5.5      | 7    | 6.5      | 1NO                   | XTAE012B10_       |
| 12                         | 20   | 3.5                         | 5.5      | 7    | 6.5      | 1NC                   | XTAE012B01_       |
| 15.5                       | 20   | 4                           | 7.5      | 8    | 7        | 1NO                   | XTAE015B10_       |
| 15.5                       | 20   | 4                           | 7.5      | 8    | 7        | 1NC                   | XTAE015B01_       |

**Frame C****Three-Pole Starters, Frame C—Maximum UL/CSA Ratings ①**

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |       |      |      | Auxiliary<br>Contacts | Catalog Number ②③ |
|-------------------------|------|------------------------|-------|------|------|-----------------------|-------------------|
| 115V                    | 230V | 200V                   | 230V  | 460V | 575V |                       |                   |
| 2                       | 3    | 5                      | 5     | 10 ④ | 15   | 1NO                   | XTAE018C10_       |
| 2                       | 3    | 5                      | 5     | 10 ④ | 15   | 1NC                   | XTAE018C01_       |
| 2                       | 5    | 7-1/2                  | 7-1/2 | 15   | 20   | 1NO                   | XTAE025C10_       |
| 2                       | 5    | 7-1/2                  | 7-1/2 | 15   | 20   | 1NC                   | XTAE025C01_       |
| 3                       | 5    | 10                     | 10    | 20   | 25   | 1NO                   | XTAE032C10_       |
| 3                       | 5    | 10                     | 10    | 20   | 25   | 1NC                   | XTAE032C01_       |

**Three-Pole Starters, Frame C—Maximum IEC Ratings ①**

| AC-3<br>I <sub>e</sub> (A) | AC-1 | Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Catalog Number ②③ |
|----------------------------|------|-----------------------------|----------|------|----------|-----------------------|-------------------|
|                            |      | 220/230V                    | 380/400V | 415V | 660/690V |                       |                   |
| 18                         | 35   | 5                           | 7.5      | 10   | 11       | 1NO                   | XTAE018C10_       |
| 18                         | 35   | 5                           | 7.5      | 10   | 11       | 1NC                   | XTAE018C01_       |
| 25                         | 40   | 7.5                         | 11       | 14.5 | 14       | 1NO                   | XTAE025C10_       |
| 25                         | 40   | 7.5                         | 11       | 14.5 | 14       | 1NC                   | XTAE025C01_       |
| 32                         | 40   | 10                          | 15       | 18   | 17       | 1NO                   | XTAE032C10_       |
| 32                         | 40   | 10                          | 15       | 18   | 17       | 1NC                   | XTAE032C01_       |

**Notes**

- ① Products shown are with the bimetallic overload relay.  
 ② Underscore ( ) indicates magnet coil suffix required. See **Page V5-T1-53**.  
 ③ Underscore ( ) indicates overload relay suffix required. See **Page V5-T1-54**.  
 ④ For electrical life contactor application data. See **Page V5-T1-53**.

Frame D

**Three-Pole Starters, Frame D—Maximum UL/CSA Ratings** ①

| Single-Phase hp Ratings |       | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog Number ②③ |
|-------------------------|-------|------------------------|------|------|------|-----------------------|-------------------|
| 115V                    | 230V  | 200V                   | 230V | 460V | 575V |                       |                   |
| 3                       | 7-1/2 | 10                     | 15   | 30   | 40   | —                     | XTAE040D00__      |
| 3                       | 10    | 15                     | 20   | 40   | 50   | —                     | XTAE050D00__      |
| 5                       | 15    | 20                     | 25   | 50   | 60   | —                     | XTAE065D00__      |

**Three-Pole Starters, Frame D—Maximum IEC Ratings** ①

| AC-3<br>I <sub>e</sub> (A) | AC-1 | Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Catalog Number ②③ |
|----------------------------|------|-----------------------------|----------|------|----------|-----------------------|-------------------|
|                            |      | 220/230V                    | 380/400V | 415V | 660/690V |                       |                   |
| 40                         | 50   | 12.5                        | 18.5     | 24   | 23       | —                     | XTAE040D00__      |
| 50                         | 60   | 15.5                        | 22       | 30   | 30       | —                     | XTAE050D00__      |
| 65                         | 72   | 20                          | 30       | 39   | 35       | —                     | XTAE065D00__      |

Frame F

**Three-Pole Starters, Frame F—Maximum UL/CSA Ratings** ①

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog Number ②③ |
|-------------------------|------|------------------------|------|------|------|-----------------------|-------------------|
| 115V                    | 230V | 200V                   | 230V | 460V | 575V |                       |                   |
| 7-1/2                   | 15   | 25                     | 30   | 60   | 75   | —                     | XTAE080F00__      |
| 7-1/2                   | 15   | 25                     | 40   | 75   | 100  | —                     | XTAE095F00__      |

**Three-Pole Starters, Frame F—Maximum IEC Ratings** ①

| AC-3<br>I <sub>e</sub> (A) | AC-1 | Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Catalog Number ②③ |
|----------------------------|------|-----------------------------|----------|------|----------|-----------------------|-------------------|
|                            |      | 220/230V                    | 380/400V | 415V | 660/690V |                       |                   |
| 80                         | 110  | 25                          | 37       | 48   | 63       | —                     | XTAE080F00__      |
| 95                         | 110  | 30                          | 45       | 57   | 75       | —                     | XTAE095F00__      |

Frame G

**Three-Pole Starters, Frame G—Maximum UL/CSA Ratings** ①

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |      |      |      | Auxiliary<br>Contacts | Catalog Number ②③ |
|-------------------------|------|------------------------|------|------|------|-----------------------|-------------------|
| 115V                    | 230V | 200V                   | 230V | 460V | 575V |                       |                   |
| 10                      | 25   | 40                     | 50   | 100  | 125  | —                     | XTAE115G00__      |
| 15                      | 30   | 40                     | 60   | 125  | 125  | —                     | XTAE150G00__      |

**Three-Pole Starters, Frame G—Maximum IEC Ratings** ①

| AC-3<br>I <sub>e</sub> (A) | AC-1 | Three-Phase Motors 50–60 Hz |          |      |          | Auxiliary<br>Contacts | Catalog Number ②③ |
|----------------------------|------|-----------------------------|----------|------|----------|-----------------------|-------------------|
|                            |      | 220/230V                    | 380/400V | 415V | 660/690V |                       |                   |
| 115                        | 160  | 37                          | 55       | 70   | 105      | —                     | XTAE115G00__      |
| 150                        | 160  | 48                          | 75       | 91   | 125      | —                     | XTAE150G00__      |

**Notes**

- ① Products shown are with the bimetallic overload relay.  
 ② Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.  
 ③ Underscore ( \_ ) indicates overload relay suffix required. See **Page V5-T1-54**.

**Full Voltage, Reversing Starters, with Bimetallic or Electronic Overload****Reversing Starters with Screw Terminals, Frame B—Maximum UL/CSA Ratings**

| Single-Phase hp Ratings |       | Three-Phase hp Ratings |      |      |       | Catalog Number <sup>①②</sup> |
|-------------------------|-------|------------------------|------|------|-------|------------------------------|
| 115V                    | 230V  | 200V                   | 230V | 460V | 575V  |                              |
| 1/4                     | 1     | 1-1/2                  | 2    | 3    | 5     | XTAR007B21_ _                |
| 1/2                     | 1-1/2 | 3                      | 3    | 5    | 7-1/2 | XTAR009B21_ _                |
| 1                       | 2     | 3                      | 3    | 10   | 10    | XTAR012B21_ _                |

**Reversing Starters with Screw Terminals, Frame B—Maximum IEC Ratings**

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          |  | Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------|----------|------|----------|--|------------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V |  |                              |
| 7                          | 2.2                         | 3        | 4    | 3.5      |  | XTAR007B21_ _                |
| 9                          | 2.5                         | 4        | 5.5  | 4.5      |  | XTAR009B21_ _                |
| 12                         | 3.5                         | 5.5      | 7    | 6.5      |  | XTAR012B21_ _                |

**Reversing Starters with Screw Terminals, Frame C—Maximum UL/CSA Ratings**

| Single-Phase hp Ratings |      | Three-Phase hp Ratings |       |      |      | Catalog Number <sup>①②</sup> |
|-------------------------|------|------------------------|-------|------|------|------------------------------|
| 115V                    | 230V | 200V                   | 230V  | 460V | 575V |                              |
| 2                       | 3    | 5                      | 5     | 10   | 15   | XTAR018C21_ _                |
| 2                       | 5    | 7-1/2                  | 7-1/2 | 15   | 20   | XTAR025C21_ _                |
| 3                       | 5    | 10                     | 10    | 20   | 25   | XTAR032C21_ _                |

**Reversing Starters with Screw Terminals, Frame C—Maximum IEC Ratings**

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          |  | Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------|----------|------|----------|--|------------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V |  |                              |
| 18                         | 5                           | 7.5      | 8    | 11       |  | XTAR018C21_ _                |
| 25                         | 7.5                         | 11       | 14.5 | 14       |  | XTAR025C21_ _                |
| 32                         | 10                          | 15       | 18   | 17       |  | XTAR032C21_ _                |

**Reversing Starters with Screw Terminals, Frame D—Maximum UL/CSA Ratings**

| Single-Phase hp Ratings |       | Three-Phase hp Ratings |      |      |      | Catalog Number <sup>①②</sup> |
|-------------------------|-------|------------------------|------|------|------|------------------------------|
| 115V                    | 230V  | 200V                   | 230V | 460V | 575V |                              |
| 3                       | 7-1/2 | 10                     | 15   | 30   | 40   | XTAR040D11_ _                |
| 3                       | 10    | 15                     | 20   | 40   | 50   | XTAR050D11_ _                |
| 5                       | 15    | 20                     | 25   | 50   | 60   | XTAR065D11_ _                |

**Reversing Starters with Screw Terminals, Frame D—Maximum IEC Ratings**

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |          |  | Catalog Number <sup>①②</sup> |
|----------------------------|-----------------------------|----------|------|----------|--|------------------------------|
|                            | 220/230V                    | 380/400V | 415V | 660/690V |  |                              |
| 40                         | 12.5                        | 18.5     | 24   | 23       |  | XTAR040D11_ _                |
| 50                         | 15.5                        | 22       | 30   | 30       |  | XTAR050D11_ _                |
| 65                         | 20                          | 30       | 39   | 35       |  | XTAR065D11_ _                |

**Notes**

① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-53**.

② Underscore ( \_ ) indicates overload relay suffix required. See **Page V5-T1-54**.

Starter Application Data <sup>①</sup>

| Catalog Prefix | AC-3 | Electrical Life (Operations) |
|----------------|------|------------------------------|
| XTAE012B       | 12A  | 1 million                    |
| XTAE015B       | 15A  | 1.2 million                  |
| XTAE018C       | 18A  | 2 million                    |

## Magnet Coil Suffix

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| <b>Frames A–B</b>      |             |
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz             | <b>F</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24 Vdc                 | <b>TD</b>   |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 600V 60 Hz             | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>    |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>    |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>    |
| 400V 50 Hz             | <b>N</b>    |
| 380V 60 Hz             | <b>P</b>    |
| 12V 50/60 Hz           | <b>R</b>    |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>    |
| 48V 50 Hz              | <b>Y</b>    |
| 120 Vdc                | <b>AD</b>   |
| 220 Vdc                | <b>BD</b>   |
| 12 Vdc                 | <b>RD</b>   |
| 48 Vdc                 | <b>WD</b>   |

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| <b>Frames C–F</b>      |             |
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz             | <b>F</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24–27 Vdc              | <b>TD</b>   |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 600V 60 Hz             | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>    |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>    |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>    |
| 400V 50 Hz             | <b>N</b>    |
| 380V 60 Hz             | <b>P</b>    |
| 12V 50/60 Hz           | <b>R</b>    |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>    |
| 48V 50 Hz              | <b>Y</b>    |
| 110–130 Vdc            | <b>AD</b>   |
| 200–240 Vdc            | <b>BD</b>   |
| 48–60 Vdc              | <b>WD</b>   |

| Coil Voltage      | Suffix Code |
|-------------------|-------------|
| <b>Frame G</b>    |             |
| 100–120V 50/60 Hz | <b>A</b>    |
| 190–240V 50/60 Hz | <b>B</b>    |
| 24V 50/60 Hz      | <b>T</b>    |
| 24–27 Vdc         | <b>TD</b>   |
| 480–500V 50/60 Hz | <b>C</b>    |
| 380–440V 50/60 Hz | <b>L</b>    |
| 42–48V 50/60 Hz   | <b>W</b>    |
| 110–130 Vdc       | <b>AD</b>   |
| 200–240 Vdc       | <b>BD</b>   |
| 48–60 Vdc         | <b>WD</b>   |
| <b>Frame H</b>    |             |
| 100–120V 50/60 Hz | <b>A</b>    |
| 190–240V 50/60 Hz | <b>B</b>    |
| 480–500V 50/60 Hz | <b>C</b>    |
| 380–440V 50/60 Hz | <b>L</b>    |
| 24V 50/60Hz       | <b>T</b>    |
| 42–48V 50/60Hz    | <b>W</b>    |
| 110–130 Vdc       | <b>AD</b>   |
| 200–240 Vdc       | <b>BD</b>   |
| 24–27 Vdc         | <b>TD</b>   |
| 48–60 Vdc         | <b>WD</b>   |

| Coil Voltage                | Suffix Code            |
|-----------------------------|------------------------|
| <b>Frames L–N</b>           |                        |
| 110–250 Vdc 40–60 Hz        | <b>A</b>               |
| 250–500V 40–60 Hz           | <b>C</b>               |
| 48–110 Vdc 40–60 Hz         | <b>Y</b>               |
| 24–48 Vdc                   | <b>TD</b> <sup>②</sup> |
| <b>Frames L–M, S-Series</b> |                        |
| 110–120V 50/60 Hz           | <b>A</b>               |
| 220–240V 50/60 Hz           | <b>B</b>               |
| <b>Frames P–R</b>           |                        |
| 230–250 Vdc 50–60 Hz        | <b>B</b>               |

## Notes

① See **Page V5-T1-111** for electrical life curves.

② Frames L–M only.

## Bimetallic Overload Relay Suffix

| Motor Full Load Amperes | Suffix Code | For Use with Contactor Ampere Range | Overload Relay Catalog Number |
|-------------------------|-------------|-------------------------------------|-------------------------------|
| <b>Frame B</b>          |             |                                     |                               |
| 0.1–0.16                | <b>P16</b>  | 7–15A                               | XTOBP16BC1                    |
| 0.16–0.24               | <b>P24</b>  | 7–15A                               | XTOBP24BC1                    |
| 0.24–0.4                | <b>P40</b>  | 7–15A                               | XTOBP40BC1                    |
| 0.4–0.6                 | <b>P60</b>  | 7–15A                               | XTOBP60BC1                    |
| 0.6–1                   | <b>001</b>  | 7–15A                               | XTOB001BC1                    |
| 1–1.6                   | <b>1P6</b>  | 7–15A                               | XTOB1P6BC1                    |
| 1.6–2.4                 | <b>2P4</b>  | 7–15A                               | XTOB2P4BC1                    |
| 2.4–4                   | <b>004</b>  | 7–15A                               | XTOB004BC1                    |
| 4–6                     | <b>006</b>  | 7–15A                               | XTOB006BC1                    |
| 6–10                    | <b>010</b>  | 7–15A                               | XTOB010BC1                    |
| 9–12                    | <b>012</b>  | 9–15A                               | XTOB012BC1                    |
| 12–16                   | <b>016</b>  | 12–15A                              | XTOB016BC1                    |
| <b>Frame C</b>          |             |                                     |                               |
| 0.1–0.16                | <b>P16</b>  | 18–32A                              | XTOBP16CC1                    |
| 0.16–0.24               | <b>P24</b>  | 18–32A                              | XTOBP24CC1                    |
| 0.24–0.4                | <b>P40</b>  | 18–32A                              | XTOBP40CC1                    |
| 0.4–0.6                 | <b>P60</b>  | 18–32A                              | XTOBP60CC1                    |
| 0.6–1                   | <b>001</b>  | 18–32A                              | XTOB001CC1                    |
| 1–1.6                   | <b>1P6</b>  | 18–32A                              | XTOB1P6CC1                    |
| 1.6–2.4                 | <b>2P4</b>  | 18–32A                              | XTOB2P4CC1                    |
| 2.4–4                   | <b>004</b>  | 18–32A                              | XTOB004CC1                    |
| 4–6                     | <b>006</b>  | 18–32A                              | XTOB006CC1                    |
| 6–10                    | <b>010</b>  | 18–32A                              | XTOB010CC1                    |
| 10–16                   | <b>016</b>  | 18–32A                              | XTOB016CC1                    |
| 16–24                   | <b>024</b>  | 18–32A                              | XTOB024CC1                    |
| 24–32                   | <b>032</b>  | 25–32A                              | XTOB032CC1                    |

| Motor Full Load Amperes | Suffix Code | For Use with Contactor Ampere Range | Overload Relay Catalog Number |
|-------------------------|-------------|-------------------------------------|-------------------------------|
| <b>Frame D</b>          |             |                                     |                               |
| 6–10                    | <b>010</b>  | 40–72A                              | XTOB010DC1                    |
| 10–16                   | <b>016</b>  | 40–72A                              | XTOB016DC1                    |
| 16–24                   | <b>024</b>  | 40–72A                              | XTOB024DC1                    |
| 24–40                   | <b>04</b>   | 40–72A                              | XTOB040DC1                    |
| 40–57                   | <b>057</b>  | 50–72A                              | XTOB057DC1                    |
| 50–65                   | <b>065</b>  | 65–72A                              | XTOB065DC1                    |
| 65–75                   | <b>075</b>  | 65–72A                              | XTOB075DC1                    |
| <b>Frame F</b>          |             |                                     |                               |
| 25–35                   | <b>035</b>  | 80–95A                              | XTOB055GC1 ①                  |
| 35–50                   | <b>050</b>  | 80–95A                              | XTOB050GC1 ①                  |
| 50–70                   | <b>070</b>  | 80–95A                              | XTOB070GC1 ①                  |
| 70–100                  | <b>100</b>  | 80–95A                              | XTOB100GC1 ①                  |
| <b>Frame G</b>          |             |                                     |                               |
| 25–35                   | <b>035</b>  | 115–170A                            | XTOB055GC1 ①                  |
| 35–50                   | <b>050</b>  | 115–170A                            | XTOB050GC1 ①                  |
| 50–70                   | <b>070</b>  | 115–170A                            | XTOB070GC1 ①                  |
| 70–100                  | <b>100</b>  | 115–170A                            | XTOB100GC1 ①                  |
| 95–125                  | <b>125</b>  | 115–170A                            | XTOB125GC1 ①                  |
| 120–150                 | <b>150</b>  | 150–170A                            | XTOB150GC1 ①                  |
| 145–175                 | <b>175</b>  | 150–170A                            | XTOB175GC1 ①                  |

## Electronic Overload Relay Suffix

## XTOE Maximum Overload Rating

|                   | Standard Type Suffix | Ground Fault Type Suffix |
|-------------------|----------------------|--------------------------|
| <b>Frame B</b>    |                      |                          |
| 0.33–1.65A        | <b>5E1P6</b>         | <b>5G1P6</b>             |
| 1–5A              | <b>5E005</b>         | <b>5G005</b>             |
| 4–20A             | <b>5E020</b>         | <b>5G020</b>             |
| <b>Frame C</b>    |                      |                          |
| 0.33–1.65A        | <b>5E1P6</b>         | <b>5G1P6</b>             |
| 1–5A              | <b>5E005</b>         | <b>5G005</b>             |
| 4–20A             | <b>5E020</b>         | <b>5G020</b>             |
| 9–45A             | <b>5E045</b>         | <b>5G045</b>             |
| <b>Frame D</b>    |                      |                          |
| 9–45A             | <b>5E045</b>         | <b>5G045</b>             |
| 20–100A           | <b>5E100</b>         | <b>5G100</b>             |
| <b>Frame F, G</b> |                      |                          |
| 20–100A           | <b>5E100</b>         | <b>5G100</b>             |
| <b>Frame G</b>    |                      |                          |
| 35–175A           | <b>5E175</b>         | <b>5G175</b>             |

**Note**

① Catalog number refers to direct mount overload relay. Add an **S** to the end of the catalog number for separate mount.

**Star-Delta (Wye-Delta) Starters****Frame B—Maximum UL/CSA Ratings**

| Three-Phase hp Ratings |      |       |      | Max. Changeover Time (sec) | Component Description  | Catalog Number ① |
|------------------------|------|-------|------|----------------------------|------------------------|------------------|
| 200V                   | 230V | 460V  | 575V |                            |                        |                  |
| 3                      | 3    | 2-1/2 | 10   | <20                        | K1M main contactor     | XTCE007B10_      |
|                        |      |       |      |                            | K5M delta contactor    | XTCE007B01_      |
|                        |      |       |      |                            | K3M star contactor     | XTCE007B01_      |
|                        |      |       |      |                            | Mechanical interlock   | XTCEXMLB         |
|                        |      |       |      |                            | K1T timing relay       | XTTR6A60S51B     |
|                        |      |       |      |                            | Overload relay         | XTOB...BC1       |
|                        |      |       |      |                            | (3) auxiliary contacts | XTCEXFAC20       |
|                        |      |       |      |                            | Star-delta link kit    | XTCEXSDB         |
| 3                      | 5    | 7-1/2 | 10   | <20                        | K1M main contactor     | XTCE009B10_      |
|                        |      |       |      |                            | K5M delta contactor    | XTCE009B01_      |
|                        |      |       |      |                            | K3M star contactor     | XTCE009B01_      |
|                        |      |       |      |                            | Mechanical interlock   | XTCEXMLB         |
|                        |      |       |      |                            | K1T timing relay       | XTTR6A60S51B     |
|                        |      |       |      |                            | Overload relay         | XTOB...BC1       |
|                        |      |       |      |                            | (3) auxiliary contacts | XTCEXFAC20       |
|                        |      |       |      |                            | Star-delta link kit    | XTCEXSDB         |
| 5                      | 5    | 10    | 15   | <20                        | K1M main contactor     | XTCE012B10_      |
|                        |      |       |      |                            | K5M delta contactor    | XTCE012B01_      |
|                        |      |       |      |                            | K3M star contactor     | XTCE012B01_      |
|                        |      |       |      |                            | Mechanical interlock   | XTCEXMLB         |
|                        |      |       |      |                            | K1T timing relay       | XTTR6A60S51B     |
|                        |      |       |      |                            | Overload relay         | XTOB...BC1       |
|                        |      |       |      |                            | (3) auxiliary contacts | XTCEXFAC20       |
|                        |      |       |      |                            | Star-delta link kit    | XTCEXSDB         |

**Frame B—Maximum IEC Ratings**

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover Time (sec) | Component Description  | Catalog Number ① |
|----------------------------|-----------------------------|----------|------|------|----------|-------|----------------------------|------------------------|------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                            |                        |                  |
| 12                         | 3                           | 5.5      | 7    | 5.5  | 5.5      | —     | <20                        | K1M main contactor     | XTCE007B10_      |
|                            |                             |          |      |      |          |       |                            | K5M delta contactor    | XTCE007B01_      |
|                            |                             |          |      |      |          |       |                            | K3M star contactor     | XTCE007B01_      |
|                            |                             |          |      |      |          |       |                            | Mechanical interlock   | XTCEXMLB         |
|                            |                             |          |      |      |          |       |                            | K1T timing relay       | XTTR6A60S51B     |
|                            |                             |          |      |      |          |       |                            | Overload relay         | XTOB...BC1       |
|                            |                             |          |      |      |          |       |                            | (3) auxiliary contacts | XTCEXFAC20       |
|                            |                             |          |      |      |          |       |                            | Star-delta link kit    | XTCEXSDB         |
| 16                         | 4                           | 7.5      | 8    | 7.5  | 7.5      | —     | <20                        | K1M main contactor     | XTCE009B10_      |
|                            |                             |          |      |      |          |       |                            | K5M delta contactor    | XTCE009B01_      |
|                            |                             |          |      |      |          |       |                            | K3M star contactor     | XTCE009B01_      |
|                            |                             |          |      |      |          |       |                            | Mechanical interlock   | XTCEXMLB         |
|                            |                             |          |      |      |          |       |                            | K1T timing relay       | XTTR6A60S51B     |
|                            |                             |          |      |      |          |       |                            | Overload relay         | XTOB...BC1       |
|                            |                             |          |      |      |          |       |                            | (3) auxiliary contacts | XTCEXFAC20       |
|                            |                             |          |      |      |          |       |                            | Star-delta link kit    | XTCEXSDB         |
| 22                         | 5.5                         | 11       | 14.5 | 11   | 11       | —     | <20                        | K1M main contactor     | XTCE012B10_      |
|                            |                             |          |      |      |          |       |                            | K5M delta contactor    | XTCE012B01_      |
|                            |                             |          |      |      |          |       |                            | K3M star contactor     | XTCE012B01_      |
|                            |                             |          |      |      |          |       |                            | Mechanical interlock   | XTCEXMLB         |
|                            |                             |          |      |      |          |       |                            | K1T timing relay       | XTTR6A60S51B     |
|                            |                             |          |      |      |          |       |                            | Overload relay         | XTOB...BC1       |
|                            |                             |          |      |      |          |       |                            | (3) auxiliary contacts | XTCEXFAC20       |
|                            |                             |          |      |      |          |       |                            | Star-delta link kit    | XTCEXSDB         |

**Note**① Underscore ( ) indicates magnet coil suffix required. See **Page V5-T1-62**.



## Frame C—Maximum UL/CSA Ratings

| Three-Phase hp Ratings |       |      |      | Max. Changeover<br>Time (sec) | Component<br>Description | Catalog Number ① |
|------------------------|-------|------|------|-------------------------------|--------------------------|------------------|
| 200V                   | 230V  | 460V | 575V |                               |                          |                  |
| 7-1/2                  | 7-1/2 | 15   | 20   | <20                           | K1M main contactor       | XTCE018C10_      |
|                        |       |      |      |                               | K5M delta contactor      | XTCE018C01_      |
|                        |       |      |      |                               | K3M star contactor       | XTCE018C01_      |
|                        |       |      |      |                               | Mechanical interlock     | XTCEXMLC         |
|                        |       |      |      |                               | K1T timing relay         | XTTR6A60S51B     |
|                        |       |      |      |                               | Overload relay           | XTOB...CC1       |
|                        |       |      |      |                               | (3) auxiliary contacts   | XTCEXFAC20       |
|                        |       |      |      |                               | Star-delta link kit      | XTCEXSDLC        |
| 10                     | 15    | 30   | 40   | <20                           | K1M main contactor       | XTCE025C10_      |
|                        |       |      |      |                               | K5M delta contactor      | XTCE025C01_      |
|                        |       |      |      |                               | K3M star contactor       | XTCE025C01_      |
|                        |       |      |      |                               | Mechanical interlock     | XTCEXMLC         |
|                        |       |      |      |                               | K1T timing relay         | XTTR6A60S51B     |
|                        |       |      |      |                               | Overload relay           | XTOB...CC1       |
|                        |       |      |      |                               | (3) auxiliary contacts   | XTCEXFAC20       |
|                        |       |      |      |                               | Star-delta link kit      | XTCEXSDLC        |
| 15                     | 20    | 40   | 50   | <20                           | K1M main contactor       | XTCE032C10_      |
|                        |       |      |      |                               | K5M delta contactor      | XTCE032C01_      |
|                        |       |      |      |                               | K3M star contactor       | XTCE032C01_      |
|                        |       |      |      |                               | Mechanical interlock     | XTCEXMLC         |
|                        |       |      |      |                               | K1T timing relay         | XTTR6A60S51B     |
|                        |       |      |      |                               | Overload relay           | XTOB...CC1       |
|                        |       |      |      |                               | (3) auxiliary contacts   | XTCEXFAC20       |
|                        |       |      |      |                               | Star-delta link kit      | XTCEXSDLC        |

## Frame C—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover<br>Time (sec) | Component<br>Description | Catalog Number ① |
|----------------------------|-----------------------------|----------|------|------|----------|-------|-------------------------------|--------------------------|------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                               |                          |                  |
| 30                         | 7.5                         | 15       | 19   | 18.5 | 18.5     | —     | <20                           | K1M main contactor       | XTCE018C10_      |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor      | XTCE018C01_      |
|                            |                             |          |      |      |          |       |                               | K3M star contactor       | XTCE018C01_      |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock     | XTCEXMLC         |
|                            |                             |          |      |      |          |       |                               | K1T timing relay         | XTTR6A60S51B     |
|                            |                             |          |      |      |          |       |                               | Overload relay           | XTOB...CC1       |
|                            |                             |          |      |      |          |       |                               | (3) auxiliary contacts   | XTCEXFAC20       |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit      | XTCEXSDLC        |
| 45                         | 11                          | 22       | 30   | 30   | 22       | —     | <20                           | K1M main contactor       | XTCE025C10_      |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor      | XTCE025C01_      |
|                            |                             |          |      |      |          |       |                               | K3M star contactor       | XTCE025C01_      |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock     | XTCEXMLC         |
|                            |                             |          |      |      |          |       |                               | K1T timing relay         | XTTR6A60S51B     |
|                            |                             |          |      |      |          |       |                               | Overload relay           | XTOB...CC1       |
|                            |                             |          |      |      |          |       |                               | (3) auxiliary contacts   | XTCEXFAC20       |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit      | XTCEXSDLC        |
| 55                         | 15                          | 30       | 39   | 37   | 30       | —     | <20                           | K1M main contactor       | XTCE032C10_      |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor      | XTCE032C01_      |
|                            |                             |          |      |      |          |       |                               | K3M star contactor       | XTCE032C01_      |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock     | XTCEXMLC         |
|                            |                             |          |      |      |          |       |                               | K1T timing relay         | XTTR6A60S51B     |
|                            |                             |          |      |      |          |       |                               | Overload relay           | XTOB...CC1       |
|                            |                             |          |      |      |          |       |                               | (3) auxiliary contacts   | XTCEXFAC20       |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit      | XTCEXSDLC        |

**Note**

① Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-62**.

## Frame D—Maximum UL/CSA Ratings

| Three-Phase hp Ratings<br>200V | 230V | 460V | 575V | Max. Changeover<br>Time (sec) | Component<br>Description          | Catalog Number <sup>①</sup> |
|--------------------------------|------|------|------|-------------------------------|-----------------------------------|-----------------------------|
| 20                             | 25   | 50   | 60   | <20                           | K1M main contactor                | XTCE040D00_                 |
|                                |      |      |      |                               | K5M delta contactor               | XTCE040D00_                 |
|                                |      |      |      |                               | K3M star contactor                | XTCE040D00_                 |
|                                |      |      |      |                               | Mechanical interlock              | XTCEXMLD                    |
|                                |      |      |      |                               | K1T timing relay                  | XTTR6A60S51B                |
|                                |      |      |      |                               | Overload relay                    | XTOB...DC1                  |
|                                |      |      |      |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                                |      |      |      |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                                |      |      |      |                               | Star-delta link kit               | XTCEXSDLD                   |
| 25                             | 30   | 60   | 75   | <20                           | K1M main contactor                | XTCE050D00_                 |
|                                |      |      |      |                               | K5M delta contactor               | XTCE050D00_                 |
|                                |      |      |      |                               | K3M star contactor                | XTCE040D00_                 |
|                                |      |      |      |                               | Mechanical interlock              | XTCEXMLD                    |
|                                |      |      |      |                               | K1T timing relay                  | XTTR6A60S51B                |
|                                |      |      |      |                               | Overload relay                    | XTOB...DC1                  |
|                                |      |      |      |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                                |      |      |      |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                                |      |      |      |                               | Star-delta link kit               | XTCEXSDLD                   |
| 40                             | 50   | 100  | 125  | <20                           | K1M main contactor                | XTCE065D00_                 |
|                                |      |      |      |                               | K5M delta contactor               | XTCE065D00_                 |
|                                |      |      |      |                               | K3M star contactor                | XTCE040D00_                 |
|                                |      |      |      |                               | Mechanical interlock              | XTCEXMLD                    |
|                                |      |      |      |                               | K1T timing relay                  | XTTR6A60S51B                |
|                                |      |      |      |                               | Overload relay                    | XTOB...DC1                  |
|                                |      |      |      |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                                |      |      |      |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                                |      |      |      |                               | Star-delta link kit               | XTCEXSDLD                   |

## Frame D—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover<br>Time (sec) | Component<br>Description          | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|------|----------|-------|-------------------------------|-----------------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                               |                                   |                             |
| 70                         | 18.5                        | 37       | 37   | 45   | 37       | —     | <20                           | K1M main contactor                | XTCE040D00_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE040D00_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE040D00_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock              | XTCEXMLD                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOB...DC1                  |
|                            |                             |          |      |      |          |       |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                            |                             |          |      |      |          |       |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit               | XTCEXSDLD                   |
| 90                         | 22                          | 45       | 45   | 55   | 45       | —     | <20                           | K1M main contactor                | XTCE050D00_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE050D00_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE040D00_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock              | XTCEXMLD                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOB...DC1                  |
|                            |                             |          |      |      |          |       |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                            |                             |          |      |      |          |       |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit               | XTCEXSDLD                   |
| 115                        | 30                          | 55       | 55   | 75   | 55       | —     | <20                           | K1M main contactor                | XTCE065D00_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE065D00_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE040D00_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock              | XTCEXMLD                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOB...DC1                  |
|                            |                             |          |      |      |          |       |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                            |                             |          |      |      |          |       |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit               | XTCEXSDLD                   |

## Note

<sup>①</sup> Underscore ( ) indicates magnet coil suffix required. See Page V5-T1-62.

## Frame F—Maximum UL/CSA Ratings

| Three-Phase hp Ratings |      |      |      | Max. Changeover<br>Time (sec) | Component<br>Description          | Catalog Number <sup>①</sup> |
|------------------------|------|------|------|-------------------------------|-----------------------------------|-----------------------------|
| 200V                   | 230V | 460V | 575V |                               |                                   |                             |
| 40                     | 60   | 125  | 150  | <20                           | K1M main contactor                | XTCE080F00_                 |
|                        |      |      |      |                               | K5M delta contactor               | XTCE080F00_                 |
|                        |      |      |      |                               | K3M star contactor                | XTCE080F00_                 |
|                        |      |      |      |                               | Mechanical interlock <sup>②</sup> | XTCEXMLG                    |
|                        |      |      |      |                               | K1T timing relay                  | XTTR6A60S51B                |
|                        |      |      |      |                               | Overload relay                    | XTOB...FC1                  |
|                        |      |      |      |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                        |      |      |      |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
| 40                     | 60   | 125  | 150  | <20                           | Star-delta link kit               | XTCEXSDF                    |
|                        |      |      |      |                               | K1M main contactor                | XTCE095F00_                 |
|                        |      |      |      |                               | K5M delta contactor               | XTCE095F00_                 |
|                        |      |      |      |                               | K3M star contactor                | XTCE080F00_                 |
|                        |      |      |      |                               | Mechanical interlock <sup>②</sup> | XTCEXMLG                    |
|                        |      |      |      |                               | K1T timing relay                  | XTTR6A60S51B                |
|                        |      |      |      |                               | Overload relay                    | XTOB...FC1                  |
|                        |      |      |      |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
| 40                     | 60   | 125  | 150  | <20                           | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                        |      |      |      |                               | Star-delta link kit               | XTCEXSDF                    |

## Frame F—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover<br>Time (sec) | Component<br>Description          | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|------|----------|-------|-------------------------------|-----------------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                               |                                   |                             |
| 140                        | 37                          | 75       | 75   | 90   | 90       | —     | <20                           | K1M main contactor                | XTCE080F00_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE080F00_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE080F00_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock <sup>②</sup> | XTCEXMLG                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOB...FC1                  |
|                            |                             |          |      |      |          |       |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
|                            |                             |          |      |      |          |       |                               | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
| 165                        | 45                          | 90       | 110  | 110  | 132      | —     | <20                           | Star-delta link kit               | XTCEXSDF                    |
|                            |                             |          |      |      |          |       |                               | K1M main contactor                | XTCE095F00_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE095F00_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE080F00_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock <sup>②</sup> | XTCEXMLG                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOB...FC1                  |
|                            |                             |          |      |      |          |       |                               | (2) auxiliary contacts (K1M, K3M) | XTCEXFBG11                  |
| 165                        | 45                          | 90       | 110  | 110  | 132      | —     | <20                           | (1) auxiliary contact (K5M)       | XTCEXFBG31                  |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit               | XTCEXSDF                    |

## Notes

<sup>①</sup> Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-62**.

<sup>②</sup> If mechanical interlock of star contactor is required, it must be the same frame size of the delta contactor or use the same mechanical interlock, see **Page V5-T1-73** for mechanical interlocks. (Example: XTCE...L22\_ and XTCE...M22\_ both use mechanical interlock XTCEXMLM.)

## Frame G—Maximum UL/CSA Ratings

| Three-Phase hp Ratings |      |      |      | Max. Changeover<br>Time (sec) | Component<br>Description    | Catalog Number <sup>①</sup> |
|------------------------|------|------|------|-------------------------------|-----------------------------|-----------------------------|
| 200V                   | 230V | 460V | 575V |                               |                             |                             |
| 50                     | 60   | 125  | 150  | <20                           | K1M main contactor          | XTCE115G00_                 |
|                        |      |      |      |                               | K5M delta contactor         | XTCE115G00_                 |
|                        |      |      |      |                               | K3M star contactor          | XTCE080F00_                 |
|                        |      |      |      |                               | Mechanical interlock        | XTCEXMLG                    |
|                        |      |      |      |                               | K1T timing relay            | XTTR6A60S51B                |
|                        |      |      |      |                               | Overload relay              | XTOB...GC1                  |
|                        |      |      |      |                               | (2) auxiliary contacts      | XTCEXFBG11                  |
|                        |      |      |      |                               | (1) auxiliary contact (K5M) | XTCEXFBG31                  |
| 75                     | 100  | 200  | 250  | <20                           | Star-delta link kit         | XTCEXSDLG                   |
|                        |      |      |      |                               | K1M main contactor          | XTCE150G00_                 |
|                        |      |      |      |                               | K5M delta contactor         | XTCE150G00_                 |
|                        |      |      |      |                               | K3M star contactor          | XTCE080F00_                 |
|                        |      |      |      |                               | Mechanical interlock        | XTCEXMLG                    |
|                        |      |      |      |                               | K1T timing relay            | XTTR6A60S51B                |
|                        |      |      |      |                               | Overload relay              | XTOB...GC1                  |
|                        |      |      |      |                               | (2) auxiliary contacts      | XTCEXFBG11                  |
|                        |      |      |      |                               | (1) auxiliary contact (K5M) | XTCEXFBG31                  |
|                        |      |      |      |                               | Star-delta link kit         | XTCEXSDLG                   |

## Frame G—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover<br>Time (sec) | Component<br>Description    | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|------|----------|-------|-------------------------------|-----------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                               |                             |                             |
| 200                        | 55                          | 110      | 132  | 132  | 160      | —     | <20                           | K1M main contactor          | XTCE115G00_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor         | XTCE115G00_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor          | XTCE080F00_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock        | XTCEXMLG                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay            | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay              | XTOB...GC1                  |
|                            |                             |          |      |      |          |       |                               | (2) auxiliary contacts      | XTCEXFBG11                  |
|                            |                             |          |      |      |          |       |                               | (1) auxiliary contact (K5M) | XTCEXFBG31                  |
| 260                        | 75                          | 132      | 148  | 160  | 160      | —     | <20                           | Star-delta link kit         | XTCEXSDLG                   |
|                            |                             |          |      |      |          |       |                               | K1M main contactor          | XTCE150G00_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor         | XTCE150G00_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor          | XTCE080F00_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock        | XTCEXMLG                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay            | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay              | XTOB...GC1                  |
|                            |                             |          |      |      |          |       |                               | (2) auxiliary contacts      | XTCEXFBG11                  |
|                            |                             |          |      |      |          |       |                               | (1) auxiliary contact (K5M) | XTCEXFBG31                  |
|                            |                             |          |      |      |          |       |                               | Star-delta link kit         | XTCEXSDLG                   |

**Note**

<sup>①</sup> Underscore ( ) indicates magnet coil suffix required. See **Page V5-T1-62**.

## Frame L—Maximum UL/CSA Ratings

| Three-Phase hp Ratings |      |      |      | Max. Changeover<br>Time (sec) | Component<br>Description | Catalog Number <sup>①</sup> |
|------------------------|------|------|------|-------------------------------|--------------------------|-----------------------------|
| 200V                   | 230V | 460V | 575V |                               |                          |                             |
| 125                    | 150  | 300  | 400  | <30                           | K1M main contactor       | XTCS250L22_                 |
|                        |      |      |      |                               | K5M delta contactor      | XTCS250L22_                 |
|                        |      |      |      |                               | K3M star contactor       | XTCS250L22_                 |
|                        |      |      |      |                               | Mechanical interlock     | XTCEXMLM                    |
|                        |      |      |      |                               | K1T timing relay         | XTTR6A60S51B                |
|                        |      |      |      |                               | Overload relay           | XTOB...LC1                  |

## Frame L—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover<br>Time (sec) | Component<br>Description | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|------|----------|-------|-------------------------------|--------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                               |                          |                             |
| 430                        | 132                         | 250      | 300  | 315  | 400      | 200   | <30                           | K1M main contactor       | XTCS250L22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor      | XTCS250L22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor       | XTCS250L22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock     | XTCEXMLM                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay         | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay           | XTOB...LC1                  |

## Frame M—Maximum UL/CSA Ratings

| Three-Phase hp Ratings |      |      |      | Max. Changeover<br>Time (sec) | Component<br>Description | Catalog Number <sup>①</sup> |
|------------------------|------|------|------|-------------------------------|--------------------------|-----------------------------|
| 200V                   | 230V | 460V | 575V |                               |                          |                             |
| 200                    | 250  | 500  | 600  | <20                           | K1M main contactor       | XTCS400M22_                 |
|                        |      |      |      |                               | K5M delta contactor      | XTCS400M22_                 |
|                        |      |      |      |                               | K3M star contactor       | XTCS250L22_                 |
|                        |      |      |      |                               | Mechanical interlock     | XTCEXMLM                    |
|                        |      |      |      |                               | K1T timing relay         | XTTR6A60S51B                |
|                        |      |      |      |                               | Overload relay           | XTOT...C3S                  |
| 290                    | 350  | 700  | 860  | <30                           | K1M main contactor       | XTCS500M22_                 |
|                        |      |      |      |                               | K5M delta contactor      | XTCS500M22_                 |
|                        |      |      |      |                               | K3M star contactor       | XTCS300M22_                 |
|                        |      |      |      |                               | Mechanical interlock     | XTCEXMLM                    |
|                        |      |      |      |                               | K1T timing relay         | XTTR6A60S51B                |
|                        |      |      |      |                               | Overload relay           | XTOT...C3S                  |

## Frame M—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover<br>Time (sec) | Component<br>Description | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|------|----------|-------|-------------------------------|--------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                               |                          |                             |
| 685                        | 200                         | 355      | 390  | 450  | 560      | 220   | <20                           | K1M main contactor       | XTCS400M22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor      | XTCS400M22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor       | XTCS250L22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock     | XTCSXMLM                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay         | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay           | XTOT...C3S                  |
| 860                        | 250                         | 450      | 500  | 560  | 600      | 220   | <30                           | K1M main contactor       | XTCS500M22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor      | XTCS500M22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor       | XTCS300M22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock     | XTCEXMLM                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay         | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay           | XTOT...C3S                  |

## Notes

<sup>①</sup> Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-62**.

<sup>②</sup> If mechanical interlock of star contactor is required, it must be the same frame size of the delta contactor or use the same mechanical interlock, see **Page V5-T1-73** for mechanical interlocks. (Example: XTCE...L22\_ and XTCE...M22\_ both use mechanical interlock XTCEXMLM.)

Frame N—Maximum UL/CSA Ratings are not applicable.

#### Frame N—Maximum IEC Ratings

| AC-3<br>I <sub>e</sub> (A) | Three-Phase Motors 50–60 Hz |          |      |      |          |       | Max. Changeover<br>Time (sec) | Component<br>Description          | Catalog Number <sup>①</sup> |
|----------------------------|-----------------------------|----------|------|------|----------|-------|-------------------------------|-----------------------------------|-----------------------------|
|                            | 220/230V                    | 380/400V | 415V | 500V | 660/690V | 1000V |                               |                                   |                             |
| 1000                       | 300                         | 560      | 610  | 710  | 900      | 355   | <30                           | K1M main contactor                | XTCE580N22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE580N22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE580N22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock <sup>②</sup> | XTCEXMLN                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOT...C3S                  |
| 1120                       | 350                         | 630      | 680  | 750  | 950      | 355   | <30                           | K1M main contactor                | XTCE650N22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE650N22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE580N22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock <sup>②</sup> | XTCEXMLN                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOT...C3S                  |
| 1290                       | 400                         | 710      | 760  | 900  | 1200     | 1400  | <30                           | K1M main contactor                | XTCE750N22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE750N22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE580N22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock              | XTCEXMLN                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOT...C3S                  |
| 1400                       | 450                         | 800      | 850  | 950  | 1300     | 1400  | <30                           | K1M main contactor                | XTCE820N22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCE820N22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE580N22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock              | XTCEXMLN                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51                 |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOT...C3S                  |
| 1700                       | 560                         | 1000     | 1050 | 1200 | 1700     | 1700  | <20                           | K1M main contactor                | XTCEC10N22_                 |
|                            |                             |          |      |      |          |       |                               | K5M delta contactor               | XTCEC10N22_                 |
|                            |                             |          |      |      |          |       |                               | K3M star contactor                | XTCE650N22_                 |
|                            |                             |          |      |      |          |       |                               | Mechanical interlock              | XTCEXMLN                    |
|                            |                             |          |      |      |          |       |                               | K1T timing relay                  | XTTR6A60S51B                |
|                            |                             |          |      |      |          |       |                               | Overload relay                    | XTOT...C3S                  |

#### Notes

Main circuit: Depending on the coordination type required (that is, Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

Control circuit: If the combinations are used in the scope of the IEC/EN 60 204-1, VDE 0113 part 1, point 9.1.1 regarding the supply of control circuits is to be observed.

<sup>①</sup> Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-62**.

<sup>②</sup> If mechanical interlock of star contactor is required, it must be the same frame size of the delta contactor or use the same mechanical interlock, see **Page V5-T1-73** for mechanical interlocks. (Example: XTCE...L22\_ and XTCE...M22\_ both use mechanical interlock XTCEXMLM.)

## Spare Auxiliary Contacts

| AC-3     | K1M                                                                               | K3M                                                                               | K5M                                                                               |
|----------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| 12–55    |  |  |  |
| 90–260   |  | —                                                                                 | —                                                                                 |
| 315–1700 |  |  |  |

## Magnet Coil Suffix

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| <b>Frames A–B</b>      |             |
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz             | <b>F</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24 Vdc                 | <b>TD</b>   |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 600V 60 Hz             | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>    |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>    |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>    |
| 400V 50 Hz             | <b>N</b>    |
| 380V 60 Hz             | <b>P</b>    |
| 12V 50/60 Hz           | <b>R</b>    |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>    |
| 48V 50 Hz              | <b>Y</b>    |
| 120 Vdc                | <b>AD</b>   |
| 220 Vdc                | <b>BD</b>   |
| 12 Vdc                 | <b>RD</b>   |
| 48 Vdc                 | <b>WD</b>   |

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| <b>Frames C–F</b>      |             |
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz             | <b>F</b>    |
| 24V 50/60 Hz           | <b>T</b>    |
| 24–27 Vdc              | <b>TD</b>   |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>    |
| 600V 60 Hz             | <b>D</b>    |
| 208V 60 Hz             | <b>E</b>    |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>    |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>    |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>    |
| 400V 50 Hz             | <b>N</b>    |
| 380V 60 Hz             | <b>P</b>    |
| 12V 50/60 Hz           | <b>R</b>    |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>    |
| 48V 50 Hz              | <b>Y</b>    |
| 110–130 Vdc            | <b>AD</b>   |
| 200–240 Vdc            | <b>BD</b>   |
| 48–60 Vdc              | <b>WD</b>   |

| Coil Voltage      | Suffix Code |
|-------------------|-------------|
| <b>Frame G</b>    |             |
| 100–120V 50/60 Hz | <b>A</b>    |
| 190–240V 50/60 Hz | <b>B</b>    |
| 24V 50/60 Hz      | <b>T</b>    |
| 24–27 Vdc         | <b>TD</b>   |
| 480–500V 50/60 Hz | <b>C</b>    |
| 380–440V 50/60 Hz | <b>L</b>    |
| 42–48V 50/60 Hz   | <b>W</b>    |
| 110–130 Vdc       | <b>AD</b>   |
| 200–240 Vdc       | <b>BD</b>   |
| 48–60 Vdc         | <b>WD</b>   |
| <b>Frame H</b>    |             |
| 100–120V 50/60 Hz | <b>A</b>    |
| 190–240V 50/60 Hz | <b>B</b>    |
| 480–500V 50/60 Hz | <b>C</b>    |
| 380–440V 50/60 Hz | <b>L</b>    |
| 24V 50/60Hz       | <b>T</b>    |
| 42–48V 50/60Hz    | <b>W</b>    |
| 110–130 Vdc       | <b>AD</b>   |
| 200–240 Vdc       | <b>BD</b>   |
| 24–27 Vdc         | <b>TD</b>   |
| 48–60 Vdc         | <b>WD</b>   |

| Coil Voltage                | Suffix Code            |
|-----------------------------|------------------------|
| <b>Frames L–N</b>           |                        |
| 110–250 Vdc 40–60 Hz        | <b>A</b>               |
| 250–500V 40–60 Hz           | <b>C</b>               |
| 48–110 Vdc 40–60 Hz         | <b>Y</b>               |
| 24–48 Vdc                   | <b>TD</b> <sup>①</sup> |
| <b>Frames L–M, S-Series</b> |                        |
| 110–120V 50/60 Hz           | <b>A</b>               |
| 220–240V 50/60 Hz           | <b>B</b>               |
| <b>Frames P–R</b>           |                        |
| 230–250 Vdc 50–60 Hz        | <b>B</b>               |

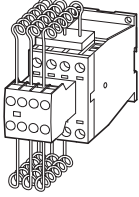
## Overload Relay Settings (A)

| Setting                                                                                                               | Starting  |
|-----------------------------------------------------------------------------------------------------------------------|-----------|
| <b>A:</b> $I_N \times 0.58$<br>Motor protection in the star (wye) and delta configurations                            | ≤15 sec   |
| <b>B:</b> $I_N \times 1$<br>Only partial motor protection in star position                                            | 15–40 sec |
| <b>C:</b> $I_N \times 0.58$<br>Motor not protected in star (wye) position<br>Timing relay set to approximately 10 sec | >40 sec   |

**Note**

<sup>①</sup> Frames L–M only.

XTCC0\_



### XTCC Contactors for Three-Phase Capacitors

Three-Phase Capacitors, 50–60 Hz  
Open kVAR Ratings <sup>①</sup>

| 230V | 400V | 525V | 690V | Contact Sequence | Catalog Number <sup>②</sup> |
|------|------|------|------|------------------|-----------------------------|
| 11   | 20   | 25   | 33.3 |                  | XTCC020C11_                 |
| 15   | 25   | 33.3 | 40   |                  | XTCC025C11_                 |
| 20   | 33.3 | 40   | 55   |                  | XTCC033D10_                 |
| 25   | 50   | 65   | 85   |                  | XTCC050D10_                 |

### Magnet Coil Suffix

| Coil Voltage           | Suffix Code |
|------------------------|-------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>    |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>    |
| 230V 50 Hz, 240V 60 Hz | <b>F</b>    |
| 400V 50 Hz, 440V 60 Hz | <b>N</b>    |
| 24V 50/60 Hz           | <b>T</b>    |

#### Notes

Weld-resistant for capacitors with inrush current peaks up to  $180 \times I_N$ .

<sup>①</sup> With series resistors, without quick-discharge resistor.

<sup>②</sup> Underscore ( \_ ) indicates magnet coil suffix required.



**Engineering Notes for XTCC and XTCE Contactors for Power Factor Correction****Individual Compensation, Open Version**

| Catalog Number | Switching Duty in kVAR |                  |      |      |
|----------------|------------------------|------------------|------|------|
|                | 230V                   | 400V, 420V, 440V | 525V | 690V |
| XTCE007B       | 1.5                    | 3                | 3.5  | 5    |
| XTCE009B       | 2                      | 4                | 4.5  | 6    |
| XTCE012B       | 2.5                    | 4.5              | 5.5  | 7    |
| XTCE015B       | 2.5                    | 4.5              | 5.5  | 7    |
| XTCE018C       | 6.5                    | 12               | 14.5 | 19   |
| XTCE025C       | 7                      | 13.5             | 16   | 21   |
| XTCE032C       | 7.5                    | 14.5             | 17   | 22.5 |
| XTCE040D       | 11                     | 20.5             | 24.5 | 32   |
| XTCE050D       | 11.5                   | 22               | 26   | 34.5 |
| XTCE065D       | 12.5                   | 23.5             | 28   | 37   |
| XTCE080F       | 16                     | 30.5             | 36.5 | 48   |
| XTCE095F       | 18                     | 34               | 41   | 54   |
| XTCE115G       | 24                     | 46               | 54.5 | 72   |
| XTCE150G       | 28                     | 53               | 63.5 | 83.5 |
| XTCE580N       | 175                    | 300              | 400  | 300  |

**Group Compensation, with Reactor, Open Version**

| Catalog Number | Switching Duty in kVAR |                  |      |      |
|----------------|------------------------|------------------|------|------|
|                | 230V                   | 400V, 420V, 440V | 525V | 690V |
| XTCE007B       | 4                      | 7                | 7.5  | 12   |
| XTCE009B       | 5                      | 8                | 10   | 14   |
| XTCE012B       | 5.5                    | 1                | 12   | 16   |
| XTCE015B       | 5.5                    | 10               | 12   | 16   |
| XTCE018C       | 7.5                    | 16               | 20   | 28   |
| XTCE025C       | 9                      | 18               | 23   | 30   |
| XTCE032C       | 10                     | 20               | 24   | 32   |
| XTCE040D       | 13                     | 25               | 30   | 40   |
| XTCE050D       | 16                     | 30               | 36   | 48   |
| XTCE065D       | 19                     | 36               | 43   | 57   |
| XTCE080F       | 30                     | 58               | 68   | 90   |
| XTCE095        | 34                     | 6                | 7    | 10   |
| XTCE115G       | 44                     | 8                | 100  | 125  |
| XTCE150        | 5                      | 97               | 115  | 152  |
| XTCE250L       | 110                    | 190              | 260  | 340  |
| XTCE400M       | 160                    | 280              | 370  | 480  |
| XTCE500M       | 220                    | 390              | 500  | 680  |

**Group Compensation, without Reactor, Open Version**

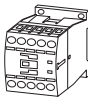
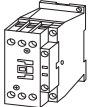
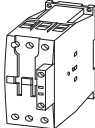
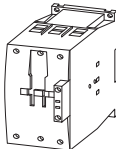
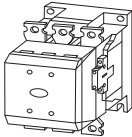
| Catalog Number | Switching Duty in kVAR |                  |      |      |
|----------------|------------------------|------------------|------|------|
|                | 230V                   | 400V, 420V, 440V | 525V | 690V |
| XTCC020C       | 11                     | 20               | 25   | 33.3 |
| XTCC025C       | 15                     | 25               | 33.3 | 40   |
| XTCC033D       | 20                     | 33.3             | 40   | 55   |
| XTCC050D       | 25                     | 50               | 65   | 85   |
| XTCE580N       | 145                    | 250              | 333  | 250  |

## Accessories

### Auxiliary Contacts

Front-mounted snap-on auxiliary contacts for **XT** contactors are available with screw or spring cage terminals in a variety of contact configurations.

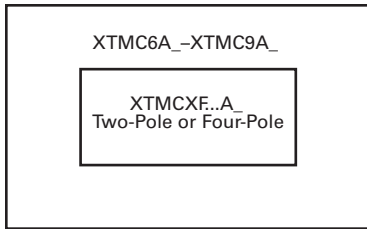
### Auxiliary Contacts Possible Combinations

| Frame Size | Catalog Number               | Contactor                                                                           | Built-In Auxiliary | Front (Top) Mount                                                                   |                                                                                     | Side-Mount  |                                                                                       | Total Auxiliary Contacts Available |
|------------|------------------------------|-------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------|------------------------------------|
|            |                              |                                                                                     |                    | Two-Pole                                                                            | Four-Pole                                                                           | Single-Pole | Two-Pole                                                                              |                                    |
| A          | XTMC6A_ –<br>XTMC9A_         |    | 1NO or 1NC         | 1                                                                                   | —                                                                                   | —           | —                                                                                     | 3                                  |
|            |                              |                                                                                     |                    | —                                                                                   | 1                                                                                   | —           | —                                                                                     | 5                                  |
|            |                              |                                                                                     |                    |    |    | —           | —                                                                                     | —                                  |
| B          | XTCE007B_ –<br>XTCE015B_     |    | 1NO or 1NC         | 1                                                                                   | —                                                                                   | —           | —                                                                                     | 3                                  |
|            |                              |                                                                                     |                    | —                                                                                   | 1                                                                                   | —           | —                                                                                     | 5                                  |
|            |                              |                                                                                     |                    | —                                                                                   | —                                                                                   | 1           | —                                                                                     | 2                                  |
| C          | XTCE018C_ –<br>XTCE032C_     |   | 1NO or 1NC         | 1                                                                                   | —                                                                                   | —           | —                                                                                     | 3                                  |
|            |                              |                                                                                     |                    | —                                                                                   | 1                                                                                   | —           | —                                                                                     | 5                                  |
|            |                              |                                                                                     |                    | —                                                                                   | —                                                                                   | —           | 1                                                                                     | 3                                  |
| D          | XTCE040D00_ –<br>XTCE065D00_ |  | —                  | 1                                                                                   | —                                                                                   | —           | 2                                                                                     | 6                                  |
|            |                              |                                                                                     |                    | —                                                                                   | 1                                                                                   | —           | 1                                                                                     | 6                                  |
|            |                              |                                                                                     |                    |  |  | —           |  | —                                  |
| F-G        | XTCE080F00_ –<br>XTCE150G00_ |  | —                  | 1                                                                                   | —                                                                                   | —           | 2                                                                                     | 6                                  |
|            |                              |                                                                                     |                    | —                                                                                   | 1                                                                                   | —           | 2                                                                                     | 8                                  |
|            |                              |                                                                                     |                    | —                                                                                   | —                                                                                   | —           | 4                                                                                     | 8                                  |
| L-R        | XTCE185H22_ –<br>XTCEC20R22_ |  | 2NO–2NC            | —                                                                                   | —                                                                                   | —           | 2                                                                                     | 8                                  |
|            |                              |                                                                                     |                    | —                                                                                   | —                                                                                   | —           | —                                                                                     | —                                  |
|            |                              |                                                                                     |                    | —                                                                                   | —                                                                                   | —           |  | —                                  |

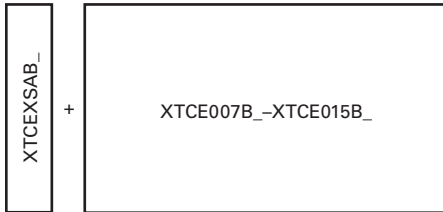
### Notes

Forced operation contact to IEC/EN 60947-5-1 Appendix L (positively driven), inside the auxiliary contact unit (not early close and late opening).  
 Auxiliary normally closed contact can be used as mirror contact to IEC/EN 60947-4-1 Appendix F (not late opening).  
 No auxiliary contacts can be fitted between two contactors.

## Auxiliary Contact Combinations



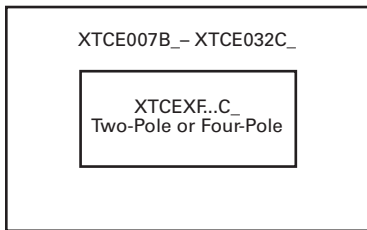
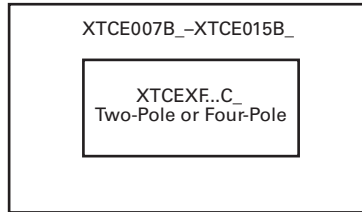
Frame A



Frame B

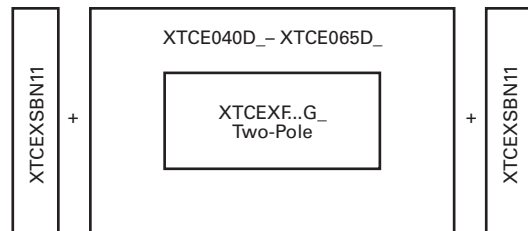
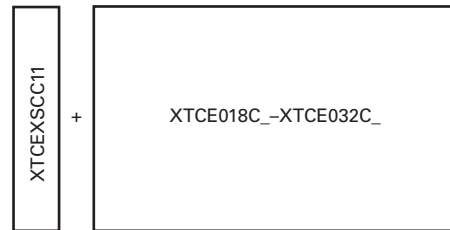
*Not for use with mechanical interlock.*

or



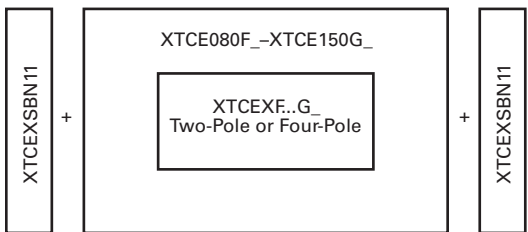
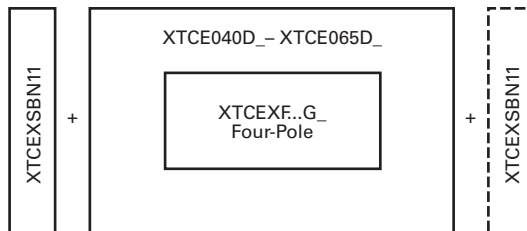
Frame C

or



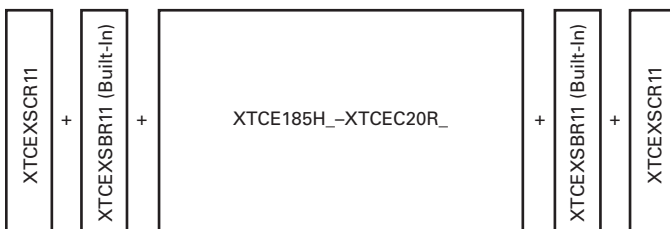
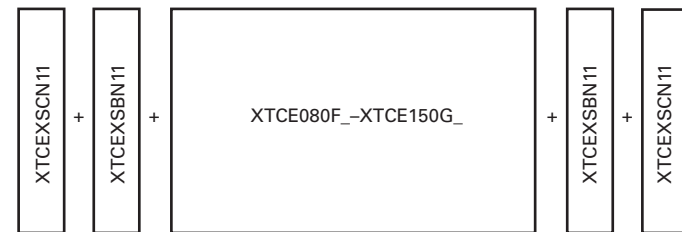
Frame D

or



Frames F-G

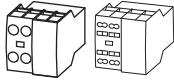
or



Frames L-R

## Auxiliary Contacts

XTCEXF\_

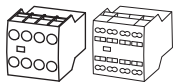


## Frames B–C, Front (Top) Mount—Two-Pole

Conventional Thermal Current,  
Open at 60°C  
 $I_{th} = I_e$ , AC-1 in Amps

|    | Contact Configuration              | Circuit Symbol | Pkg. Qty. ① | Screw Terminal Catalog Number |
|----|------------------------------------|----------------|-------------|-------------------------------|
| 16 | 2NO                                |                | 5           | XTCEXFAC20                    |
| 16 | 1NO-1NC                            |                | 5           | XTCEXFAC11 ④                  |
| 16 | 2NC                                |                | 5           | XTCEXFAC02                    |
| 16 | 1NO <sub>E</sub> -1NC <sub>L</sub> |                | 5           | XTCEXFALC11 ②                 |
| 16 | 1NO-1NC                            |                | 5           | XTCEXFDC11 ③                  |
| 16 | 2NC                                |                | 5           | XTCEXFCC02 ③                  |

XTCEXF\_



## Frames B–C, Front (Top) Mount—Four-Pole

Conventional Thermal Current,  
Open at 60°C  
 $I_{th} = I_e$ , AC-1 in Amps

|    | Contact Configuration              | Circuit Symbol | Pkg. Qty. ① | Screw Terminal Catalog Number |
|----|------------------------------------|----------------|-------------|-------------------------------|
| 16 | 4NO                                |                | 5           | XTCEXFAC40 ④                  |
| 16 | 3NO-1NC                            |                | 5           | XTCEXFAC31 ④                  |
| 16 | 2NO-2NC                            |                | 5           | XTCEXFAC22 ④                  |
| 16 | 1NO-3NC                            |                | 5           | XTCEXFAC13                    |
| 16 | 4NC                                |                | 5           | XTCEXFAC04                    |
| 16 | 1NO <sub>E</sub> -1NC <sub>L</sub> |                | 5           | XTCEXFCLC22 ②                 |
| 16 | 2NO-2NC                            |                | 5           | XTCEXFCC22 ③                  |

## Notes

- ① Orders must be placed in multiples of package quantity listed.
- ② 1 early-make contact (1NO<sub>E</sub>), 1 late-break contact (1NC<sub>L</sub>).
- ③ To avoid duplicate terminal numbers in contact sequence, these auxiliary contacts should only be used with contactors having a built-in 1NO contact (XTCE...B10\_, XTCE...C10\_).
- ④ Catalog number is shown with screw type terminal. For spring cage, add a "C" before the last 2 digits. For example, to order a spring cage version of the XTCEXFAC22, change the catalog number to XTCEXFACC22.

1

## XTCEXFATC\_



## Frames B–C, Front (Top) Mount—Tall Version Two-Pole ①

| Conventional Thermal Current,<br>Open at 60°C<br>$I_{th} = I_e$ , AC-1 in Amps | Contact<br>Configuration | Circuit<br>Symbol | Pkg.<br>Qty. ② | Screw Terminal<br>Catalog Number |
|--------------------------------------------------------------------------------|--------------------------|-------------------|----------------|----------------------------------|
| 16                                                                             | 2NO                      |                   | 5              | XTCEXFATC20                      |
| 16                                                                             | 1NO-1NC                  |                   | 5              | XTCEXFATC11                      |
| 16                                                                             | 2NC                      |                   | 5              | XTCEXFATC02                      |

## XTCEXFATC22



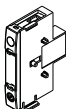
## Frames B–C, Front (Top) Mount—Tall Version Four-Pole ①

| Conventional Thermal Current,<br>Open at 60°C<br>$I_{th} = I_e$ , AC-1 in Amps | Contact<br>Configuration | Circuit<br>Symbol | Pkg.<br>Qty. ② | Screw Terminal<br>Catalog Number |
|--------------------------------------------------------------------------------|--------------------------|-------------------|----------------|----------------------------------|
| 16                                                                             | 2NO-2NC                  |                   | 5              | XTCEXFATC22                      |

## Frames B–C, Front (Top) Mount—Electronic Contacts, Two- and Four-Pole ①

| Conventional Thermal Current,<br>Open at 60°C<br>$I_{th} = I_e$ , AC-1 in Amps | Contact<br>Configuration | Circuit<br>Symbol | Pkg.<br>Qty. ② | Screw Terminal<br>Catalog Number |
|--------------------------------------------------------------------------------|--------------------------|-------------------|----------------|----------------------------------|
| 1 mA–0.5A                                                                      | 2NO-2NC                  |                   | 1              | XTCEXFARC22 ③                    |
| 1 mA–5A                                                                        | 1NO-1NC                  |                   | 1              | XTCEXFARC11 ③                    |

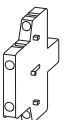
## XTCEXSAB\_



## Frame B, Side-Mount—Single-Pole

| Conventional Thermal Current,<br>Open at 60°C<br>$I_{th} = I_e$ , AC-1 in Amps | Contact<br>Configuration | Circuit<br>Symbol | Pkg.<br>Qty. ② | Screw Terminal<br>Catalog Number |
|--------------------------------------------------------------------------------|--------------------------|-------------------|----------------|----------------------------------|
| 16                                                                             | 1NO                      |                   | 1              | XTCEXSAB10 ④                     |
| 16                                                                             | 1NC                      |                   | 1              | XTCEXSAB01 ④                     |

## XTCEXSCC11



## Frame C, Side-Mount—Two-Pole

| Conventional Thermal Current,<br>Open at 60°C<br>$I_{th} = I_e$ , AC-1 in Amps | Contact<br>Configuration | Circuit<br>Symbol | Pkg.<br>Qty. ② | Screw Terminal<br>Catalog Number |
|--------------------------------------------------------------------------------|--------------------------|-------------------|----------------|----------------------------------|
| 10                                                                             | 1NO-1NC                  |                   | 1              | XTCEXSCC11 ④                     |

## Notes

Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO [early make] and NC [late break] contacts) and for the built-in auxiliary contacts of the XTCE007B\_–XTCE032C\_.

Auxiliary break contact can be used as mirror contact to IEC/EN 60947-4-1 Annex F (not NC [late break] contact).

No auxiliary contacts can be fitted between two contactors.

① Front (top) mount tall version is for use with Frame B electrical wire bridges and link kits (see **Page V5-T1-74**) and toolless plug combination connection kits: XTCEXRLB, XTCEXSDLB, XTPAXTPCB, XTPAXTPCRB, XTPAX.

② Orders must be placed in multiples of package quantity listed.

③ Low level inputs down to 1 mA (PLC communications). Ideal for functional safety applications.

④ Can be mounted to the left side of contactor only. Cannot be used in combination with front (top) mount auxiliary contacts or mechanical interlocks.

XTCEXF\_



## Frames D–G—Two-Pole

Conventional Thermal Current,  
Open at 60°C  
 $I_{th} = I_e$ , AC-1 in Amps

| 16 | Contact Configuration | Circuit Symbol | Pkg. Qty. ① | Screw Terminal Catalog Number |
|----|-----------------------|----------------|-------------|-------------------------------|
| 16 | 2NO                   |                | 5           | XTCEXFBG20                    |
| 16 | 1NO-1NC               |                | 5           | XTCEXFAG11                    |
| 16 | 1NO-1NC               |                | 5           | XTCEXFBG11                    |
| 16 | 2NC                   |                | 5           | XTCEXFBG02                    |

XTCEXF\_



## Frames D–G—Four-Pole

Conventional Thermal Current,  
Open at 60°C  
 $I_{th} = I_e$ , AC-1 in Amps

| 16 | Contact Configuration              | Circuit Symbol | Pkg. Qty. ① | Screw Terminal Catalog Number |
|----|------------------------------------|----------------|-------------|-------------------------------|
| 16 | 4NO-0NC                            |                | 5           | XTCEXFBG40                    |
| 16 | 3NO-1NC                            |                | 5           | XTCEXFBG31                    |
| 16 | 2NO-2NC                            |                | 5           | XTCEXFBG22                    |
| 16 | 2NO-2NC                            |                | 5           | XTCEXFAG_22 ②                 |
| 16 | 1NO-3NC                            |                | 5           | XTCEXFBG13                    |
| 16 | 0NO-4NC                            |                | 5           | XTCEXFBG04                    |
| 16 | 1NO <sub>E</sub> -1NC <sub>L</sub> |                | 5           | XTCEXFBG22 ③                  |

**Notes**

Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO (early make) and NC (late break) contacts) and for the built-in auxiliary contacts of the XTCE007B\_–XTCE032C\_.

Auxiliary break contact can be used as mirror contact to IEC/EN 60947-4-1 Annex F (not NC (late break) contact).

No auxiliary contacts can be fitted between two contactors.

① Orders must be placed in multiples of package quantity listed.

② A “\_” denotes catalog numbers are incomplete. To complete the catalog number for ordering a spring cage terminal, insert a **C** in the “\_” position or remove “\_” for screw type terminal.

③ One early-make contact (1NO<sub>E</sub>), one late-break contact (1NC<sub>L</sub>).

1

XTCEXS\_



## Frames D–H, Side Mount (Snap-On) – Two-Pole

Conventional Free Air  
Thermal Current,  
 $I_{th} = I_e$ , AC-1 in AmpsContact  
ConfigurationCircuit  
SymbolPkg.  
Qty. ①Screw Terminal  
Catalog Number

|    |                                    |  |   |               |
|----|------------------------------------|--|---|---------------|
| 10 | 1NO–1NC                            |  | 1 | XTCEXSBN11    |
| 10 | 1NO <sub>E</sub> –1NC <sub>L</sub> |  | 1 | XTCEXSBLN11 ② |
| 10 | 1NO–1NC                            |  | 1 | XTCEXSCN11 ③  |

XTCEXS\_



## Frames L–R, Side Mount (Screw Mount) – Two-Pole

Conventional Free Air  
Thermal Current,  
 $I_{th} = I_e$ , AC-1 in AmpsContact  
ConfigurationCircuit  
SymbolPkg.  
Qty. ①Screw Terminal  
Catalog Number

|    |                                    |  |   |              |
|----|------------------------------------|--|---|--------------|
| 10 | 1NO–1NC                            |  | 1 | XTCEXSBR11 ④ |
| 10 | 1NO <sub>E</sub> –1NC <sub>L</sub> |  | 1 | XTCEXSBLR11  |
| 10 | 1NO–1NC                            |  | 1 | XTCEXSCR11   |

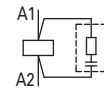
## Notes

- ① Orders must be placed in multiples of package quantity listed.
- ② 1 early-make contact (1NO<sub>E</sub>), 1 late-break contact (1NC<sub>L</sub>).
- ③ To avoid duplicate terminal numbers in contact sequence, the XTCEXSCN11 should be used with Frame D when a top mount auxiliary is also installed.
- ④ For replacement only. XTCEXSBR11 and XTCEXSBLR11 cannot be added onto side mount auxiliaries that come with the Frames L–R contactors as standard. To add auxiliaries onto the included side auxiliaries on Frames L–R contactors, use XTCEXSCR11.

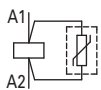
**Suppressors**

The switching of contactor coils can generate voltage transients that may cause arching on switch contacts and/or damage electronics on the control line. Either an RC or varistor suppressor is recommended in these types of applications. All **XT** DC contactor coils have built-in suppression.

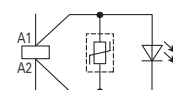
Varistor suppressors clamp the voltage transient above the maximum coil voltage and are recommended when the level of the transient is known to not exceed the coil voltage. RC suppressors slow and reduce the level of the voltage transient but do not clamp them at a specific level. The slowing of the transient can reduce electrical interference. These are recommended in applications where operating rates are high.

**XTCEXRS\_****Contact Sequence****RC Suppressor** <sup>①②</sup>

| Voltage | For Use with...       | Pkg. Qty. <sup>③</sup> | Catalog Number   |
|---------|-----------------------|------------------------|------------------|
| 24–48   | XTCE007B–             | 10                     | <b>XTCEXRSBW</b> |
| 48–130  | XTCE015B,<br>XTCF020B | 10                     | <b>XTCEXRSBA</b> |
| 110–240 |                       | 10                     | <b>XTCEXRSBB</b> |
| 240–500 |                       | 10                     | <b>XTCEXRSBC</b> |
| 24–48   | XTCE018C–             | 10                     | <b>XTCEXRSBW</b> |
| 110–130 | XTCE032C              | 10                     | <b>XTCEXRSBA</b> |
| 130–240 |                       | 10                     | <b>XTCEXRSBB</b> |
| 240–500 |                       | 10                     | <b>XTCEXRSBC</b> |
| 24–48   | XTCE040D–             | 10                     | <b>XTCEXRSBW</b> |
| 110–130 | XTCE095F              | 10                     | <b>XTCEXRSBA</b> |
| 130–240 |                       | 10                     | <b>XTCEXRSBB</b> |
| 240–500 |                       | 10                     | <b>XTCEXRSBC</b> |

**XTCEXVS\_****Contact Sequence****Varistor Suppressor** <sup>①②</sup>

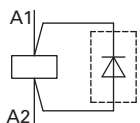
| Voltage | For Use with...       | Pkg. Qty. <sup>③</sup> | Catalog Number   |
|---------|-----------------------|------------------------|------------------|
| 24–48   | XTCE007B–             | 10                     | <b>XTCEXVSBW</b> |
| 48–130  | XTCE015B,<br>XTCF020B | 10                     | <b>XTCEXVSBA</b> |
| 130–240 |                       | 10                     | <b>XTCEXVSBB</b> |
| 240–500 |                       | 10                     | <b>XTCEXVSBC</b> |
| 24–48   | XTCE018C–             | 10                     | <b>XTCEXVSCW</b> |
| 48–130  | XTCE032C              | 10                     | <b>XTCEXVSCA</b> |
| 130–240 |                       | 10                     | <b>XTCEXVSCB</b> |
| 240–500 |                       | 10                     | <b>XTCEXVSCC</b> |
| 24–48   | XTCE040D–             | 10                     | <b>XTCEXVSFW</b> |
| 48–130  | XTCE095F              | 10                     | <b>XTCEXVSFA</b> |
| 130–240 |                       | 10                     | <b>XTCEXVSFB</b> |
| 240–500 |                       | 10                     | <b>XTCEXVSFC</b> |

**XTCEXVSL\_****Contact Sequence****Varistor Suppressor with Integrated LED** <sup>①②</sup>

| Voltage AC | For Use with... | Pkg. Qty. <sup>③</sup> | Catalog Number    |
|------------|-----------------|------------------------|-------------------|
| 24–48      | XTCE007B–       | 10                     | <b>XTCEXVSLBW</b> |
| 130–240    | XTCE015B        | 10                     | <b>XTCEXVSLBB</b> |
| 24–48      | XTCE018C–       | 10                     | <b>XTCEXVSLCW</b> |
| 130–240    | XTCE032C        | 10                     | <b>XTCEXVSLCB</b> |
| 24–48      | XTCE040D–       | 10                     | <b>XTCEXVSLFW</b> |
| 130–240    | XTCE095F        | 10                     | <b>XTCEXVSLFB</b> |

**Notes**

- ① Note dropout delay.
- ② For AC operated contactors, 50–60 Hz. DC operated contactors and XTCE115G\_ to XTCE170G\_ have a built-in suppressor circuit.
- ③ Orders must be placed in multiples of package quantity listed.
- ④ In addition to the built-in suppressor circuit for DC actuated contactors. Prevents negative breaking voltage when contactors are used in combination with a safety PLC.

**XTCEXDSB****Contact Sequence****Free-Wheel Diode Suppressor** <sup>④</sup>

| Voltage DC | For Use with...                    | Pkg. Qty. <sup>③</sup> | Catalog Number  |
|------------|------------------------------------|------------------------|-----------------|
| 12–250     | XTCE007B–<br>XTCE015B,<br>XTCF020B | 10                     | <b>XTCEXDSB</b> |

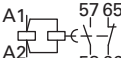
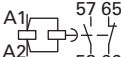
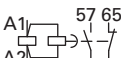
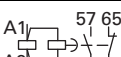
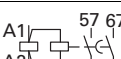


## Electronic Timer Modules

Frames B–C Contactors (7–32A) <sup>①</sup>

## XTCEXTE\_



| Voltage           | Contact Sequence                                                                  | Timing Range | For Use with... | Pkg. Qty. ② | Catalog Number  |
|-------------------|-----------------------------------------------------------------------------------|--------------|-----------------|-------------|-----------------|
| <b>On-Delay</b>   |                                                                                   |              |                 |             |                 |
| 24 Vac/Vdc        |  | 0.05s–1s     | XTCE...B_       | 1           | XTCEXTEEC11T    |
| 100–130 Vac       |                                                                                   | 0.5s–10s     | XTCE...C_       | 1           | XTCEXTEEC11A    |
| 200–240 Vac       |                                                                                   | 5s–100s      |                 | 1           | XTCEXTEEC11B    |
| <b>Off-Delay</b>  |                                                                                   |              |                 |             |                 |
| 24 Vac/Vdc        |  | 0.05s–1s     | XTCE...B_       | 1           | XTCEXTED1C11T   |
| 100–130 Vac       |                                                                                   |              | XTCE...C_       | 1           | XTCEXTED1C11A   |
| 200–230 Vac       |                                                                                   |              |                 | 1           | XTCEXTED1C11B   |
| 24 Vac/Vdc        |  | 0.5s–10s     | XTCE...B_       | 1           | XTCEXTED10C11T  |
| 100–130 Vac       |                                                                                   |              | XTCE...C_       | 1           | XTCEXTED10C11A  |
| 200–240 Vac       |                                                                                   |              |                 | 1           | XTCEXTED10C11B  |
| 24 Vac/Vdc        |  | 5s–100s      | XTCE...B_       | 1           | XTCEXTED100C11T |
| 100–130 Vac       |                                                                                   |              | XTCE...C_       | 1           | XTCEXTED100C11A |
| 200–240 Vac       |                                                                                   |              |                 | 1           | XTCEXTED100C11B |
| <b>Star-Delta</b> |                                                                                   |              |                 |             |                 |
| 24 Vac/Vdc        |  | 1s–30s       | XTCE...B_       | 1           | XTCEXTEYC20T    |
| 100–130 Vac       |                                                                                   |              | XTCE...C_       | 1           | XTCEXTEYC20A    |
| 200–240 Vac       |                                                                                   |              |                 | 1           | XTCEXTEYC20B    |

## XTCEXTESHRD



|                        |                                                                                           |  |                                    |   |             |
|------------------------|-------------------------------------------------------------------------------------------|--|------------------------------------|---|-------------|
| <b>Sealable Shroud</b> |                                                                                           |  |                                    |   |             |
| —                      | Transparent sealable shroud used to protect electronic timer modules from unwanted access |  | XTCEXTEE,<br>XTCEXTED,<br>XTCEXTEY | 1 | XTCEXTESHRD |

**Notes**

- ① Front (top) mounted timer modules for use with XTCE...B and XTCE...C contactors.  
Cannot be combined with top-mount auxiliary contacts, XTCEXF...C\_.
- ② Orders must be placed in multiples of package quantity listed.

## Additional Accessories

Mechanical Interlock <sup>①</sup>

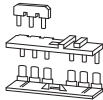
|                                                                                   | For Use with...                         | Pkg. Qty. <sup>②</sup> | Catalog Number               |
|-----------------------------------------------------------------------------------|-----------------------------------------|------------------------|------------------------------|
| <b>XTCEXMLB</b>                                                                   | XTCE007B–XTCE015B,<br>XTCF020B          | 5                      | <b>XTCEXMLB</b>              |
|  |                                         |                        |                              |
| <b>XTCEXML</b>                                                                    | XTCE018C–XTCE032C,<br>XTCF032C–XTCF045C | 1                      | <b>XTCEXMLC</b>              |
|  | XTCE040D–XTCE072D,<br>XTCF063D–XTCF080D | 1                      | <b>XTCEXMLD</b>              |
|                                                                                   | XTCE080F–XTCE170G,<br>XTCF125G–XTCF200G | 1                      | <b>XTCEXMLG</b> <sup>③</sup> |
| <b>XTCEXMLM</b>                                                                   | XTCE185H–XTCE570M                       | 1                      | <b>XTCEXMLM</b>              |
|  |                                         |                        |                              |
| <b>XTCEXMLN</b>                                                                   | XTCE580N–XTCEC10N                       | 1                      | <b>XTCEXMLN</b> <sup>③</sup> |
|  |                                         |                        |                              |

## Reversing Link Kits

|                                                                                     | For Use with...   | Pkg. Qty. <sup>②</sup> | Catalog Number               |
|-------------------------------------------------------------------------------------|-------------------|------------------------|------------------------------|
| <b>XTCEXRLB</b>                                                                     | XTCE007B–XTCE015B | 1                      | <b>XTCEXRLB</b> <sup>④</sup> |
|  |                   |                        |                              |
| <b>XTCEXRL</b>                                                                      | XTCE018C–XTCE032C | 1                      | <b>XTCEXRLC</b>              |
|  | XTCE040D–XTCE065D | 1                      | <b>XTCEXRLD</b>              |
|                                                                                     | XTCE080F–XTCE150G | 1                      | <b>XTCEXRLG</b>              |

Main current wiring for reversing combinations. Includes paralleling bridge and reversing bridge. Does not include mechanical interlock, see table on this page.

## Star-Delta (Wye-Delta) Link Kits

|                                                                                   | For Use with...   | Pkg. Qty. <sup>②</sup> | Catalog Number                |
|-----------------------------------------------------------------------------------|-------------------|------------------------|-------------------------------|
| <b>XTCEXSDLB</b>                                                                  | XTCE007B–XTCE015B | 1                      | <b>XTCEXSDLB</b> <sup>③</sup> |
|  |                   |                        |                               |
| <b>XTCEXSDL</b>                                                                   | XTCE018C–XTCE032C | 1                      | <b>XTCEXSDLC</b>              |
|  | XTCE040D–XTCE072D | 1                      | <b>XTCEXSDLD</b>              |
|                                                                                   | XTCE080F–XTCE095F | 1                      | <b>XTCEXSDLF</b>              |
|                                                                                   | XTCE115G–XTCE150G | 1                      | <b>XTCEXSDLG</b>              |

Main current wiring for star-delta (wye-delta) combinations. Includes paralleling bridge, reversing bridge and star-delta bridge. Does not include mechanical interlock, see table on this page.

## Paralleling Bridge

|                                                                                     | For Use with...   | Pkg. Qty. <sup>②</sup> | Catalog Number  |
|-------------------------------------------------------------------------------------|-------------------|------------------------|-----------------|
| <b>XTCEXPBB</b>                                                                     | XTCE007B–XTCE015B | 20                     | <b>XTCEXPBB</b> |
|  |                   |                        |                 |
| <b>XTCEXPBC</b>                                                                     | XTCE018C–XTCE032C | 20                     | <b>XTCEXPBC</b> |
|  |                   |                        |                 |

Component part of reversing link kit (XTCEXRL<sub>\_\_</sub>). Parallels the phases on the line-side of two contactors.

## Reversing Bridge

|                                                                                     | For Use with...   | Pkg. Qty. <sup>②</sup> | Catalog Number  |
|-------------------------------------------------------------------------------------|-------------------|------------------------|-----------------|
| <b>XTCEXRBB</b>                                                                     | XTCE007B–XTCE015B | 20                     | <b>XTCEXRBB</b> |
|  |                   |                        |                 |
| <b>XTCEXRB</b>                                                                      | XTCE018C–XTCE032C | 20                     | <b>XTCEXRBC</b> |
|  | XTCE040D–XTCE065D | 10                     | <b>XTCEXRBD</b> |

Component part of reversing link kit (XTCEXRL<sub>\_\_</sub>). Reverses the phases on the load-side of two contactors.

## Notes

<sup>①</sup> For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For Frames B–G, mechanical lifespan is 2.5 x 10<sup>6</sup> operations and the distance between contactors is 0 mm. For Frames L–N, mechanical lifespan is 5 x 10<sup>6</sup> operations and no auxiliary contact can be mounted between the mechanical interlock and the contactor—the distance between contactors is 15 mm.

<sup>②</sup> Orders must be placed in multiples of package quantity listed.

<sup>③</sup> XTCEXMLG and XTCEXMLN consist of an interlock element and mounting plate.

<sup>④</sup> Also includes interlocking bridge (XTCEXLB). The following control cables are integrated for electrical interlock: K1M: A1–K2M: 21; K1M: 21–K2M: A1; K1M: A2–K2M: A2.

## Electrical Interlocking Bridge

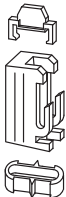
| For Use with...   | Pkg. Qty. ① | Catalog Number  |
|-------------------|-------------|-----------------|
| XTCE007B–XTCE015B | 20          | <b>XTCEXLBB</b> |

## Star-Delta (Wye-Delta) Bridge

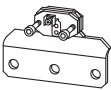
|                                                                                   | For Use with...   | Pkg. Qty. ① | Catalog Number     |
|-----------------------------------------------------------------------------------|-------------------|-------------|--------------------|
| <b>XTCEXSDB</b>                                                                   | XTCE007B–XTCE015B | 20          | <b>XTCEXSDBB</b> ② |
|  |                   |             |                    |
| <b>XTCEXSDB_</b>                                                                  | XTCE080F–XTCE170G | 1           | <b>XTCEXSDBG</b>   |
|  | XTCE185L–XTCE400M | 1           | <b>XTCEXSDB400</b> |
|                                                                                   | XTCE500M          | 1           | <b>XTCEXSDB500</b> |

Component part of star-delta link kit (XTCEXSDL\_). Commons the three phases on the line side of shorting contactor.

## Connector

|                                                                                     | For Use with...   | Pkg. Qty. ① | Catalog Number  |
|-------------------------------------------------------------------------------------|-------------------|-------------|-----------------|
| <b>XTCEXCNC</b>                                                                     | XTCE007B–XTCE032C | 50          | <b>XTCEXCNC</b> |
|   |                   |             |                 |
| <b>XTCEXCNG</b>                                                                     | XTCE040D–XTCE170G | 10          | <b>XTCEXCNG</b> |
|  |                   |             |                 |

## Parallel Link ④⑤⑥

|                                                                                   | For Use with...   | Pkg. Qty. ① | Catalog Number      |
|-----------------------------------------------------------------------------------|-------------------|-------------|---------------------|
| <b>XTCEXPLKB</b>                                                                  | XTCE007B–XTCE015B | 5           | <b>XTCEXPLKB</b>    |
|  |                   |             |                     |
| <b>XTCEXPLK_</b>                                                                  | XTCE018C–XTCE032C | 5           | <b>XTCEXPLKC</b>    |
|  | XTCE040D–XTCE072D | 1           | <b>XTCEXPLKD</b>    |
|                                                                                   | XTCE080F–XTCE170G | 1           | <b>XTCEXPLKG</b>    |
| <b>XTCEXPLKL185</b>                                                               | XTCE185L          | 1           | <b>XTCEXPLKL185</b> |
|  |                   |             |                     |

For using one contactor per phase. Each package comes with two links for line: load.

## Contactor Labels

|                                                                                    | For Use with... | Pkg. Qty. | Catalog Number   |
|------------------------------------------------------------------------------------|-----------------|-----------|------------------|
| <b>XGKE-GE</b>                                                                     | XTC...          | 25        | <b>XGKE-GE</b> ⑦ |
|  |                 |           |                  |

## Notes

- ① Orders must be placed in multiples of package quantity listed.
- ② Frame B is toolless connection type.
- ③ For mechanically arranging contactors in combinations. Distance between contactors is 0 mm.
- ④ Fourth pole can be broken off: four-pole:  $I_{th} = 60A$ ; three-pole:  $I_{th} = 50A$ .
- ⑤ AC-1 current carrying capacity of the contactor increases by a factor of 2.5. For XTCEXPLKL185, one shroud is included for protection against accidental contact.
- ⑥ Protected against accidental contact in accordance with IEC 536.
- ⑦ Quantity 1 equals one sheet. One sheet contains 240 labels.

## CI-K Basic Enclosures

CI-K Basic Enclosures <sup>①②</sup>

Dimensions in Inches (mm)

| Width        | Height        | External Depth | Internal Depth | Internal Mounting Type | Pkg. Qty. | Catalog Number                |
|--------------|---------------|----------------|----------------|------------------------|-----------|-------------------------------|
| 3.94 (100.0) | 6.30 (160.0)  | 3.94 (100.0)   | 2.87 (73.0)    | With mounting rail     | 1         | CI-K2X-100-TS-NA <sup>③</sup> |
|              |               |                | 3.11 (79.0)    | With mounting plate    |           | CI-K2X-100-M-NA <sup>③</sup>  |
|              |               | 5.71 (145.0)   | 4.65 (118.0)   | With mounting rail     |           | CI-K2X-145-TS-NA <sup>③</sup> |
|              |               |                | 4.88 (124.0)   | With mounting plate    |           | CI-K2X-145-M-NA <sup>③</sup>  |
| 4.72 (120.0) | 7.87 (200.0)  | 4.92 (125.0)   | 3.66 (93.0)    | With mounting rail     | 1         | CI-K3X-125-TS-NA <sup>④</sup> |
|              |               |                | 3.86 (98.0)    | With mounting plate    |           | CI-K3X-125-M-NA <sup>④</sup>  |
|              |               | 6.30 (160.0)   | 5.04 (128.0)   | With mounting rail     |           | CI-K3X-160-TS-NA <sup>④</sup> |
|              |               |                | 5.24 (133.0)   | With mounting plate    |           | CI-K3X-160-M-NA <sup>④</sup>  |
| 6.30 (160.0) | 9.45 (240.0)  | 6.30 (160.0)   | 5.04 (128.0)   | With mounting rail     | 1         | CI-K4X-160-TS-NA <sup>④</sup> |
|              |               |                | 5.24 (133.0)   | With mounting plate    |           | CI-K4X-160-M-NA <sup>④</sup>  |
| 7.87 (200.0) | 11.02 (280.0) | 6.30 (160.0)   | 5.04 (128.0)   | With mounting rail     | 1         | CI-K5X-160-TS-NA <sup>④</sup> |
|              |               |                | 5.24 (133.0)   | With mounting plate    |           | CI-K5X-160-M-NA <sup>④</sup>  |

## XTCEXCN\_



## Terminal Lug Kit—Set of Three Lugs

| For Use with...    | Description                                                        | Pkg. Qty. <sup>⑤</sup> | Catalog Number |
|--------------------|--------------------------------------------------------------------|------------------------|----------------|
| XTCE500M, XTCE570M | #4-500 kcmil two-phase Cu/Al 500A<br>Also for use with XTCS series | 1                      | XTCEXTL500     |

## XTCEXTFB6\_

Terminal Flat Bar <sup>⑥</sup>

| For Use with...   | Pkg. Qty. <sup>⑤</sup> | Catalog Number |
|-------------------|------------------------|----------------|
| XTCE500M–XTCE570M | 1                      | XTCEXTFB650    |
| XTCE750N–XTCE820N | 1                      | XTCEXTFB820    |

For connection of a flat strip conductor. Comes with control circuit terminal (consisting of three flat strip conductor terminals). Also for use with XTCS series.

## XTCEXTS\_



## Terminal Shroud

| For Use with...   | Pkg. Qty. <sup>⑤</sup> | Catalog Number |
|-------------------|------------------------|----------------|
| XTCE185H–XTCE225H | 1                      | XTCEXTS225     |
| XTCE250L–XTCE400M | 1                      | XTCEXTS400     |
| XTCE500M–XTCE570M | 1                      | XTCEXTS500     |
| XTCE580N–XTCE650N | 1                      | XTCEXTS650     |
| XTCE750N–XTCEC10N | 1                      | XTCEXTS820     |

Protection against direct contact with connection lugs when touched vertically from the front. Also for use with XTCS series.

## XTCEXTLA400



## Terminal Lug Assembly

| For Use with...                          | Pkg. Qty. <sup>⑤</sup> | Catalog Number |
|------------------------------------------|------------------------|----------------|
| XTCE185–XTCE225H                         | 1                      | XTCEXTLA225A   |
| XTCS250L–XTCS400M,<br>XTCE250L–XTCE400M_ | 1                      | XTCEXTLA400    |

For connection of: round conductor, flexible and stranded, flat strip conductor, with control circuit terminal. See **Page V5-T1-97** for terminal capacities. Consists of 3 integrated lugs for line or load side. Also for use with XTCS series.

## Notes

- ① Enclosure base RAL 9005, black/enclosure top only RAL 7035, light gray.
- ② Degree of protection—IEC: IP65; UL/CSA: Type 1, 3R, 4X, 12, 13—indoor and outdoor use.
- ③ CI-K2X\_: 4 x 1/2 inch knockouts.
- ④ CI-K3X\_, CI-K4X\_, CI-K5X\_: Smooth overall with sharp corners.
- ⑤ Orders must be placed in multiples of package quantity listed.
- ⑥ Not UL listed.

## Renewal Parts

## XTCERENC\_



## Replacement Coil—Frame C

| Voltage       | Coil Suffix | Catalog Number        |
|---------------|-------------|-----------------------|
| 110/50 120/60 | <b>A</b>    | <b>XTCERENCOILCA</b>  |
| 110–130 Vdc   | <b>AD</b>   | <b>XTCERENCOILCAD</b> |
| 220/50 240/60 | <b>B</b>    | <b>XTCERENCOILCB</b>  |
| 200–240 Vdc   | <b>BD</b>   | <b>XTCERENCOILCBD</b> |
| 415/50 480/60 | <b>C</b>    | <b>XTCERENCOILCC</b>  |
| 600/60        | <b>D</b>    | <b>XTCERENCOILCD</b>  |
| 208/60        | <b>E</b>    | <b>XTCERENCOILCE</b>  |
| 230/50        | <b>F</b>    | <b>XTCERENCOILCF</b>  |
| 190/50 220/60 | <b>G</b>    | <b>XTCERENCOILCG</b>  |
| 240/50 277/60 | <b>H</b>    | <b>XTCERENCOILCH</b>  |
| 380/50 440/60 | <b>L</b>    | <b>XTCERENCOILCL</b>  |
| 400/50        | <b>N</b>    | <b>XTCERENCOILCN</b>  |
| 380/60        | <b>P</b>    | <b>XTCERENCOILCP</b>  |
| 12/50 12/60   | <b>R</b>    | <b>XTCERENCOILCR</b>  |
| 12–14 Vdc     | <b>RD</b>   | <b>XTCERENCOILCRD</b> |
| 24/50 24/60   | <b>T</b>    | <b>XTCERENCOILCT</b>  |
| 24–27 Vdc     | <b>TD</b>   | <b>XTCERENCOILCTD</b> |
| 42/50 48/60   | <b>W</b>    | <b>XTCERENCOILCW</b>  |
| 48–60 Vdc     | <b>WD</b>   | <b>XTCERENCOILCWD</b> |
| 48/50         | <b>Y</b>    | <b>XTCERENCOILCY</b>  |

## Replacement Coil—Frame D

| Voltage       | Coil Suffix | Catalog Number        |
|---------------|-------------|-----------------------|
| 110/50 120/60 | <b>A</b>    | <b>XTCERENCOILDA</b>  |
| 110–130 Vdc   | <b>AD</b>   | <b>XTCERENCOILDAD</b> |
| 220/50 240/60 | <b>B</b>    | <b>XTCERENCOILDB</b>  |
| 200–240 Vdc   | <b>BD</b>   | <b>XTCERENCOILDBD</b> |
| 415/50 480/60 | <b>C</b>    | <b>XTCERENCOILDC</b>  |
| 600/60        | <b>D</b>    | <b>XTCERENCOILDD</b>  |
| 208/60        | <b>E</b>    | <b>XTCERENCOILDE</b>  |
| 230/50        | <b>F</b>    | <b>XTCERENCOILDF</b>  |
| 190/50 220/60 | <b>G</b>    | <b>XTCERENCOILDG</b>  |
| 240/50 277/60 | <b>H</b>    | <b>XTCERENCOILDH</b>  |
| 380/50 440/60 | <b>L</b>    | <b>XTCERENCOILDL</b>  |
| 400/50        | <b>N</b>    | <b>XTCERENCOILDN</b>  |
| 380/60        | <b>P</b>    | <b>XTCERENCOILD P</b> |
| 12/50 12/60   | <b>R</b>    | <b>XTCERENCOILDR</b>  |
| 12–14 Vdc     | <b>RD</b>   | <b>XTCERENCOILDRD</b> |
| 24/50 24/60   | <b>T</b>    | <b>XTCERENCOILDT</b>  |
| 24–27 Vdc     | <b>TD</b>   | <b>XTCERENCOILDTD</b> |
| 42/50 48/60   | <b>W</b>    | <b>XTCERENCOILDW</b>  |
| 48–60 Vdc     | <b>WD</b>   | <b>XTCERENCOILDWD</b> |
| 48/50         | <b>Y</b>    | <b>XTCERENCOILDY</b>  |

## Replacement Coil—Frame F ①

| Voltage       | Coil Suffix | Catalog Number        |
|---------------|-------------|-----------------------|
| 110/50 120/60 | <b>A</b>    | <b>XTCERENCOILFA</b>  |
| 110–130 Vdc   | <b>AD</b>   | <b>XTCERENCOILFAD</b> |
| 220/50 240/60 | <b>B</b>    | <b>XTCERENCOILFB</b>  |
| 200–240 Vdc   | <b>BD</b>   | <b>XTCERENCOILFBD</b> |
| 415/50 480/60 | <b>C</b>    | <b>XTCERENCOILFC</b>  |
| 600/60        | <b>D</b>    | <b>XTCERENCOILFD</b>  |
| 208/60        | <b>E</b>    | <b>XTCERENCOILFE</b>  |
| 230/50        | <b>F</b>    | <b>XTCERENCOILFF</b>  |
| 190/50 220/60 | <b>G</b>    | <b>XTCERENCOILFG</b>  |
| 240/50 277/60 | <b>H</b>    | <b>XTCERENCOILFH</b>  |
| 380/50 440/60 | <b>L</b>    | <b>XTCERENCOILFL</b>  |
| 400/50        | <b>N</b>    | <b>XTCERENCOILFN</b>  |
| 380/60        | <b>P</b>    | <b>XTCERENCOILFP</b>  |
| 12/50 12/60   | <b>R</b>    | <b>XTCERENCOILFR</b>  |
| 24/50 24/60   | <b>T</b>    | <b>XTCERENCOILFT</b>  |
| 24–27 Vdc     | <b>TD</b>   | <b>XTCERENCOILFTD</b> |
| 42/50 48/60   | <b>W</b>    | <b>XTCERENCOILFW</b>  |
| 48–60 Vdc     | <b>WD</b>   | <b>XTCERENCOILFWD</b> |
| 48/50         | <b>Y</b>    | <b>XTCERENCOILFY</b>  |

## Replacement Coil—Frame G ②

| Voltage        | Coil Suffix | Catalog Number        |
|----------------|-------------|-----------------------|
| 100–120V 50/60 | <b>A</b>    | <b>XTCERENCOILGA</b>  |
| 110–130 Vdc    | <b>AD</b>   | <b>XTCERENCOILGAD</b> |
| 190–240V 50/60 | <b>B</b>    | <b>XTCERENCOILGB</b>  |
| 200–240 Vdc    | <b>BD</b>   | <b>XTCERENCOILGBD</b> |
| 480–500V 50/60 | <b>C</b>    | <b>XTCERENCOILGC</b>  |
| 380–440V 50/60 | <b>L</b>    | <b>XTCERENCOILGL</b>  |
| 4/50 24/60     | <b>T</b>    | <b>XTCERENCOILGT</b>  |
| 24–27 Vdc      | <b>TD</b>   | <b>XTCERENCOILGTD</b> |
| 42–48V 50/60   | <b>W</b>    | <b>XTCERENCOILGW</b>  |
| 48–60 Vdc      | <b>WD</b>   | <b>XTCERENCOILGWD</b> |

## Notes

- ① Frame F replacement coils can only be used with contactors having the following date codes: DC coils, 2706 or later; AC coils, 4706 or later.
- ② Frame G replacement coils can only be used with contactors having date codes of 2706 or later.

## Replacement Coil—Frame H

| Voltage           | Coil Suffix | Catalog Number        |
|-------------------|-------------|-----------------------|
| 100–120V 50/60 Hz | <b>A</b>    | <b>XTCERENCOILHA</b>  |
| 190–240V 50/60 Hz | <b>B</b>    | <b>XTCERENCOILHB</b>  |
| 480–500V 50/60 Hz | <b>C</b>    | <b>XTCERENCOILHC</b>  |
| 380–440V 50/60 Hz | <b>L</b>    | <b>XTCERENCOILHL</b>  |
| 24V 50/60Hz       | <b>T</b>    | <b>XTCERENCOILHT</b>  |
| 42–48V 50/60Hz    | <b>W</b>    | <b>XTCERENCOILHW</b>  |
| 110–130 Vdc       | <b>AD</b>   | <b>XTCERENCOILHAD</b> |
| 200–240 Vdc       | <b>BD</b>   | <b>XTCERENCOILHBD</b> |
| 24–27 Vdc         | <b>TD</b>   | <b>XTCERENCOILHTD</b> |
| 48–60 Vdc         | <b>WD</b>   | <b>XTCERENCOILHWD</b> |

Replacement Coil—Frame L <sup>①</sup>

| Voltage         | Coil Suffix | Catalog Number        |
|-----------------|-------------|-----------------------|
| 110–250 Vac/Vdc | <b>A</b>    | <b>XTCERENCOILLA</b>  |
| 250–500V 40–60  | <b>C</b>    | <b>XTCERENCOILLC</b>  |
| 24–48 Vdc       | <b>TD</b>   | <b>XTCERENCOILLTD</b> |
| 48–110 Vac/Vdc  | <b>Y</b>    | <b>XTCERENCOILLY</b>  |

## Replacement Coil—Frame L, S-Series

| Voltage           | Coil Suffix | Catalog Number       |
|-------------------|-------------|----------------------|
| 110–120V 50/60 Hz | <b>A</b>    | <b>XTCSRENCOILLA</b> |
| 220–240V 50/60 Hz | <b>B</b>    | <b>XTCSRENCOILB</b>  |

Replacement Coil—Frame M <sup>①</sup>

| Voltage         | Coil Suffix | Catalog Number        |
|-----------------|-------------|-----------------------|
| 110–250 Vac/Vdc | <b>A</b>    | <b>XTCERENCOILMA</b>  |
| 250–500V 40–60  | <b>C</b>    | <b>XTCERENCOILMC</b>  |
| 24–48 Vdc       | <b>TD</b>   | <b>XTCERENCOILMTD</b> |
| 48–110 Vac/Vdc  | <b>Y</b>    | <b>XTCERENCOILMY</b>  |

## Replacement Coil—Frame M, S-Series

| Voltage           | Coil Suffix | Catalog Number       |
|-------------------|-------------|----------------------|
| 110–120V 50/60 Hz | <b>A</b>    | <b>XTCSRENCOILMA</b> |
| 220–240V 50/60 Hz | <b>B</b>    | <b>XTCSRENCOILMB</b> |

Replacement Coil—Frame N <sup>①</sup>

| Voltage         | Coil Suffix | Catalog Number       |
|-----------------|-------------|----------------------|
| 110–250 Vac/Vdc | <b>A</b>    | <b>XTCERENCOILNA</b> |
| 250–500V 40–60  | <b>C</b>    | <b>XTCERENCOILNC</b> |
| 48–110 Vac/Vdc  | <b>Y</b>    | <b>XTCERENCOILNY</b> |

## Replacement Contact Kit

| For Use with...   | Catalog Number            |
|-------------------|---------------------------|
| XTCE040D–XTCE065D | <b>XTCERENCONTACTD</b>    |
| XTCE085F–XTCE095F | <b>XTCERENCONTACTF</b>    |
| XTCE115G–XTCE150G | <b>XTCERENCONTACTG</b>    |
| XTCE185H–XTCE225H | <b>XTCERENCONTACTH</b>    |
| XTCE250L–XTCE300L | <b>XTCERENCONTACTL</b>    |
| XTCE300M          | <b>XTCERENCONTACTM300</b> |
| XTCE400M          | <b>XTCERENCONTACTM400</b> |
| XTCE500M          | <b>XTCERENCONTACTM500</b> |

## Replacement Vacuum Tube Assembly

| For Use with... | Catalog Number        |
|-----------------|-----------------------|
| XTCE580N        | <b>XTCERENVACT580</b> |
| XTCE650N        | <b>XTCERENVACT650</b> |
| XTCE750N        | <b>XTCERENVACT750</b> |
| XTCE820N        | <b>XTCERENVACT820</b> |

## Replacement Arc Chamber

| For Use with...   | Catalog Number       |
|-------------------|----------------------|
| XTCE250L          | <b>XTCERENARC250</b> |
| XTCE300M          | <b>XTCERENARC300</b> |
| XTCE400M          | <b>XTCERENARC400</b> |
| XTCE500M–XTCE570M | <b>XTCERENARC500</b> |

**Note**

<sup>①</sup> Electronic modules including coils.

## Technical Data and Specifications

## XT Contactors—Frame B

| Description                                                               | XTCE007B                                   | XTCE009B                                   | XTCE012B                                   | XTCE015B                                   |
|---------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| <b>General</b>                                                            |                                            |                                            |                                            |                                            |
| Standards                                                                 | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS |
| Weights in kg [lb]                                                        |                                            |                                            |                                            |                                            |
| AC operated                                                               | 0.23 [0.51]                                | 0.23 [0.51]                                | 0.23 [0.51]                                | 0.23 [0.51]                                |
| DC operated                                                               | 0.28 [0.62]                                | 0.28 [0.62]                                | 0.28 [0.62]                                | 0.28 [0.62]                                |
| Mechanical life—operations                                                | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 |
| Mechanical operating frequency (ops/hr)                                   |                                            |                                            |                                            |                                            |
| AC operated                                                               | 9000                                       | 9000                                       | 9000                                       | 5000                                       |
| DC operated                                                               | 9000                                       | 9000                                       | 9000                                       | 5000                                       |
| Electrical life                                                           | See Curves, <b>Page V5-T1-111</b>          | See Curves, <b>Page V5-T1-111</b>          | See Curves, <b>Page V5-T1-111</b>          | See Curves, <b>Page V5-T1-111</b>          |
| Electrical operating frequency (ops/hr)—see Curves, <b>Page V5-T1-111</b> |                                            |                                            |                                            |                                            |
| AC-1; 400V I <sub>e</sub>                                                 | 800                                        | 800                                        | 800                                        | 800                                        |
| AC-3; 400V I <sub>e</sub>                                                 | 1000                                       | 1000                                       | 1000                                       | 1000                                       |
| AC-4; 400V I <sub>e</sub>                                                 | 300                                        | 300                                        | 300                                        | 300                                        |
| Climatic proofing                                                         | ③                                          | ③                                          | ③                                          | ③                                          |
| Insulation voltage (U <sub>i</sub> ) Vac                                  | 690                                        | 690                                        | 690                                        | 690                                        |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac                         | 8000                                       | 8000                                       | 8000                                       | 8000                                       |
| Operational voltage (U <sub>a</sub> ) Vac                                 | 690                                        | 690                                        | 690                                        | 690                                        |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1                       |                                            |                                            |                                            |                                            |
| Between coil and contacts (Vac)                                           | 400                                        | 400                                        | 400                                        | 400                                        |
| Between contacts (Vac)                                                    | 400                                        | 400                                        | 400                                        | 400                                        |
| Making capacity up to 690V (amps) ①                                       | 112                                        | 112                                        | 144                                        | 155                                        |
| Breaking capacity (amps)                                                  |                                            |                                            |                                            |                                            |
| 220/230V                                                                  | 70                                         | 90                                         | 120                                        | 124                                        |
| 380/400V                                                                  | 70                                         | 90                                         | 120                                        | 124                                        |
| 500V                                                                      | 50                                         | 70                                         | 100                                        | 100                                        |
| 660/690V                                                                  | 40                                         | 50                                         | 70                                         | 70                                         |
| Short-circuit protection rating maximum fuse                              |                                            |                                            |                                            |                                            |
| Type 2 coordination ②                                                     |                                            |                                            |                                            |                                            |
| 400V; gG/gL 500V                                                          | 20                                         | 20                                         | 20                                         | 20                                         |
| 690V; gG/gL 690V                                                          | 16                                         | 16                                         | 20                                         | 20                                         |
| Type 1 coordination ②                                                     |                                            |                                            |                                            |                                            |
| 400V; gG/gL 500V                                                          | 35                                         | 35                                         | 35                                         | 63                                         |
| 690V; gG/gL 690V                                                          | 20                                         | 20                                         | 20                                         | 50                                         |
| Degree of protection                                                      | IP20                                       | IP20                                       | IP20                                       | IP20                                       |
| Protection against direct contact when actuated from front (IEC 536)      | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              |
| Terminal capacity main cable—screw terminals                              |                                            |                                            |                                            |                                            |
| Solid (mm <sup>2</sup> )                                                  | 1 x (0.75–4)<br>2 x (0.75–2.5)             | 1 x (0.75–4)<br>2 x (0.75–2.5)             | 1 x (0.75–4)<br>2 x (0.75–2.5)             | 1 x (0.75–4)<br>2 x (0.75–2.5)             |
| Flexible with ferrule (mm <sup>2</sup> )                                  | 1 x (0.75–2.5)<br>1 x (0.75–2.5)           | 1 x (0.75–2.5)<br>1 x (0.75–2.5)           | 1 x (0.75–2.5)<br>1 x (0.75–2.5)           | 1 x (0.75–2.5)<br>1 x (0.75–2.5)           |
| Solid or stranded (AWG)                                                   | 18–14                                      | 18–14                                      | 18–14                                      | 18–14                                      |
| Terminal capacity control circuit cable—screw terminals                   |                                            |                                            |                                            |                                            |
| Solid (mm <sup>2</sup> )                                                  | 1 x (0.75–4)<br>2 x (0.75–2.5)             | 1 x (0.75–4)<br>2 x (0.75–2.5)             | 1 x (0.75–4)<br>2 x (0.75–2.5)             | 1 x (0.75–4)<br>2 x (0.75–2.5)             |

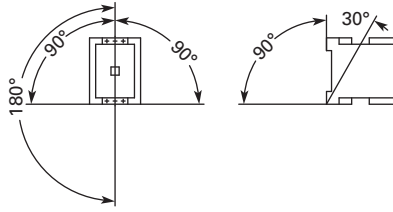
**Notes**

① Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

② IEC 60947 Standard.

③ Damp heat, constant, to IEC 60068-2-78; damp heat, cyclical, to IEC 60068-2-30.

## XT Contactors—Frame B, continued

| Description                                                                          | XTCE007B                         | XTCE009B                         | XTCE012B                         | XTCE015B                         |
|--------------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>General, continued</b>                                                            |                                  |                                  |                                  |                                  |
| Flexible with ferrule (mm <sup>2</sup> )                                             | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) |
| Solid or stranded (AWG)                                                              | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| Main cable and control circuit cable connection screw/bolt                           | M3.5                             | M3.5                             | M3.5                             | M3.5                             |
| Tightening torque                                                                    |                                  |                                  |                                  |                                  |
| Nm                                                                                   | 1.2                              | 1.2                              | 1.2                              | 1.2                              |
| Lb-in                                                                                | 10.6                             | 10.6                             | 10.6                             | 10.6                             |
| <b>Tools</b>                                                                         |                                  |                                  |                                  |                                  |
| Main and control circuit cable—screw terminals                                       | Size 2                           | Size 2                           | Size 2                           | Size 2                           |
| Pozidriv screwdriver                                                                 | 0.8 x 5.5                        | 0.8 x 5.5                        | 0.8 x 5.                         | 0.8 x 5.5                        |
| Standard screwdriver                                                                 | 1 x 6                            | 1 x 6                            | 1 x 6                            | 1 x 6                            |
| <b>Terminal capacity main circuit cable—spring cage terminals</b>                    |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                                             | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) |
| Flexible (mm <sup>2</sup> )                                                          | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) |
| Flexible with ferrule (mm <sup>2</sup> )                                             | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) |
| Solid or stranded (AWG)                                                              | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| <b>Terminal capacity control circuit cable—spring cage terminals</b>                 |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                                             | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) |
| Flexible (mm <sup>2</sup> )                                                          | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) |
| Flexible with ferrule (mm <sup>2</sup> )                                             | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) | 1 x (0.75–2.5)<br>1 x (0.75–2.5) |
| Solid or stranded (AWG)                                                              | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| <b>Tools</b>                                                                         |                                  |                                  |                                  |                                  |
| Main and control circuit cable—spring cage terminals                                 |                                  |                                  |                                  |                                  |
| Stripping length (mm)                                                                | 10                               | 10                               | 10                               | 10                               |
| Screwdriver blade width (mm)                                                         | 3.5                              | 3.5                              | 3.5                              | 3.5                              |
| Mounting position, AC and DC operated                                                |                                  |                                  |                                  |                                  |
|  |                                  |                                  |                                  |                                  |
| <b>Ambient temperature</b>                                                           |                                  |                                  |                                  |                                  |
| Open                                                                                 | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    |
| Enclosed                                                                             | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    |
| Ambient storage temperature                                                          | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    |
| <b>Environmental</b>                                                                 |                                  |                                  |                                  |                                  |
| Mechanical shock resistance (IEC/EN 60068-2-27)                                      |                                  |                                  |                                  |                                  |
| Half-sinusoidal shock 10 ms                                                          |                                  |                                  |                                  |                                  |
| Main contact—NO contact                                                              | 10g                              | 10g                              | 10g                              | 10g                              |
| Auxiliary contact—NO contact                                                         | 7g                               | 7g                               | 7g                               | 7g                               |
| Auxiliary contact—NC contact                                                         | 5g                               | 5g                               | 5g                               | 5g                               |
| Overvoltage category/pollution degree                                                | III/3                            | III/3                            | III/3                            | III/3                            |



## XT Contactors—Frames C–D

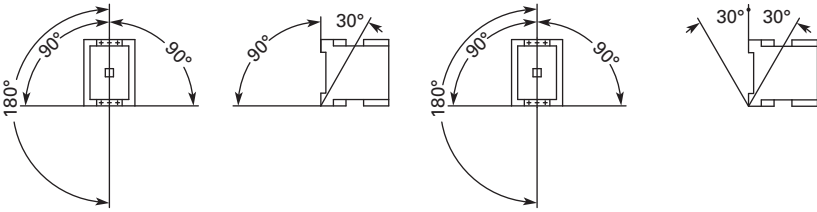
| Description                                                                          | XTCE018C                                   | XTCE025C                                   | XTCE032C                                   | XTCE040D                                   | XTCE050D                                   | XTCE065D, XTCE072D                         |
|--------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| <b>General</b>                                                                       |                                            |                                            |                                            |                                            |                                            |                                            |
| Standards                                                                            | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS |
| Weights in kg [lb]                                                                   |                                            |                                            |                                            |                                            |                                            |                                            |
| AC operated                                                                          | 0.42 [0.93]                                | 0.42 [0.93]                                | 0.42 [0.93]                                | 0.9 [2.0]                                  | 0.9 [2.0]                                  | 0.9 [2.0]                                  |
| DC operated                                                                          | 0.48 [1.06]                                | 0.48 [1.06]                                | 0.48 [1.06]                                | 1.1 [2.4]                                  | 1.1 [2.4]                                  | 1.1 [2.4]                                  |
| Mechanical life—operations                                                           | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 |
| Mechanical operating frequency (ops/hr)                                              |                                            |                                            |                                            |                                            |                                            |                                            |
| AC operated                                                                          | 5000                                       | 5000                                       | 5000                                       | 5000                                       | 5000                                       | 5000                                       |
| DC operated                                                                          | 5000                                       | 5000                                       | 5000                                       | 5000                                       | 5000                                       | 5000                                       |
| Electrical mechanical operating frequency (ops/hr)—see Curves, <b>Page V5-T1-111</b> |                                            |                                            |                                            |                                            |                                            |                                            |
| AC-1; 400V I <sub>e</sub>                                                            | 800                                        | 800                                        | 800                                        | 800                                        | 800                                        | 800                                        |
| AC-3; 400V I <sub>e</sub>                                                            | 800                                        | 800                                        | 800                                        | 800                                        | 800                                        | 800                                        |
| AC-4; 400V I <sub>e</sub>                                                            | 300                                        | 300                                        | 300                                        | 300                                        | 300                                        | 300                                        |
| Climatic proofing                                                                    | ②                                          | ②                                          | ②                                          | ②                                          | ②                                          | ②                                          |
| Insulation voltage (U <sub>i</sub> ) Vac                                             | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac                                    | 8000                                       | 8000                                       | 8000                                       | 8000                                       | 8000                                       | 8000                                       |
| Operating voltage (U <sub>e</sub> ) Vac                                              | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1                                  |                                            |                                            |                                            |                                            |                                            |                                            |
| Between coil and contacts (Vac)                                                      | 440                                        | 440                                        | 440                                        | 440                                        | 440                                        | 440                                        |
| Between contacts (Vac)                                                               | 238                                        | 440                                        | 440                                        | 440                                        | 440                                        | 440                                        |
| Making capacity (amps)                                                               | 238                                        | 350                                        | 384                                        | 560                                        | 700                                        | 910                                        |
| Breaking capacity (amps)                                                             |                                            |                                            |                                            |                                            |                                            |                                            |
| 220/230V                                                                             | 170                                        | 250                                        | 320                                        | 400                                        | 500                                        | 650                                        |
| 380/400V                                                                             | 170                                        | 250                                        | 320                                        | 400                                        | 500                                        | 650                                        |
| 500V                                                                                 | 170                                        | 250                                        | 320                                        | 400                                        | 500                                        | 650                                        |
| 660/690V                                                                             | 120                                        | 150                                        | 180                                        | 250                                        | 320                                        | 370                                        |
| Short-circuit protection rating maximum fuse (amps)                                  |                                            |                                            |                                            |                                            |                                            |                                            |
| Type 2 coordination ①                                                                |                                            |                                            |                                            |                                            |                                            |                                            |
| 400V; gG/gL 500V                                                                     | 25                                         | 35                                         | 63                                         | 63                                         | 80                                         | 125                                        |
| 690V; gG/gL 690V                                                                     | 25                                         | 35                                         | 35                                         | 50                                         | 63                                         | 80                                         |
| Type 1 coordination ①                                                                |                                            |                                            |                                            |                                            |                                            |                                            |
| 400V; gG/gL 500V                                                                     | 63                                         | 100                                        | 125                                        | 125                                        | 160                                        | 250                                        |
| 690V; gG/gL 690V                                                                     | 50                                         | 50                                         | 63                                         | 80                                         | 80                                         | 100                                        |
| Degree of protection                                                                 | IP00                                       | IP00                                       | IP00                                       | IP00                                       | IP00                                       | IP00                                       |
| Protection against direct contact when actuated from front (IEC 536)                 | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              |
| Terminal capacity main cable—screw terminals                                         |                                            |                                            |                                            |                                            |                                            |                                            |
| Solid (mm <sup>2</sup> )                                                             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (0.75–16)<br>2 x (0.75–10)             |
| Flexible with ferrule (mm <sup>2</sup> )                                             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (0.75–16)<br>2 x (0.75–10)             | 1 x (2.5–35)<br>2 x (2.5–25)               | 1 x (2.5–35)<br>2 x (2.5–25)               | 1 x (2.5–35)<br>2 x (2.5–25)               |
| Stranded (mm <sup>2</sup> )                                                          | 1 x 16                                     | 1 x 16                                     | 1 x 16                                     | 1 x (16–50)<br>2 x (16–35)                 | 1 x (16–50)<br>2 x (16–35)                 | 1 x (16–50)<br>2 x (16–35)                 |
| Solid or stranded (AWG)                                                              | 14–8                                       | 14–8                                       | 14–8                                       | 14–1                                       | 14–1                                       | 14–1                                       |
| Flat conductor (number of segments x width x thickness) (mm)                         | —                                          | —                                          | —                                          | 2 x (6 x 9 x 0.8)                          | 2 x (6 x 9 x 0.8)                          | 2 x (6 x 9 x 0.8)                          |

**Notes**

① IEC 60947 Standard.

② Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60 068-2-30.

## XT Contactors—Frames C–D, continued

| Description                                                   | XTCE018C                                                                             | XTCE025C                         | XTCE032C                         | XTCE040D                         | XTCE050D                         | XTCE065D, XTCE072D               |
|---------------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>General, continued</b>                                     |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Main cable connection screw/bolt                              | M5                                                                                   | M5                               | M5                               | M6                               | M6                               | M6                               |
| Tightening torque                                             |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Nm                                                            | 3                                                                                    | 3                                | 3                                | 3.3                              | 3.3                              | 3.3                              |
| Lb-in                                                         | 26.6                                                                                 | 26.6                             | 26.6                             | 29.2                             | 29.2                             | 29.2                             |
| Terminal capacity control circuit cable—screw terminals       |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                      | 1 x (0.75–4)<br>2 x (0.75–4)                                                         | 1 x (0.75–4)<br>2 x (0.75–4)     | 1 x (0.75–4)<br>2 x (0.75–4)     | 1 x (0.75–4)<br>2 x (0.75–4)     | 1 x (0.75–4)<br>2 x (0.75–4)     | 1 x (0.75–4)<br>2 x (0.75–4)     |
| Flexible with ferrule (mm <sup>2</sup> )                      | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                     | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                       | 18–14                                                                                | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| Control circuit cable connection screw/bolt                   | M3.5                                                                                 | M3.5                             | M3.5                             | M3.5                             | M3.5                             | M3.5                             |
| Tightening torque                                             |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Nm                                                            | 1.2                                                                                  | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              |
| Lb-in                                                         | 10.6                                                                                 | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             |
| Tools                                                         |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Main and control circuit cable—screw terminals                | Size 2                                                                               | Size 2                           | Size 2                           | Size 2                           | Size 2                           | Size 2                           |
| Pozidriv screwdriver                                          | 0.8 x 5.5                                                                            | 0.8 x 5.5                        | 0.8 x 5.5                        | 0.8 x 5.5                        | 0.8 x 5.5                        | 0.8 x 5.5                        |
| Standard screwdriver                                          | 1 x 6                                                                                | 1 x 6                            | 1 x 6                            | 1 x 6                            | 1 x 6                            | 1 x 6                            |
| Terminal capacity control circuit cable—spring cage terminals |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                      | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                     | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Flexible (mm <sup>2</sup> )                                   | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                     | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Flexible with ferrule (mm <sup>2</sup> )                      | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                     | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                       | 18–14                                                                                | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| Tools                                                         |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Main and control circuit cable—spring cage terminals          |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Stripping length (mm)                                         | 10                                                                                   | 10                               | 10                               | 10                               | 10                               | 10                               |
| Screwdriver blade width (mm)                                  | 3.5                                                                                  | 3.5                              | 3.5                              | 3.5                              | 3.5                              | 3.5                              |
| Mounting position, AC and DC operated                         |  |                                  |                                  |                                  |                                  |                                  |
| Ambient temperature                                           |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Open                                                          | –25 to 60°C<br>[–13 to 140°F]                                                        | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    |
| Enclosed                                                      | –25 to 40°C<br>[–13 to 104°F]                                                        | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    |
| Ambient storage temperature                                   | –40 to 80°C<br>[–40 to 176°F]                                                        | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    |
| <b>Environmental</b>                                          |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Mechanical shock resistance<br>(IEC/EN 60068-2-27)            |                                                                                      |                                  |                                  |                                  |                                  |                                  |
| Main contact—NO Contact                                       | 10                                                                                   | 10                               | 10                               | 10                               | 1                                | 1                                |
| Auxiliary contact—NO Contact                                  | 7                                                                                    | 7                                | 7                                | 7                                | 7                                | 7                                |
| Auxiliary contact—NC Contact                                  | 5                                                                                    | 5                                | 5                                | 5                                | 5                                | 5                                |
| Overvoltage category/pollution degree                         | III/3                                                                                | III/3                            | III/3                            | III/3                            | III/3                            | III/3                            |

## XT Contactors—Frames F–G

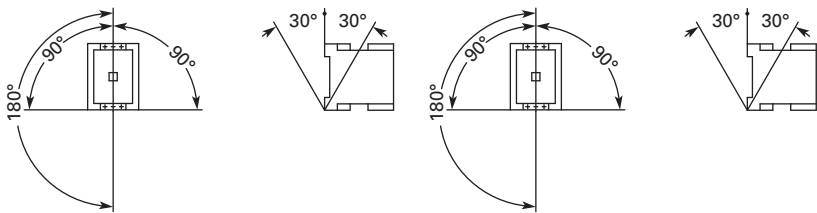
| Description                                                                          | XTCE080F                                   | XTCE095F                                   | XTCE115G                                   | XTCE150G                                   | XTCE170G                                   |
|--------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|--------------------------------------------|
| <b>General</b>                                                                       |                                            |                                            |                                            |                                            |                                            |
| Standards                                                                            | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS | IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS |
| Weights in kg [lb]                                                                   |                                            |                                            |                                            |                                            |                                            |
| AC operated                                                                          | 2 [4.41]                                   | 2 [4.41]                                   | 2 [4.41]                                   | 2 [4.41]                                   | 2 [4.41]                                   |
| DC operated                                                                          | 2.1 [4.63]                                 | 2.1 [4.63]                                 | 2.1 [4.63]                                 | 2.1 [4.63]                                 | 2.1 [4.63]                                 |
| Mechanical life—operations                                                           | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 | 10,000,000                                 |
| Mechanical operating frequency (ops/hr)                                              |                                            |                                            |                                            |                                            |                                            |
| AC operated                                                                          | 3600                                       | 3600                                       | 3600                                       | 3600                                       | 3600                                       |
| DC operated                                                                          | 3600                                       | 3600                                       | 3600                                       | 3600                                       | 3600                                       |
| Electrical mechanical operating frequency (ops/hr)—see Curves, <b>Page V5-T1-111</b> |                                            |                                            |                                            |                                            |                                            |
| AC-1; 400V I <sub>e</sub>                                                            | 800                                        | 800                                        | 800                                        | 800                                        | 800                                        |
| AC-3; 400V I <sub>e</sub>                                                            | 800                                        | 800                                        | 800                                        | 800                                        | 800                                        |
| AC-4; 400V I <sub>e</sub>                                                            | 300                                        | 300                                        | 300                                        | 300                                        | 300                                        |
| Climatic proofing                                                                    | ②                                          | ②                                          | ②                                          | ②                                          | ②                                          |
| Insulation voltage (U <sub>i</sub> ) Vac                                             | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac                                    | 8000                                       | 8000                                       | 8000                                       | 8000                                       | 8000                                       |
| Operational voltage (U <sub>e</sub> ) Vac                                            | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1                                  |                                            |                                            |                                            |                                            |                                            |
| Between coil and contacts (Vac)                                                      | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Between contacts (Vac)                                                               | 690                                        | 690                                        | 690                                        | 690                                        | 690                                        |
| Making capacity (amps)                                                               | 1120                                       | 1330                                       | 1610                                       | 2100                                       | 2100                                       |
| Breaking capacity (amps)                                                             |                                            |                                            |                                            |                                            |                                            |
| 220/230V                                                                             | 800                                        | 950                                        | 1150                                       | 1500                                       | 1500                                       |
| 380/400V                                                                             | 800                                        | 950                                        | 1150                                       | 1500                                       | 1500                                       |
| 500V                                                                                 | 800                                        | 950                                        | 1150                                       | 1500                                       | 1500                                       |
| 660/690V                                                                             | 650                                        | 800                                        | 1100                                       | 1200                                       | 1320                                       |
| 1000V                                                                                | —                                          | —                                          | —                                          | —                                          | —                                          |
| Short-circuit protection rating maximum fuse                                         |                                            |                                            |                                            |                                            |                                            |
| Type 2 coordination ①                                                                |                                            |                                            |                                            |                                            |                                            |
| 400V; gG/gL 500V                                                                     | 160                                        | 160                                        | 250                                        | 25                                         | 400                                        |
| 690V; gG/gL 690V                                                                     | 160                                        | 160                                        | 25                                         | 250                                        | 25                                         |
| Type 1 coordination ①                                                                |                                            |                                            |                                            |                                            |                                            |
| 400V; gG/gL 500V                                                                     | 250                                        | 25                                         | 250                                        | 250                                        | 400                                        |
| 690V; gG/gL 690V                                                                     | 200                                        | 200                                        | 250                                        | 250                                        | 250                                        |
| Degree of protection                                                                 | IP00                                       | IP00                                       | IP00                                       | IP00                                       | IP00                                       |
| Protection against direct contact when actuated from front (IEC 536)                 | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              | Finger and back-of-hand proof              |
| Terminal capacity main cable—screw terminals                                         |                                            |                                            |                                            |                                            |                                            |
| Solid (mm <sup>2</sup> )                                                             | —                                          | —                                          | —                                          | —                                          | —                                          |
| Flexible with ferrule (mm <sup>2</sup> )                                             | 1 x (10–95)<br>2 x (10–70)                 | 1 x (10–95)<br>2 x (10–70)                 | 1 x (10–95)<br>2 x (10–70)                 | 1 x (10–95)<br>2 x (10–70)                 | 1 x (10–95)<br>2 x (10–70)                 |
| Stranded (mm <sup>2</sup> )                                                          | 1 x (16–95)<br>2 x (16–70)                 | 1 x (16–95)<br>2 x (16–70)                 | 1 x (16–95)<br>2 x (16–70)                 | 1 x (16–95)<br>2 x (16–70)                 | 1 x (16–95)<br>2 x (16–70)                 |
| Flat conductor (number of segments x width x thickness) (mm)                         | 2 x (6 x 16 x 0.8)                         | 2 x (6 x 16 x 0.8)                         | 2 x (6 x 16 x 0.8)                         | 2 x (6 x 16 x 0.8)                         | 2 x (6 x 16 x 0.8)                         |
| Solid or stranded (AWG)                                                              | 8–3/0                                      | 8–3/0                                      | 8–3/0                                      | 8–3/0                                      | 8–3/0                                      |
| Main cable connection screw/bolt                                                     | M10                                        | M10                                        | M10                                        | M10                                        | M10                                        |
| Tightening torque                                                                    |                                            |                                            |                                            |                                            |                                            |
| Nm                                                                                   | 14                                         | 14                                         | 14                                         | 14                                         | 14                                         |
| Lb-in                                                                                | 123.9                                      | 123.9                                      | 123.9                                      | 123.9                                      | 123.9                                      |

**Notes**

① IEC 60947 Standard.

② Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60 068-2-30.

## XT Contactors—Frames F–G, continued

| Description                                                                          | XTCE080F                         | XTCE095F                         | XTCE115G                         | XTCE150G                         | XTCE170G                         |
|--------------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>General, continued</b>                                                            |                                  |                                  |                                  |                                  |                                  |
| Terminal capacity control circuit cable—screw terminals                              |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                                             | 1 x (0.75–4)<br>1 x (0.75–4)     | 1 x (0.75–4)<br>1 x (0.75–4)     | 1 x (0.75–4)<br>1 x (0.75–4)     | 1 x (0.75–4)<br>1 x (0.75–4)     | 1 x (0.75–4)<br>1 x (0.75–4)     |
| Flexible with ferrule (mm <sup>2</sup> )                                             | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                                              | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| Control circuit cable connection screw/bolt                                          | M3.5                             | M3.5                             | M3.5                             | M3.5                             | M3.5                             |
| Tightening torque                                                                    |                                  |                                  |                                  |                                  |                                  |
| Nm                                                                                   | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              |
| Lb-in                                                                                | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             |
| Tools                                                                                |                                  |                                  |                                  |                                  |                                  |
| Main circuit cable—screw terminals                                                   |                                  |                                  |                                  |                                  |                                  |
| Hexagon socket-head spanner (mm)                                                     | 5                                | 5                                | 5                                | 5                                | 5                                |
| Control circuit cable—screw terminals                                                |                                  |                                  |                                  |                                  |                                  |
| Pozidriv screwdriver                                                                 | Size 2                           | Size 2                           | Size 2                           | Size 2                           | Size 2                           |
| Standard screwdriver                                                                 | 1 x 6, 0.8 x 5.5                 | 1 x 6, 0.8 x 5.5                 | 1 x 6, 0.8 x 5.5                 | 1 x 6, 0.8 x 5.5                 | 1 x 6, 0.8 x 5.5                 |
| Terminal capacity control circuit cable—spring cage terminals                        |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                                             | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Flexible (mm <sup>2</sup> )                                                          | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Flexible with ferrule (mm <sup>2</sup> )                                             | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                                              | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| Tools                                                                                |                                  |                                  |                                  |                                  |                                  |
| Control circuit cable—spring cage terminals                                          |                                  |                                  |                                  |                                  |                                  |
| Stripping length (mm)                                                                | 10                               | 10                               | 10                               | 10                               | 10                               |
| Screwdriver blade width (mm)                                                         | 3.5                              | 3.5                              | 3.5                              | 3.5                              | 3.5                              |
| Mounting position, AC and DC operated                                                |                                  |                                  |                                  |                                  |                                  |
|  |                                  |                                  |                                  |                                  |                                  |
| Ambient temperature                                                                  |                                  |                                  |                                  |                                  |                                  |
| Open                                                                                 | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    |
| Enclosed                                                                             | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    | –25 to 40°C<br>[–13 to 104°F]    |
| Ambient storage temperature                                                          | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    |
| <b>Environmental</b>                                                                 |                                  |                                  |                                  |                                  |                                  |
| Mechanical shock resistance<br>(IEC/EN 60068-2-27)                                   |                                  |                                  |                                  |                                  |                                  |
| Half-sinusoidal shock 10 ms                                                          |                                  |                                  |                                  |                                  |                                  |
| Main contact—NO contact                                                              | 10g                              | 10g                              | 10g                              | 10g                              | 10g                              |
| Auxiliary contact—NO contact                                                         | 7g                               | 7g                               | 7g                               | 7g                               | 7g                               |
| Auxiliary contact—NC contact                                                         | 5g                               | 5g                               | 5g                               | 5g                               | 5g                               |
| Overvoltage category/pollution degree                                                | III/3                            | III/3                            | III/3                            | III/3                            | III/3                            |

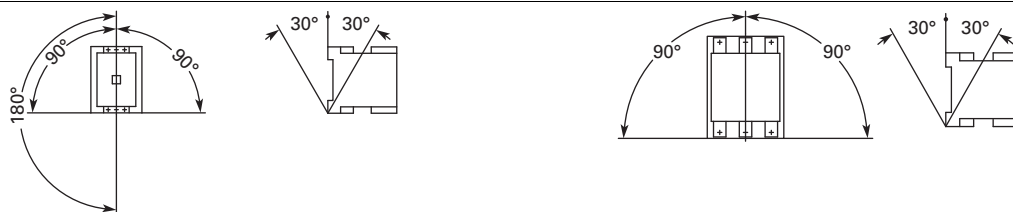
## XT Contactors—Frames H–M

| Description                                                          | XTCE185H                                                             | XTCE225H                              | XTCE250L,<br>XTCS250L                 | XTCE300L,<br>XTCS300L                 | XTCE400M<br>XTCS400M                  | XTCE500M,<br>XTCS500M                 | XTCE570M<br>XTCS570M                  |
|----------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <b>General</b>                                                       |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| Standards                                                            | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA                                | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA | IEC/EN 60947,<br>VDE 0660,<br>UL, CSA |
| Weights in kg [lb]                                                   | 3.2 [7.1]                                                            | 3.2 [7.1]                             | 6.5 [14.3]                            | 6.5 [14.3]                            | 8 [18]                                | 8 [18]                                | 8 [18]                                |
| Mechanical life—operations                                           | 10,000,000                                                           | 10,000,000                            | 10,000,000                            | 10,000,000                            | 7,000,000                             | 7,000,000                             | 7,000,000                             |
| Mechanical operating frequency (ops/hr)                              |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| AC operated                                                          | 3000                                                                 | 3000                                  | 3000                                  | 3000                                  | 2000                                  | 2000                                  | 2000                                  |
| DC operated                                                          | 3000                                                                 | 3000                                  | 3000                                  | 3000                                  | 2000                                  | 2000                                  | 2000                                  |
| Mechanical operating frequency (ops/hr)                              | See <b>Page V5-T1-93</b>                                             |                                       |                                       |                                       |                                       |                                       |                                       |
| Climatic proofing                                                    | ②                                                                    | ②                                     | ②                                     | ②                                     | ②                                     | ②                                     | ②                                     |
| Insulation voltage (U <sub>i</sub> ) Vac                             | 1000                                                                 | 1000                                  | 1000                                  | 1000                                  | 1000                                  | 1000                                  | 1000                                  |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac                    | 8000                                                                 | 8000                                  | 8000                                  | 8000                                  | 8000                                  | 8000                                  | 8000                                  |
| Operating voltage (U <sub>e</sub> ) Vac                              | 1000                                                                 | 1000                                  | 1000                                  | 1000                                  | 1000                                  | 1000                                  | 1000                                  |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1                  |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| Between coil and contacts (Vac)                                      | 500                                                                  | 500                                   | 500                                   | 500                                   | 500                                   | 500                                   | 500                                   |
| Between contacts (Vac)                                               | 500                                                                  | 500                                   | 500                                   | 500                                   | 500                                   | 500                                   | 500                                   |
| Making capacity (amps)                                               | 2700                                                                 | 2700                                  | 3000                                  | 3600                                  | 5500                                  | 5500                                  | 5500                                  |
| Breaking capacity (amps)                                             |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| Between coil and contacts (Vac)                                      |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| 220/230V                                                             | 2250                                                                 | 2250                                  | 2500                                  | 3000                                  | 5000                                  | 5000                                  | 5000                                  |
| 380/400V                                                             | 2250                                                                 | 2250                                  | 2500                                  | 3000                                  | 5000                                  | 5000                                  | 5000                                  |
| 500V                                                                 | 2250                                                                 | 2250                                  | 2500                                  | 3000                                  | 5000                                  | 5000                                  | 5000                                  |
| 660/690V                                                             | 2250                                                                 | 2250                                  | 2500                                  | 3000                                  | 5000                                  | 5000                                  | 5000                                  |
| 1000V                                                                | 760                                                                  | 760                                   | 760                                   | 950                                   | 950                                   | 950                                   | 950                                   |
| Short-circuit protection rating maximum fuse                         |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| Type 2 coordination ①                                                |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| 400V; gG/gL 500V                                                     | 315                                                                  | 315                                   | 315                                   | 315                                   | 500                                   | 500                                   | 500                                   |
| 690V; gG/gL 690V                                                     | 250                                                                  | 250                                   | 315                                   | 315                                   | 500                                   | 500                                   | 500                                   |
| 1000V; gG/gL 1000V                                                   | 160                                                                  | 160                                   | 160                                   | 160                                   | 200                                   | 200                                   | 200                                   |
| Degree of protection                                                 | IP00                                                                 | IP00                                  | IP00                                  | IP00                                  | IP00                                  | IP00                                  | IP00                                  |
| Protection against direct contact when actuated from front (IEC 536) | Finger and back-of-hand proof with terminal shroud or terminal block |                                       |                                       |                                       |                                       |                                       |                                       |
| Main cable cross-section                                             |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| Flexible with cable lug (mm <sup>2</sup> )                           | 50–185                                                               | 50–185                                | 50–240                                | 50–240                                | 50–240                                | 50–240                                | 50–240                                |
| Stranded with cable lug (mm <sup>2</sup> )                           | 50–185                                                               | 70–185                                | 70–240                                | 70–240                                | 70–240                                | 70–240                                | 70–240                                |
| Solid or stranded (AWG)                                              | 1/0–350 kcmil                                                        | 2/0–250 kcmil                         | 1/0–250 kcmil                         | 2/0–500 kcmil                         | 1/0–250 kcmil                         | 1/0–250 kcmil                         | 1/0–250 kcmil                         |
| Flat conductor (mm)                                                  | ③                                                                    | ③                                     | ③                                     | ③                                     | ③                                     | ③                                     | ③                                     |
| Busbar—width in mm                                                   | 32                                                                   | 32                                    | 25                                    | 25                                    | 25                                    | 30                                    | 30                                    |
| Main cable connection screw/bolt                                     | M10                                                                  | M10                                   | M10                                   | M10                                   | M10                                   | M10                                   | M10                                   |
| Tightening torque                                                    |                                                                      |                                       |                                       |                                       |                                       |                                       |                                       |
| Nm                                                                   | 24                                                                   | 24                                    | 24                                    | 24                                    | 2                                     | 2                                     | 2                                     |
| Lb-in                                                                | 213                                                                  | 213                                   | 213                                   | 213                                   | 213                                   | 213                                   | 213                                   |

**Notes**

- ① IEC 60947 Standard.
- ② Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60 068-2-30.
- ③ Screw tightening with flat cable terminal or cable terminal blocks. See terminal capacity for cable terminal blocks.

## XT Contactors—Frames H–M, continued

| Description                                 | XTCE185H                                                                           | XTCE225H                         | XTCE250L,<br>XTCS250L            | XTCE300L,<br>XTCS300L            | XTCE400M<br>XTCS400M             | XTCE500M,<br>XTCS500M            | XTCE570M<br>XTCS570M             |
|---------------------------------------------|------------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>General, continued</b>                   |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Control circuit cable cross-sections        |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                    | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                   | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Flexible with ferrule (mm <sup>2</sup> )    | 1 x (0.75–2.5)<br>2 x (0.75–2.5)                                                   | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                     | 2 x (18–12)                                                                        | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      |
| Control circuit cable connection screw/bolt | M3.5                                                                               | M3.5                             | M3.5                             | M3.5                             | M3.5                             | M3.5                             | M3.5                             |
| Tightening torque                           |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Nm                                          | 1.2                                                                                | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              |
| Lb-in                                       | 10.6                                                                               | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             |
| Tools                                       |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Main cable wrench                           | 16 mm                                                                              | 16 mm                            | 16 mm                            | 16 mm                            | 16 mm                            | 16 mm                            | 16 mm                            |
| Control circuit cable pozidriv screwdriver  | Size 2                                                                             | Size 2                           | Size 2                           | Size 2                           | Size 2                           | Size 2                           | Size 2                           |
| Mounting position, AC and DC operated       |  |                                  |                                  |                                  |                                  |                                  |                                  |
| Ambient temperature                         | –25 to 60°C<br>[–13 to 140°F]                                                      | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    |
| Ambient storage temperature                 | –40 to 80°C<br>[–40 to 176°F]                                                      | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    |
| <b>Environmental</b>                        |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Mechanical shock                            |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Resistance (IEC/EN 60068-2-27)              |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Half-sinusoidal shock 10 ms                 |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Main contact—NO contact                     | 10g                                                                                | 10g                              | 10g                              | 10g                              | 10g                              | 10g                              | 10g                              |
| Auxiliary contact—NO contact                | 10g                                                                                | 10g                              | 10g                              | 10g                              | 10g                              | 10g                              | 10g                              |
| Auxiliary contact—NC contact                | 8g                                                                                 | 8g                               | 8g                               | 8g                               | 8g                               | 8g                               | 8g                               |
| Overvoltage category/pollution degree       | III/3                                                                              | III/3                            | III/3                            | III/3                            | III/3                            | III/3                            | III/3                            |
| Switching capacity, kVAR <sup>①</sup>       |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| Individual compensation                     |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| 230V                                        | —                                                                                  | —                                | —                                | —                                | —                                | —                                | —                                |
| 400/420/440V                                | —                                                                                  | —                                | —                                | —                                | —                                | —                                | —                                |
| 525V                                        | 220                                                                                | 220                              | —                                | 307                              | —                                | —                                | —                                |
| 690V                                        | 133                                                                                | 133                              | —                                | 177                              | —                                | —                                | —                                |
| Group compensation, with choke              |                                                                                    |                                  |                                  |                                  |                                  |                                  |                                  |
| 230V                                        | —                                                                                  | —                                | 100                              | —                                | 160                              | 160                              | 160                              |
| 400/420/440V                                | —                                                                                  | —                                | 190                              | —                                | 280                              | 280                              | 280                              |
| 525V                                        | —                                                                                  | —                                | 260                              | —                                | 370                              | 370                              | 370                              |
| 690V                                        | —                                                                                  | —                                | 340                              | —                                | 480                              | 480                              | 480                              |

**Note**

- <sup>①</sup> When using contactors for group compensation, a minimum inductance of approx. 6 uH per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with five windings and a coil diameter of approximately 140 mm. The conductor cross-section must be selected according to the rated current per phase.

## XT Contactors—Frames N–R

| Description                                                          | XTCE580N                                                             | XTCE650N                                                             | XTCE750N,<br>XTCE820N                                                | XTCEC10N                                                             | XTCEC14P                                                             | XTCEC16R,<br>XTCEC20R                                                |
|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|
| <b>General</b>                                                       |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| Standards                                                            | IEC/EN 60947,<br>VDE 0660, UL, CSA                                   | IEC/EN 60947,<br>VDE 0660, UL, CSA                                   | IEC/EN 60947,<br>VDE 0660, UL, CSA                                   | IEC/EN 60947,<br>VDE 0660, UL, CSA                                   | IEC/EN 60947,<br>VDE 0660, UL, CSA                                   | IEC/EN 60947,<br>VDE 0660, UL, CSA                                   |
| Weights in kg [lb]                                                   | 15 [33]                                                              | 15 [33]                                                              | 15 [33]                                                              | 15 [33]                                                              | 15, [33]                                                             | 32 [70]                                                              |
| Mechanical life—operations                                           | 5,000,000                                                            | 5,000,000                                                            | 5,000,000                                                            | 5,000,000                                                            | 5,000,000                                                            | 5,000,000                                                            |
| Mechanical operating frequency (ops/hr)                              |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| AC operated                                                          | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 |
| DC operated                                                          | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 |
| Maximum operating frequency (ops/hr)                                 | See <b>Page V5-T1-113</b>                                            |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| Climatic proofing                                                    | ②                                                                    | ②                                                                    | ②                                                                    | ②                                                                    | ②                                                                    | ②                                                                    |
| Insulation voltage (U <sub>i</sub> ) Vac                             | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac                    | 8000                                                                 | 8000                                                                 | 8000                                                                 | 8000                                                                 | 8000                                                                 | 8000                                                                 |
| Operating voltage (U <sub>e</sub> ) Vac                              | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 | 1000                                                                 |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1                  |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| Between coil and contacts (Vac)                                      | 500                                                                  | 500                                                                  | 500                                                                  | 500                                                                  | 500                                                                  | 500                                                                  |
| Between contacts (Vac)                                               | 500                                                                  | 500                                                                  | 500                                                                  | 500                                                                  | 500                                                                  | 500                                                                  |
| Making capacity (amps)                                               | 7800                                                                 | 7800                                                                 | 9840                                                                 | 9840                                                                 | 9840                                                                 | 19000, 9840                                                          |
| Breaking capacity (amps)                                             |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| 220/230V                                                             | 6500                                                                 | 6500                                                                 | 8200                                                                 | 8200                                                                 | 8200                                                                 | 16000, 8200                                                          |
| 380/400V                                                             | 6500                                                                 | 6500                                                                 | 8200                                                                 | 8200                                                                 | 8200                                                                 | 16000, 8200                                                          |
| 500V                                                                 | 6500                                                                 | 6500                                                                 | 8200                                                                 | 8200                                                                 | 8200                                                                 | 16000, 8200                                                          |
| 660/690V                                                             | 6500                                                                 | 6500                                                                 | 8200                                                                 | 8200                                                                 | 8200                                                                 | 16000, 8200                                                          |
| 1000V                                                                | 4350                                                                 | 4350                                                                 | 5800                                                                 | 5800                                                                 | 5800                                                                 | 5800                                                                 |
| Short-circuit protection rating maximum fuse                         |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| Type 2 coordination ①                                                |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| 400V; gG/gL 500V                                                     | 630                                                                  | 630                                                                  | 630                                                                  | 630                                                                  | —                                                                    | —                                                                    |
| 690V; gG/gL 690V                                                     | 630                                                                  | 630                                                                  | 630                                                                  | 630                                                                  | —                                                                    | —                                                                    |
| 1000V; gG/gL 1000V                                                   | 500                                                                  | 500                                                                  | 630                                                                  | 630                                                                  | —                                                                    | —                                                                    |
| Type 1 coordination ①                                                |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| 400V; gG/gL 500V                                                     | 1000                                                                 | 1000                                                                 | 1200                                                                 | 1200                                                                 | —                                                                    | —                                                                    |
| 690V; gG/gL 690V                                                     | 1000                                                                 | 1000                                                                 | 1200                                                                 | 1200                                                                 | —                                                                    | —                                                                    |
| 1000V; gG/gL 1000V                                                   | 630                                                                  | 630                                                                  | 800                                                                  | 800                                                                  | —                                                                    | —                                                                    |
| Degree of protection                                                 | IP00                                                                 | IP00                                                                 | IP00                                                                 | IP00                                                                 | IP00                                                                 | IP00                                                                 |
| Protection against direct contact when actuated from front (IEC 536) | Finger and back-of-hand proof with terminal shroud or terminal block | Finger and back-of-hand proof with terminal shroud or terminal block | Finger and back-of-hand proof with terminal shroud or terminal block | Finger and back-of-hand proof with terminal shroud or terminal block | Finger and back-of-hand proof with terminal shroud or terminal block | Finger and back-of-hand proof with terminal shroud or terminal block |
| Main cable cross-section                                             |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| Flexible with cable lug (mm <sup>2</sup> )                           | 50-240                                                               | 50-240                                                               | 50-240                                                               | 50-240                                                               | 50-240                                                               | 50-240                                                               |
| Stranded with cable lug (mm <sup>2</sup> )                           | 70-240                                                               | 70-240                                                               | 70-240                                                               | 70-240                                                               | 70-240                                                               | 70-240                                                               |
| Solid or stranded (AWG)                                              | 2/0–500 kcmil                                                        | 2/0–500 kcmil                                                        | 2/0–500 kcmil                                                        | 2/0–500 kcmil                                                        | 2/0–500 kcmil                                                        | 2/0–500 kcmil                                                        |
| Flat conductor (mm)                                                  | ③                                                                    | ③                                                                    | ③                                                                    | ③                                                                    | ③                                                                    | ③                                                                    |
| Busbar—width in mm                                                   | 50                                                                   | 50                                                                   | 50                                                                   | 50                                                                   | 50                                                                   | 50                                                                   |
| Main cable connection screw/bolt                                     | M10                                                                  | M10                                                                  | M12                                                                  | M12                                                                  | M12                                                                  | M1                                                                   |
| Tightening torque                                                    |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |                                                                      |
| Nm                                                                   | 24                                                                   | 24                                                                   | 35                                                                   | 35                                                                   | 35                                                                   | 35                                                                   |
| Lb-in                                                                | 213                                                                  | 213                                                                  | 311                                                                  | 311                                                                  | 311                                                                  | 311                                                                  |

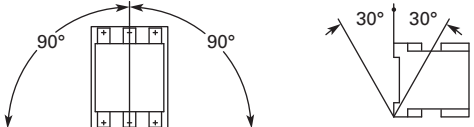
**Notes**

① IEC 60947 Standard.

② Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60 068-2-30.

③ Screw tightening with flat cable terminal or cable terminal blocks. See terminal capacity for cable terminal blocks.

## XT Contactors—Frames N–R, continued

| Description                                                                       | XTCE580N                         | XTCE650N                         | XTCE750N, XTCE820N               | XTCEC10N                         | XTCEC14P                         | XTCEC16R, XTCEC20R               |
|-----------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>General, continued</b>                                                         |                                  |                                  |                                  |                                  |                                  |                                  |
| Control circuit cable cross-sections                                              |                                  |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                                          | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Flexible with ferrule (mm <sup>2</sup> )                                          | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                                           | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      | 2 x (18–12)                      |
| Control circuit cable connection screw/bolt                                       | M3.5                             | M3.5                             | M3.5                             | M3.5                             | M3.5                             | M3.5                             |
| Tightening torque                                                                 |                                  |                                  |                                  |                                  |                                  |                                  |
| Nm                                                                                | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              |
| Lb-in                                                                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             |
| Tools                                                                             |                                  |                                  |                                  |                                  |                                  |                                  |
| Main cable wrench                                                                 | 16 mm                            | 16 mm                            | 18 mm                            | 18 mm                            | 18 mm                            | 18 mm                            |
| Control circuit cable pozidriv screwdriver                                        | Size 2                           | Size 2                           | Size 2                           | Size 2                           | Size 2                           | Size 2                           |
| Mounting position, AC and DC operated                                             |                                  |                                  |                                  |                                  |                                  |                                  |
|  |                                  |                                  |                                  |                                  |                                  |                                  |
| Ambient temperature                                                               | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    | –25 to 60°C<br>[–13 to 140°F]    |
| Ambient storage temperature                                                       | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    | –40 to 80°C<br>[–40 to 176°F]    |
| <b>Environmental</b>                                                              |                                  |                                  |                                  |                                  |                                  |                                  |
| Mechanical shock resistance (IEC/EN 60068-2-27)                                   |                                  |                                  |                                  |                                  |                                  |                                  |
| Half-sinusoidal shock 10 ms (g)                                                   |                                  |                                  |                                  |                                  |                                  |                                  |
| Main contact—NO contact                                                           | 10                               | 10                               | 10                               | 10                               | 10                               | 10                               |
| Auxiliary contact—NO contact                                                      | 10                               | 10                               | 10                               | 10                               | 10                               | 10                               |
| Auxiliary contact—NC contact                                                      | 8                                | 8                                | 8                                | 8                                | 8                                | 8                                |
| Overvoltage category/pollution degree                                             | III/3                            | III/3                            | III/3                            | III/3                            | III/3                            | III/3                            |
| Switching capacity, kVAR <sup>①</sup>                                             |                                  |                                  |                                  |                                  |                                  |                                  |
| Individual compensation                                                           |                                  |                                  |                                  |                                  |                                  |                                  |
| 230V                                                                              | 175                              | —                                | —                                | —                                | —                                | —                                |
| 400/420/440V                                                                      | 300                              | —                                | —                                | —                                | —                                | —                                |
| 525V                                                                              | 400                              | —                                | —                                | —                                | —                                | —                                |
| 690V                                                                              | 300                              | —                                | —                                | —                                | —                                | —                                |

**Note**

- ① When using contactors for group compensation, a minimum inductance of approx. 6 uH per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with five windings and a coil diameter of approximately 140 mm. The conductor cross-section must be selected according to the rated current per phase.



## Coil Data—Frames B–D

| Description                                                                | XTCE007B      | XTCE009B      | XTCE012B,<br>XTCF020B | XTCE015B      | XTCE018C      | XTCE025C      | XTCE032C      | XTCE040D      | XTCE050D      | XTCE065D,<br>XTCE072D |
|----------------------------------------------------------------------------|---------------|---------------|-----------------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------------|
| <b>Voltage Tolerance</b>                                                   |               |               |                       |               |               |               |               |               |               |                       |
| Pickup (x U <sub>c</sub> )                                                 |               |               |                       |               |               |               |               |               |               |                       |
| AC operated                                                                | 0.8–1.1       | 0.8–1.1       | 0.8–1.1               | 0.8–1.1       | 0.8–1.1       | 0.8–1.1       | 0.8–1.1       | 0.8–1.1       | 0.8–1.1       | 0.8–1.1               |
| DC operated                                                                | 0.8–1.1 ①     | 0.8–1.1 ①     | 0.8–1.1 ①             | 0.8–1.1 ①     | 0.7–1.2 ②     | 0.7–1.2 ②     | 0.7–1.2 ②     | 0.7–1.2 ②     | 0.7–1.2 ②     | 0.7–1.2 ②             |
| Dropout (x U <sub>c</sub> )                                                |               |               |                       |               |               |               |               |               |               |                       |
| AC operated                                                                | 0.3–0.6       | 0.3–0.6       | 0.3–0.6               | 0.3–0.6       | 0.3–0.6       | 0.3–0.6       | 0.3–0.6       | 0.3–0.6       | 0.3–0.6       | 0.3–0.6               |
| DC operated                                                                | 0.15–0.6      | 0.15–0.6      | 0.15–0.6              | 0.15–0.6      | 0.15–0.6      | 0.15–0.6      | 0.15–0.6      | 0.15–0.6      | 0.15–0.6      | 0.15–0.6              |
| <b>Power Consumption of the Coil at Cold State and 1.0 x U<sub>c</sub></b> |               |               |                       |               |               |               |               |               |               |                       |
| AC operated                                                                |               |               |                       |               |               |               |               |               |               |                       |
| Single-voltage coil 50 Hz                                                  |               |               |                       |               |               |               |               |               |               |                       |
| Pickup VA                                                                  | 24            | 24            | 24                    | 24            | 52            | 52            | 52            | 149           | 149           | 149                   |
| Pickup W                                                                   | 19            | 19            | 19                    | 19            | 40            | 40            | 40            | 80            | 80            | 80                    |
| Sealing VA                                                                 | 3.4           | 3.4           | 3.4                   | 3.4           | 7.1           | 7.1           | 7.1           | 16            | 16            | 16                    |
| Sealing W                                                                  | 1.2           | 1.2           | 1.2                   | 1.2           | 2.1           | 2.1           | 2.1           | 4.3           | 4.3           | 4.3                   |
| Single-voltage coil 60 Hz                                                  |               |               |                       |               |               |               |               |               |               |                       |
| Pickup VA                                                                  | 30            | 30            | 30                    | 30            | 67            | 67            | 67            | 178           | 178           | 178                   |
| Pickup W                                                                   | 23            | 23            | 23                    | 23            | 50            | 50            | 50            | 117           | 117           | 117                   |
| Sealing VA                                                                 | 4.4           | 4.4           | 4.4                   | 4.4           | 8.7           | 8.7           | 8.7           | 19            | 19            | 19                    |
| Sealing W                                                                  | 1.4           | 1.4           | 1.4                   | 1.4           | 2.6           | 2.6           | 2.6           | 5.3           | 5.3           | 5.3                   |
| 50/60 Hz                                                                   |               |               |                       |               |               |               |               |               |               |                       |
| Pickup VA                                                                  | 27<br>25      | 27<br>25      | 27<br>25              | 27<br>25      | 62<br>58      | 62<br>58      | 62<br>58      | 168<br>154    | 168<br>154    | 168<br>154            |
| Pickup W                                                                   | 22<br>21      | 22<br>21      | 22<br>21              | 22<br>21      | 48<br>43      | 48<br>43      | 48<br>43      | 120<br>43     | 120<br>43     | 120<br>43             |
| Sealing VA                                                                 | 4.2<br>3.3    | 4.2<br>3.3    | 4.2<br>3.3            | 4.2<br>3.3    | 9.1<br>6.5    | 9.1<br>6.5    | 9.1<br>6.5    | 22<br>14      | 22<br>14      | 22<br>14              |
| Sealing W                                                                  | 1.4<br>1.2    | 1.4<br>1.2    | 1.4<br>1.2            | 1.4<br>1.2    | 2.5<br>2      | 2.5<br>2      | 2.5<br>2      | 5.3<br>4.3    | 5.3<br>4.3    | 5.3<br>4.3            |
| DC operated                                                                |               |               |                       |               |               |               |               |               |               |                       |
| Pickup W                                                                   | 3             | 3             | 4.5                   | 4.5           | 12 at 24V     | 12 at 24V     | 12 at 24V     | 24 at 24V     | 24 at 24V     | 24 at 24V             |
| Sealing W                                                                  | 3             | 3             | 4.5                   | 4.5           | 0.5 at 24V    | 0.5 at 24V    | 0.5 at 24V    | 0.5 at 24V    | 0.5 at 24V    | 0.5 at 24V            |
| Duty factor (%DF)                                                          | 100           | 100           | 100                   | 100           | 100           | 100           | 100           | 100           | 100           | 100                   |
| <b>Switching Time at 100% U<sub>c</sub> (Approximate Values)</b>           |               |               |                       |               |               |               |               |               |               |                       |
| Main contact                                                               |               |               |                       |               |               |               |               |               |               |                       |
| AC operated                                                                |               |               |                       |               |               |               |               |               |               |                       |
| Closing delay (ms)                                                         | <21           | <21           | <21                   | <21           | <22           | <22           | <22           | <18           | <18           | <18                   |
| Opening delay (ms)                                                         | <18           | <18           | <18                   | <18           | <14           | <14           | <14           | <13           | <13           | <13                   |
| DC operated                                                                |               |               |                       |               |               |               |               |               |               |                       |
| Closing delay (ms)                                                         | <31           | <31           | <31                   | <31           | <47           | <47           | <47           | <54           | <54           | <54                   |
| Opening delay (ms)                                                         | <12           | <12           | <12                   | <12           | <30           | <30           | <30           | <24           | <24           | <24                   |
| Arcing time (ms)                                                           | 10            | 10            | 10                    | 10            | 10            | 10            | 10            | 10            | 10            | 10                    |
| <b>Electromagnetic Compatibility (EMC)</b>                                 |               |               |                       |               |               |               |               |               |               |                       |
| Emitted interference                                                       | To EN-60947-1 | To EN-60947-1 | To EN-60947-1         | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1         |
| Noise immunity                                                             | To EN-60947-1 | To EN-60947-1 | To EN-60947-1         | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1 | To EN-60947-1         |

**Notes**

① 0.7–1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

② Coil Suffix TD: U<sub>min</sub> 24 Vdc/U<sub>max</sub> 27 Vdc.Coil Suffix WD: U<sub>min</sub> 48 Vdc/U<sub>max</sub> 60 Vdc.Coil Suffix AD: U<sub>min</sub> 110 Vdc/U<sub>max</sub> 130 Vdc.Coil Suffix BD: U<sub>min</sub> 200 Vdc/U<sub>max</sub> 240 Vdc.

Example:

U<sub>c</sub> = 0.7 x U<sub>min</sub>—1.2 x U<sub>max</sub>U<sub>c</sub> = 0.7 x 24V—1.2 x 27 Vdc

## Coil Data—Frames F–G

| Description                                                                                  | XTCE80F              | XTCE95F              | XTCE115G             | XTCE150G             | XTCE170G             |
|----------------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>Voltage Tolerance</b>                                                                     |                      |                      |                      |                      |                      |
| Pickup (x U <sub>c</sub> )                                                                   |                      |                      |                      |                      |                      |
| AC operated                                                                                  | 0.8–1.1              | 0.8–1.1              | 0.8–1.1              | 0.8–1.1              | 0.8–1.1              |
| DC operated                                                                                  | 0.7–1.2 <sup>①</sup> | 0.7–1.2 <sup>①</sup> | 0.7–1.2 <sup>①</sup> | 0.7–1.2 <sup>①</sup> | 0.7–1.2 <sup>①</sup> |
| Dropout (x U <sub>c</sub> )                                                                  |                      |                      |                      |                      |                      |
| AC operated                                                                                  | 0.3–0.6              | 0.3–0.6              | 0.25–0.6             | 0.25–0.6             | 0.25–0.6             |
| DC operated                                                                                  | 0.15–0.6             | 0.15–0.6             | 0.15–0.6             | 0.15–0.6             | 0.15–0.6             |
| <b>Power Consumption of the Coil at Cold State and 1.0 x U<sub>c</sub></b>                   |                      |                      |                      |                      |                      |
| AC operated                                                                                  |                      |                      |                      |                      |                      |
| Single-voltage coil 50 Hz                                                                    |                      |                      |                      |                      |                      |
| Pickup VA                                                                                    | 310                  | 310                  | 180                  | 180                  | 180                  |
| Pickup W                                                                                     | 165                  | 165                  | 130                  | 130                  | 130                  |
| Sealing VA                                                                                   | 26                   | 26                   | 3.1                  | 3.1                  | 3.1                  |
| Sealing W                                                                                    | 5.8                  | 5.8                  | 2.1                  | 2.1                  | 2.1                  |
| Single-voltage coil 60 Hz                                                                    |                      |                      |                      |                      |                      |
| Pickup VA                                                                                    | 345                  | 345                  | 170                  | 170                  | 170                  |
| Pickup W                                                                                     | 190                  | 190                  | 130                  | 130                  | 130                  |
| Sealing VA                                                                                   | 30                   | 30                   | 3.1                  | 3.1                  | 3.1                  |
| Sealing W                                                                                    | 7.1                  | 7.1                  | 2.1                  | 2.1                  | 2.1                  |
| 50/60 Hz                                                                                     |                      |                      |                      |                      |                      |
| Pickup VA                                                                                    | 372                  | 328                  | 170                  | 170                  | 170                  |
| Pickup W                                                                                     | 190                  | 190                  | 130                  | 130                  | 130                  |
| Sealing VA                                                                                   | 37.1                 | 22.6                 | 3.1                  | 3.1                  | 3.1                  |
| Sealing W                                                                                    | 7.5                  | 6.1                  | 2.1                  | 2.1                  | 2.1                  |
| DC operated                                                                                  |                      |                      |                      |                      |                      |
| Pickup W                                                                                     | 90 at 24V            | 90 at 24V            | 149 at 24V           | 149 at 24V           | 149 at 24V           |
| Sealing W                                                                                    | 1.3 at 24V           | 1.3 at 24V           | 2.1 at 24V           | 2.1 at 24V           | 2.1 at 24V           |
| Duty factor (%DF)                                                                            | 100                  | 100                  | 100                  | 100                  | 100                  |
| <b>Switching Time at 100% U<sub>c</sub> (Approximate Values)</b>                             |                      |                      |                      |                      |                      |
| Main contact                                                                                 |                      |                      |                      |                      |                      |
| AC operated                                                                                  |                      |                      |                      |                      |                      |
| Closing delay (ms)                                                                           | <20                  | <20                  | <33                  | <33                  | <33                  |
| Opening delay (ms)                                                                           | <14                  | <14                  | <41                  | <41                  | <41                  |
| DC operated                                                                                  |                      |                      |                      |                      |                      |
| Closing delay (ms)                                                                           | <45                  | <45                  | <35                  | <35                  | <35                  |
| Opening delay (ms)                                                                           | <34                  | <34                  | <30                  | <30                  | <30                  |
| Arcing time (ms)                                                                             | 15                   | 15                   | 15                   | 15                   | 15                   |
| Permissible residual current with actuation of A1–A2 by the electronics (with 0 signal) (mA) | ≤1                   | ≤1                   | ≤1                   | ≤1                   | ≤1                   |
| <b>Electromagnetic Compatibility (EMC)</b>                                                   |                      |                      |                      |                      |                      |
| Emitted interference                                                                         | To EN60947-1         | To EN60947-1         | To EN60947-1         | To EN60947-1         | To EN60947-1         |
| Noise immunity                                                                               | To EN60947-1         | To EN60947-1         | To EN60947-1         | To EN60947-1         | To EN60947-1         |

**Note**

① At 24V: 0.7–1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

## Coil Data—Frames H–R

| Description                                                                         | XTCE185H, XTCE225H                           | XTCE250L, XTCS250L                           | XTCE300L, XTCS300L                           | XTCE400M, XTCS400M, XTCE500M, XTCS500M, XTCE570M, XTCS570M |
|-------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|------------------------------------------------------------|
| <b>Voltage Tolerance</b>                                                            |                                              |                                              |                                              |                                                            |
| Pickup ( $\times U_c$ )                                                             |                                              |                                              |                                              |                                                            |
| XTCE185H–XTCEC20R                                                                   | $0.8 \times U_{cmin} - 1.15 \times U_{cmax}$ | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$ | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$ | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$               |
| XTCS250L–XTCS500M                                                                   | —                                            | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$ | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$ | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$               |
| Dropout ( $\times U_c$ )                                                            |                                              |                                              |                                              |                                                            |
| XTCE185H–XTCEC20R                                                                   | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$                |
| XTCS250L–XTCS500M                                                                   | —                                            | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$                |
| <b>Power Consumption of the Coil at Cold State and <math>1.0 \times U_c</math></b>  |                                              |                                              |                                              |                                                            |
| XTCE185H–XTCEC20R                                                                   |                                              |                                              |                                              |                                                            |
| Pickup VA                                                                           | 210 ①                                        | 250 ①                                        | 380 ①                                        | 450 ①                                                      |
| Pickup W                                                                            | 180                                          | 200                                          | 250                                          | 350                                                        |
| Sealing VA                                                                          | 2.6                                          | 4.3                                          | 4.3                                          | 4.3                                                        |
| Sealing W                                                                           | 2.1                                          | 3.3                                          | 3.3                                          | 3.3                                                        |
| XTCS250L–XTCS500M                                                                   |                                              |                                              |                                              |                                                            |
| Pickup VA                                                                           | —                                            | 360                                          | 360                                          | 715                                                        |
| Pickup W                                                                            | —                                            | 325                                          | 625                                          | 645                                                        |
| Sealing VA                                                                          | —                                            | 4.3                                          | 4.3                                          | 4.3                                                        |
| Sealing W                                                                           | —                                            | 3.3                                          | 3.3                                          | 3.3                                                        |
| Duty factor (%DF)                                                                   | —                                            | 100                                          | 100                                          | 100                                                        |
| <b>Switching Time at 100% Main Contact <math>U_c</math> (Approximate Values)</b>    |                                              |                                              |                                              |                                                            |
| XTCE185H–XTCEC20R                                                                   |                                              |                                              |                                              |                                                            |
| Closing delay (ms)                                                                  | <60                                          | <100                                         | <80                                          | <80                                                        |
| Opening delay (ms)                                                                  | <40                                          | <80                                          | <110                                         | <80                                                        |
| XTCS250L–XTCS500M                                                                   |                                              |                                              |                                              |                                                            |
| Closing delay (ms)                                                                  | —                                            | <50                                          | <55                                          | <50                                                        |
| Opening delay (ms)                                                                  | —                                            | <40                                          | <40                                          | <40                                                        |
| <b>Reaction in Threshold and Sealing State Transition Range (XTCE185H–XTCEC20R)</b> |                                              |                                              |                                              |                                                            |
| Voltage interruptions                                                               |                                              |                                              |                                              |                                                            |
| $(0 - 0.2 \times U_{cmin}) \leq 10$ ms                                              | Time is bridged successfully                 | Time is bridged successfully                 | Time is bridged successfully                 | Time is bridged successfully                               |
| $(0 - 0.2 \times U_{cmin}) > 10$ ms                                                 | Dropout of the contactor                     | Dropout of the contactor                     | Dropout of the contactor                     | Dropout of the contactor                                   |
| Voltage dips                                                                        |                                              |                                              |                                              |                                                            |
| $(0.2 - 0.6 \times U_{cmin}) \leq 12$ ms                                            | Time is bridged successfully                 | Time is bridged successfully                 | Time is bridged successfully                 | Time is bridged successfully                               |
| $(0.2 - 0.6 \times U_{cmin}) > 12$ ms                                               | Contactor remains switched on                | Contactor remains switched on                | Dropout of the contactor                     | Contactor remains switched on                              |
| $(0.6 - 0.7 \times U_{cmin})$                                                       | Contactor remains switched on                | Contactor remains switched on                | Contactor remains switched on                | Contactor remains switched on                              |
| Excess voltage                                                                      |                                              |                                              |                                              |                                                            |
| $(1.15 - 1.3 \times U_{cmax})$                                                      | Contactor remains switched on                | Contactor remains switched on                | Contactor remains switched on                | Contactor remains switched on                              |
| $(> 1.3 \times U_{cmax}) \leq 3$ s                                                  | Contactor remains switched on                | Contactor remains switched on                | Contactor remains switched on                | Contactor remains switched on                              |
| $(> 1.3 \times U_{cmax}) > 3$ s                                                     | Dropout of the contactor                     | Dropout of the contactor                     | Dropout of the contactor                     | Dropout of the contactor                                   |
| Pickup phase                                                                        |                                              |                                              |                                              |                                                            |
| $(0 - 0.7 \times U_{cmin})$                                                         | Contactor does not switch on                 | Contactor does not switch on                 | Contactor does not switch on                 | Contactor does not switch on                               |
| $(0.7 \times U_{cmin} - 1.15 \times U_{cmax})$                                      | Contactor switches on with certainty         | Contactor switches on with certainty         | Contactor switches on with certainty         | Contactor switches on with certainty                       |
| $(> 1.15 \times U_{cmax})$                                                          | Contactor switches on with certainty         | Contactor switches on with certainty         | Contactor switches on with certainty         | Contactor switches on with certainty                       |

**Note**① Control transformer with  $U_k \leq 6\%$ .

## Coil Data—Frames H–R, continued

| Description                                                                                    | XTCE185H, XTCE225H                                                                                                                                                                                                       | XTCE250L, XTCS250L | XTCE300L, XTCS300L | XTCE400M, XTCS400M,<br>XTCE500M, XTCS500M,<br>XTCE570M, XTCS570M |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|------------------------------------------------------------------|
| <b>Reaction in Threshold and Sealing State Transition Range (XTCE185H–XTCEC20R), continued</b> |                                                                                                                                                                                                                          |                    |                    |                                                                  |
| Permissible contact resistance (of the external command device with actuation of A11), ohms    | —                                                                                                                                                                                                                        | ≤500               | ≤500               | ≤500                                                             |
| Permissible residual current (with actuation of A11 by the electronics with 0 signal)          | —                                                                                                                                                                                                                        | ≤1                 | ≤1                 | ≤1                                                               |
| SPS signal level (A3–A4) to IEC/EN 61131-2 (Type 2)                                            |                                                                                                                                                                                                                          |                    |                    |                                                                  |
| High                                                                                           | 15V                                                                                                                                                                                                                      | 15V                | 15V                | 15V                                                              |
| Low                                                                                            | 5V                                                                                                                                                                                                                       | 5V                 | 5V                 | 5V                                                               |
| Electromagnetic compatibility (EMC)                                                            | This product is designed for operation in industrial environments (environment 2). The use in residential environments (environment 1) could cause electrical interference so that addition suppression must be planned. |                    |                    |                                                                  |

## Coil Data—Frames N–R

| Description                                                                        | XTCE580N                                     | XTCE750N,<br>XTCE820N                        | XTCEC10N                                     | XTCEC14P                                     | XTCE16R,<br>XTCEC20R                         |
|------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|
| <b>Voltage Tolerance</b>                                                           |                                              |                                              |                                              |                                              |                                              |
| Pickup ( $\times U_c$ )                                                            |                                              |                                              |                                              |                                              |                                              |
| XTCE185L–XTCEC20R                                                                  | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$ | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$ | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$ | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$ | $0.7 \times U_{cmin} - 1.15 \times U_{cmax}$ |
| XTCS185L–XTCS500M                                                                  | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$ | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$ | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$ | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$ | $0.85 \times U_{cmin} - 1.1 \times U_{cmax}$ |
| Dropout ( $\times U_c$ )                                                           |                                              |                                              |                                              |                                              |                                              |
| XTCE185L–XTCEC20R                                                                  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.6 \times U_{cmax}$  |
| XTCS185L–XTCS500M                                                                  | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$  | $0.2 \times U_{cmin} - 0.4 \times U_{cmax}$  |
| <b>Power Consumption of the Coil at Cold State and <math>1.0 \times U_c</math></b> |                                              |                                              |                                              |                                              |                                              |
| XTCE185L–XTCEC20R                                                                  |                                              |                                              |                                              |                                              |                                              |
| Pickup VA                                                                          | 800 ①                                        | 800 ①                                        | 800 ①                                        | 800 ①                                        | 1600 ①                                       |
| Pickup W                                                                           | 700                                          | 700                                          | 700                                          | 700                                          | 1400                                         |
| Sealing VA                                                                         | 7.5                                          | 7.5                                          | 7.5                                          | 7.5                                          | 15                                           |
| Sealing W                                                                          | 6.5                                          | 6.5                                          | 6.5                                          | 6.5                                          | 13                                           |
| XTCS185L–XTCS500M                                                                  |                                              |                                              |                                              |                                              |                                              |
| Pickup VA                                                                          | —                                            | —                                            | —                                            | —                                            | —                                            |
| Pickup W                                                                           | —                                            | —                                            | —                                            | —                                            | —                                            |
| Sealing VA                                                                         | —                                            | —                                            | —                                            | —                                            | —                                            |
| Sealing W                                                                          | —                                            | —                                            | —                                            | —                                            | —                                            |
| Duty factor (%DF)                                                                  | 100                                          | 100                                          | 100                                          | 100                                          | 100                                          |
| <b>Switching Time at 100% Main Contact <math>U_c</math> (Approximate Values)</b>   |                                              |                                              |                                              |                                              |                                              |
| XTCE185L–XTCEC20R                                                                  |                                              |                                              |                                              |                                              |                                              |
| Closing delay (ms)                                                                 | <70                                          | <70                                          | <70                                          | <70                                          | <70                                          |
| Opening delay (ms)                                                                 | <70                                          | <70                                          | <70                                          | <40                                          | <40                                          |
| XTCS185L–XTCS500M                                                                  |                                              |                                              |                                              |                                              |                                              |
| Closing delay (ms)                                                                 | —                                            | —                                            | —                                            | —                                            | —                                            |
| Opening delay (ms)                                                                 | —                                            | —                                            | —                                            | —                                            | —                                            |

**Note**① Control transformer with  $U_k \leq 7\%$ .

## Coil Data—Frames N–R, continued

| Description                                                                                 | XTCE580N                           | XTCE750N,<br>XTCE820N              | XTCEC10N                           | XTCEC14P                           | XTCE16R,<br>XTCEC20R               |
|---------------------------------------------------------------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| <b>Reaction in Threshold and Sealing State Transition Range (XTCE185L–XTCEC20R)</b>         |                                    |                                    |                                    |                                    |                                    |
| Voltage interruptions                                                                       |                                    |                                    |                                    |                                    |                                    |
| $(0-0.2 \times U_{cmin}) \leq 10 \text{ ms}$                                                | Time is bridged successfully       | Time is bridged successfully       | Time is bridged successfully       | Time is bridged successfully       | Time is bridged successfully       |
| $(0-0.2 \times U_{cmin}) > 10 \text{ ms}$                                                   | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           |
| Voltage dips                                                                                |                                    |                                    |                                    |                                    |                                    |
| $(0.2-0.6 \times U_{cmin}) \leq 12 \text{ ms}$                                              | Time is bridged successfully       | Time is bridged successfully       | Time is bridged successfully       | Time is bridged successfully       | Time is bridged successfully       |
| $(0.2-0.6 \times U_{cmin}) > 12 \text{ ms}$                                                 | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           |
| $(0.6-0.7 \times U_{cmin})$                                                                 | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        |
| Excess voltage                                                                              |                                    |                                    |                                    |                                    |                                    |
| $(1.15-1.3 \times U_{cmax})$                                                                | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        |
| $(>1.3 \times U_{cmax}) \leq 3\text{s}$                                                     | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        | Contact remains switched on        |
| $(>1.3 \times U_{cmax}) > 3\text{s}$                                                        | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           | Dropout of the contactor           |
| Pickup phase                                                                                |                                    |                                    |                                    |                                    |                                    |
| $(0-0.7 \times U_{cmin})$                                                                   | Contact does not switch on         | Contact does not switch on         | Contact does not switch on         | Contact does not switch on         | Contact does not switch on         |
| $(0.7 \times U_{cmin} - 1.15 \times U_{cmax})$                                              | Contact switches on with certainty | Contact switches on with certainty | Contact switches on with certainty | Contact switches on with certainty | Contact switches on with certainty |
| $(>1.15 \times U_{cmax})$                                                                   | Contact switches on with certainty | Contact switches on with certainty | Contact switches on with certainty | Contact switches on with certainty | Contact switches on with certainty |
| Permissible contact resistance (of the external command device with actuation of A11), ohms | $\leq 500$                         | $\leq 500$                         | $\leq 500$                         | $\leq 500$                         | $\leq 500$                         |
| Permissible residual current (with actuation of A11 by the electronics with 0 signal)       | $\leq 1$                           | $\leq 1$                           | $\leq 1$                           | $\leq 1$                           | $\leq 1$                           |
| SPS signal level (A3–A4) to IEC/EN 61131-2 (Type 2)                                         |                                    |                                    |                                    |                                    |                                    |
| High                                                                                        | 15V                                | 15V                                | 15V                                | 15V                                | 15V                                |
| Low                                                                                         | 5V                                 | 5V                                 | 5V                                 | 5V                                 | 5V                                 |
| Electromagnetic compatibility (EMC)                                                         | ①                                  | ①                                  | ①                                  | ①                                  | ①                                  |

**Note**

- ① This product is designed for operation in industrial environments. Usage in domestic areas can cause radio frequency interference (RFI). Noise suppression measures must be provided for the additional interference.

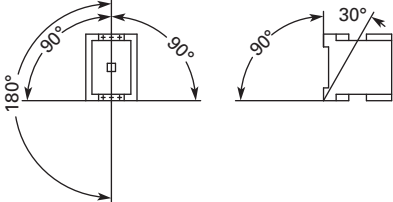
## XT Contactors—Four-Pole

| Description                                                          | XTCF020B                        | XTCF032C                        | XTCF045C                        | XTCF063D                        | XTCF080D                        | XTCF125G                        | XTCF160G                        | XTCF200G                        |
|----------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>General</b>                                                       |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| Standards                                                            | IEC/EN 60947, VDE 0660, UL, CSA | IEC/EN 60947, VDE 0660, UL, CSA | IEC/EN 60947, VDE 0660, UL, CSA | IEC/EN 60947, VDE 0660, UL, CSA | IEC/EN 60947, VDE 0660, UL, CSA | IEC/EN 60947, VDE 0660, UL, CSA | IEC/EN 60947, VDE 0660, UL, CSA | IEC/EN 60947, VDE 0660, UL, CSA |
| Weights in kg [lb]                                                   |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| AC operated                                                          | 0.22 [0.49]                     | 0.49 [1.1]                      | 0.49 [1.1]                      | 1.0 [2.3]                       | 1.0 [2.3]                       | 2.8 [6.2]                       | 2.8 [6.2]                       | 2.8 [6.2]                       |
| DC operated                                                          | 0.29 [0.64]                     | 0.49 [1.1]                      | 0.49 [1.1]                      | 1.0 [2.3]                       | 1.0 [2.3]                       | 2.8 [6.2]                       | 2.8 [6.2]                       | 2.8 [6.2]                       |
| Mechanical life—operations                                           | 10,000,000                      | 10,000,000                      | 10,000,000                      | 10,000,000                      | 10,000,000                      | 10,000,000                      | 10,000,000                      | 10,000,000                      |
| Mechanical operating frequency (ops/hr)                              |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| AC operated                                                          | 5000                            | 5000                            | 5000                            | 5000                            | 5000                            | 3600                            | 3600                            | 3600                            |
| DC operated                                                          | 5000                            | 5000                            | 5000                            | 5000                            | 5000                            | 3600                            | 3600                            | 3600                            |
| Electrical life                                                      | See Curves, Page V5-T1-111      | See Curves, Page V5-T1-111      | See Curves, Page V5-T1-111      | See Curves, Page V5-T1-111      | See Curves, Page V5-T1-111      | See Curves, Page V5-T1-111      | See Curves, Page V5-T1-111      | See Curves, Page V5-T1-111      |
| Electrical operating frequency (ops/hr)                              | 600                             | 600                             | 600                             | 600                             | 600                             | 600                             | 600                             | 600                             |
| Climatic proofing                                                    | ①                               | ①                               | ①                               | ①                               | ①                               | ①                               | ①                               | ①                               |
|                                                                      | ②                               | ②                               | ②                               | ②                               | ②                               | ②                               | ②                               | ②                               |
| Insulation voltage (U <sub>i</sub> ) Vac                             | 690                             | 690                             | 690                             | 690                             | 690                             | 690                             | 690                             | 690                             |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac                    | 8000                            | 8000                            | 8000                            | 8000                            | 8000                            | 8000                            | 8000                            | 8000                            |
| Operation voltage (U <sub>e</sub> ) Vac                              | 690                             | 690                             | 690                             | 690                             | 690                             | 690                             | 690                             | 690                             |
| Safe isolation to VDE 0106 Part 101 and Part 101/A1                  |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| Between coil and contacts (Vac)                                      | 400                             | 440                             | 440                             | 440                             | 440                             | 440                             | 440                             | 440                             |
| Between contacts (Vac)                                               | 400                             | 440                             | 440                             | 440                             | 440                             | 440                             | 440                             | 440                             |
| Making capacity up to 690V (amps)                                    | 144                             | 238                             | 350                             | 560                             | 700                             | 1120                            | 1330                            | 1800                            |
| Breaking capacity (amps)                                             |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| 220/230V                                                             | 120                             | 180                             | 250                             | 00                              | 00                              | 800                             | 950                             | 1150                            |
| 380/400V                                                             | 120                             | 180                             | 250                             | 400                             | 500                             | 800                             | 950                             | 1150                            |
| 500V                                                                 | 100                             | 180                             | 250                             | 400                             | 500                             | 800                             | 950                             | 1150                            |
| 660/690V                                                             | 70                              | 120                             | 144                             | 250                             | 296                             | 650                             | 750                             | 800                             |
| Short-circuit protection rating maximum fuse                         |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| Type 2 coordination                                                  |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| 400V; gG/gL 500V                                                     | 20                              | 35                              | 35                              | 63                              | 80                              | 160                             | 160                             | 250                             |
| 690V; gG/gL 690V                                                     | 2                               | 35                              | 35                              | 50                              | 63                              | 160                             | 160                             | 200                             |
| Type 1 coordination                                                  |                                 |                                 |                                 |                                 |                                 |                                 |                                 |                                 |
| 400V; gG/gL 500V                                                     | 35                              | 6                               | 100                             | 125                             | 160                             | 250                             | 250                             | 250                             |
| 690V; gG/gL 690V                                                     | 25                              | 50                              | 50                              | 80                              | 80                              | 200                             | 200                             | 200                             |
| Degree of protection with accessories                                | IP20                            | IP00                            | IP00                            | IP00                            | IP00                            | IP00                            | IP00                            | IP00                            |
|                                                                      | —                               | —                               | —                               | IP20                            | IP20                            | IP20                            | IP20                            | IP20                            |
| Protection against direct contact when actuated from front (IEC 536) | Finger and back-of-hand proof   | Finger and back-of-hand proof   | Finger and back-of-hand proof   | Finger and back-of-hand proof   | Finger and back-of-hand proof   | Finger and back-of-hand proof   | Finger and back-of-hand proof   | Finger and back-of-hand proof   |

**Notes**

- ① Damp heat, constant, to IEC 60068-2-3.  
 ② Damp heat, cyclical, to IEC 60068-2-30.

## XT Contactors—Four-Pole, continued

| Description                                                                         | XTCF020B                         | XTCF032C                         | XTCF045C                         | XTCF063D                         | XTCF080D                         | XTCF125G                         | XTCF160G                         | XTCF200G                         |
|-------------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| <b>General, continued</b>                                                           |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Terminal capacity main cable—screw terminals                                        |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                                            | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–16)<br>2 x (0.75–10)   | 1 x (0.75–16)<br>2 x (0.75–10)   | 1 x (2.5–16)<br>2 x (2.5–16)     | 1 x (2.5–16)<br>2 x (2.5–16)     | —                                | —                                | —                                |
| Flexible with ferrule (mm <sup>2</sup> )                                            | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–16)<br>2 x (0.75–10)   | 1 x (0.75–16)<br>2 x (0.75–10)   | 1 x (2.5–35)<br>2 x (2.5–25)     | 1 x (2.5–35)<br>2 x (2.5–25)     | 1 x (10–95)<br>2 x (10–70)       | 1 x (10–95)<br>2 x (10–70)       | 1 x (10–95)<br>2 x (10–70)       |
| Solid or stranded (AWG)                                                             | 18–14                            | 18–6                             | 18–6                             | 12–2                             | 12–2                             | 8–250 kcmil                      | 8–250 kcmil                      | 8–250 kcmil                      |
| Terminal capacity control circuit cable—screw terminals                             |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Solid (mm <sup>2</sup> )                                                            | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–4)<br>2 x (0.75–2.5)   | 1 x (0.75–4)<br>2 x (0.75–2.5)   |
| Flexible with ferrule (mm <sup>2</sup> )                                            | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                                             | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            | 18–14                            |
| Main cable connection screw/bolt                                                    |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Tightening torque                                                                   |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Nm                                                                                  | 1.2                              | 3                                | 3                                | 3.3                              | 3.3                              | 14                               | 14                               | 14                               |
| Lb-in                                                                               | 10.6                             | 26.6                             | 26.6                             | 29.2                             | 29.2                             | 123.9                            | 123.9                            | 123.9                            |
| Control circuit cable connection screw/bolt                                         |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Tightening torque                                                                   |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Nm                                                                                  | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              | 1.2                              |
| Lb-in                                                                               | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             | 10.6                             |
| Tools                                                                               |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Main and control circuit cable—                                                     |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Screw terminals                                                                     | 2                                | 2                                | 2                                | 2                                | 2                                | —                                | —                                | —                                |
| Pozidriv screwdriver                                                                | 0.8 x 5.5                        | 0.8 x 5.5                        | 0.8 x 5.5                        | 0.8 x 5.5                        | 0.8 x 5.5                        | —                                | —                                | —                                |
| Standard screwdriver                                                                | 1 x 6                            | 1 x 6                            | 1 x 6                            | 1 x 6                            | 1 x 6                            | —                                | —                                | —                                |
| Mounting position, AC and DC operated                                               |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
|  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Ambient temperature                                                                 |                                  |                                  |                                  |                                  |                                  |                                  |                                  |                                  |
| Open                                                                                | –25 to 60°C<br>(–13 to 140°F)    | –25 to 60°C<br>(–13 to 140°F)    | –25 to 60°C<br>(–13 to 140°F)    | –25 to 60°C<br>(–13 to 140°F)    | –25 to 60°C<br>(–13 to 140°F)    | –25 to 60°C<br>(–13 to 140°F)    | –25 to 60°C<br>(–13 to 140°F)    | –25 to 60°C<br>(–13 to 140°F)    |
| Enclosed                                                                            | –25 to 40°C<br>(–13 to 104°F)    | –25 to 40°C<br>(–13 to 104°F)    | –25 to 40°C<br>(–13 to 104°F)    | –25 to 40°C<br>(–13 to 104°F)    | –25 to 40°C<br>(–13 to 104°F)    | –25 to 40°C<br>(–13 to 104°F)    | –25 to 40°C<br>(–13 to 104°F)    | –25 to 40°C<br>(–13 to 104°F)    |
| Ambient storage temperature                                                         | –40 to 80°C<br>(–40 to 176°F)    | –40 to 80°C<br>(–40 to 176°F)    | –40 to 80°C<br>(–40 to 176°F)    | –40 to 80°C<br>(–40 to 176°F)    | –40 to 80°C<br>(–40 to 176°F)    | –40 to 80°C<br>(–40 to 176°F)    | –40 to 80°C<br>(–40 to 176°F)    | –40 to 80°C<br>(–40 to 176°F)    |

**XT Contactors—Four-Pole, continued**

| Description                                                                | XTCF020B | XTCF032C | XTCF045C | XTCF063D | XTCF080D | XTCF125G | XTCF160G | XTCF200G |
|----------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| <b>Environmental</b>                                                       |          |          |          |          |          |          |          |          |
| Mechanical shock resistance (IEC/EN 60068-2-27)                            |          |          |          |          |          |          |          |          |
| Half-sinusoidal shock 10 ms                                                |          |          |          |          |          |          |          |          |
| Main contact—NO contact                                                    | 10g      | 10g      | 10g      | 10g      | 10g      | 10g      | 10g      | 10g      |
| Auxiliary contact—NO contact                                               | 7g       | 7g       | 7g       | 7g       | 7g       | 7g       | 7g       | 7g       |
| Auxiliary contact—NC contact                                               | 5g       | 5g       | 5g       | 5g       | 5g       | 5g       | 5g       | 5g       |
| Overvoltage category/pollution degree                                      | III/3    | III/3    | III/3    | III/3    | III/3    | III/3    | III/3    | III/3    |
| <b>Coil Data Voltage Tolerance</b>                                         |          |          |          |          |          |          |          |          |
| Pickup (x U <sub>c</sub> )                                                 |          |          |          |          |          |          |          |          |
| AC operated                                                                | 0.8–1.1  | 0.8–1.1  | 0.8–1.1  | 0.8–1.1  | 0.8–1.1  | 0.8–1.1  | 0.8–1.1  | 0.8–1.1  |
| DC operated                                                                | 0.8–1.1  | 0.7–1.2  | 0.7–1.2  | 0.7–1.2  | 0.7–1.2  | 0.7–1.2  | 0.7–1.2  | 0.7–1.2  |
| Dropout (x U <sub>c</sub> )                                                |          |          |          |          |          |          |          |          |
| AC operated                                                                | 0.4–0.6  | 0.4–0.6  | 0.4–0.6  | 0.4–0.6  | 0.4–0.6  | 0.4–0.6  | 0.4–0.6  | 0.4–0.6  |
| DC operated                                                                | 0.2–0.6  | 0.2–0.6  | 0.2–0.6  | 0.2–0.6  | 0.2–0.6  | 0.2–0.6  | 0.2–0.6  | 0.2–0.6  |
| <b>Power Consumption of the Coil at Cold State and 1.0 x U<sub>c</sub></b> |          |          |          |          |          |          |          |          |
| AC operated 50/50Hz                                                        |          |          |          |          |          |          |          |          |
| Pickup VA                                                                  | 24       | 50       | 50       | 150      | 150      | 180      | 180      | 180      |
| Pickup W                                                                   | 19       | 40       | 40       | 95       | 95       | 150      | 150      | 150      |
| Sealing VA                                                                 | 4        | 8        | 8        | 16       | 16       | 3.1      | 3.1      | 3.1      |
| Sealing W                                                                  | 1.2      | 2.4      | 2.4      | 4        | 4        | 2.1      | 2.1      | 2.1      |
| DC operated                                                                |          |          |          |          |          |          |          |          |
| Pickup W                                                                   | 4.5      | 12       | 12       | 24       | 24       | 149      | 149      | 149      |
| Sealing W                                                                  | 4.5      | 0.5      | 0.5      | 0.5      | 0.5      | 2.1      | 2.1      | 2.1      |
| Duty factor (%DF)                                                          | 100      | 100      | 100      | 100      | 100      | 100      | 100      | 100      |
| <b>Switching Time at 100% U<sub>c</sub> (Approximate Values)</b>           |          |          |          |          |          |          |          |          |
| Main contact                                                               |          |          |          |          |          |          |          |          |
| AC operated                                                                |          |          |          |          |          |          |          |          |
| Closing delay (ms)                                                         | 15 to 21 | 6 to 22  | 6 to 22  | 12 to 18 | 12 to 18 | 28 to 33 | 28 to 33 | 28 to 33 |
| Opening delay (ms)                                                         | 9 to 18  | 8 to 14  | 8 to 14  | 8 to 13  | 8 to 13  | 35 to 41 | 35 to 41 | 35 to 41 |
| DC operated                                                                |          |          |          |          |          |          |          |          |
| Closing delay (ms)                                                         | 31       | 47       | 47       | 54       | 54       | 35       | 35       | 35       |
| Opening delay (ms)                                                         | 12       | 30       | 30       | 24       | 24       | 30       | 30       | 30       |
| Arcing time (ms)                                                           | 10       | 10       | 10       | 10       | 10       | 15       | 15       | 15       |



## Auxiliary Contacts

| Description                                                                                                     | XTCE007B _<br>XTCE032C                                      | XTCEXFAC_<br>XTCEXFATC_                                     | XTCEXFCC_<br>XTCEXSCC_                                      | XTCEXFAG_                                                   | XTCEXSBLN_<br>XTCEXSBN_<br>XTCEXSBNCL<br>XTCEXSBNL<br>XTCEXSCLN_<br>XTCEXSCLNC_ |
|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------|
| Interlocked opposing contacts with an auxiliary contact module (to IEC 60947-5 -1 Annex L)                      | —                                                           | Yes                                                         | Yes                                                         | Yes                                                         | Yes                                                                             |
| Break contact (not late-break contact) suitable as a mirror contact (to IEC/EN 60947-4 -1 Annex F)              | XTCE007B _<br>XTCE032C                                      | XTCE007B _XTCE032C                                          | XTCE007B _XTCE032C                                          | XTCE040D _XTCE065D _                                        | XTCE040D _XTCE065D _<br>XTCE185L _XTCEC10N _                                    |
| Rated impulse withstand voltage, (U <sub>imp</sub> ) Vac                                                        | 6000                                                        | 6000                                                        | 6000                                                        | 6000                                                        | 6000                                                                            |
| Overvoltage category/pollution degree                                                                           | III/3                                                       | III/3                                                       | III/3                                                       | III/3                                                       | III/3                                                                           |
| Rated insulation voltage, (U <sub>i</sub> ) Vac                                                                 | 690                                                         | 690                                                         | 690                                                         | 690                                                         | 690                                                                             |
| Rated operational voltage, (U <sub>e</sub> ) Vac                                                                | 500                                                         | 500                                                         | 500                                                         | 500                                                         | 500                                                                             |
| Safe isolation to VDE 0106 Part 101 and Part 101(A) in Vac                                                      |                                                             |                                                             |                                                             |                                                             |                                                                                 |
| Between coil and auxiliary contacts                                                                             | 400                                                         | 400                                                         | 400                                                         | 440                                                         | 440                                                                             |
| Between the auxiliary contacts                                                                                  | 400                                                         | 400                                                         | 400                                                         | 440                                                         | 440                                                                             |
| Rated operational current, I <sub>e</sub>                                                                       |                                                             |                                                             |                                                             |                                                             |                                                                                 |
| AC-15                                                                                                           |                                                             |                                                             |                                                             |                                                             |                                                                                 |
| 230V                                                                                                            | 6A                                                          | 6A                                                          | 6A                                                          | 6A                                                          | 6A                                                                              |
| 380/415V                                                                                                        | 4A                                                          | 3A                                                          | 4A                                                          | 4A                                                          | 4A                                                                              |
| 500V                                                                                                            | 1.5A                                                        | —                                                           | 1.5A                                                        | 1.5A                                                        | 1.5A                                                                            |
| DC-3 L/R ≤5 ms ①                                                                                                |                                                             |                                                             |                                                             |                                                             |                                                                                 |
| 24V                                                                                                             | 10A                                                         | 10A                                                         | 10A                                                         | 10A                                                         | 10A                                                                             |
| 60V                                                                                                             | 6A                                                          | 6A                                                          | 6A                                                          | 6A                                                          | 6A                                                                              |
| 110V                                                                                                            | 3A                                                          | 3A                                                          | 3A                                                          | 3A                                                          | 3A                                                                              |
| 220V                                                                                                            | 1A                                                          | 1A                                                          | 1A                                                          | 1A                                                          | 1A                                                                              |
| Conventional thermal current, I <sub>th</sub>                                                                   | 16A                                                         | 16A                                                         | 16A ③                                                       | 10A                                                         | 10A                                                                             |
| Control circuit reliability<br>(at U <sub>e</sub> = 24 Vdc, U <sub>min</sub> = 17 V, I <sub>min</sub> = 5.4 mA) | <10 <sup>-8</sup> , <1 failure at<br>100 million operations | <10 <sup>-8</sup> , <1 failure at<br>100 million operations | <10 <sup>-8</sup> , <1 failure at<br>100 million operations | <10 <sup>-8</sup> , <1 failure at<br>100 million operations | <10 <sup>-8</sup> , <1 failure at<br>100 million operations                     |
| Component lifespan, operations x 10 <sup>6</sup><br>at U <sub>e</sub> = 230V, AC-15, 3A                         | 1.3                                                         | 1.3                                                         | 1.3                                                         | 1.3                                                         | 1.3                                                                             |
| Short-circuit rating without welding ②                                                                          |                                                             |                                                             |                                                             |                                                             |                                                                                 |
| Maximum fuse, gG/gL                                                                                             | 10A                                                         | 10A                                                         | 10A                                                         | 16A                                                         | 16A                                                                             |

## Notes

① Making and breaking conditions to DC-13, time L/R contact as stated.

② See fuses overlay for time/current characteristic (on request).

③ Conventional thermal current ( $I_{th}$ ) of XTCEXSCC is 10A.

## Parallel Link

| Description                                                | XTCEXPLKB                    | XTCEXPLKC   | XTCEXPLKD    | XTCEXPLKG                    | XTCEXPLK185                                                    |
|------------------------------------------------------------|------------------------------|-------------|--------------|------------------------------|----------------------------------------------------------------|
| Terminal capacity                                          |                              |             |              |                              |                                                                |
| Solid (mm <sup>2</sup> )                                   | 1–16                         | 16          | 16           | —                            | —                                                              |
| Flexible with ferrule (mm <sup>2</sup> )                   | 1 x (0.5–25)<br>2 x (0.5–16) | 1 x (16–35) | 1 x (16–120) | —                            | —                                                              |
| Stranded (mm <sup>2</sup> )                                | 1 x (0.5–25)<br>2 x (0.5–16) | 1 x (16–50) | 1 x (16–120) | 1 x (35–300)<br>2 x (35–120) | —                                                              |
| Flat conductor—number of segments x width x thickness (mm) | 6 x 9 x 0.8                  | —           | —            | 2 x (11 x 21 x 1)            | 1 x (6 x 16 x 0.8)<br>2 x (20 x 32 x 0.5)<br>2 x (11 x 21 x 1) |
| Tightening torque (Nm)                                     | 4                            | 4           | 14           | —                            | —                                                              |
| Tools                                                      |                              |             |              |                              |                                                                |
| Pozidriv screwdriver                                       | Size 2                       | Size 2      | —            | —                            | —                                                              |
| Hexagon socket head spanner—SW (mm)                        | —                            | —           | 5            | 6                            | —                                                              |
| Conventional thermal current                               |                              |             |              |                              |                                                                |
| Three-pole (I <sub>th</sub> ) A                            | 50                           | 100         | 180          | 400                          | —                                                              |
| Four-pole (I <sub>th</sub> ) A                             | 60                           | —           | —            | —                            | —                                                              |

## Cable Terminal Block, Flat Cable Terminal

| Description                                                | XTCEXTLA225A                           | XTCEXTLA400                                | XTCEXPLK185                                                    | XTCEXTFB650                                                    | XTCEXTFB820                                                    |
|------------------------------------------------------------|----------------------------------------|--------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|
| Terminal capacity                                          |                                        |                                            |                                                                |                                                                |                                                                |
| Stranded (mm <sup>2</sup> )                                | 1 x (16–185)<br>2 x (16–150)           | 1 x (120–300)<br>2 x (70–240)              | —                                                              | —                                                              | —                                                              |
| Stranded (AWG)                                             | 1 x (6–350 kcmil)<br>2 x (6–350 kcmil) | 1 x (250–600 kcmil)<br>2 x (2/0–500 kcmil) | —                                                              | —                                                              | —                                                              |
| Flat conductor—number of segments x width x thickness (mm) | —                                      | —                                          | 1 x (6 x 16 x 0.8)<br>2 x (20 x 32 x 0.5)<br>2 x (11 x 21 x 1) | 1 x (6 x 16 x 0.8)<br>2 x (20 x 32 x 0.5)<br>2 x (11 x 21 x 1) | 1 x (6 x 16 x 0.8)<br>2 x (10 x 40 x 1)<br>2 x (20 x 40 x 0.5) |

## AC Ratings—AC-1 Operation

| Description                                                           | XTCE007B | XTCE009B | XTCE012B | XTCE015B | XTCE018C | XTCE025C | XTCE032C |
|-----------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Conventional free air thermal current, three-pole, 50–60 Hz           |          |          |          |          |          |          |          |
| Open                                                                  |          |          |          |          |          |          |          |
| at 40°C (I <sub>th</sub> )                                            | 22A      | 22A      | 22A      | 22A      | 40A      | 45A      | 45A      |
| at 50°C (I <sub>th</sub> )                                            | 21A      | 21A      | 21A      | 21A      | 38A      | 43A      | 43A      |
| at 55°C (I <sub>th</sub> )                                            | 21A      | 21A      | 21A      | 21A      | 37A      | 42A      | 42A      |
| at 60°C (I <sub>th</sub> )                                            | 20A      | 20A      | 20A      | 20A      | 35A      | 40A      | 40A      |
| Enclosed                                                              | 18A      | 18A      | 18A      | 18A      | 32A      | 36A      | 36A      |
| Conventional free air thermal current, single-pole (I <sub>th</sub> ) |          |          |          |          |          |          |          |
| Open                                                                  | 50A      | 50A      | 50A      | 50A      | 88A      | 100A     | 100A     |
| Enclosed                                                              | 45A      | 45A      | 45A      | 45A      | 80A      | 90A      | 90A      |

## AC Ratings—AC-3 Operation

| Description                                                                   | XTCE007B | XTCE009B | XTCE012B | XTCE015B | XTCE018C | XTCE025C | XTCE032C |
|-------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz <sup>①</sup> (I <sub>B</sub> ) in amperes |          |          |          |          |          |          |          |
| 220/230V                                                                      | 7        | 9        | 12       | 15.5     | 18       | 25       | 32       |
| 240V                                                                          | 7        | 9        | 12       | 15.5     | 18       | 25       | 32       |
| 380/400V                                                                      | 7        | 9        | 12       | 15.5     | 18       | 25       | 32       |
| 415V                                                                          | 7        | 9        | 12       | 15.5     | 18       | 25       | 32       |
| 440V                                                                          | 7        | 9        | 12       | 15.5     | 18       | 25       | 32       |
| 500V                                                                          | 5        | 7        | 10       | 12.5     | 18       | 25       | 32       |
| 660/690V                                                                      | 4        | 5        | 7        | 9        | 12       | 15       | 18       |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        |
| Rated power (P) in kilowatts                                                  |          |          |          |          |          |          |          |
| 220/230V                                                                      | 2.2      | 2.5      | 3.5      | 4        | 5        | 7.5      | 10       |
| 240V                                                                          | 2.2      | 3        | 4        | 4.6      | 5.5      | 8.5      | 11       |
| 380/400V                                                                      | 3        | 4        | 5.5      | 7.5      | 7.5      | 11       | 15       |
| 415V                                                                          | 4        | 5.5      | 7        | 8        | 10       | 14.5     | 19       |
| 440V                                                                          | 4.5      | 5.5      | 7.5      | 8.4      | 10.5     | 15.5     | 20       |
| 500V                                                                          | 3.5      | 4.5      | 7        | 7.5      | 12       | 17.5     | 23       |
| 660/690V                                                                      | 3.5      | 4.5      | 6.5      | 7        | 11       | 14       | 17       |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        |

## AC Ratings—AC-4 Operation

| Description                                                                   | XTCE007B | XTCE009B | XTCE012B | XTCE015B | XTCE018C | XTCE025C | XTCE032C |
|-------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz <sup>②</sup> (I <sub>B</sub> ) in amperes |          |          |          |          |          |          |          |
| 220/230V                                                                      | 5        | 6        | 7        | 7        | 10       | 13       | 15       |
| 240V                                                                          | 5        | 6        | 7        | 7        | 10       | 13       | 15       |
| 380/400V                                                                      | 5        | 6        | 7        | 7        | 10       | 13       | 15       |
| 415V                                                                          | 5        | 6        | 7        | 7        | 10       | 13       | 15       |
| 440V                                                                          | 5        | 6        | 7        | 7        | 10       | 13       | 15       |
| 500V                                                                          | 4.5      | 5        | 6        | 6        | 1        | 13       | 1        |
| 660/690V                                                                      | 4        | 4.5      | 5        | 5        | 8        | 10       | 12       |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        |
| Rated power (P) in kilowatts                                                  |          |          |          |          |          |          |          |
| 220/230V                                                                      | 1        | 1.5      | 2        | 2        | 2.5      | 3.5      | 4        |
| 240V                                                                          | 1.5      | 1.6      | 2.2      | 2.2      | 3        | 4        | 4.5      |
| 380/400V                                                                      | 2.2      | 2.5      | 3        | 3        | 4.5      | 6        | 7        |
| 415V                                                                          | 2.3      | 2.8      | 3.4      | 3.4      | 5        | 6.5      | 7.5      |
| 440V                                                                          | 2.4      | 3        | 3.6      | 3.6      | 5.5      | 7        | 8        |
| 500V                                                                          | 2.5      | 2.8      | 3.5      | 3.5      | 6        | 8        | 9        |
| 660/690V                                                                      | 2.9      | 3.6      | 4.4      | 4.4      | 6.5      | 8.5      | 10       |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        |

**Notes**

<sup>①</sup> At maximum permissible ambient temperature.

<sup>②</sup> Example—

The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of  $18/6 \times 10A = 30A$ . Using an XTCE032C (32A AC-3) contactor is recommended.

**AC Ratings—AC-6A Operation**

| Description                                                                                                                                                             | XTCE007B                        | XTCE009B                        | XTCE012B                        | XTCE015B                        | XTCE018C                        | XTCE025C                        | XTCE032C                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Transformer loads                                                                                                                                                       | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific |
| Calculation is $I_b \text{ AC-3} = X / 6 * I_b$ transformer where X is the inrush current of the transformer and $I_b$ transformer is the nominal current. <sup>①</sup> |                                 |                                 |                                 |                                 |                                 |                                 |                                 |

**AC Ratings—AC-6B Operation**

| Description                                                                                  | XTCE007B                                | XTCE009B | XTCE012B | XTCE015B | XTCE018C | XTCE025C | XTCE032C |
|----------------------------------------------------------------------------------------------|-----------------------------------------|----------|----------|----------|----------|----------|----------|
| Capacitor loads                                                                              |                                         |          |          |          |          |          |          |
| Individual compensation rated operational current $I_b$ of three-phase capacitors in amperes |                                         |          |          |          |          |          |          |
| Up to 525V                                                                                   | See Page V5-T1-63 for capacitor ratings |          |          |          |          |          |          |
| 690V                                                                                         | See Page V5-T1-63 for capacitor ratings |          |          |          |          |          |          |
| Maximum inrush current peak (x $I_b$ )                                                       | 30                                      | 30       | 30       | 30       | 30       | 30       | 30       |
| Component lifesaving (operations)                                                            | —                                       | —        | —        | —        | —        | —        | —        |
| Maximum operating frequency (ops/hr)                                                         | —                                       | —        | —        | —        | —        | —        | —        |

**AC Ratings—AC-1 Operation**

| Description                                                     | XTCE040D | XTCE050D | XTCE065D | XTCE072D | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE170G          |
|-----------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-------------------|
| Conventional free air thermal current, three-pole, 50–60 Hz     |          |          |          |          |          |          |          |          |                   |
| Open                                                            |          |          |          |          |          |          |          |          |                   |
| at 40°C ( $I_{th}$ )                                            | 60A      | 80A      | 98A      | 98A      | 110A     | 130A     | 160A     | 190A     | 275A <sup>②</sup> |
| at 50°C ( $I_{th}$ )                                            | 57A      | 71A      | 88A      | 88A      | 98A      | 125A     | 142A     | 180A     | 200A              |
| at 55°C ( $I_{th}$ )                                            | 55A      | 68A      | 83A      | 83A      | 94A      | 115A     | 135A     | 170A     | 190A              |
| at 60°C ( $I_{th}$ )                                            | 50A      | 65A      | 80A      | 80A      | 90A      | 110A     | 130A     | 160A     | 185A              |
| Enclosed                                                        | 45A      | 58A      | 72A      | 72A      | 80A      | 100A     | 115A     | 144A     | 166A              |
| Conventional free air thermal current, single-pole ( $I_{th}$ ) |          |          |          |          |          |          |          |          |                   |
| Open                                                            | 125A     | 162A     | 200A     | 200A     | 225A     | 275A     | 325A     | 400A     | 460A              |
| Enclosed                                                        | 112A     | 145A     | 180A     | 180A     | 200A     | 250A     | 285A     | 360A     | 415A              |

**Notes**

- ① Example—  
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of  $18/6 \times 10A = 30A$ . Using an XTCE032C (32A AC-3) contactor is recommended.
- ② For 225–275A, use 2X 70 mm<sup>2</sup> wire.
- ③ At maximum permissible ambient temperature.

## AC Ratings—AC-3 Operation

| Description                                                                   | XTCE040D | XTCE050D | XTCE065D | XTCE072D | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE170G |
|-------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz <sup>①</sup> (I <sub>0</sub> ) in amperes |          |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 40       | 50       | 65       | 72       | 80       | 95       | 115      | 150      | 170      |
| 240V                                                                          | 40       | 50       | 65       | 72       | 80       | 95       | 115      | 150      | 170      |
| 380/400V                                                                      | 40       | 50       | 65       | 7        | 80       | 95       | 115      | 150      | 170      |
| 415V                                                                          | 40       | 50       | 65       | 72       | 80       | 95       | 115      | 150      | 170      |
| 440V                                                                          | 40       | 50       | 65       | 72       | 80       | 95       | 115      | 15       | 170      |
| 500V                                                                          | 40       | 50       | 65       | 72       | 80       | 95       | 115      | 150      | 170      |
| 660/690                                                                       | 25       | 32       | 37       | 37       | 65       | 80       | 93       | 100      | 150      |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        | —        | —        |
| Rated power (P) in kilowatts                                                  |          |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 12.5     | 15.5     | 20       | 22       | 25       | 30       | 37       | 48       | 52       |
| 240V                                                                          | 13.5     | 17       | 22       | 35       | 27.5     | 34       | 40       | 52       | 57       |
| 380/400V                                                                      | 18.5     | 22       | 30       | 37       | 37       | 45       | 55       | 75       | 90       |
| 415V                                                                          | 24       | 30       | 39       | 41       | 43       | 57       | 70       | 91       | 100      |
| 440V                                                                          | 25       | 32       | 41       | 44       | 51       | 60       | 75       | 95       | 105      |
| 500V                                                                          | 28       | 36       | 47       | 45       | 58       | 70       | 85       | 110      | 120      |
| 660/690V                                                                      | 23       | 30       | 35       | 35       | 63       | 75       | 90       | 96       | 140      |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        | —        | —        |

## AC Ratings—AC-4 Operation

| Description                                                                   | XTCE040D | XTCE050D | XTCE065D | XTCE072D | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE170G |
|-------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz <sup>①</sup> (I <sub>0</sub> ) in amperes |          |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 18       | 21       | 25       | 25       | 40       | 50       | 55       | 65       | 65       |
| 240V                                                                          | 18       | 21       | 25       | 25       | 40       | 50       | 55       | 65       | 65       |
| 380/400V                                                                      | 18       | 21       | 25       | 25       | 40       | 50       | 55       | 65       | 65       |
| 415V                                                                          | 18       | 21       | 25       | 25       | 40       | 50       | 55       | 65       | 65       |
| 440V                                                                          | 18       | 21       | 25       | 25       | 40       | 50       | 55       | 65       | 65       |
| 500V                                                                          | 18       | 21       | 25       | 25       | 40       | 50       | 55       | 65       | 65       |
| 660/690V                                                                      | 14       | 17       | 20       | 20       | 40       | 50       | 45       | 50       | 50       |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        | —        | —        |
| Rated power (P) in kilowatts                                                  |          |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 5        | 6        | 7        | 7        | 12       | 16       | 17       | 20       | 20       |
| 240V                                                                          | 5.5      | 6.5      | 7.5      | 7.5      | 13       | 17       | 19       | 22       | 22       |
| 380/400V                                                                      | 9        | 10       | 12       | 12       | 20       | 26       | 28       | 33       | 33       |
| 415V                                                                          | 9.5      | 11       | 13       | 13       | 24       | 30       | 33       | 39       | 39       |
| 440V                                                                          | 10       | 12       | 14       | 14       | 25       | 32       | 35       | 41       | 41       |
| 500V                                                                          | 11       | 13       | 16       | 16       | 29       | 36       | 40       | 47       | 47       |
| 660/690V                                                                      | 12       | 14       | 17       | 17       | 26       | 35       | 43       | 48       | 48       |
| 1000V                                                                         | —        | —        | —        | —        | —        | —        | —        | —        | —        |

**Note**

<sup>①</sup> At maximum permissible ambient temperature.

**AC Ratings—AC6-A Operation**

| Description       | XTCE040D                        | XTCE050D                        | XTCE065D                        | XTCE072D                        | XTCE080F                        | XTCE095F                        | XTCE115G                        | XTCE150G                        | XTCE170G                        |
|-------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Transformer loads | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific |

Calculation is  $I_b \text{ AC-3} = X / 6 * I_b$  transformer where X is the inrush current of the transformer and  $I_b$  transformer is the nominal current. <sup>①</sup>

**AC Ratings—AC6-B Operation**

| Description                                                                                  | XTCE040D                                | XTCE050D | XTCE065D | XTCE072D | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE170G |
|----------------------------------------------------------------------------------------------|-----------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Capacitor loads                                                                              |                                         |          |          |          |          |          |          |          |          |
| Individual compensation rated operational current $I_b$ of three-phase capacitors in amperes |                                         |          |          |          |          |          |          |          |          |
| Up to 525V                                                                                   | See Page V5-T1-63 for capacitor ratings |          |          |          |          |          |          |          |          |
| 690V                                                                                         | See Page V5-T1-63 for capacitor ratings |          |          |          |          |          |          |          |          |
| Maximum inrush current peak (x $I_b$ )                                                       | 30                                      | 30       | 30       | 30       | 30       | 30       | 30       | 30       | 30       |
| Component lifesaving (operations)                                                            | —                                       | —        | —        | —        | —        | —        | —        | —        | —        |
| Maximum operating frequency (ops/hr)                                                         | —                                       | —        | —        | —        | —        | —        | —        | —        | —        |

**AC Ratings—AC-1 Operation**

| Description                                                     | XTCE185H | XTCE225L | XTCE250L | XTCE300L | XTCE400M | XTCE500M | XTCE570M | XTCE580N |
|-----------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Conventional free air thermal current, three-pole, 50–60 Hz     |          |          |          |          |          |          |          |          |
| at 40°C ( $I_{th}$ )                                            | 337      | 356      | 429      | 490      | 612      | 857      | 857      | 980      |
| at 50°C ( $I_{th}$ )                                            | 301      | 310      | 383      | 438      | 548      | 767      | 767      | 876      |
| at 55°C ( $I_{th}$ )                                            | 287      | 295      | 366      | 418      | 522      | 731      | 731      | 836      |
| at 60°C ( $I_{th}$ )                                            | 275      | 285      | 350      | 400      | 500      | 700      | 700      | 800      |
| Conventional free air thermal current, single-pole ( $I_{th}$ ) | 245      | 275      | 875      | 315      | 1250     | 1750     | 1750     | 2000     |

**Note**

- ① Example—The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of  $18/6 \times 10A = 30A$ . Using an XTCE032C (32A AC-3) contactor is recommended.

## AC Ratings—AC-3 Operation

| Description                                                                   | XTCE185H | XTCE225L | XTCE250L | XTCE300L | XTCE400M | XTCE500M | XTCE570M | XTCE580N |
|-------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz <sup>①</sup> (I <sub>0</sub> ) in amperes |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 185      | 225      | 250      | 300      | 400      | 500      | 580      | 580      |
| 240V                                                                          | 185      | 225      | 250      | 300      | 400      | 500      | 580      | 580      |
| 380/400V                                                                      | 185      | 225      | 250      | 300      | 400      | 500      | 580      | 580      |
| 415V                                                                          | 185      | 225      | 250      | 300      | 400      | 500      | 580      | 580      |
| 440V                                                                          | 185      | 225      | 250      | 300      | 400      | 500      | 580      | 580      |
| 500V                                                                          | 185      | 225      | 250      | 300      | 400      | 500      | 580      | 580      |
| 660/690V                                                                      | 150      | 160      | 250      | 210      | 400      | 500      | 580      | 580      |
| 1000V                                                                         | 76       | 76       | 76       | 95       | 95       | 95       | 95       | 435      |
| Rated power (P) in kilowatts                                                  |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 55       | 70       | 75       | 90       | 125      | 155      | 185      | 185      |
| 240V                                                                          | 62       | 75       | 85       | 100      | 132      | 170      | 200      | 200      |
| 380/400V                                                                      | 90       | 110      | 132      | 160      | 200      | 250      | 315      | 315      |
| 415V                                                                          | 110      | 132      | 148      | 180      | 240      | 300      | 348      | 348      |
| 440V                                                                          | 115      | 138      | 157      | 185      | 255      | 345      | 370      | 370      |
| 500V                                                                          | 132      | 160      | 180      | 215      | 290      | 360      | 420      | 420      |
| 660/690V                                                                      | 140      | 150      | 240      | 195      | 344      | 344      | 344      | 560      |
| 1000V                                                                         | 108      | 108      | 108      | 132      | 132      | 132      | 132      | 600      |

## AC Ratings—AC-4 Operation

| Description                                                                   | XTCE185H | XTCE225L | XTCE250L | XTCE300L | XTCE400M | XTCE500M | XTCE570M | XTCE580N |
|-------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz <sup>①</sup> (I <sub>0</sub> ) in amperes |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 136      | 164      | 200      | 200      | 296      | 360      | 360      | 456      |
| 240V                                                                          | 136      | 164      | 200      | 200      | 296      | 360      | 360      | 456      |
| 380/400V                                                                      | 136      | 164      | 200      | 200      | 296      | 360      | 360      | 456      |
| 415V                                                                          | 136      | 164      | 200      | 200      | 296      | 360      | 360      | 456      |
| 440V                                                                          | 136      | 164      | 200      | 200      | 296      | 360      | 360      | 456      |
| 500V                                                                          | 136      | 164      | 200      | 200      | 296      | 360      | 360      | 456      |
| 660/690V                                                                      | 110      | 120      | 200      | 200      | 296      | 360      | 360      | 456      |
| 1000V                                                                         | 55       | 55       | 76       | 76       | 95       | 95       | 95       | 348      |
| Rated power (P) in kilowatts                                                  |          |          |          |          |          |          |          |          |
| 220/230V                                                                      | 41       | 51       | 62       | 75       | 92       | 112      | 112      | 143      |
| 240V                                                                          | 45       | 54       | 68       | 82       | 101      | 122      | 122      | 156      |
| 380/400V                                                                      | 75       | 90       | 110      | 132      | 160      | 200      | 200      | 250      |
| 415V                                                                          | 80       | 96       | 117      | 142      | 176      | 216      | 216      | 274      |
| 440V                                                                          | 85       | 102      | 125      | 150      | 186      | 229      | 229      | 290      |
| 500V                                                                          | 96       | 116      | 143      | 172      | 214      | 260      | 260      | 330      |
| 660/690V                                                                      | 102      | 110      | 189      | 160      | 283      | 344      | 344      | 440      |
| 1000V                                                                         | 77       | 77       | 108      | 109      | 132      | 132      | 132      | 509      |

**Note**

<sup>①</sup> At maximum permissible ambient temperature.

**AC Ratings—AC-1 Operation**

| Description                                                     | XTCE650N | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC16R | XTCEC20R |
|-----------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Conventional free air thermal current, three-pole, 50–60 Hz     |          |          |          |          |          |          |          |
| at 40°C ( $I_{th}$ )                                            | 1041     | 1102     | 1225     | 1225     | 1714 ①   | 2200     | 2450 ①   |
| at 50°C ( $I_{th}$ )                                            | 931      | 986      | 1095     | 1095     | 1533 ①   | 1970     | 2190 ①   |
| at 55°C ( $I_{th}$ )                                            | 888      | 940      | 1044     | 1044     | 1462 ①   | 1800     | 2089 ①   |
| at 60°C ( $I_{th}$ )                                            | 850      | 900      | 1000     | 1000     | 1400 ①   | 1800     | 2000 ①   |
| Conventional free air thermal current, single-pole ( $I_{th}$ ) | 2125     | 2250     | 2500     | 2500     | 3500     | 4500     | 5000     |

**AC Ratings—AC-3 Operation**

| Description                                                | XTCE650N | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC16R | XTCEC20R |
|------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz ② ( $I_b$ ) in amperes |          |          |          |          |          |          |          |
| 220/230V                                                   | 650      | 750      | 820      | 1000     | —        | 1600     | —        |
| 240V                                                       | 650      | 750      | 820      | 1000     | —        | 1600     | —        |
| 380/400V                                                   | 650      | 750      | 820      | 1000     | —        | 1600     | —        |
| 415V                                                       | 650      | 750      | 820      | 1000     | —        | 1600     | —        |
| 440V                                                       | 650      | 750      | 820      | 1000     | —        | 1600     | —        |
| 500V                                                       | 650      | 750      | 820      | 1000     | —        | 1600     | —        |
| 660/690V                                                   | 650      | 750      | 820      | 1000     | —        | 1600     | —        |
| 1000V                                                      | 435      | 580      | 580      | 700      | —        | —        | —        |
| Rated power (P) in kilowatts                               |          |          |          |          |          |          |          |
| 220/230V                                                   | 205      | 240      | 260      | 315      | —        | 500      | —        |
| 240V                                                       | 225      | 260      | 285      | 340      | —        | 550      | —        |
| 380/400V                                                   | 355      | 400      | 450      | 560      | —        | 900      | —        |
| 415V                                                       | 390      | 455      | 500      | 610      | —        | 930      | —        |
| 440V                                                       | 420      | 480      | 525      | 650      | —        | 1000     | —        |
| 500V                                                       | 470      | 550      | 600      | 730      | —        | 1180     | —        |
| 660/690V                                                   | 630      | 720      | 750      | 1000     | —        | 1600     | —        |
| 1000V                                                      | 600      | 800      | 800      | 1000     | —        | —        | —        |

**Notes**

① Up to 690V.

② At maximum permissible ambient temperature.



## AC Ratings—AC-4 Operation

| Description                                                                   | XTCE650N | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC16R | XTCEC20R |
|-------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz <sup>①</sup> (I <sub>B</sub> ) in amperes |          |          |          |          |          |          |          |
| 220/230V                                                                      | 512      | 576      | 656      | 800      | —        | 1280     | —        |
| 240V                                                                          | 512      | 576      | 656      | 800      | —        | 1280     | —        |
| 380/400V                                                                      | 512      | 576      | 656      | 800      | —        | 1280     | —        |
| 415V                                                                          | 512      | 576      | 656      | 800      | —        | 1280     | —        |
| 440V                                                                          | 512      | 576      | 656      | 800      | —        | 1280     | —        |
| 500V                                                                          | 512      | 576      | 656      | 800      | —        | 1280     | —        |
| 660/690V                                                                      | 512      | 576      | 656      | 800      | —        | 1280     | —        |
| 1000V                                                                         | 348      | 464      | 464      | 700      | —        | —        | —        |
| Rated power (P) in kilowatts                                                  |          |          |          |          |          |          |          |
| 220/230V                                                                      | 161      | 181      | 209      | 260      | —        | 30       | —        |
| 240V                                                                          | 176      | 200      | 228      | 280      | —        | 450      | —        |
| 380/400V                                                                      | 280      | 315      | 355      | 450      | —        | 750      | —        |
| 415V                                                                          | 307      | 346      | 394      | 490      | —        | 770      | —        |
| 440V                                                                          | 32       | 367      | 41       | 520      | —        | 830      | —        |
| 500V                                                                          | 370      | 417      | 474      | 590      | —        | 940      | —        |
| 660/690V                                                                      | 494      | 556      | 633      | 780      | —        | 1300     | —        |
| 1000V                                                                         | 509      | 678      | 678      | 1000     | —        | —        | —        |

## AC Ratings—AC-6A Operation

| Description                                                                                                                                                                                  | XTCE650N                        | XTCE750N                        | XTCE820N                        | XTCEC10N                        | XTCEC14P                        | XTCEC16R                        | XTCEC20R                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Transformer loads                                                                                                                                                                            | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific | Values are application specific |
| Calculation is I <sub>B</sub> AC-3 = X / 6 * I <sub>B</sub> transformer where X is the inrush current of the transformer and I <sub>B</sub> transformer is the nominal current. <sup>②</sup> |                                 |                                 |                                 |                                 |                                 |                                 |                                 |

## Notes

<sup>①</sup> At maximum permissible ambient temperature.

<sup>②</sup> Example—The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

**AC Ratings—AC-6B Operation**

| Description                                                                                                               | XTCE650N | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC16R | XTCEC20R |
|---------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|
| Capacitor loads<br>Individual compensation rated operational<br>current $I_{\theta}$ of three-phase capacitors in amperes |          |          |          |          |          |          |          |
| Up to 525V                                                                                                                | 463      | 463      | 463      | 463      | —        | —        | —        |
| 690V                                                                                                                      | 265      | 265      | 265      | 265      | —        | —        | —        |
| Maximum inrush current peak (x $I_{\theta}$ )                                                                             | 30       | 30       | 30       | 30       | —        | —        | —        |
| Component lifesaving (operations)                                                                                         | 100,000  | 100,000  | 100,000  | 100,000  | —        | —        | —        |
| Maximum operating frequency (ops/hr)                                                                                      | 200      | 200      | 200      | 200      | —        | —        | —        |

**AC Ratings—Four-Pole—AC-1 Operation**

| Description                                                 | XTCF020B | XTCF032C | XTCF045C | XTCF063D | XTCF080D | XTCF125G | XTCF160G | XTCF200G |
|-------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Conventional free air thermal current, three-pole, 50-60 Hz |          |          |          |          |          |          |          |          |
| Open (amps)                                                 |          |          |          |          |          |          |          |          |
| at 40°C ( $I_{th}$ )                                        | 22       | 32       | 45       | 3        | 80       | 125      | 160      | 200      |
| at 50°C ( $I_{th}$ )                                        | 21       | 30       | 41       | 60       | 76       | 116      | 15       | 188      |
| at 60°C ( $I_{th}$ )                                        | 20       | 28       | 39       | 54       | 69       | 108      | 138      | 172      |
| Enclosed (amps)                                             | 18       | 27       | 36       | 50       | 64       | 100      | 128      | 160      |
| Conventional free air thermal current, single-pole          |          |          |          |          |          |          |          |          |
| Open (amps)                                                 | 60       | 84       | 117      | 162      | 207      | 325      | 415      | 516      |
| Enclosed (amps)                                             | 54       | 76       | 105      | 146      | 186      | 292      | 373      | 464      |

**AC Ratings—Four-Pole—AC-3 Operation**

| Description                                                     | XTCF020B | XTCF032C | XTCF045C | XTCF063D | XTCF080D | XTCF125G | XTCF160G | XTCF200G |
|-----------------------------------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Rated operational current, 50/60 Hz ( $I_{\theta}$ ) in amperes |          |          |          |          |          |          |          |          |
| 220/230V                                                        | 12       | 18       | 25       | 40       | 50       | 80       | 95       | 115      |
| 240V                                                            | 12       | 18       | 25       | 40       | 50       | 80       | 95       | 115      |
| 380/400V                                                        | 12       | 18       | 25       | 40       | 50       | 80       | 95       | 115      |
| 415V                                                            | 12       | 18       | 25       | 40       | 50       | 80       | 95       | 115      |
| 440V                                                            | 12       | 18       | 25       | 40       | 50       | 80       | 95       | 115      |
| 500V                                                            | 10       | 18       | 25       | 40       | 50       | 80       | 95       | 115      |
| 660/690V                                                        | 7        | 12       | 15       | 25       | 32       | 65       | 80       | 93       |
| Rated power, (P) in kilowatts                                   |          |          |          |          |          |          |          |          |
| 220/230V                                                        | 3.5      | 5        | 7.5      | 2.5      | 15.5     | 25       | 30       | 37       |
| 240V                                                            | 4        | 5.5      | 8.5      | 13.5     | 17       | 27.5     | 33       | 40       |
| 380/400V                                                        | 5.5      | 7.5      | 11       | 18.5     | 22       | 37       | 45       | 55       |
| 415V                                                            | 7        | 10       | 14.5     | 24       | 30       | 48       | 57       | 70       |
| 440V                                                            | 7.5      | 10.5     | 15.5     | 25       | 32       | 51       | 60       | 75       |
| 500V                                                            | 47       | 12       | 17.5     | 28       | 36       | 58       | 70       | 85       |
| 660/690V                                                        | 6.5      | 11       | 14       | 23       | 30       | 63       | 75       | 90       |

## DC Ratings—DC-1

Description  
Rated Operation  
Current {1} (I<sub>0</sub>) in  
Amperes

|      | XTCE007B | XTCE009B | XTCE012B,<br>XTCE020B | XTCE015B | XTCE018C | XTCE025C | XTCE032C | XTCE040D | XTCE050D | XTCE065D |
|------|----------|----------|-----------------------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 20       | 20       | 20                    | 20       | 35       | 40       | 40       | 50       | 60       | 72       |
| 110V | 20       | 20       | 20                    | 20       | 35       | 40       | 40       | 50       | 50       | 72       |
| 220V | 15       | 15       | 15                    | 15       | 3        | 4        | 40       | 45       | 45       | 65       |
| 440V | 1        | 1.3      | 1.3                   | 1.3      | 2.9      | 2.9      | 2.9      | 2.9      | 2.9      | 2.9      |

|      | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE185H | XTCE225H | XTCE250L | XTCE300L | XTCE400M | XTCE500M |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 110      | 110      | 160      | 160      | 300      | 300      | 300      | 300      | 400      | 400      |
| 110V | 110      | 110      | 16       | 160      | 300      | 300      | 300      | 300      | 400      | 400      |
| 220V | 70       | 70       | 90       | 90       | 300      | 300      | 300      | 300      | 400      | 400      |
| 440V | 4.5      | 4.5      | 4.5      | 4.5      | 11       | 11       | 11       | 11       | 11       | 11       |

|      | XTCE580N | XTCE650N | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC20R | XTCEC16R |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | —        | —        | —        | —        | —        | —        | —        | —        |
| 110V | —        | —        | —        | —        | —        | —        | —        | —        |
| 220V | —        | —        | —        | —        | —        | —        | —        | —        |
| 440V | —        | —        | —        | —        | —        | —        | —        | —        |

## DC Ratings—DC-3

Description  
Rated Operation  
Current {1} (I<sub>0</sub>) in  
Amperes

|      | XTCE007B | XTCE009B | XTCE012B | XTCE015B | XTCE018C | XTCE025C | XTCE032C | XTCE040D | XTCE050D | XTCE065D |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 20       | 20       | 20       | 20       | 35       | 35       | 40       | 50       | 60       | 72       |
| 110V | 20       | 20       | 20       | 20       | 35       | 35       | 40       | 50       | 50       | 72       |
| 220V | 1.5      | 1.5      | 1.5      | 1.5      | 10       | 10       | 25       | 25       | 25       | 35       |
| 440V | 0.2      | 0.2      | 0.2      | 0.2      | 0.6      | 0.6      | 0.6      | 0.6      | 0.6      | 0.6      |

|      | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE185H | XTCE225H | XTCE250L | XTCE300L | XTCE400M | XTCE500M |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 110      | 110      | 160      | 160      | 300      | 300      | 300      | 300      | 400      | 400      |
| 110V | 110      | 110      | 160      | 160      | 300      | 300      | 300      | 300      | 400      | 400      |
| 220V | 35       | 35       | 40       | 40       | 300      | 300      | 300      | 300      | 400      | 400      |
| 440V | 1        | 1        | 1        | 1        | —        | —        | —        | —        | —        | —        |

|      | XTCE580N | XTCE650N | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC20R | XTCEC16R |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | —        | —        | —        | —        | —        | —        | —        | —        |
| 110V | —        | —        | —        | —        | —        | —        | —        | —        |
| 220V | —        | —        | —        | —        | —        | —        | —        | —        |
| 440V | —        | —        | —        | —        | —        | —        | —        | —        |

## DC Ratings—DC-5

Description  
Rated Operation  
Current {1} (I<sub>e</sub>) in  
Amperes

|      | XTCE007B | XTCE009B | XTCE012B | XTCE015B | XTCE018C | XTCE025C | XTCE032C | XTCE040D | XTCE050D | XTCE065D |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 20       | 20       | 20       | 20       | 35       | 35       | 40       | 50       | 60       | 72       |
| 110V | 20       | 20       | 20       | 20       | 35       | 35       | 40       | 50       | 50       | 72       |
| 220V | 1.5      | 1.5      | 1.5      | 1.5      | 10       | 10       | 25       | 25       | 25       | 35       |
| 440V | 0.2      | 0.2      | 0.2      | 0.2      | 0.6      | 0.6      | 0.6      | 0.6      | 0.6      | 0.6      |

|      | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE185H | XTCE225H | XTCE250L | XTCE300L | XTCE400M | XTCE500M |
|------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 110      | 110      | 160      | 160      | 300      | 300      | 300      | 300      | 400      | 400      |
| 110V | 110      | 110      | 160      | 160      | 300      | 300      | 300      | 300      | 400      | 400      |
| 220V | 35       | 35       | 40       | 40       | 300      | 300      | 300      | 300      | 400      | 400      |
| 440V | 1        | 1        | 1        | 1        | —        | —        | —        | —        | —        | —        |

|      | XTCE580N | XTCE650N | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC20R |
|------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | —        | —        | —        | —        | —        | —        | —        |
| 110V | —        | —        | —        | —        | —        | —        | —        |
| 220V | —        | —        | —        | —        | —        | —        | —        |
| 440V | —        | —        | —        | —        | —        | —        | —        |

## DC Ratings—Four-Pole—DC-1 Operation

Description  
Rated Operation  
Current {1} (I<sub>e</sub>) in  
Amperes

|      | XTCF020B | XTCF032C | XTCF045C | XTCF063D | XTCF080D | XTCF125G | XTCF160G | XTCF200G |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 22       | 32       | 45       | 63       | 80       | 125      | 160      | 200      |
| 110V | 22       | 32       | 45       | 6        | 80       | 125      | 160      | 200      |
| 220V | 6        | 32       | 45       | 63       | 80       | 125      | 160      | 200      |
| 440V | 1.3      | 3        | 3        | 5        | 5        | 100      | 125      | 150      |

## DC Ratings—Four-Pole—DC-3 Operation

Description  
Rated Operation  
Current {1} (I<sub>e</sub>) in  
Amperes

|      | XTCF020B | XTCF032C | XTCF045C | XTCF063D | XTCF080D | XTCF125G | XTCF160G | XTCF200G |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 20       | 32       | 45       | 63       | 80       | 125      | 160      | 200      |
| 110V | 20       | 32       | 45       | 63       | 80       | 125      | 160      | 200      |
| 220V | 1.5      | 32       | 45       | 63       | 80       | 125      | 160      | 200      |
| 440V | 0.2      | 6        | 6        | 8        | 8        | 75       | 95       | 115      |

## DC Ratings—Four-Pole—DC-5 Operation

Description  
Rated Operation  
Current {1} (I<sub>e</sub>) in  
Amperes

|      | XTCF020B | XTCF032C | XTCF045C | XTCF063D | XTCF080D | XTCF125G | XTCF160G | XTCF200G |
|------|----------|----------|----------|----------|----------|----------|----------|----------|
| 60V  | 20       | 32       | 45       | 63       | 80       | 125      | 160      | 200      |
| 110V | 20       | 25       | 32       | 508      | 80       | 125      | 160      | 200      |
| 220V | 1.5      | 15       | 22       | 38       | 70       | 100      | 125      | 150      |
| 440V | 0.2      | 4        | 4        | 8        | 8        | 60       | 75       | 90       |

## Current Heat Loss (Three-Pole) in Watts

| Description                             | XTCE007B | XTCE009B | XTCE012B,<br>XTCF020B | XTCE015B | XTCE018C | XTCE025C | XTCE032C | XTCE040D |
|-----------------------------------------|----------|----------|-----------------------|----------|----------|----------|----------|----------|
| Current heat loss (three-pole) in watts |          |          |                       |          |          |          |          |          |
| at $I_{th}$                             | 3        | 3        | 3                     | 3        | 7.3      | 9.6      | 12.1     | 11.3     |
| at $I_{\theta}$ to AC-3/400V            | 0.37     | 0.6      | 1.1                   | 1.8      | 1.9      | 3.8      | 6.1      | 7.2      |
| Impedance per pole, megohms             | 2.5      | 2.5      | 2.5                   | 2.5      | 2        | 2        | 2        | 1.5      |

|                                         | XTCE050D | XTCE065D | XTCE072D | XTCE080F | XTCE095F | XTCE115G | XTCE150G | XTCE170G |
|-----------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Current heat loss (three-pole) in watts |          |          |          |          |          |          |          |          |
| at $I_{th}$                             | 19       | 28.8     | 28.8     | 12.2     | 18.2     | 20.3     | 30.7     | 41.1     |
| at $I_{\theta}$ to AC-3/400V            | 11.3     | 19       | 23       | 9.6      | 13.5     | 15.9     | 27.0     | 34.7     |
| Impedance per pole, megohms             | 1.5      | 1.5      | 1.5      | 0.5      | 0.5      | 0.4      | 0.4      | 0.4      |

|                                         | XTCE185H | XTCE225H | XTCE250L | XTCE300L | XTCE400M | XTCE500M | XTCE580N | XTCE650N |
|-----------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Current heat loss (three-pole) in watts |          |          |          |          |          |          |          |          |
| at $I_{th}$                             | 34       | 45       | 55       | 37       | 58       | 113      | 61       | 69       |
| at $I_{\theta}$ to AC-3/400V            | 16       | 23       | 28       | 21       | 37       | 58       | 32       | 41       |
| Impedance per pole, megohms             | —        | —        | —        | —        | —        | —        | —        | —        |

|                                         | XTCE750N | XTCE820N | XTCEC10N | XTCEC14P | XTCEC20R | XTCEC16R |
|-----------------------------------------|----------|----------|----------|----------|----------|----------|
| Current heat loss (three-pole) in watts |          |          |          |          |          |          |
| at $I_{th}$                             | 78       | 96       | 96       | 188      | 192      | 155      |
| at $I_{\theta}$ to AC-3/400V            | 54       | 65       | 96       | —        | —        | 123      |
| Impedance per pole, megohms             | —        | —        | —        | —        | —        | —        |

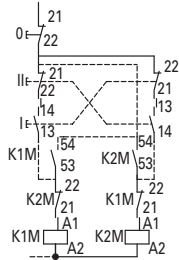
## Current Heat Loss (Four-Pole) in Watts

| Description                            | XTCF020B | XTCF032C | XTCF045C | XTCF063D | XTCF080D | XTCF125G | XTCF160G | XTCF200G |
|----------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Current heat loss (four-pole) in watts |          |          |          |          |          |          |          |          |
| at $I_{th}$                            | 4.7      | 8.2      | 12       | 16       | 23       | 29       | 46       | 60       |
| Impedance per pole, megohms            | 2.5      | 2        | 1.5      | 1        | 0.7      | 0.6      | 0.6      | 0.5      |

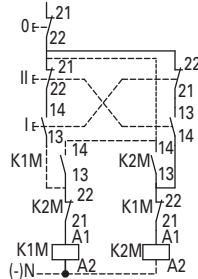
## Wiring Diagrams

## 7–150A XTCR Reversing Contactors

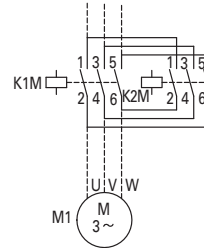
## Control Circuit—7–32A



## Control Circuit—40–170A

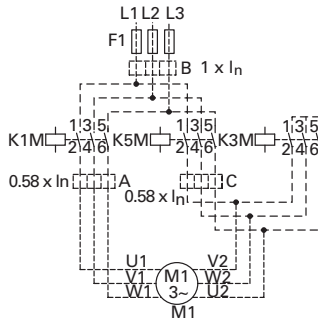


## Power Circuit—7–150A with Mechanical Interlock 80–150A on Mounting Plate

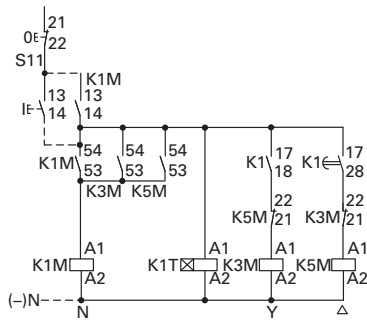


## Star-Delta (Wye-Delta) Starters

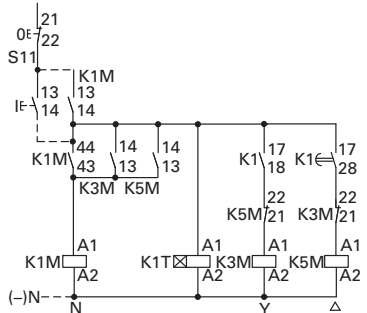
## Power Circuit—12–385A AC-3



## Control Circuit—12–55A AC-3

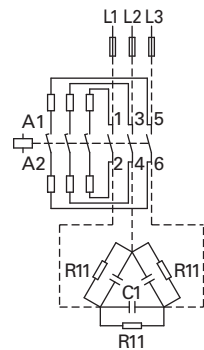


## Control Circuit—70–1700A AC-3



## XTCC Contactors for Three-Phase Capacitors

## Power Circuit—11–85 kVAR



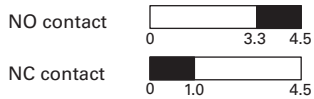
In the case of group compensation, multi-stage capacitor banks are connected to the mains, as required. In the process, transient currents of up to  $180 \times I_e$  can flow between the capacitors. The capacitors are pre-charged via the early-make auxiliary contacts and the fitted wire resistors, thereby reducing the inrush current. The main contacts then close after a time lag and carry the uninterrupted current. The contactors for capacitors are weld-resistant with inrush current peaks up to  $180 \times 1 I_e$  due to their special contacts. For switching reactive-power compensation equipment with chokes, observe design notes.

For switching of power factor correction with reactors, please observe engineering notes, **Page V5-T1-64**. Use of the contactors XTCE without series resistor for centralized power factor correction—when using contactors for group compensation, a minimum inductance of approximately  $6 \mu\text{H}$  per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately 140 mm diameter. The conductor cross-section must be selected according to the rated current per phase.

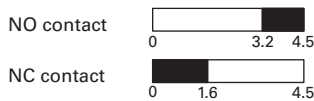
## Contactor Contact Travel Diagrams

## Frame B

## XTCE 7–15A, XTC—AC



## XTCEXSAC11

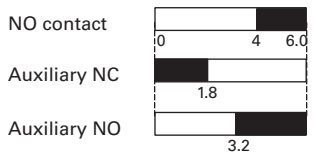


## XTCEXF...LC\_

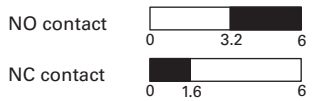


## Frame C

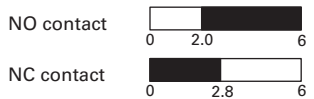
## XTCE 15–32A



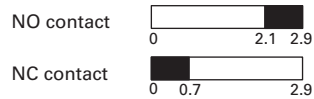
## XTCEXSAC11, XTCEXF...C\_



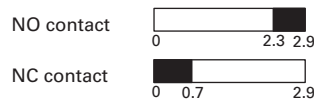
## XTCEXF...LC\_



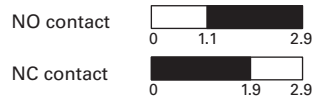
## XTCE 7–9A—DC



## XTCEXSAC11



## XTCEXF...LC\_

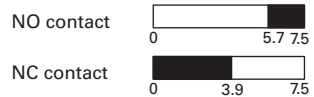


## Frame D

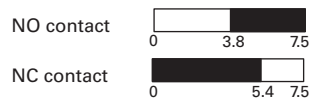
## XTCE 40–72A



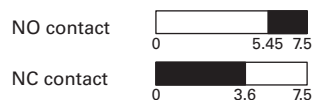
## XTCEXF...G\_



## XTCEXF...LG\_



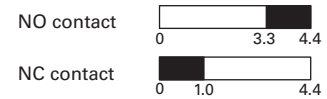
## XTCEXS...N\_



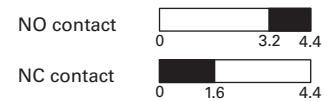
## XTCEXSBLN11



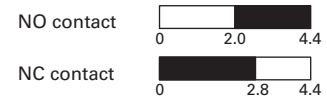
## XTCE 12–15A, XTCF—DC



## XTCEXSAC11



## XTCEXF...LC\_

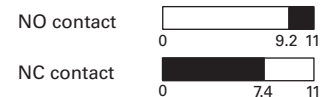


## Frames F and G

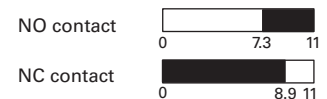
## XTCE 80–170A



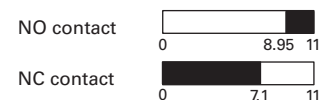
## XTCEXF...G\_



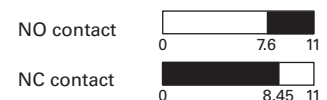
## XTCEXF...LG\_



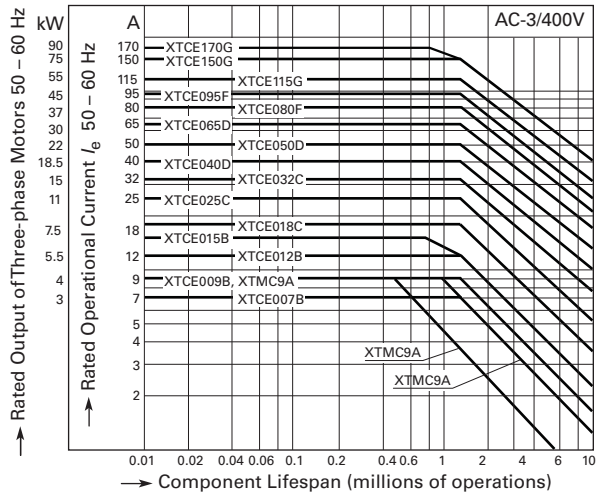
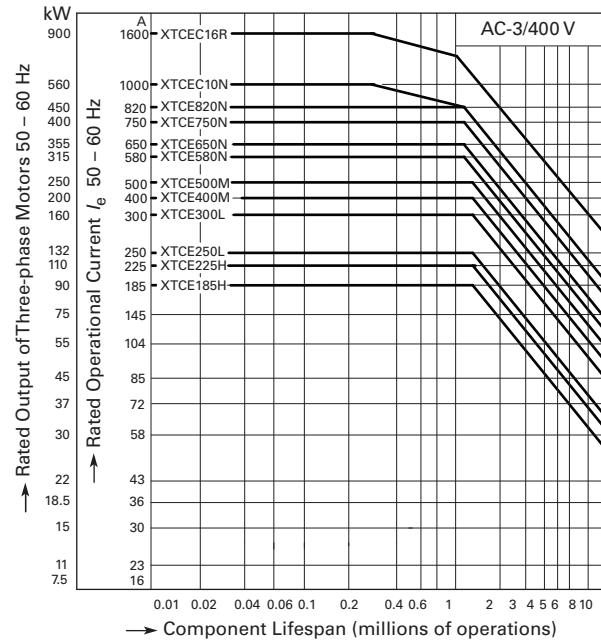
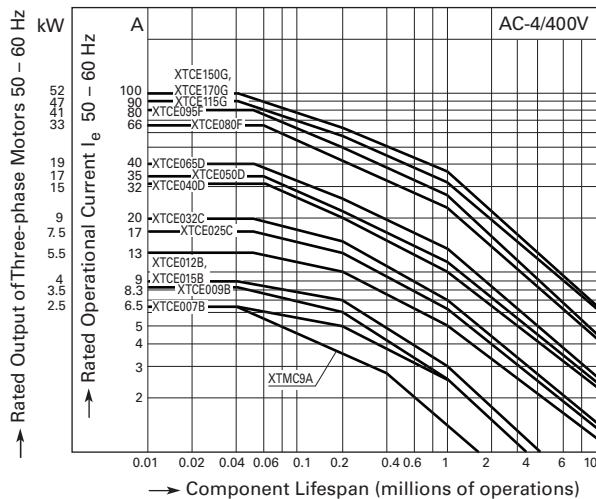
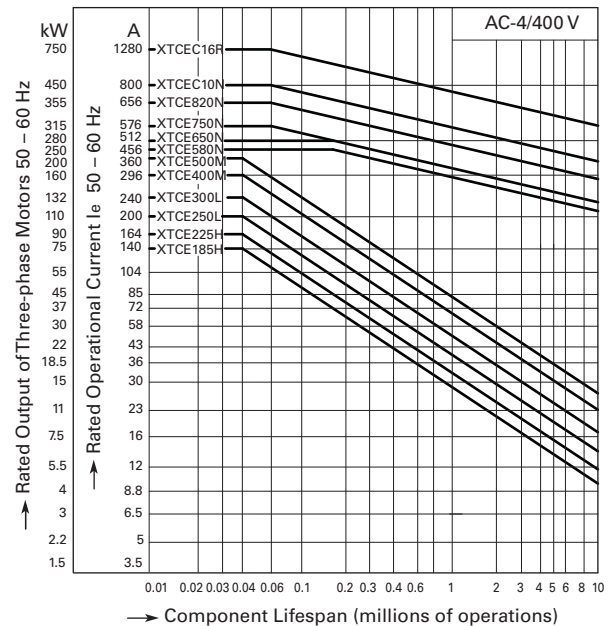
## XTCEXS...N\_



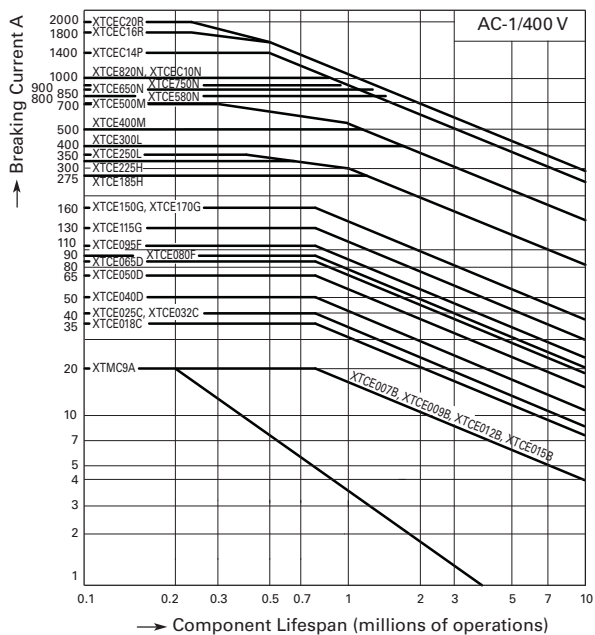
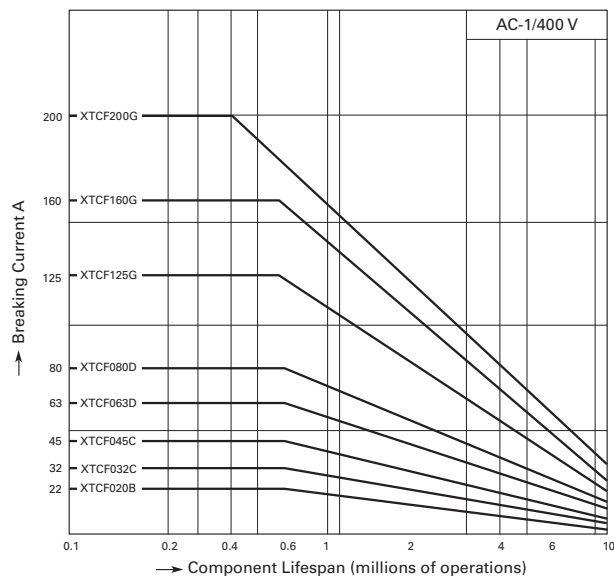
## XTCEXSBLN11



**Note:** The diagrams indicate the closing and travel of the contacts of the contactors and auxiliary contacts at no-load. Tolerances are not taken into consideration.

**Electrical Life Curves****Normal Switching Duty****XTCE007B–XTCE170G****XTCE185H–XTCEC16R****Extreme Switching Duty****XTCE007B–XTCE170G****XTCE185H–XTCEC16R**



**Switching Duty for Non-Motor Loads****Three-Pole—XTCE007B–XTCEC20R****Four-Pole—XTCF020B–XTCF200G**

Operating characteristics:

Non-inductive and slightly inductive loads

Electrical characteristics:

Switch on: 1 x Rated current

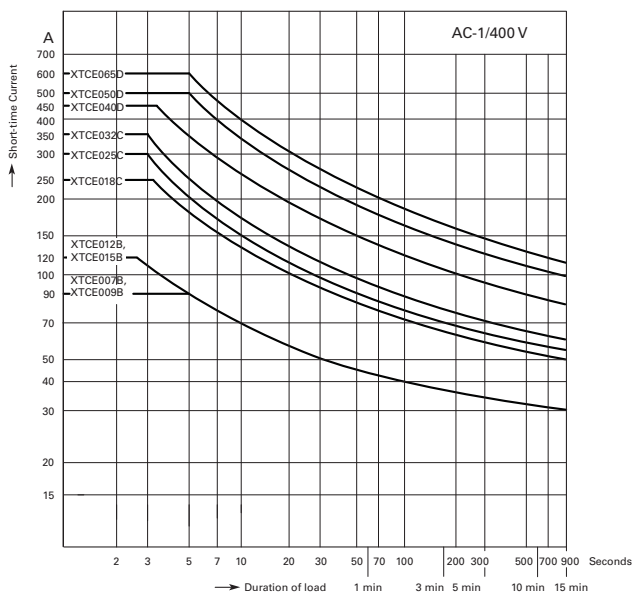
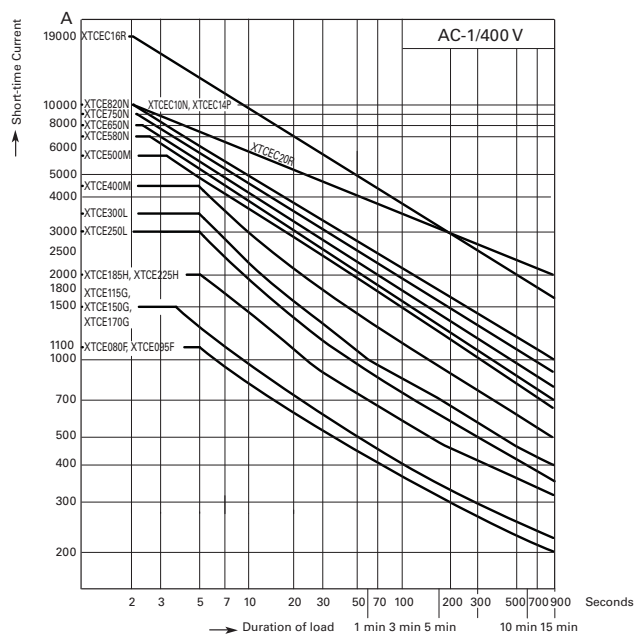
Switch off: 1 x Rated current

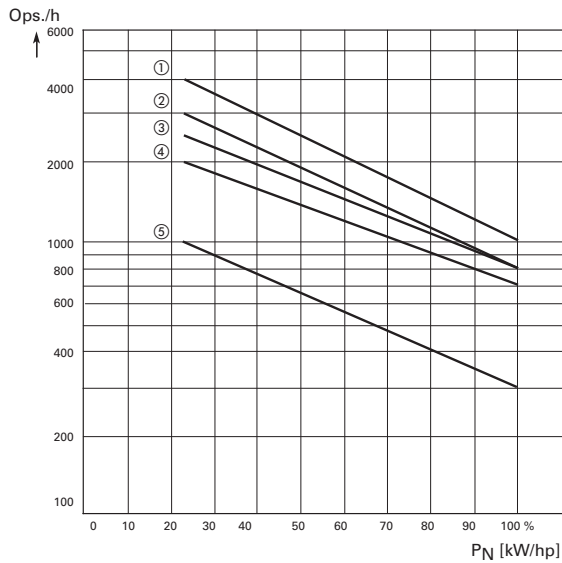
Utilization category:

100% AC-1

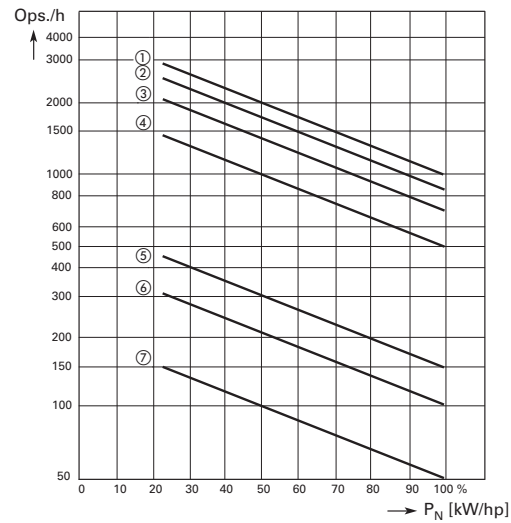
Typical applications:

Electrical heating

**Short-Time Loading****Three-Pole—XTCE007B–XTCEC20R****Three-Pole—XTCE080F–XTCEC16R**

**Maximum Operating Frequency—Related to Rating and Utilization Category (400V)****7 to 150 hp****Utilization Category ①**

| Type              | Characteristic Curve Above |      |            |
|-------------------|----------------------------|------|------------|
|                   | AC-1                       | AC-3 | AC-2, AC-4 |
| XTCE007B–XTCE015B | 3                          | 1    | 5          |
| XTCE018C–XTCE032C | 3                          | 2    | 5          |
| XTCE040D–XTCE065D | 3                          | 2    | 5          |
| XTCE080F–XTCE150G | 3                          | 4    | 5          |

**185 to 820 hp****Utilization Category ①**

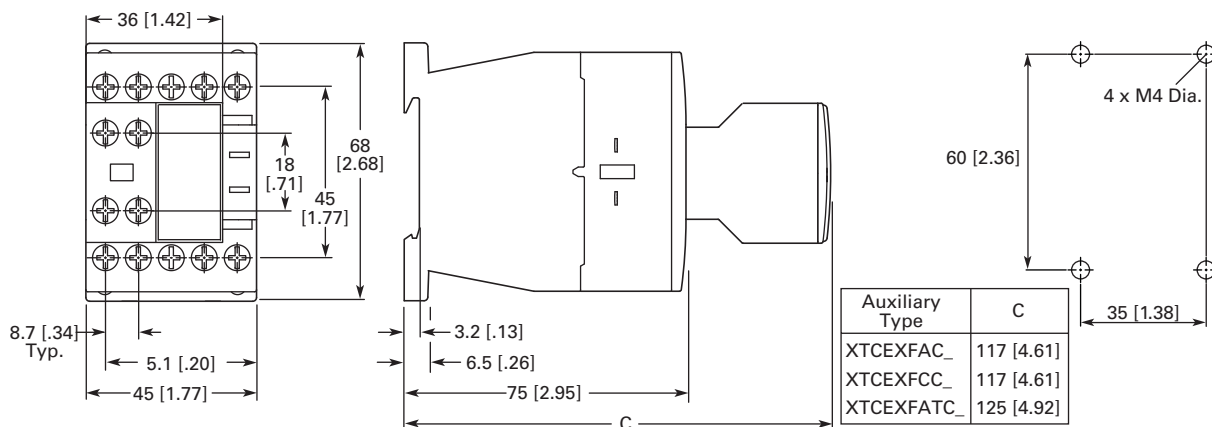
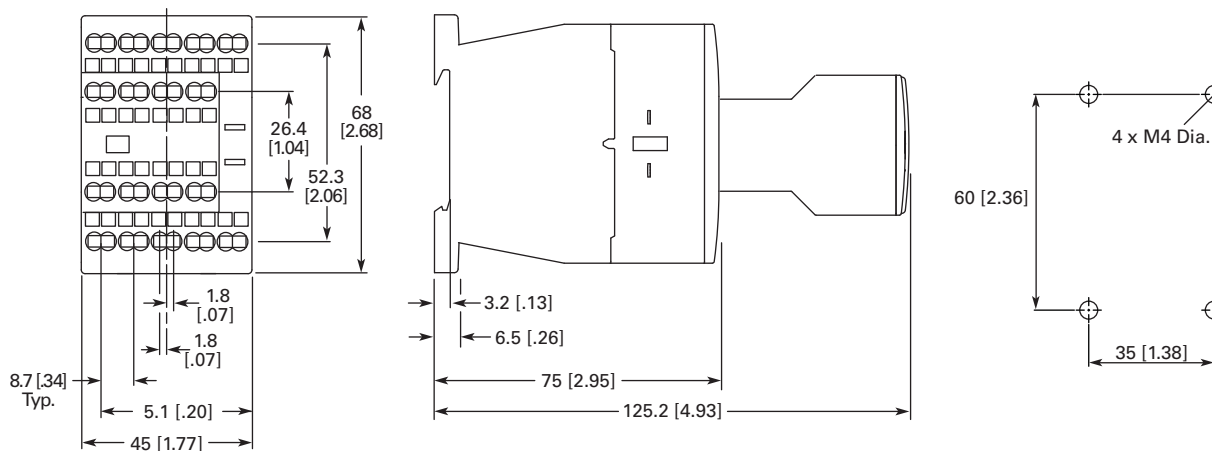
| Type     | Characteristic Curve Above |      |            |
|----------|----------------------------|------|------------|
|          | AC-1                       | AC-3 | AC-2, AC-4 |
| XTCE185H | 2                          | 1    | 6          |
| XTCE225H | 2                          | 1    | 6          |
| XTCE250L | 2                          | 1    | 6          |
| XTCE300L | 3                          | 2    | 7          |
| XTCE400M | 3                          | 2    | 7          |
| XTCE500M | 3                          | 2    | 7          |
| XTCE580N | 3                          | 4    | 5          |
| XTCE650N | 3                          | 4    | 5          |
| XTCE750N | 3                          | 4    | 5          |
| XTCE820N | 3                          | 4    | 5          |

**Note**

- ①  $P_N$  = max. motor rating (kW/hp) of the relevant contactor.  
ops./h = max. number of operations per hour.

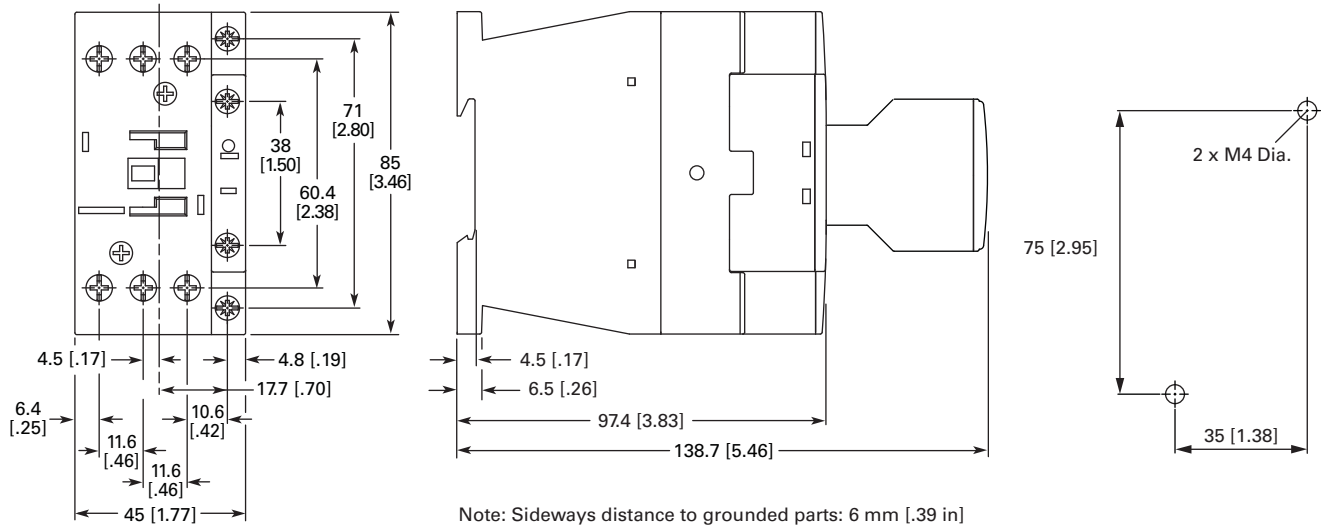
**Dimensions**

Approximate Dimensions in mm [in]

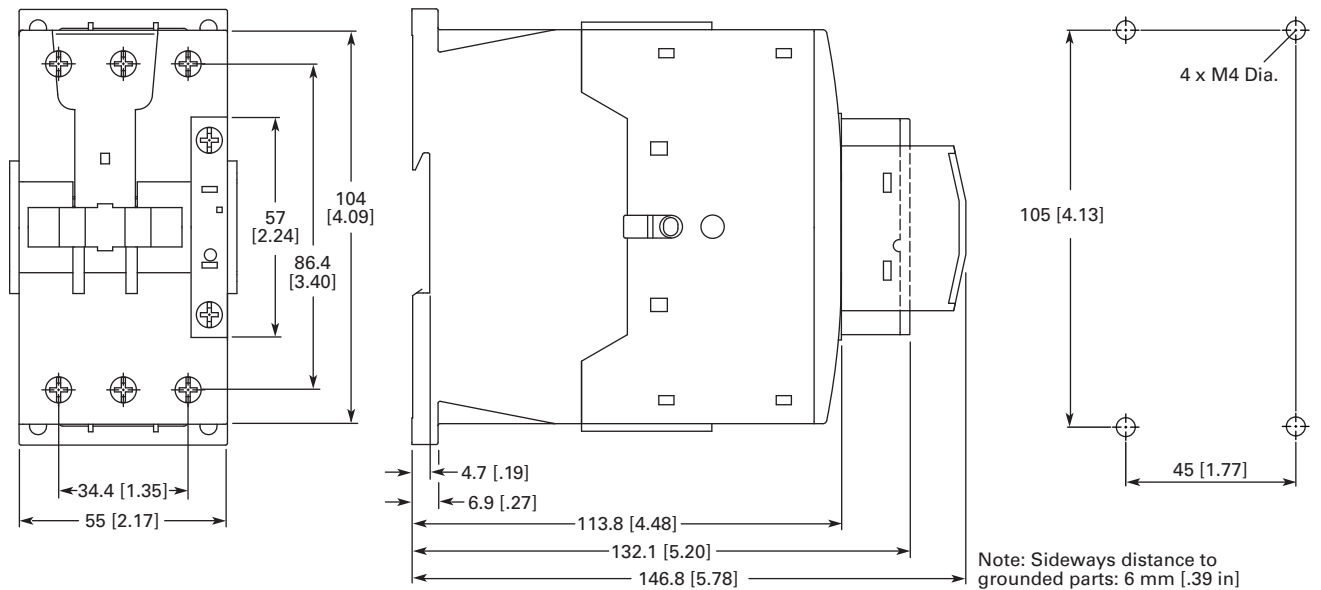
**XTCE Contactors (Three-Pole)****Frame B, XTCE007B and XTCE015B Contactors with Screw Terminals (7–15A) XTCE020B****Frame B, XTCEC007B–XTCEC012B Contactors with Spring Cage Terminals (7–12A)**

Approximate Dimensions in mm [in]

### Frame C, XTCE018C–XTCE032C Contactors (18–32A)



### Frame D, XTCE040D–XTCE072D Contactors (72A)



# 1.1

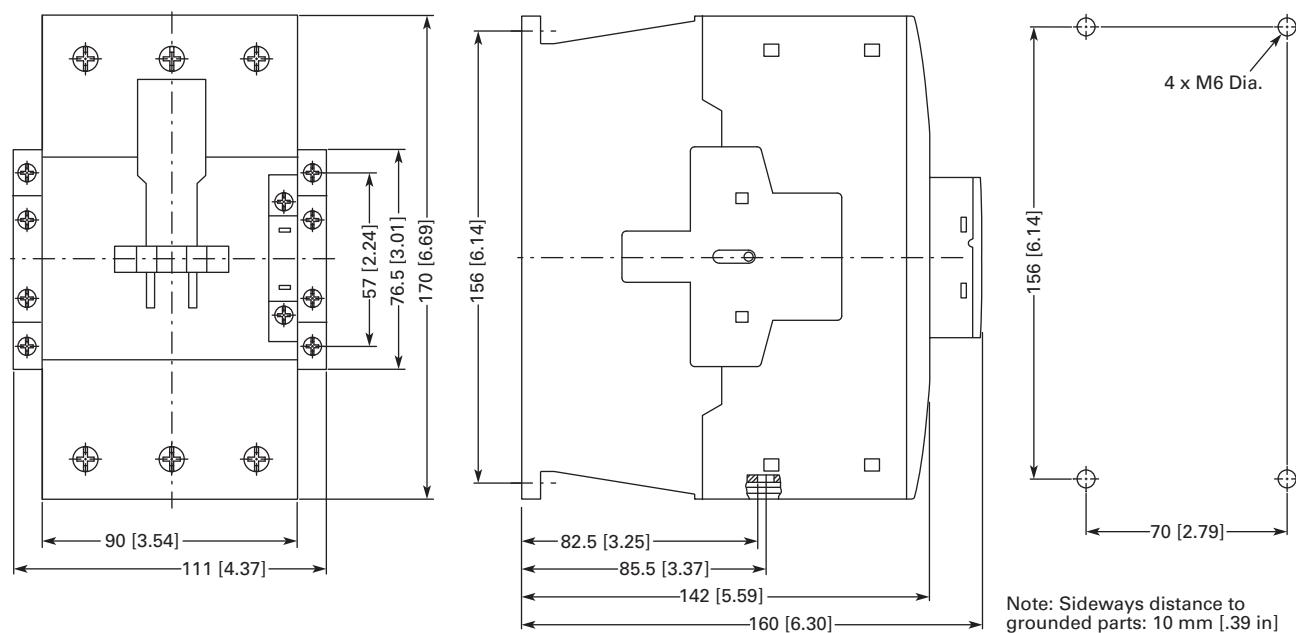
## IEC Contactors and Starters

### XT IEC Power Control

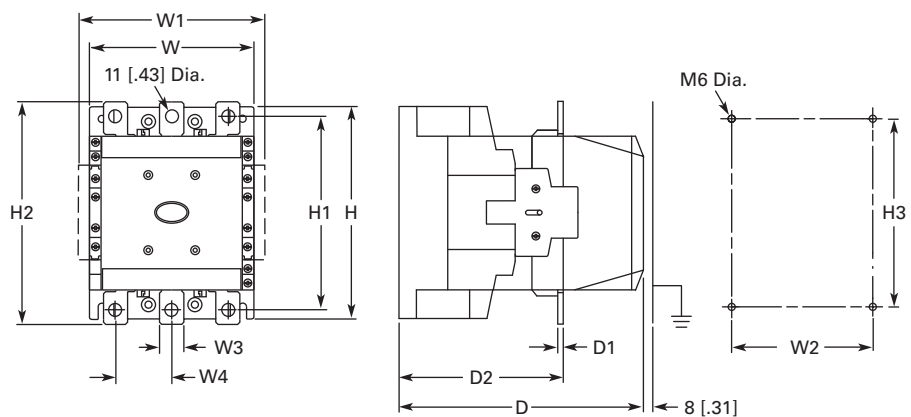
1

Approximate Dimensions in mm [in]

#### Frames F–G, XTCE080F–XTCE170G Contactors (80–170A)



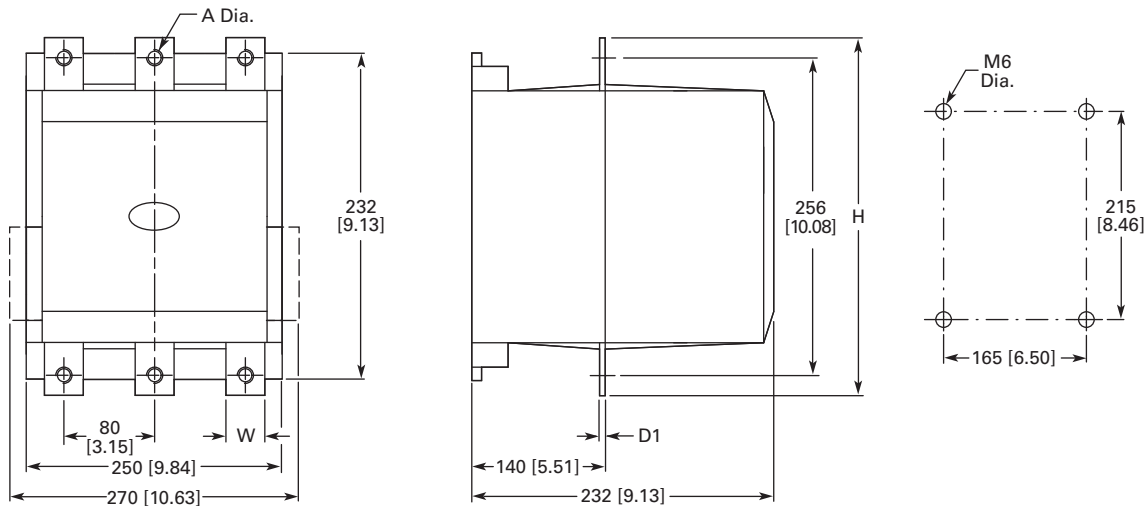
#### Frames H–M, XTCE185H–XTCE570M Contactors (185–580A)



|         | W          | W1         | W2         | W3        | W4        | H          | H1         | H2         | H3         | D          | D1      | D2         |
|---------|------------|------------|------------|-----------|-----------|------------|------------|------------|------------|------------|---------|------------|
| Frame H | 140 [5.51] | 160 [6.30] | 120 [4.72] | 20 [.79]  | 41 [1.61] | 180 [7.09] | 165 [6.50] | 190 [7.48] | 160 [6.30] | 158 [6.22] | 4 [.16] | 83 [3.27]  |
| Frame L | 140 [5.51] | 160 [6.30] | 120 [4.72] | 20 [.79]  | 48 [1.89] | 180 [7.09] | 164 [6.46] | 189 [7.44] | 160 [6.30] | 208 [8.19] | 5 [.20] | 140 [5.51] |
| Frame M | 160 [6.30] | 180 [7.09] | 130 [5.12] | 25 [.98]  | 48 [1.89] | 200 [7.87] | 184 [7.24] | 209 [8.23] | 180 [7.09] | 216 [8.50] | 6 [.24] | 140 [5.51] |
|         | 160 [6.30] | 180 [7.09] | 130 [5.12] | 38 [1.50] | 57 [2.24] | 200 [7.87] | 189 [7.44] | 219 [8.62] | 180 [7.09] | 216 [8.50] | 6 [.24] | 140 [5.51] |

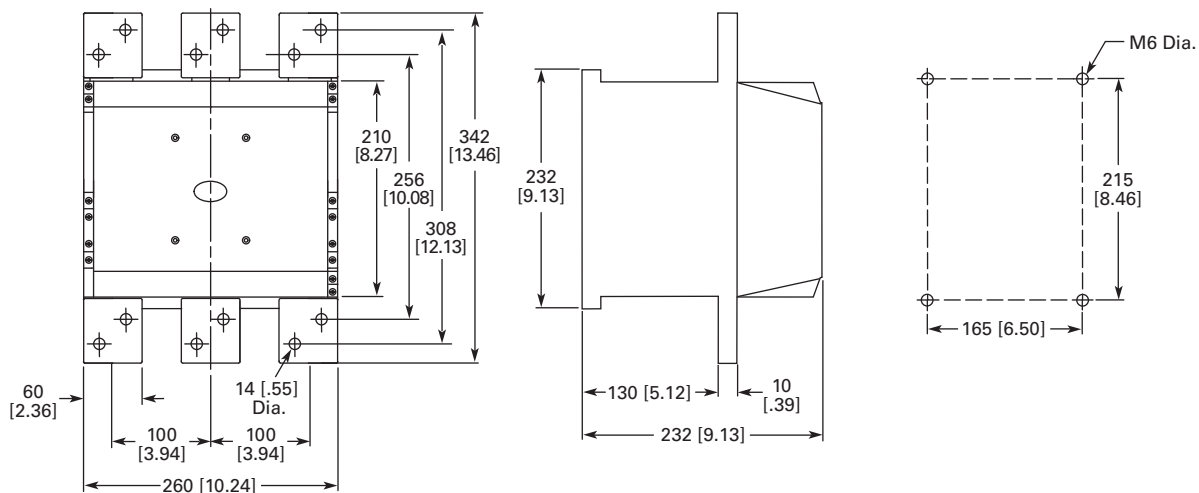
Approximate Dimensions in mm [in]

### Frame N, XTCE580N–XTCEC10N Contactors (580–1000A)



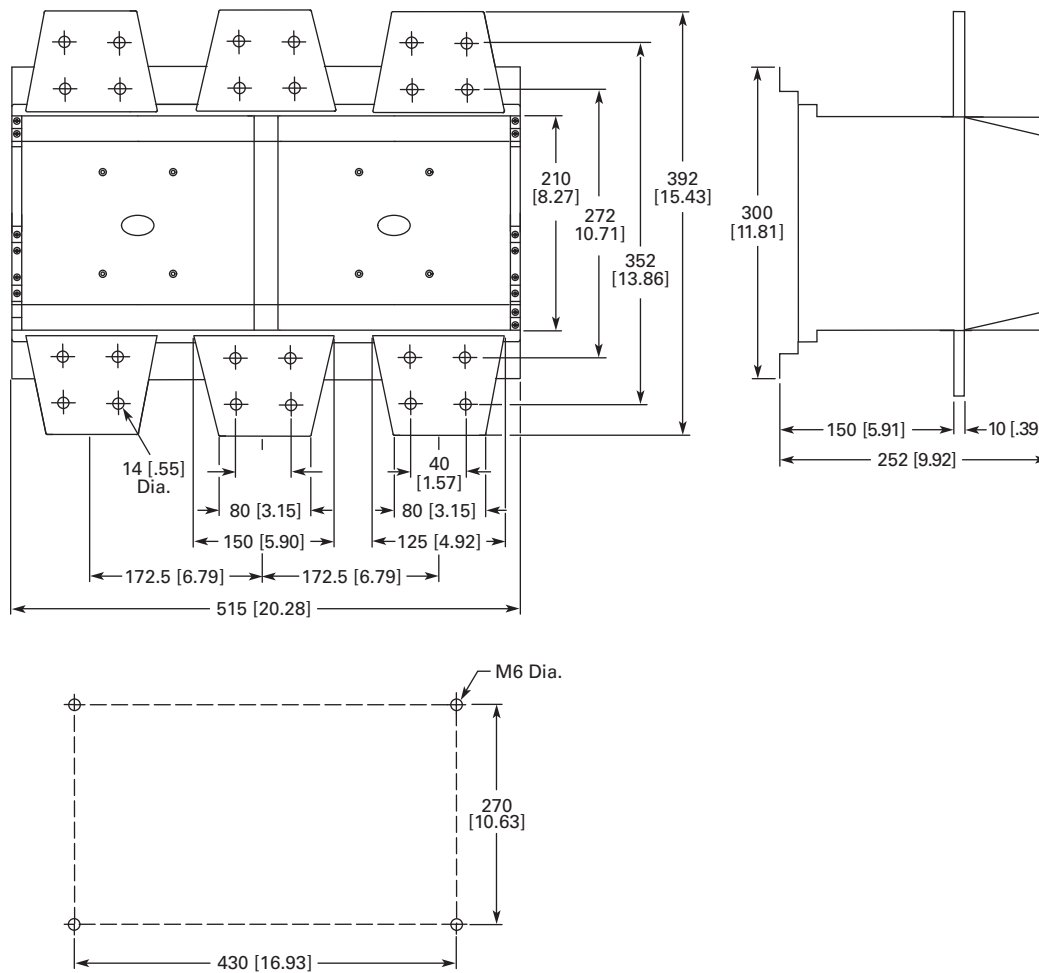
|          | W         | H           | D1       | A (Dia.)   |
|----------|-----------|-------------|----------|------------|
| XTCE580N | 45 [1.77] | 296 [11.65] | 6 [.24]  | 13.5 [.53] |
| XTCE650N | 45 [1.77] | 296 [11.65] | 6 [.24]  | 13.5 [.53] |
| XTCE750N | 45 [1.77] | 296 [11.65] | 6 [.24]  | 13.5 [.53] |
| XTCE820N | 45 [1.77] | 296 [11.65] | 6 [.24]  | 13.5 [.53] |
| XTCEC10N | 45 [1.77] | 296 [11.65] | 10 [.40] | 13.5 [.53] |

### Frame P, XTCEC14P Contactor (1400A, AC-1)



1

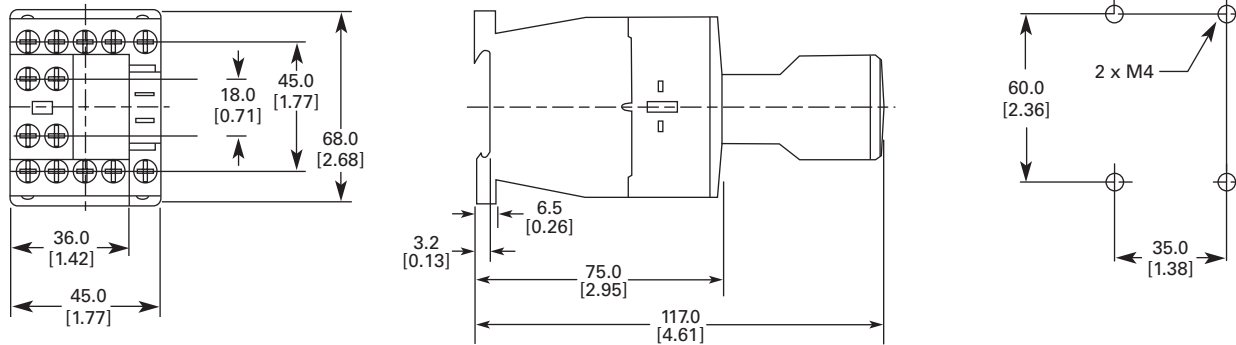
Approximate Dimensions in mm [in]

**Frame R, XTCEC16R, XTCEC20R Contactors**

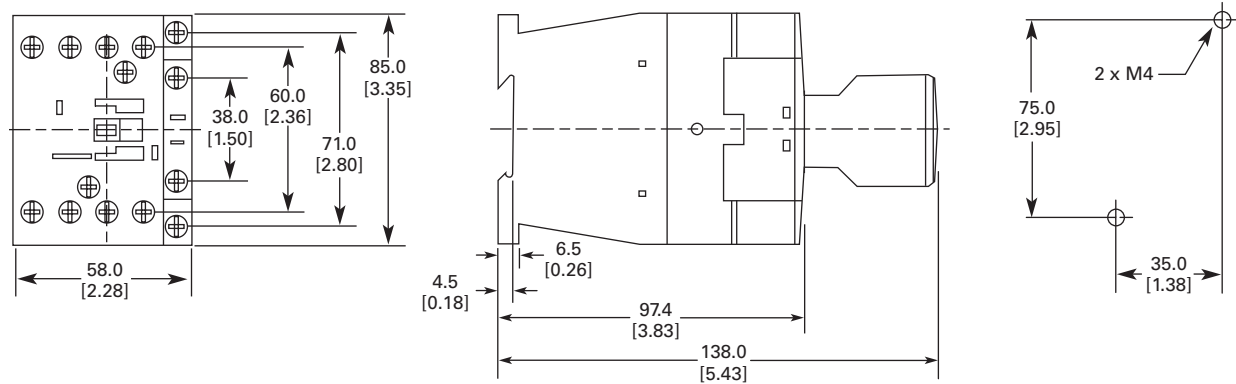
Approximate Dimensions in mm [in]

### XTCF Contactors (Four-Pole)

#### Frame B, XTCF020B Contactors



#### Frame C, XTCF032C–XTCF045C Contactors





# 1.1

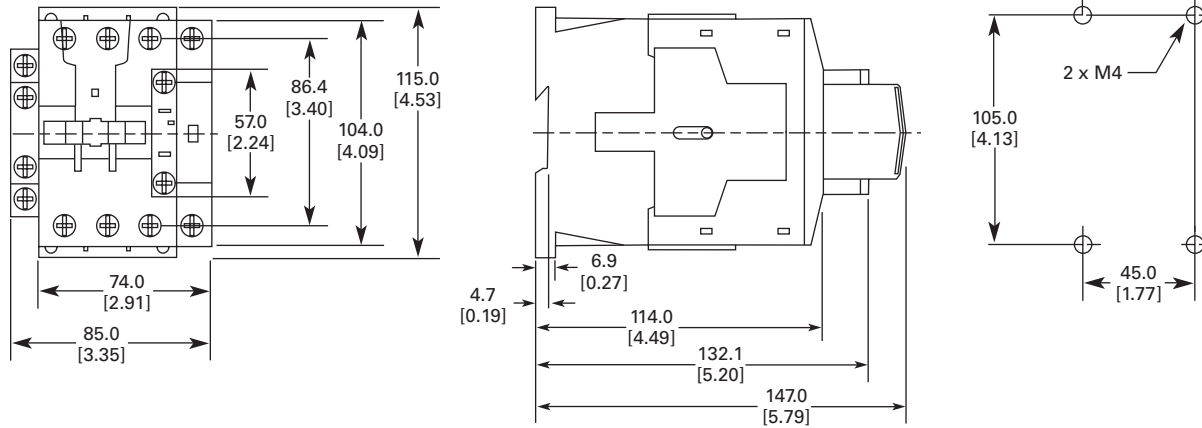
## IEC Contactors and Starters

### XT IEC Power Control

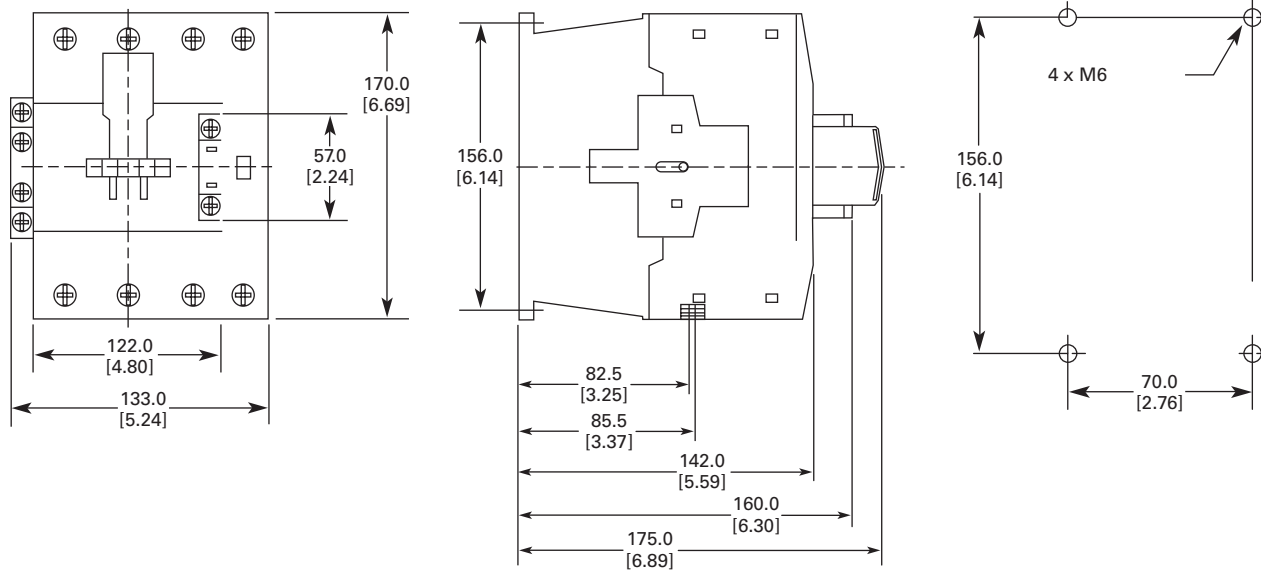
1

Approximate Dimensions in mm [in]

#### Frame D, XTCF063D–XTCF080D Contactors



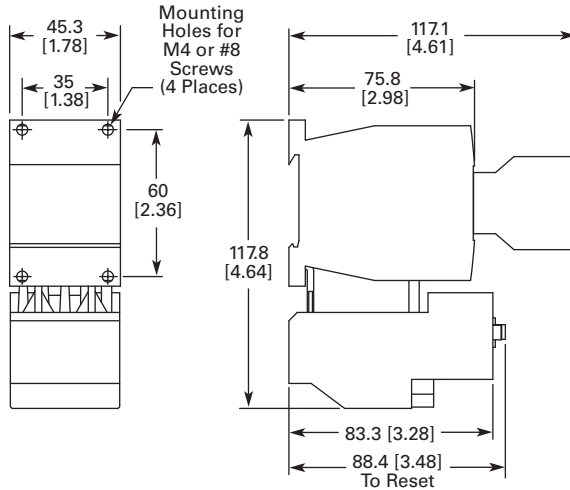
#### Frame G, XTCF125G–XTCF200G Contactors



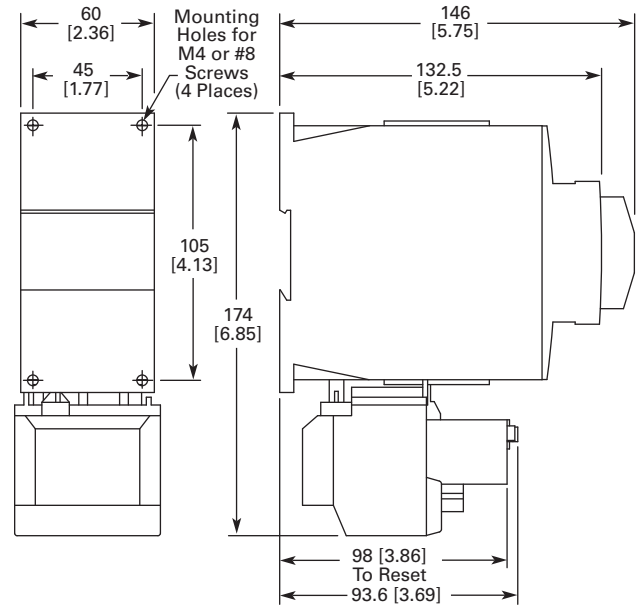
Approximate Dimensions in mm [in]

### XTAE Starters with XTOB Overload Relay

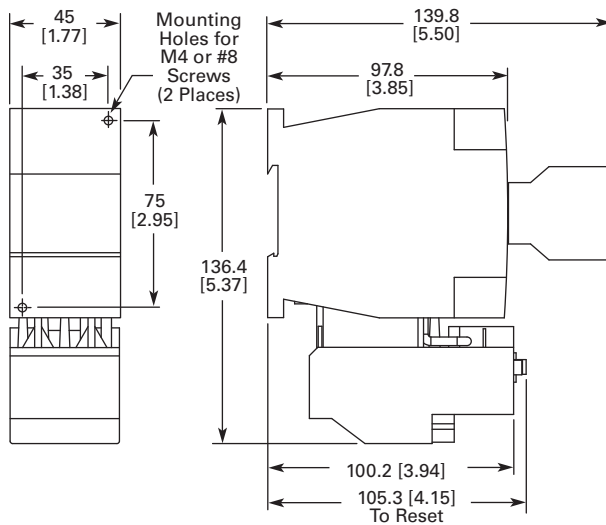
#### Frame B, XTAE007B–XTAE015B Starters with XTOB (7–12A)



#### Frame D, XTAE040D–XTAE065D Starters with XTOB (40–65A)



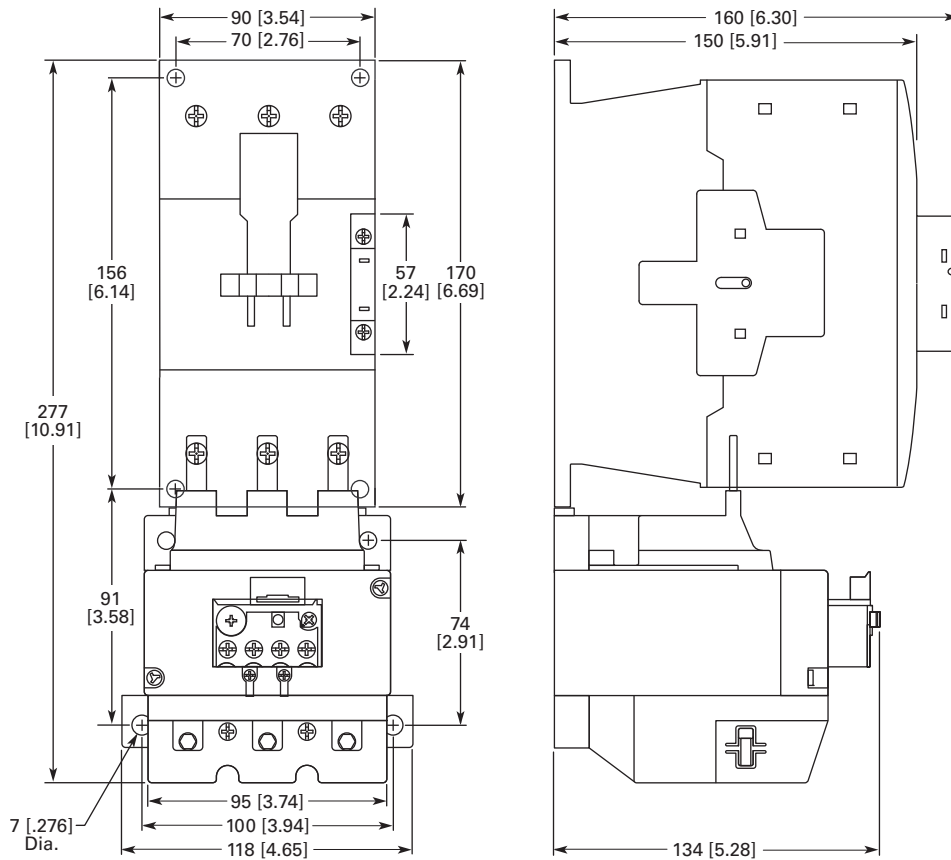
#### Frame C, XTAE018C–XTAE032C Starters with XTOB (18–32A)



1

Approximate Dimensions in mm [in]

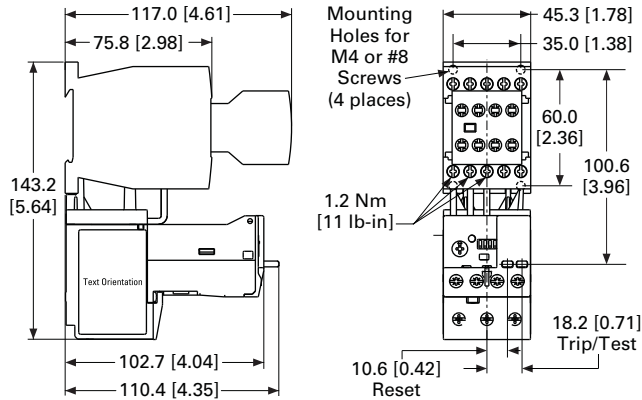
Frames F–G, XTAE080F–XTAE150G Starters with XTOB (80–150A)



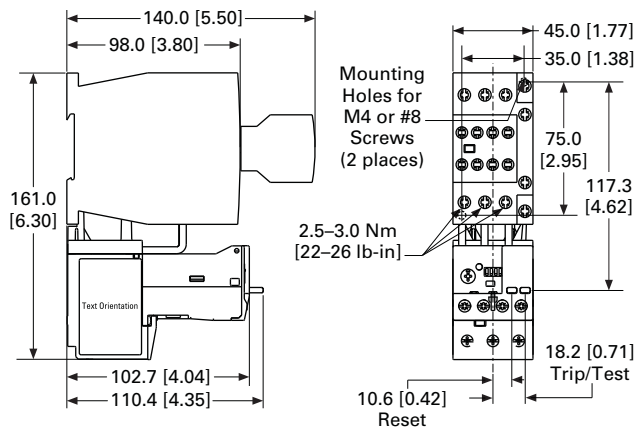
Approximate Dimensions in mm [in]

### XTAE Starters with XTOE Overload Relay

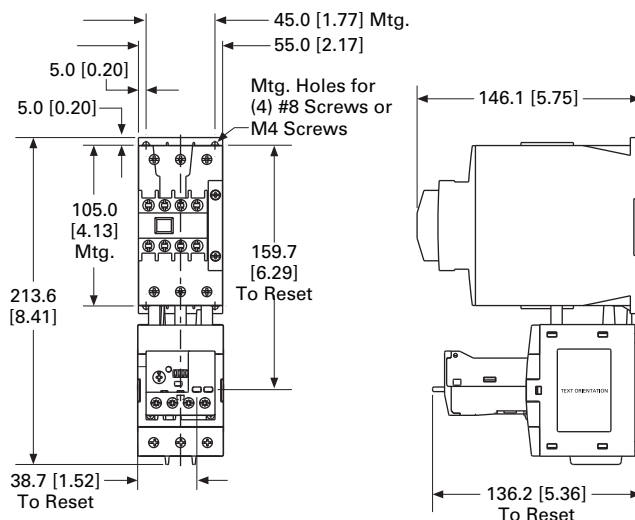
#### Frame B, XTAE007B–XTAE012B Starters with XTOE (0.35–20A)



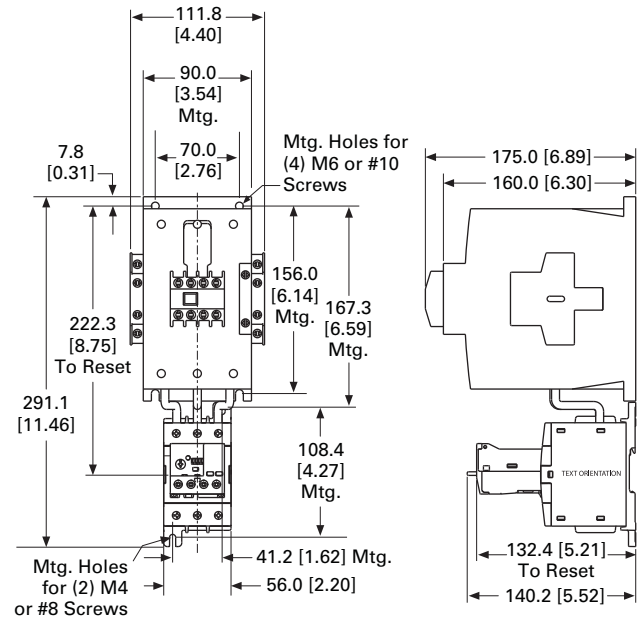
#### Frame C, XTAE018C–XTAE032C Starters with XTOE (0.35–45A)



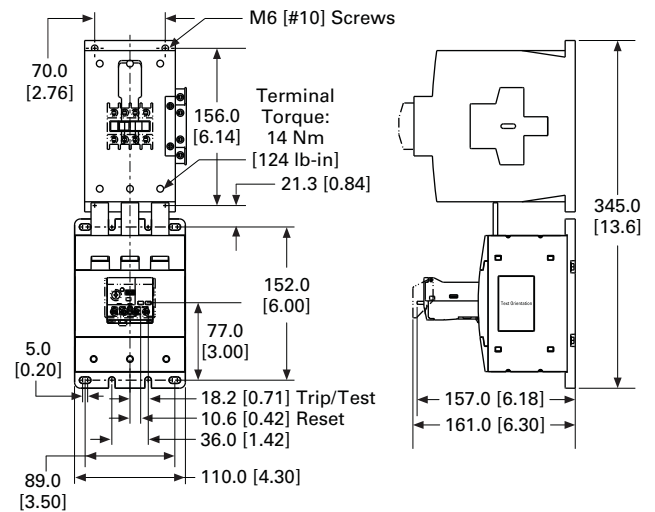
#### Frame D, XTAE040D–XTAE065D Starters with XTOE (20–100A)



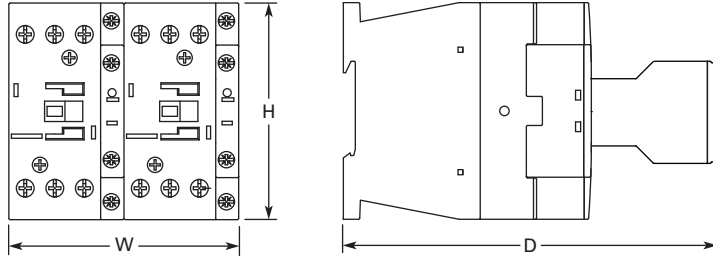
#### Frames F–G, XTAE080F–XTAE115G Starters with XTOE (20–100A)



#### Frame G, XTAE115G–XTAE150G Starters with XTOE (100–175A)



Approximate Dimensions in mm [in]

**XTCR Reversing Combination****Frames B–D****Frame B (7–15A)**

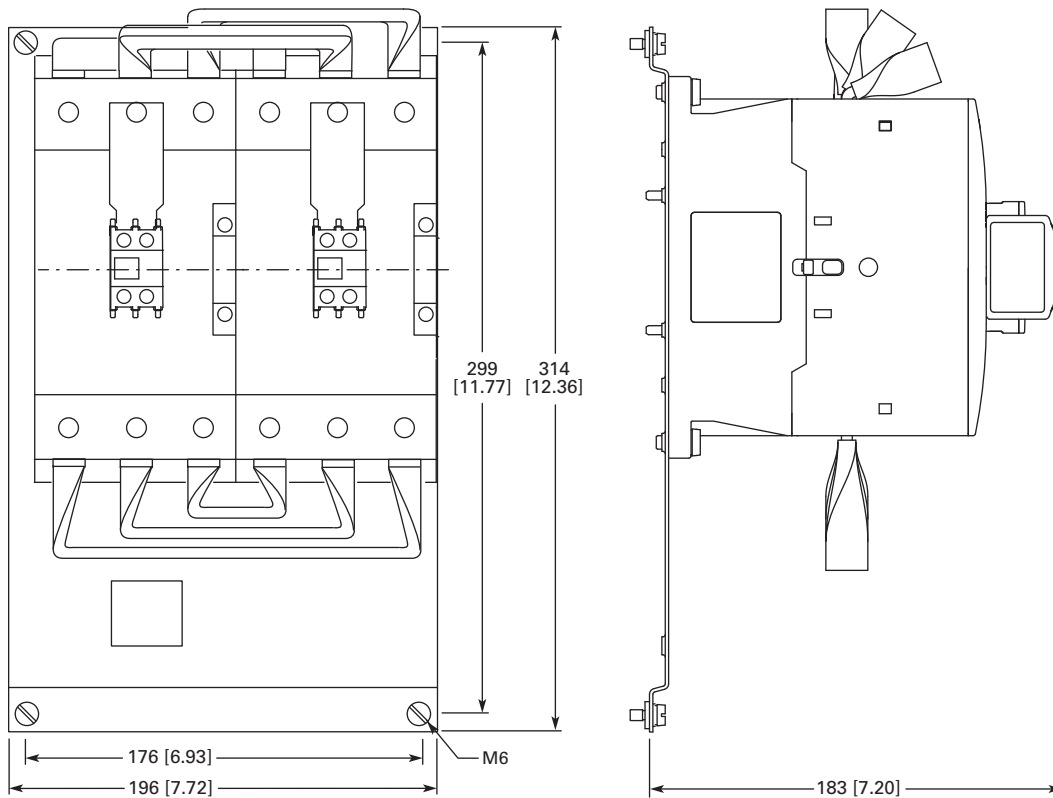
| W      | H      | D      |
|--------|--------|--------|
| 90     | 68     | 117    |
| [3.54] | [2.68] | [4.61] |

**Frame C (18–32A)**

| W      | H      | D      |
|--------|--------|--------|
| 90     | 85     | 138    |
| [3.54] | [3.34] | [5.43] |

**Frame D (40–65A)**

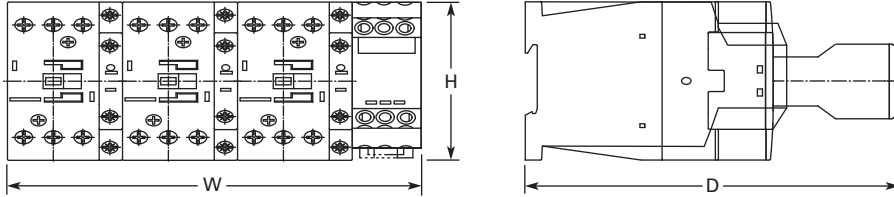
| W      | H      | D      |
|--------|--------|--------|
| 110    | 115    | 146.8  |
| [4.33] | [4.53] | [5.78] |

**Frames F–G**

Approximate Dimensions in mm [in]

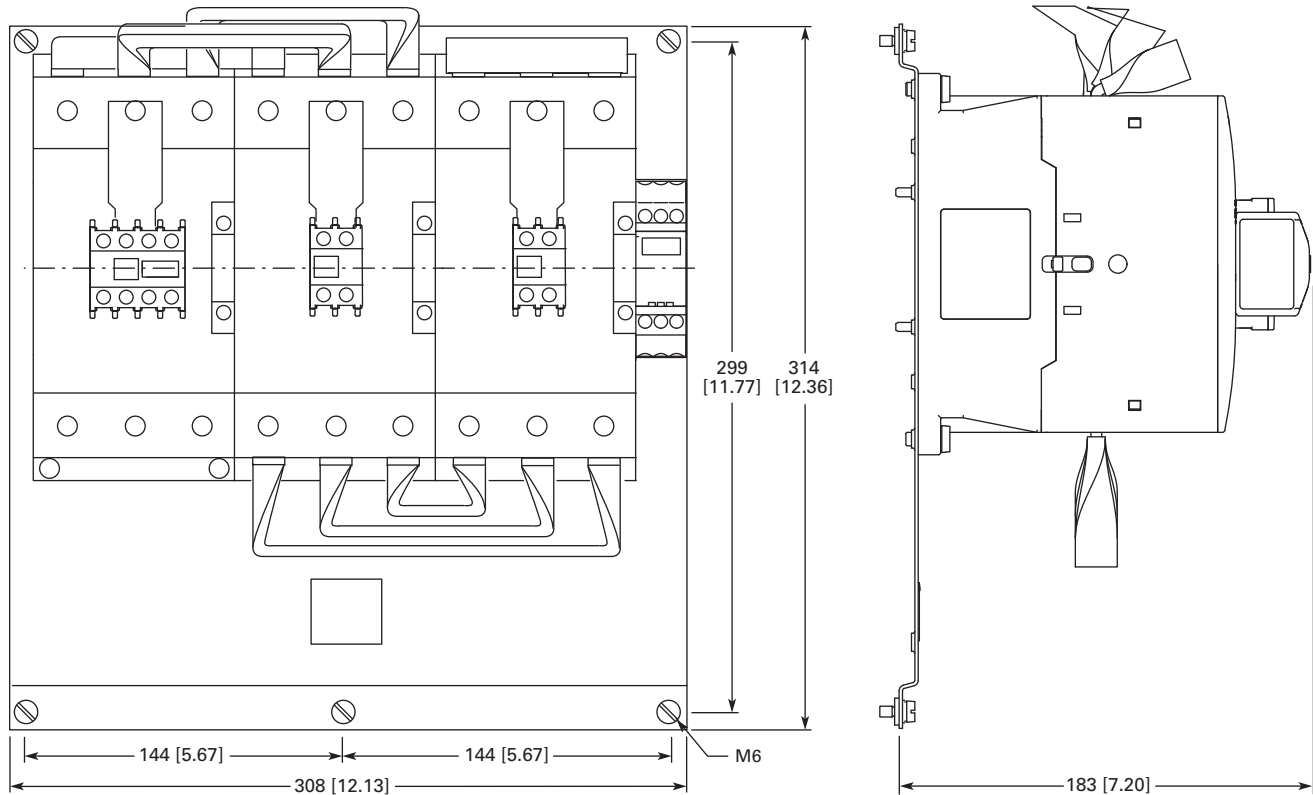
### Star-Delta Combination

#### Frames B–D

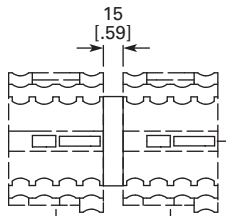
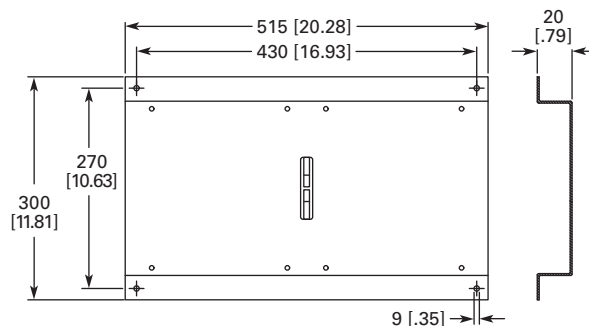
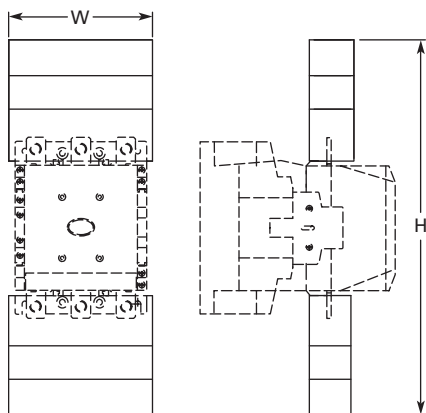


| Frame B |        |        | Frame C |        |        | Frame D |        |        |
|---------|--------|--------|---------|--------|--------|---------|--------|--------|
| W       | H      | D      | W       | H      | D      | W       | H      | D      |
| 158     | 68     | 117    | 158     | 85     | 138    | 188     | 115    | 146.8  |
| [6.22]  | [2.68] | [4.61] | [6.22]  | [3.34] | [5.43] | [7.40]  | [4.53] | [5.78] |

#### Frames F–G



Approximate Dimensions in mm [in]

**Mechanical Interlock****Frames H–M—XTCEXMLM****XTCEXMLN****Contactor with Terminal Shroud****Frames L–N Contactors, XTCE250L–XTCEC10N, with Terminal Shroud XTLEXTS****XTCE250L**

| W      | H       |
|--------|---------|
| 150    | 384     |
| [5.91] | [15.12] |

**XTCE400M**

| W      | H       |
|--------|---------|
| 150    | 404     |
| [5.91] | [15.91] |

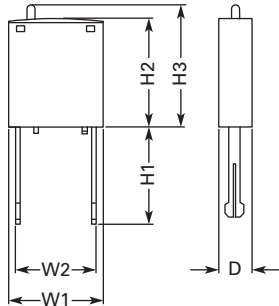
**XTCE500M, XTCE570M**

| W      | H       |
|--------|---------|
| 174    | 426     |
| [6.85] | [16.77] |

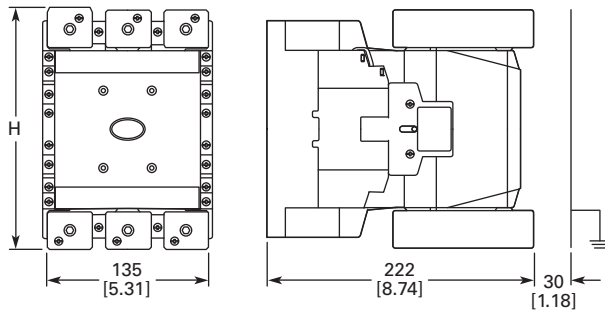
**XTCE580N, XTCE650N,  
XTCE750N, XTCE820N,  
XTCEC10N**

| W      | H       |
|--------|---------|
| 236    | 506     |
| [9.29] | [19.92] |

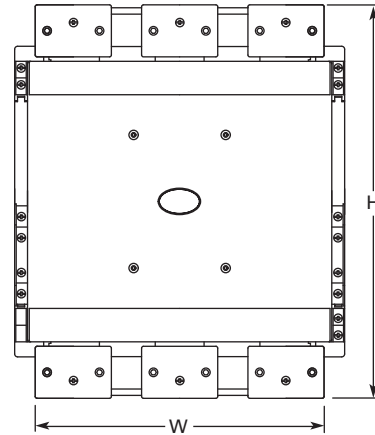
Approximate Dimensions in mm [in]

**Suppressor****XTCE\_Suppressor**

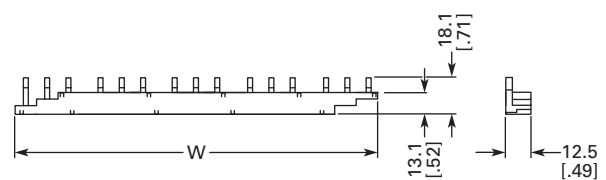
|            | W1    | W2    | H1     | H2     | H3     | D     |
|------------|-------|-------|--------|--------|--------|-------|
| XTCEXRSB_  | 25    | 9.2   | 25.9   | 28     | 32     | 9     |
| XTCEXVSB_  | [.98] | [.36] | [1.02] | [1.10] | [1.26] | [.35] |
| XTCEXVSLB_ |       |       |        |        |        |       |
| XTCEXDSB_  |       |       |        |        |        |       |
| XTCEXRSC_  | 25    | 9.2   | 16     | 28     | 32     | 9     |
| XTCEXVSC_  | [.98] | [.36] | [.63]  | [1.10] | [1.26] | [.35] |
| XTCEXVSLC_ |       |       |        |        |        |       |
| XTCEXRSF_  | 25    | 20    | 18.5   | 28     | 32     | 9     |
| XTCEXVSF_  | [.98] | [.79] | [.73]  | [1.10] | [1.26] | [.35] |
| XTCEXVSF_  |       |       |        |        |        |       |

**Cable Terminal Block****XTCEXTLA**

|          | H          |
|----------|------------|
| XTCE250L | 198 [7.80] |
| XTCE400M | 218 [8.58] |

**Flat Strip Conductor Terminals****XTCEXTFB**

|                   | W          | H           |
|-------------------|------------|-------------|
| XTCE500M–XTCE570M | 171 [6.73] | 232 [9.13]  |
| XTCE750N–XTCE820N | 231 [9.09] | 310 [12.20] |

**Three-Phase Commoning Link****Frame B**

|            | W          |
|------------|------------|
| XTCEXCLK3B | 112 [4.41] |
| XTCEXCLK4B | 157 [6.18] |
| XTCBXCLK5B | 202 [7.95] |



## XTSE Contactor



## XTSE Contactors

## Product Description

Eaton XTSE safety contactors are designed with the OEM and end customer in mind.

Providing enhanced levels of safety, XTSE contactors integrate to applications to not only achieve the highest safety circuits, but provide additional levels of protection that reinforce end-user safety.

## Application Description

With offerings up to 150 A and 125 hp, XTSE contactors were engineered to provide highly effective control and protection for motors, compressors and pumps, etc. XTSE contactors can be used in safety applications according to EN 954-1, EN ISO 13849-1 and IEC 62061 up to Category 4, PI e and SIL 3. Information concerning safety-related characteristics (B10 and B10d values) is available online. The auxiliary contact modules and built-in auxiliary contacts meet IEC EN 60947-5-1 Annex L (positively driven) and IEC EN 60947-4-1 Annex F (mirror contacts).

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| Contactors and Starters              | V5-T1-35  |
| XTSE Contactors                      |           |
| Catalog Number Selection             | V5-T1-129 |
| Product Selection                    | V5-T1-129 |
| Thermal Overload Relays              | V5-T1-130 |
| C440/XT Electronic Overload Relay    | V5-T1-143 |
| Manual Motor Protectors              | V5-T1-159 |
| Combination Motor Controllers        | V5-T1-193 |
| XT Electronic Manual Motor Protector | V5-T1-219 |
| EMS—Electronic Motor Starter         | V5-T1-232 |
| XT DC Contactors                     | V5-T1-234 |
| Reference Data                       | V5-T1-236 |

## Features and Benefits

## Clear Inspection Window

- The clear inspection window located on top of the auxiliary contact prevents the contactor from being manually activated and also allows for safe status monitoring for the user

## Rated for Highest Safety Characteristics

- XTSE contactors are able to integrate to safety circuits for up to category 4, PI e and SIL 3 applications
- SUVA Certified

## Safety Agency Approval

- Integrated front-mounted auxiliary contacts
- XTSE contactors utilize a new enhanced latching mechanism to prevent removal of the auxiliary contact

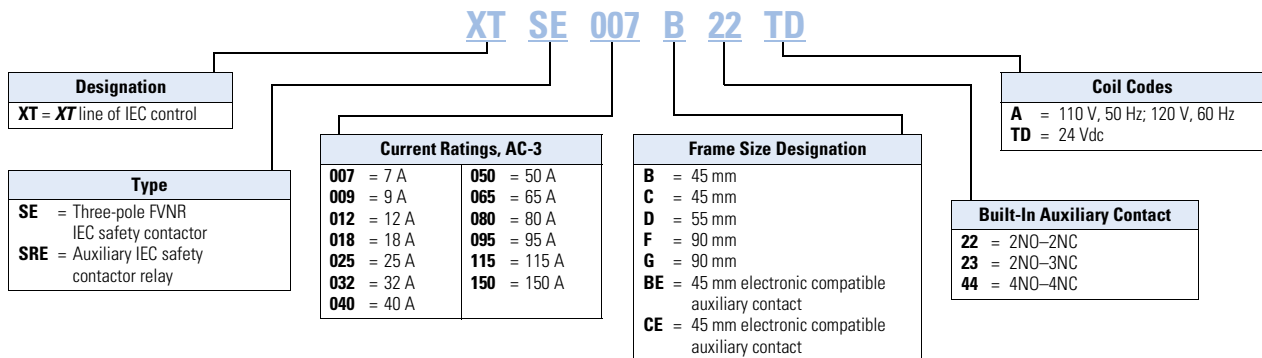
## Standards and Certifications

- CE Approved
- UL Listed
- IEC/EN 60947-4-1, 60947-5-1
- CSA Listed



## Catalog Number Selection

## XTSE Contactors



## Product Selection

## XTSRE10B



## XTSE Safety Relay

| Conventional Thermal Current<br>$I_{th}$ (A) | Rated Operational Current<br>AC-15 $I_e$ (A) |           |       | Auxiliary Contacts  | Coil Voltage               |                |
|----------------------------------------------|----------------------------------------------|-----------|-------|---------------------|----------------------------|----------------|
|                                              | 220–240 V                                    | 380–415 V | 500 V |                     | 110 V, 50 Hz; 120 V, 60 Hz | 24 Vdc         |
|                                              |                                              |           |       |                     | Catalog Number             | Catalog Number |
| 16                                           | 6                                            | 4         | 1.5   | 4NO, 4NC            | XTSRE10B44A                | XTSRE10B44TD   |
| 16                                           | 6                                            | 4         | 1.5   | 3NO, 3NC+1NO, 1NC ① | XTSRE10BE44A               | XTSRE10BE44TD  |

## XTSE Safety Contactor

## XTSE\_B\_



## XTSE\_C\_



## XTSE\_D\_



## XTSE\_F\_



| Horsepower Rating (hp), Three-Phase |           |           |           | Auxiliary Contacts  | Coil Voltage               |                |
|-------------------------------------|-----------|-----------|-----------|---------------------|----------------------------|----------------|
| 200/208 V                           | 230/240 V | 460/480 V | 575/600 V |                     | 110 V, 50 Hz; 120 V, 60 Hz | 24 Vdc         |
|                                     |           |           |           |                     | Catalog Number             | Catalog Number |
| 1-1/2                               | 2         | 3         | 5         | 2NO, 3NC            | XTSE007B23A                | XTSE007B23TD   |
| 3                                   | 3         | 5         | 7-1/2     | 2NO, 3NC            | XTSE009B23A                | XTSE009B23TD   |
| 3                                   | 3         | 10        | 10        | 2NO, 3NC            | XTSE012B23A                | XTSE012B23TD   |
| 1-1/2                               | 2         | 3         | 5         | 1NO, 2NC+1NO, 1NC ① | XTSE007BE23A               | XTSE007BE23TD  |
| 3                                   | 3         | 5         | 7-1/2     | 1NO, 2NC+1NO, 1NC ① | XTSE009BE23A               | XTSE009BE23TD  |
| 3                                   | 3         | 10        | 10        | 1NO, 2NC+1NO, 1NC ① | XTSE012BE23A               | XTSE012BE23TD  |
| 5                                   | 7-1/2     | 10        | 15        | 2NO, 3NC            | XTSE018C23A                | XTSE018C23TD   |
| 7-1/2                               | 7-1/2     | 15        | 20        | 2NO, 3NC            | XTSE025C23A                | XTSE025C23TD   |
| 10                                  | 10        | 20        | 25        | 2NO, 3NC            | XTSE032C23A                | XTSE032C23TD   |
| 5                                   | 7-1/2     | 10        | 15        | 1NO, 2NC+1NO, 1NC ① | XTSE018CE23A               | XTSE018CE23TD  |
| 7-1/2                               | 7-1/2     | 15        | 20        | 1NO, 2NC+1NO, 1NC ① | XTSE025CE23A               | XTSE025CE23TD  |
| 10                                  | 10        | 20        | 25        | 1NO, 2NC+1NO, 1NC ① | XTSE032CE23A               | XTSE032CE23TD  |
| 10                                  | 15        | 30        | 40        | 2NO, 2NC            | XTSE040D22A                | XTSE040D22TD   |
| 15                                  | 20        | 40        | 50        | 2NO, 2NC            | XTSE050D22A                | XTSE050D22TD   |
| 20                                  | 25        | 40        | 60        | 2NO, 2NC            | XTSE065D22A                | XTSE065D22TD   |
| 25                                  | 30        | 60        | 75        | 2NO, 2NC            | XTSE080F22A                | XTSE080F22TD   |
| 25                                  | 40        | 75        | 100       | 2NO, 2NC            | XTSE095F22A                | XTSE095F22TD   |
| 40                                  | 50        | 100       | 125       | 2NO, 2NC            | XTSE115G22A                | XTSE115G22TD   |
| 40                                  | 60        | 125       | 125       | 2NO, 2NC            | XTSE150G22A                | XTSE150G22TD   |

## Note

① 1NO and 1NC electronic compatible.

## XTOB, XTOT Overload Relays



## Thermal Overload Relays

## Product Description

The **XT** line of IEC motor thermal overload relays provides an efficient motor protection solution, available up to 630A. XTOB units can be directly mounted to the contactor or mounted separately.

## Features and Benefits

- Direct connect up to 250A
- Stand alone and CT type up to 630A
- Large thermal overcurrent range
- Test button
- Manual/automatic selectable reset
- NO-NC auxiliary as standard
- Class 10A (to 250A)
- Class 30 (CT type)

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| Manual Motor Protectors .....                     | V5-T1-159 |
| Combination Motor Controllers .....               | V5-T1-193 |
| <b>XT</b> Electronic Manual Motor Protector ..... | V5-T1-219 |
| EMS—Electronic Motor Starter .....                | V5-T1-232 |
| <b>XT</b> DC Contactors .....                     | V5-T1-234 |
| Reference Data .....                              | V5-T1-236 |

## Standards and Certifications

- IEC EN 60947
- CE approved
- UL
- CSA
- ATEX
- RoHS



## Notes

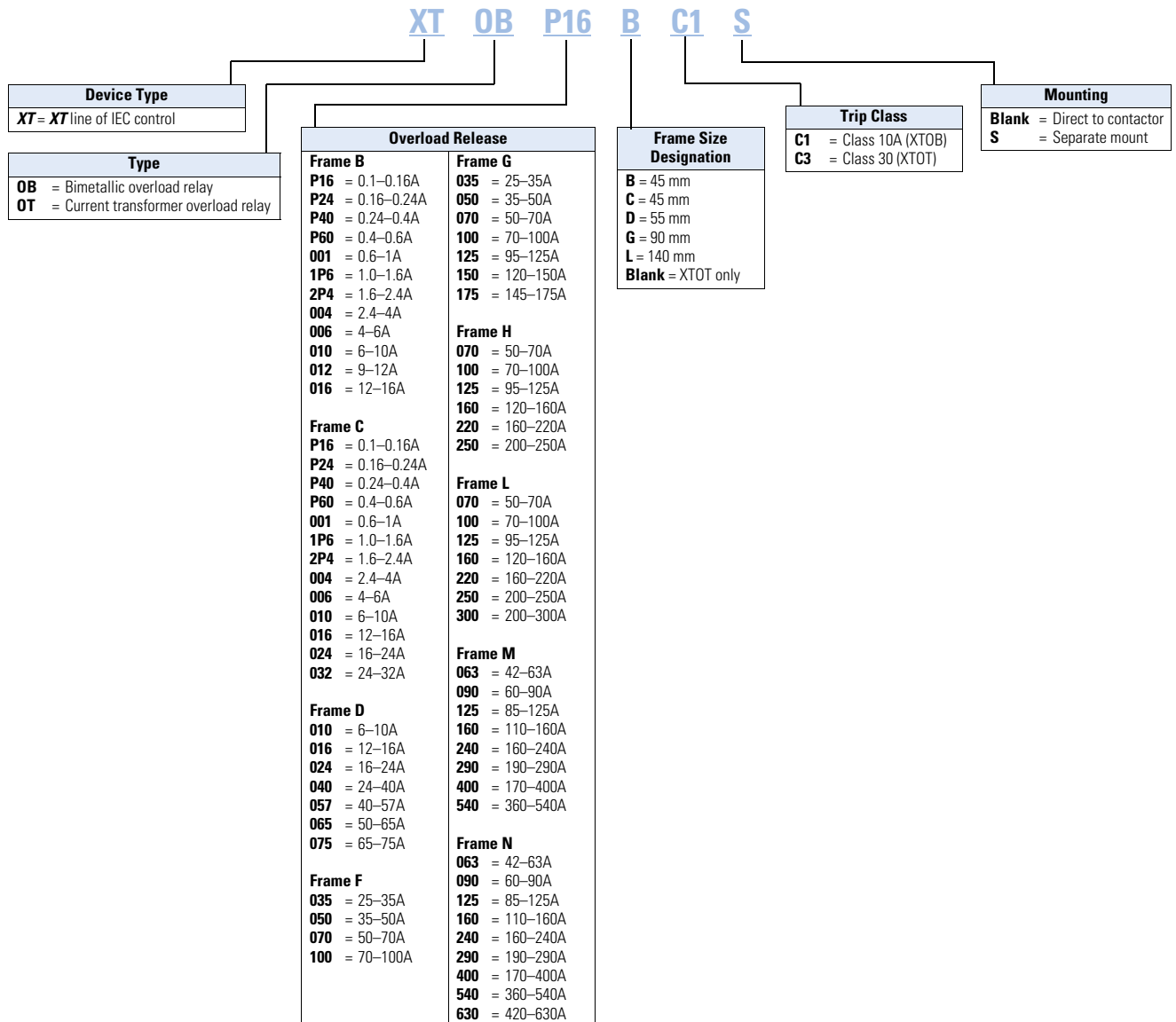
Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402001E for more information on overload relays for Frames B–G.  
Trip Class: 10A  
Suitable for protection of EEx e-motors. EC prototype test certificate available upon request.  
See manuals MN03402001E and MN03407001E, **Page V5-T1-135**.

## Instructional Leaflets

|          |                                                       |
|----------|-------------------------------------------------------|
| Pub51221 | XTOB, D Frame overload relays (inside of packaging)   |
| Pub51222 | XTOB, B–C Frame overload relays (inside of packaging) |

## Catalog Number Selection

## XT IEC Overload Relays



## Product Selection

## Frame B



## Overload Relay, Direct Mount—Frame B

| Overload Releases, I <sub>r</sub> | Contact Sequence | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A)    |                            | Maximum Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|------------------|-----------------------|----------------------------------|---------------------------------|----------------------------|-------------------------|--------------|----------------|
|                                   |                  |                       |                                  | Fuse Type 1 Coordination, gG/gL | Type 2 Coordination, gG/gL |                         |              |                |
| 0.1–0.16                          |                  | 1NO-1NC               | 7–15A                            | 25                              | 0.5                        | 25                      | 3            | XTOBP16BC1     |
| 0.16–0.24                         |                  | 1NO-1NC               | 7–15A                            | 25                              | 1                          | 25                      | 3            | XTOBP24BC1     |
| 0.24–0.4                          |                  | 1NO-1NC               | 7–15A                            | 25                              | 2                          | 25                      | 3            | XTOBP40BC1     |
| 0.4–0.6                           |                  | 1NO-1NC               | 7–15A                            | 25                              | 4                          | 25                      | 3            | XTOBP60BC1     |
| 0.6–1                             |                  | 1NO-1NC               | 7–15A                            | 25                              | 4                          | 25                      | 3            | XTOB001BC1     |
| 1–1.6                             |                  | 1NO-1NC               | 7–15A                            | 25                              | 6                          | 25                      | 6            | XTOB1P6BC1     |
| 1.6–2.4                           |                  | 1NO-1NC               | 7–15A                            | 25                              | 10                         | 25                      | 6            | XTOB2P4BC1     |
| 2.4–4                             |                  | 1NO-1NC               | 7–15A                            | 25                              | 16                         | 25                      | 15           | XTOB004BC1     |
| 4–6                               |                  | 1NO-1NC               | 7–15A                            | 25                              | 20                         | 25                      | 20           | XTOB006BC1     |
| 6–10                              |                  | 1NO-1NC               | 7–15A                            | 50                              | 25                         | 25                      | 35           | XTOB010BC1     |
| 9–12                              |                  | 1NO-1NC               | 9–15A                            | 50                              | 25                         | 25                      | 45           | XTOB012BC1     |
| 12–16                             |                  | 1NO-1NC               | 12–15A                           | 50                              | 25                         | 30                      | 45           | XTOB016BC1     |

## Frame C



## Overload Relay, Direct Mount—Frame C

| Overload Releases, I <sub>r</sub> | Contact Sequence | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A)    |                            | Maximum Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|------------------|-----------------------|----------------------------------|---------------------------------|----------------------------|-------------------------|--------------|----------------|
|                                   |                  |                       |                                  | Fuse Type 1 Coordination, gG/gL | Type 2 Coordination, gG/gL |                         |              |                |
| 0.1–0.16                          |                  | 1NO-1NC               | 18–32A                           | 25                              | 0.5                        | 25                      | 3            | XTOBP16CC1     |
| 0.16–0.24                         |                  | 1NO-1NC               | 18–32A                           | 25                              | 1                          | 25                      | 3            | XTOBP24CC1     |
| 0.24–0.4                          |                  | 1NO-1NC               | 18–32A                           | 25                              | 2                          | 25                      | 3            | XTOBP40CC1     |
| 0.4–0.6                           |                  | 1NO-1NC               | 18–32A                           | 25                              | 4                          | 25                      | 3            | XTOBP60CC1     |
| 0.6–1                             |                  | 1NO-1NC               | 18–32A                           | 25                              | 4                          | 25                      | 3            | XTOB001CC1     |
| 1–1.6                             |                  | 1NO-1NC               | 18–32A                           | 25                              | 6                          | 25                      | 6            | XTOB1P6CC1     |
| 1.6–2.4                           |                  | 1NO-1NC               | 18–32A                           | 25                              | 10                         | 25                      | 6            | XTOB2P4CC1     |
| 2.4–4                             |                  | 1NO-1NC               | 18–32A                           | 25                              | 16                         | 25                      | 15           | XTOB004CC1     |
| 4–6                               |                  | 1NO-1NC               | 18–32A                           | 25                              | 20                         | 25                      | 20           | XTOB006CC1     |
| 6–10                              |                  | 1NO-1NC               | 18–32A                           | 50                              | 25                         | 25                      | 25           | XTOB010CC1     |
| 10–16                             |                  | 1NO-1NC               | 18–32A                           | 63                              | 35                         | 30                      | 25           | XTOB016CC1     |
| 16–24                             |                  | 1NO-1NC               | 18–32A                           | 100                             | 35                         | 30                      | 25           | XTOB024CC1     |
| 24–32                             |                  | 1NO-1NC               | 25–32A                           | 125                             | 63                         | 30                      | 25           | XTOB032CC1     |
| 32–38                             |                  | 1NO-1NC               | 32–38A                           | 125                             | 63                         | 30                      | 25           | XTOB032CC1     |

## Frame D

## Overload Relay, Direct Mount—Frame D



| Overload Releases, I <sub>r</sub> | Contact Sequence | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A)    |                                 | Maximum Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|------------------|-----------------------|----------------------------------|---------------------------------|---------------------------------|-------------------------|--------------|----------------|
|                                   |                  |                       |                                  | Fuse Type 1 Coordination, gG/gL | Fuse Type 2 Coordination, gG/gL |                         |              |                |
| 6–10                              |                  | 1NO-1NC               | 40–72A                           | 50                              | 25                              | 25                      | 25           | XTOB010DC1     |
| 10–16                             |                  | 1NO-1NC               | 40–72A                           | 63                              | 35                              | 25                      | 25           | XTOB016DC1     |
| 16–24                             |                  | 1NO-1NC               | 40–72A                           | 63                              | 50                              | 30                      | 25           | XTOB024DC1     |
| 24–40                             |                  | 1NO-1NC               | 40–72A                           | 125                             | 63                              | 125                     | 125          | XTOB040DC1     |
| 40–57                             |                  | 1NO-1NC               | 50–72A                           | 160                             | 80                              | 150                     | 150          | XTOB057DC1     |
| 50–65                             |                  | 1NO-1NC               | 65–72A                           | 160                             | 100                             | 150                     | 200          | XTOB065DC1     |
| 65–75                             |                  | 1NO-1NC               | 72A                              | 200                             | 125                             | 150                     | 200          | XTOB075DC1     |

## Frames F–G

## Overload Relay, Direct Mount—Frames F–G



| Overload Releases, I <sub>r</sub> | Contact Sequence | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A)    |                                 | Maximum Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|------------------|-----------------------|----------------------------------|---------------------------------|---------------------------------|-------------------------|--------------|----------------|
|                                   |                  |                       |                                  | Fuse Type 1 Coordination, gG/gL | Fuse Type 2 Coordination, gG/gL |                         |              |                |
| 25–35                             |                  | 1NO-1NC               | 80–170A                          | 125                             | 100                             | 125                     | 125          | XTOB035GC1     |
| 35–50                             |                  | 1NO-1NC               | 80–170A                          | 160                             | 125                             | 150                     | 200          | XTOB050GC1     |
| 50–70                             |                  | 1NO-1NC               | 80–170A                          | 250                             | 160                             | 150                     | 200          | XTOB070GC1     |
| 70–100                            |                  | 1NO-1NC               | 80–170A                          | 315                             | 200                             | 400                     | 400          | XTOB100GC1     |
| 95–125                            |                  | 1NO-1NC               | 80–170A                          | 315                             | 200                             | 500                     | 400          | XTOB125GC1     |
| 120–150                           |                  | 1NO-1NC               | 80–170A                          | 315                             | 200                             | 600                     | 600          | XTOB150GC1     |
| 145–175                           |                  | 1NO-1NC               | 150–170A                         | 315                             | 200                             | 600                     | 600          | XTOB175GC1     |

## Frames F–G

## Overload Relay, Separate Mount—Frames F–G



| Overload Releases, I <sub>r</sub> | Contact Sequence | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A)    |                                 | Maximum Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|------------------|-----------------------|----------------------------------|---------------------------------|---------------------------------|-------------------------|--------------|----------------|
|                                   |                  |                       |                                  | Fuse Type 1 Coordination, gG/gL | Fuse Type 2 Coordination, gG/gL |                         |              |                |
| 25–35                             |                  | 1NO-1NC               | 80–170A                          | 125                             | 100                             | 125                     | 125          | XTOB035GC1S    |
| 35–50                             |                  | 1NO-1NC               | 80–170A                          | 160                             | 125                             | 150                     | 200          | XTOB050GC1S    |
| 50–70                             |                  | 1NO-1NC               | 80–170A                          | 250                             | 160                             | 150                     | 200          | XTOB070GC1S    |
| 70–100                            |                  | 1NO-1NC               | 80–170A                          | 315                             | 200                             | 400                     | 400          | XTOB100GC1S    |
| 95–125                            |                  | 1NO-1NC               | 80–170A                          | 315                             | 250                             | 500                     | 400          | XTOB125GC1S    |
| 120–150                           |                  | 1NO-1NC               | 80–170A                          | 315                             | 250                             | 600                     | 600          | XTOB150GC1S    |
| 145–175                           |                  | 1NO-1NC               | 150–170A                         | 315                             | 250                             | 600                     | 600          | XTOB175GC1S    |

## Frame H



## Overload Relay, Separate Mount—Frame H

| Overload Releases, I <sub>r</sub> | Contact Sequence                                                                              | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A)    |                                 | Maximum Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|-----------------------------------------------------------------------------------------------|-----------------------|----------------------------------|---------------------------------|---------------------------------|-------------------------|--------------|----------------|
|                                   |                                                                                               |                       |                                  | Fuse Type 1 Coordination, gG/gL | Fuse Type 2 Coordination, gG/gL |                         |              |                |
| 50–70                             | 1 3 5 97 95                                                                                   | 1NO-1NC               | 185–250A                         | 250                             | 160                             | 150                     | 200          | XTOB070HC1     |
| 70–100                            |  1 3 5 97 95 | 1NO-1NC               | 185–250A                         | 315                             | 200                             | 400                     | 400          | XTOB100HC1     |
| 95–125                            | 2 4 6 98 96                                                                                   | 1NO-1NC               | 185–250A                         | 315                             | 250                             | 500                     | 400          | XTOB125HC1     |
| 120–160                           |                                                                                               | 1NO-1NC               | 185–250A                         | 400                             | 250                             | 600                     | 600          | XTOB160HC1     |
| 160–220                           |                                                                                               | 1NO-1NC               | 185–250A                         | 400 ①                           | 315 ①                           | 600                     | 800          | XTOB220HC1     |
| 200–250                           |                                                                                               | 1NO-1NC               | 225–250A                         | 400 ①                           | 315 ①                           | 600                     | 700          | XTOB250HC1     |

## Frame L



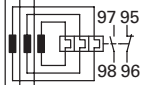
## Overload Relay, Separate Mount—Frame L

| Overload Releases, I <sub>r</sub> | Contact Sequence                                                                              | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A)    |                                 | Maximum Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|-----------------------------------------------------------------------------------------------|-----------------------|----------------------------------|---------------------------------|---------------------------------|-------------------------|--------------|----------------|
|                                   |                                                                                               |                       |                                  | Fuse Type 1 Coordination, gG/gL | Fuse Type 2 Coordination, gG/gL |                         |              |                |
| 50–70                             | 1 3 5 97 95                                                                                   | 1NO-1NC               | 185–250A                         | 250                             | 160                             | 150                     | 200          | XTOB070LC1     |
| 70–100                            |  1 3 5 97 95 | 1NO-1NC               | 185–250A                         | 315                             | 200                             | 400                     | 400          | XTOB100LC1     |
| 95–125                            | 2 4 6 98 96                                                                                   | 1NO-1NC               | 185–250A                         | 315                             | 250                             | 500                     | 400          | XTOB125LC1     |
| 120–160                           |                                                                                               | 1NO-1NC               | 185–250A                         | 400                             | 250                             | 600                     | 600          | XTOB160LC1     |
| 160–220                           |                                                                                               | 1NO-1NC               | 185–250A                         | 400 ①                           | 315 ①                           | 600                     | 800          | XTOB220LC1     |
| 200–250                           |                                                                                               | 1NO-1NC               | 225–250A                         | 400 ①                           | 315 ①                           | 600                     | 700          | XTOB250LC1     |
| 200–300                           |                                                                                               | 1NO-1NC               | 225–300A                         | 630 ①                           | 630 ①                           | 600                     | 700          | XTOB300LC1     |

## Frames M-N



## Current Transformer Operated Overload Relays, Separate Mount—Frames M-N ②

| Overload Releases, I <sub>r</sub> | Contact Sequence                                                                          | Contact Configuration | For Use with Contactor Amp Range | Short-Circuit Protection (A) |                            | Circuit Breaker | CEC/NEC Fuse | Catalog Number |
|-----------------------------------|-------------------------------------------------------------------------------------------|-----------------------|----------------------------------|------------------------------|----------------------------|-----------------|--------------|----------------|
|                                   |                                                                                           |                       |                                  | Type 1 Coordination, gG/gL   | Type 2 Coordination, gG/gL |                 |              |                |
| 42–63                             |  97 95 | 1NO-1NC               | 300–500A                         | —                            | —                          | 150             | 200          | XTOT063C3S     |
| 60–90                             |  98 96 | 1NO-1NC               | 300–500A                         | —                            | —                          | 250             | 250          | XTOT090C3S     |
| 85–125                            |                                                                                           | 1NO-1NC               | 300–500A                         | —                            | —                          | 500             | 400          | XTOT125C3S     |
| 110–160                           |                                                                                           | 1NO-1NC               | 300–500A                         | —                            | —                          | 600             | 600          | XTOT160C3S     |
| 160–240                           |                                                                                           | 1NO-1NC               | 300–500A                         | —                            | —                          | 600             | 700          | XTOT240C3S     |
| 190–290                           |                                                                                           | 1NO-1NC               | 300–500A                         | —                            | —                          | 600             | 700          | XTOT290C3S     |
| 270–400                           |                                                                                           | 1NO-1NC               | 300–500A                         | —                            | —                          | 1000            | 1000         | XTOT400C3S     |
| 360–540                           |                                                                                           | 1NO-1NC               | 500A                             | —                            | —                          | 600             | 1000         | XTOT540C3S     |
| 420–630 ③                         |                                                                                           | 1NO-1NC               | 630A                             | —                            | —                          | 600             | 1000         | XTOT630C3S     |

## Notes

- ① For separate mounting, short-circuit Type 1 rating is 500A and short-circuit Type 2 rating is 400A.  
 ② The main current parameters are defined by the main current wiring that is used.  
 ③ Recommend busbar solution at 600A, 1.06 diameter CT openings.

## Accessories

## XTOBXDIN\_

**DIN Rail or Panel Mount Adapter, Frames C-D** <sup>①</sup>

| For Use with... | Pkg. Qty. <sup>②</sup> | Catalog Number |
|-----------------|------------------------|----------------|
| XTOB...CC1      | 5                      | XTOBXDINC      |
| XTOB...DC1      | 2                      | XTOBXDIND      |

**Terminal Shroud**

| For Use with... | Catalog Number |
|-----------------|----------------|
| XTOB...LC1      | XTOBXTSL       |

## XTOBXTSL



|            |           |
|------------|-----------|
| XTOB...HC1 | XTOBXTSCH |
|------------|-----------|

## XTOBXTSCL



|                                    |           |
|------------------------------------|-----------|
| XTOB...LC1 to XTCE250L or XTCE300L | XTOBXTSCL |
|------------------------------------|-----------|

**Terminal Lug Kit—Set of Three Lugs**

| Description      | For Use with... | Pkg. Qty. <sup>②</sup> | Catalog Number |
|------------------|-----------------|------------------------|----------------|
| #6 AWG-350 kcmil | XTOB...LC1      | 1                      | XTOBXTLL       |

**Documentation—Manuals for Overload Monitoring of EEX e-motors**

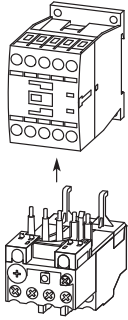
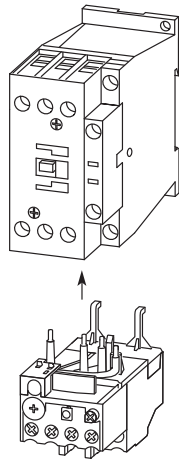
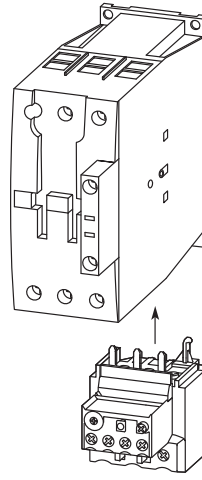
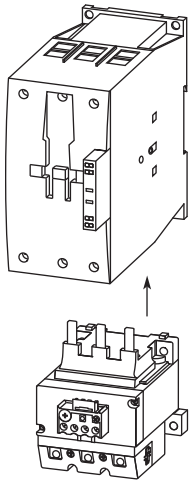
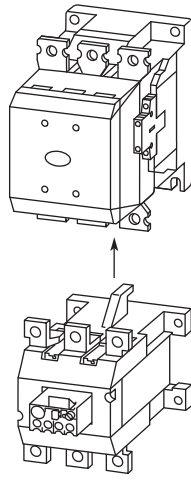
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| MN03407001E        | XTOB...DC1<br>XTOB...GC1 |

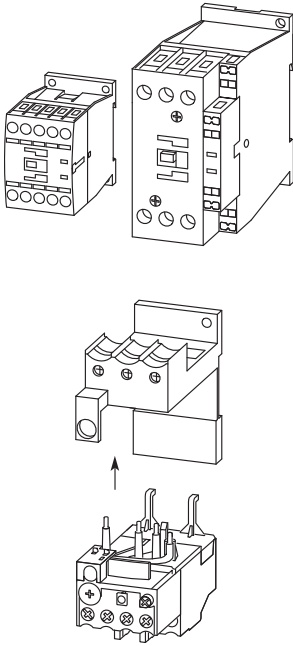
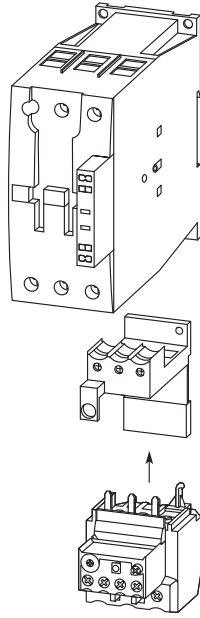
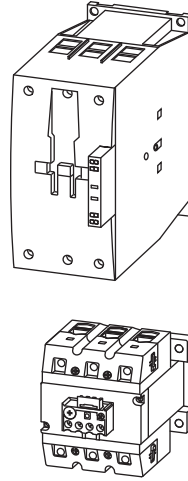
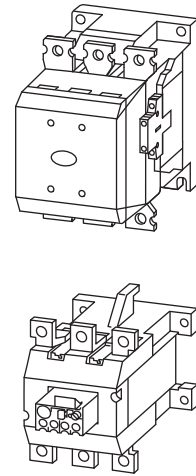
**Notes**

- ① Can be snap fitted on a top hat rail (DIN rail) to IEC/EN 60715 or can be screw fitted.  
 ② Orders must be placed in multiples of package quantity listed.



1

**Overload Fitted Directly to the Contactor****Frame B (7–15A)****Frame C (18–32A)****Frame D (40–72A)****Frames F–G (80–170A)****Frames H–L (185–250A)**

**Overload Mounted Separately from the Contactor****Frame C (18–32A)****Frame D (40–72A)****Frames F–G (80–170A)****Frames H–L (185–250A)**

## Technical Data and Specifications

## XTOB Overload Relay—General

| Description                                                                                               | XTOB...BC1, XTOB...CC1                                        | XTOB...DC1                        | XTOB...GC1, XTOB...GC1S           | XTOB...HC1, XTOB...LC1            |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Standards                                                                                                 | IEC/EN 60947, VDE 0660, UL, CSA                               | IEC/EN 60947, VDE 0660, UL, CSA   | IEC/EN 60947, VDE 0660, UL, CSA   | IEC/EN 60947, VDE 0660, UL, CSA   |
| Climate proofing                                                                                          | ①                                                             | ①                                 | ①                                 | ①                                 |
| Ambient temperature ②                                                                                     | –25°C to 55°C<br>[–13°F to 131°F]                             | –25°C to 55°C<br>[–13°F to 131°F] | –25°C to 55°C<br>[–13°F to 131°F] | –25°C to 50°C<br>[–13°F to 122°F] |
| Temperature compensation                                                                                  | Continuous                                                    | Continuous                        | Continuous                        | Continuous                        |
| Mechanical shock resistance (IEC/EN 60068-2-27)<br>half-sinusoidal shock 10 ms                            | 10g                                                           | 10g                               | 10g                               | 10g                               |
| Degree of protection                                                                                      | IP20                                                          | IP20                              | IP20                              | P00                               |
| Protection against direct contact when actuated<br>from front (IEC 536)                                   | Finger and<br>back-of-hand proof                              | Finger and<br>back-of-hand proof  | Finger and<br>back-of-hand proof  | Finger and<br>back-of-hand proof  |
| Insulation voltage (U <sub>i</sub> ) Vac                                                                  | 690                                                           | 690                               | 690                               | 1000                              |
| Overvoltage category/pollution degree                                                                     | III/3                                                         | III/3                             | III/3                             | III/3                             |
| Impulse withstand voltage (U <sub>imp</sub> ) Vac                                                         | 6000                                                          | 6000                              | 6000                              | 8000                              |
| Operational voltage (U <sub>o</sub> ) Vac                                                                 | 690                                                           | 690                               | 690                               | 1000                              |
| Safe isolation to VDE 0106 Part 101 and part 101/A1<br>between auxiliary contacts and main contacts (Vac) | 440                                                           | 440                               | 440                               | 500                               |
| between main contacts (Vac)                                                                               | 440                                                           | 440                               | 440                               | 500                               |
| Overload release setting range                                                                            | 0.1–32A                                                       | 6–75A                             | 25–150A                           | 50–300A                           |
| Short-circuit protection maximum fuse                                                                     | See overload relay tables starting on <b>Page V5-T1-146</b> . |                                   |                                   |                                   |
| Temperature compensation residual error >40°C                                                             | <0.25                                                         | <0.25                             | <0.25                             | <0.25                             |
| Current heat loss (three conductors)                                                                      |                                                               |                                   |                                   |                                   |
| Lower value of setting range, W                                                                           | 2.5                                                           | 3                                 | 16                                | 16                                |
| Upper value of setting range                                                                              | 6                                                             | 7.5                               | 28                                | 28                                |
| Terminal capacity                                                                                         |                                                               |                                   |                                   |                                   |
| Solid, mm <sup>2</sup>                                                                                    | 2 x (1–6)                                                     | 2 x (1–16)                        | 2 x (4–16)                        | —                                 |
| Flexible with ferrule, mm <sup>2</sup>                                                                    | 2 x (1–4)<br>2 x (1–6) ③                                      | 1 x 25<br>2 x (1–10) ④            | 1 x (4–70)<br>2 x (4–50)          | —                                 |
| Flexible with cable lug, mm <sup>2</sup>                                                                  | —                                                             | —                                 | —                                 | 50–240                            |
| Stranded with cable lug, mm <sup>2</sup>                                                                  | —                                                             | —                                 | —                                 | 50–240                            |
| Solid or stranded, AWG                                                                                    | 14 - 8                                                        | 14 - 2                            | 3 / 0                             | 250 kcmil                         |
| Flat conductor (number of segments x width x thickness, mm <sup>2</sup> )                                 | —                                                             | —                                 | —                                 | 6 x 16 x 0.8                      |
| Busbar—width (mm)                                                                                         | —                                                             | —                                 | —                                 | 25                                |
| Terminal screw                                                                                            | M4                                                            | M6                                | M10                               | M10 x 35                          |
| Tightening torque                                                                                         |                                                               |                                   |                                   |                                   |
| Nm                                                                                                        | 1.8                                                           | 3.5                               | 10                                | 18                                |
| Lb-in                                                                                                     | 16                                                            | 31                                | 88.5                              | 159.31                            |
| Tools                                                                                                     |                                                               |                                   |                                   |                                   |
| Pozidriv screwdriver                                                                                      | Size 2                                                        | Size 2                            | —                                 | —                                 |
| Standard screwdriver                                                                                      | 1 x 6                                                         | 1 x 6                             | —                                 | —                                 |
| Hexagon socket head spanner (SW)                                                                          | —                                                             | —                                 | 5 mm                              | 16 mm                             |

## Notes

① Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60068-2-30.

② Ambient temperature operating range to IEC/EN 60947, PTB: –5°C to 50°C.

③ 6 mm<sup>2</sup> flexible with ferrules to DIN 46228.

④ Main contact terminal capacity, solid and stranded conductors with ferrules: When using two conductors use identical cross-section.

**XTOB Overload Relay—Auxiliary and Control Circuit Connections**

| Description                                                                    | XTOB...BC1, XTOB...CC1 | XTOB...DC1     | XTOB...GC1, XTOB...GC1S | XTOB...HC1, XTOB...LC1 |
|--------------------------------------------------------------------------------|------------------------|----------------|-------------------------|------------------------|
| Impulse withstand voltage ( $U_{imp}$ ) Vac                                    | 6000                   | 6000           | 6000                    | 4000                   |
| Overvoltage category/pollution degree                                          | III/3                  | III/3          | III/3                   | III/3                  |
| Terminal capacity                                                              |                        |                |                         |                        |
| Solid, mm <sup>2</sup>                                                         | 2 x (0.75–4)           | 2 x (0.75–4)   | 2 x (0.75–4)            | 2 x (0.75–4)           |
| Flexible with ferrule, mm <sup>2</sup>                                         | 2 x (0.75–2.5)         | 2 x (0.75–2.5) | 2 x (0.75–2.5)          | 2 x (0.75–2.5)         |
| Solid or stranded (AWG)                                                        | 2 x (18–12)            | 2 x (18–12)    | 2 x (18–12)             | 2 x (18–12)            |
| Terminal screw                                                                 | M3.5                   | M3.5           | M3.5                    | M3.5                   |
| Tightening torque                                                              |                        |                |                         |                        |
| Nm                                                                             | 0.8–1.2                | 0.8–1.2        | 0.8–1.2                 | 0.8–1.2                |
| Lb-in                                                                          | 7–10.6                 | 7–10.6         | 7–10.6                  | 7–10.6                 |
| Tools                                                                          |                        |                |                         |                        |
| Pozidriv screwdriver                                                           | Size 2                 | Size 2         | Size 2                  | Size 2                 |
| Standard screwdriver                                                           | 1 x 6                  | 1 x 6          | 1 x 6                   | 1 x 6                  |
| Rated insulated voltage ( $U_i$ ) Vac                                          | 500                    | 500            | 500                     | 500                    |
| Rated operational voltage                                                      | 500                    | 500            | 500                     | 500                    |
| Safe isolation to VDE 0106 Part 101 and part 101/A1 between auxiliary contacts | 240                    | 240            | 240                     | 240                    |
| Conventional thermal current, $I_{th}$                                         | 6                      | 6              | 6                       | 6                      |
| Rated operational current—AC-15                                                |                        |                |                         |                        |
| Make contact                                                                   |                        |                |                         |                        |
| 120V                                                                           | 1.5                    | 1.5            | 1.5                     | 1.5                    |
| 240V                                                                           | 1.5                    | 1.5            | 1.5                     | 1.5                    |
| 415V                                                                           | 0.5                    | 0.5            | 0.5                     | 0.5                    |
| 500V                                                                           | 0.5                    | 0.5            | 0.5                     | 0.5                    |
| Break contact                                                                  |                        |                |                         |                        |
| 120V                                                                           | 1.5                    | 1.5            | 1.5                     | 1.5                    |
| 240V                                                                           | 1.5                    | 1.5            | 1.5                     | 1.5                    |
| 415V                                                                           | 0.9                    | 0.9            | 0.9                     | 0.9                    |
| 500V                                                                           | 0.8                    | 0.8            | 0.8                     | 0.8                    |
| Rated operational current—DC-13 L/R ≤15 ms <sup>①</sup>                        |                        |                |                         |                        |
| 24V                                                                            | 0.9                    | 0.9            | 0.9                     | 0.9                    |
| 60V                                                                            | 0.75                   | 0.75           | 0.75                    | 0.75                   |
| 110V                                                                           | 0.4                    | 0.4            | 0.4                     | 0.4                    |
| 220V                                                                           | 0.2                    | 0.2            | 0.2                     | 0.2                    |
| Short-circuit rating without welding maximum fuse, A gG/gI                     | 6                      | 6              | 6                       | 6                      |

**Note**

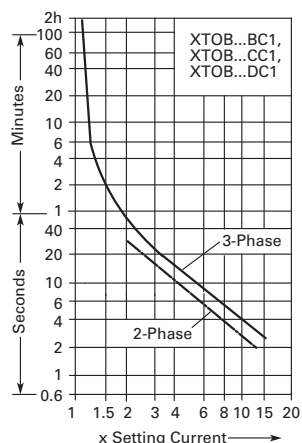
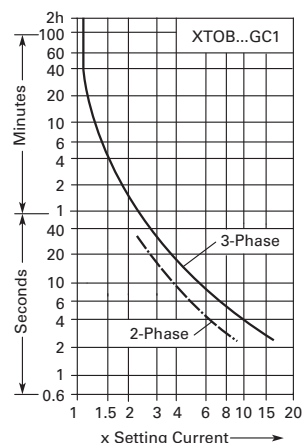
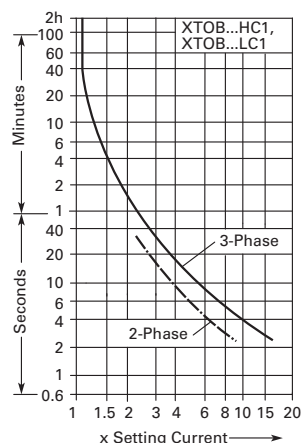
<sup>①</sup> Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

**Tripping Characteristics**

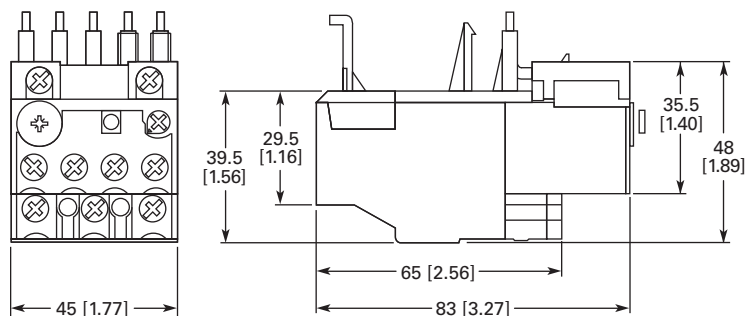
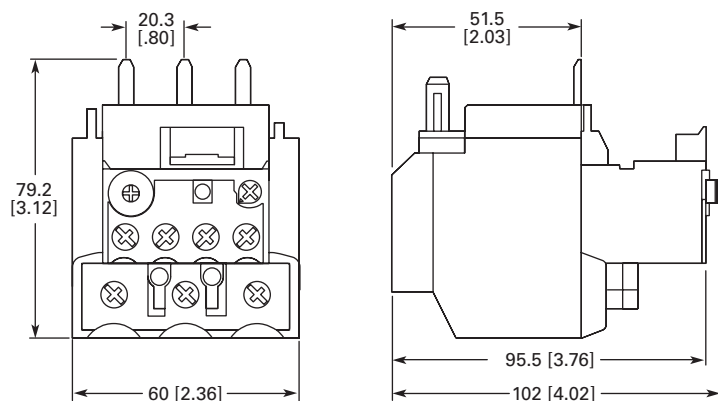
These tripping characteristics are the mean values of the spread at 20°C ambient temperature in a cold state.

Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approximately

25% of the read off value. Specific characteristics for each individual setting range can be found in MN03402001E.

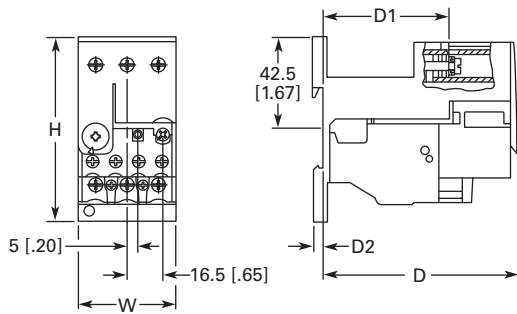
**XTOB...BC1, XTOB...CC1, XTOB...DC1****XTOB...GC1****XTOB...HC1, XTOB...LC1****Dimensions**

Approximate Dimensions in mm [in]

**Frames B–C, XTOB...BC1 and XTOB...CC1 Overload Relays****Frame D, XTOB...DC1 Overload Relay**

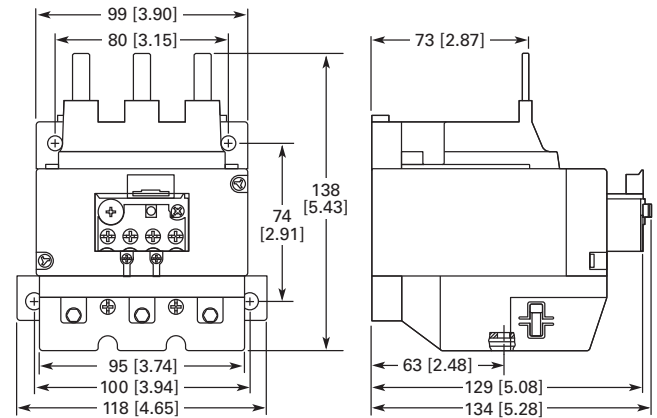
Approximate Dimensions in mm [in]

**Frame C, XTOBXDINC DIN Rail or Panel Mount Adapter  
and Frame D, XTOBXDIND DIN Rail or Panel Mount Adapter**

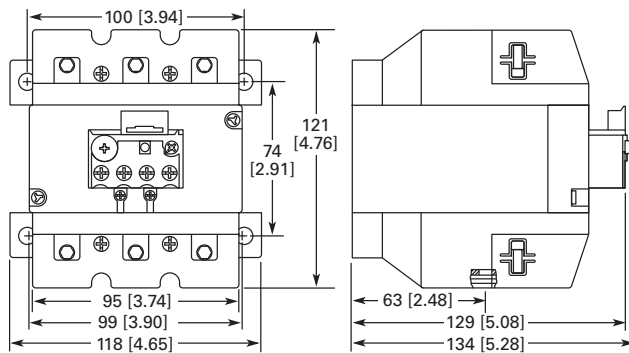


|                   | H         | W         | D           | D1          | D2        |
|-------------------|-----------|-----------|-------------|-------------|-----------|
| <b>XTOB...CC1</b> | 85 [3.46] | 45 [1.77] | 90.5 [3.56] | 58.3 [2.30] | 3.8 [.15] |
| <b>XTOB...DC1</b> | 86 [3.39] | 60 [2.36] | 112 [4.41]  | 80.5 [3.17] | 4.7 [.19] |

**Frames F–G, XTOB...GC1 Overload Relay**

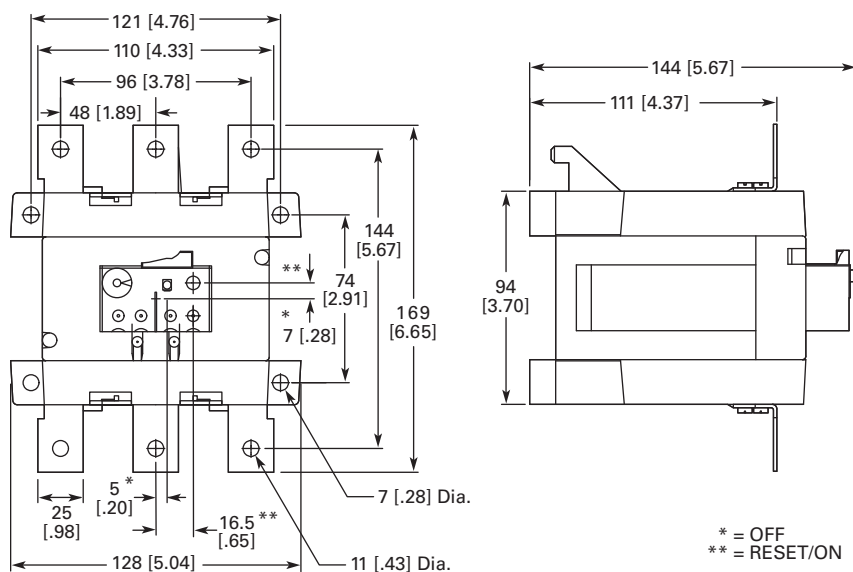
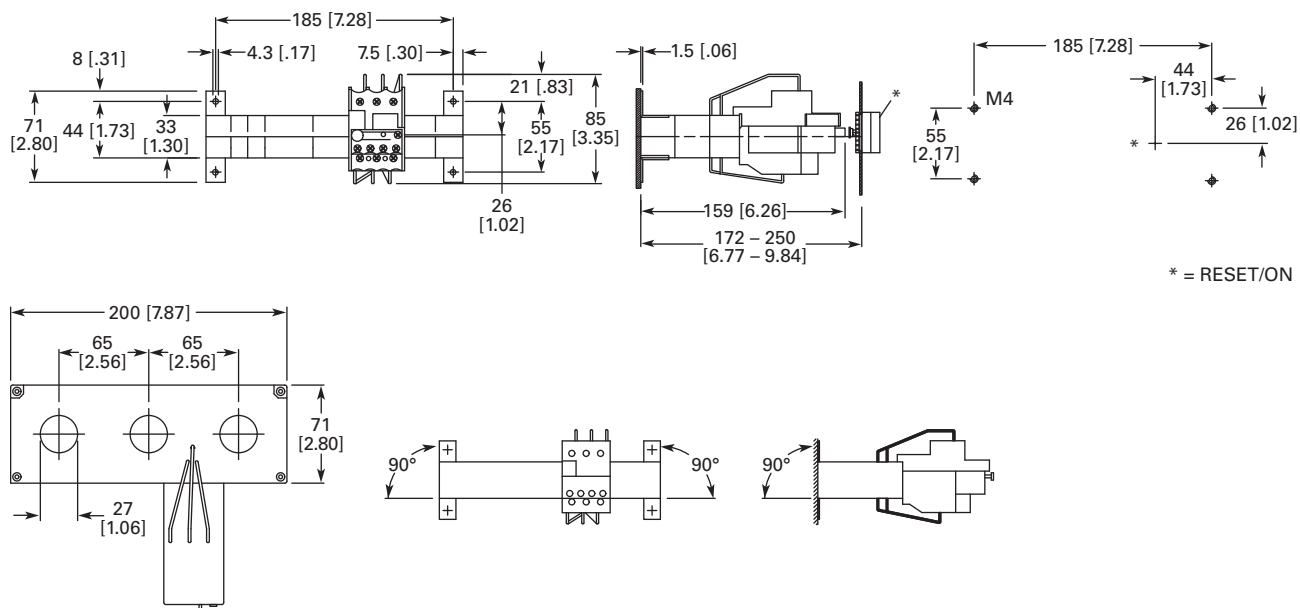


**Frames F–G, XTOB...G1CS Overload Relay**



1

Approximate Dimensions in mm [in]

**Frames L and H, XTOB...LC1, HC1 Overload Relay****XTOT...C3S Current Transformer Operated Overload Relay**

## C440/XT Electronic Overload Relay



## C440/XT Electronic Overload Relay

## Product Description

Eaton's new electronic overload relay (EOL) is the most compact, high-featured, economical product in its class. Designed on a global platform, the new EOL covers the entire power control spectrum including NEMA, IEC and DP contactors. The NEMA and DP versions are offered with the *C440* designation while the IEC offering has the *XT* designation. The electronic design provides reliable, accurate and value driven protection and communications capabilities in a single compact device. It is the flexible choice for any application requiring easy-to-use, reliable protection.

Eaton has a long history of innovations and product development in motor control and protection, including both traditional NEMA, as well as IEC control. It was from this experience that the C440 was developed, delivering new solutions to meet today's demands.

C440 is a self-powered electronic overload relay available up to 175A as a self contained unit. With external CTs, C440 can protect motor up to 1500 FLA. Available add-on accessories include remote reset capability and communication modules with I/O for DeviceNet, PROFIBUS, and Modbus.

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## Features and Benefits

## Features

- Reliable, accurate, electronic motor protection
- Easy to select, install and maintain
- Compact size
- Flexible, intelligent design
- Global product offering—available with NEMA, IEC and DP power control

## Size/Range

- Broad FLA range (0.33–1500A)
- Selectable trip class (10A, 10, 20, 30)
- Direct mounting to NEMA, IEC and DP contactors
- Most compact electronic overload in its class

## Motor Control

- Two B600 alarm (NO) and fault (NC) contacts
- Test/Trip button

## Motor Protection

- Thermal overload
- Phase loss
- Selectable (ON/OFF) phase unbalance
- Selectable (ON/OFF) ground fault

## User Interface

- Large FLA selection dial
- Trip status indicator
- Operating mode LED
- DIP switch selectable trip class, phase unbalance and ground fault
- Selectable Auto/Manual reset

## Feature Options

- Remote reset
  - 120 Vac
  - 24 Vac
  - 24 Vdc
- Tamper-proof cover
- Communications modules
  - Modbus RTU RS-485
  - DeviceNet with I/O
  - PROFIBUS with I/O
  - Modbus RTU with I/O
  - Ethernet IP with I/O
  - Modbus TCP with I/O



**Benefits****Reliability and Improved Uptime**

- C440 provides the users with peace of mind knowing that their assets are protected with the highest level of motor protection and communication capability in its class
- Extends the life of plant assets with selectable motor protection features such as trip class, phase unbalance and ground fault
- Protects against unnecessary downtime by discovering changes in your system (line/load) with remote monitoring capabilities
- Status LED provides added assurance that valuable assets are protected by indicating the overload operational status

**Flexibility**

- Available with NEMA, IEC and DP contactors
- Improves return on investment by reducing inventory carrying costs with wide FLA adjustment (5:1) and selectable trip class
- Design incorporates built-in ground fault protection thus eliminating the need for separate CTs and modules
- Flexible communication with optional I/O enables easy integration into plant management systems for remote monitoring and control
- Available as an open component and in enclosed control and motor control center assemblies

**Monitoring Capabilities**

- Individual phase currents RMS
- Average three-phase current RMS
- Thermal memory
- Fault indication (overload, phase loss, phase unbalance, ground fault)

**Safety**

- IP 20 rated terminal blocks
- Available in Eaton's industry leading FlashGard MCCs
- Tested to the highest industry standards such as UL, CSA, CE and IEC
- RoHS compliant

**Standards and Certifications**

- UL
- CSA
- CE
- NEMA
- IEC/EN 60947 VDE 0660
- ISO 13849-1 (EN954-1)
- RoHS
- ATEX 2014/34/EU
- ATEX Mark



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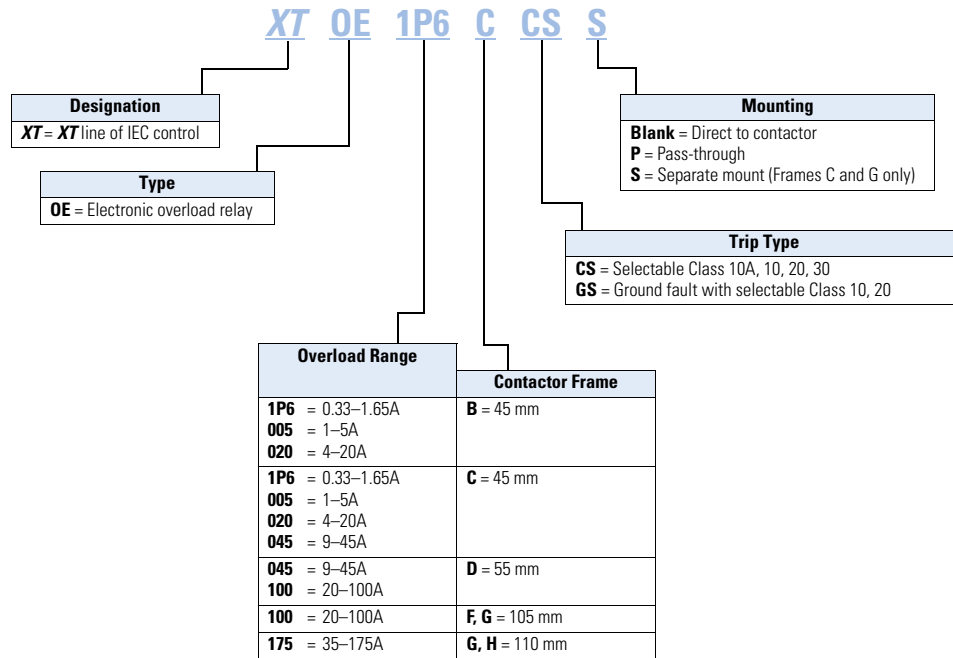
[Ex d] [Ex e] [Ex tb]

**Electronic Overload Education**

| Description                             | Definition                                                                                                          | Cause                                                                                                                                                                                                                                                                                               | Effect if not Protected                                                                                                                                                                                                                       | C440/XT Protection                                                                                                                                                                                                          |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Motor Protection</b>                 |                                                                                                                     |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                             |
| Thermal overload                        | Overload is a condition in which current draw exceeds 115% of the full load amperage rating for an inductive motor. | <ul style="list-style-type: none"> <li>• An increase in the load or torque that is being driven by the motor.</li> <li>• A low voltage supply to the motor causes the current to go high to maintain the power needed.</li> <li>• A poor power factor causing above normal current draw.</li> </ul> | <ul style="list-style-type: none"> <li>• Increase in current draw leads to heat and insulation breakdown, which can cause system failure.</li> <li>• Increase in current can increase power consumption and waste valuable energy.</li> </ul> | <ul style="list-style-type: none"> <li>• Thermal trip behavior is defined by UL, CSA and IEC standards.</li> <li>• Trip class is settable from 10A, 10, 20, 30</li> </ul>                                                   |
| Ground fault                            | A line to ground fault.                                                                                             | A current leakage path to ground.                                                                                                                                                                                                                                                                   | An undetected ground fault can burn through multiple insulation windings, ultimately leading to motor failure, not to mention risk to equipment or personnel                                                                                  | Fixed protective setting that takes the starter offline if ground fault current exceeds 50% of the FLA dial setting, that is, if the FLA dial is set to 12A, the overload relay will trip if the ground current exceeds 6A. |
| Unbalanced phases (voltage and current) | Uneven voltage or current between phases in a three-phase system.                                                   | When a three-phase load is powered with a poor quality line, the voltage per phase may be unbalanced.                                                                                                                                                                                               | Unbalanced voltage causes large unbalanced currents and as a result this can lead to motor stator windings being overloaded, causing excessive heating, reduced motor efficiency and reduced insulation life.                                 | Fixed protective setting that takes the starter offline if a phase drops below 50% of the other two phases.                                                                                                                 |
| Phase loss—current (single-phasing)     | One of the three-phase voltages is not present.                                                                     | Multiple causes, loose wire, improper wiring, grounded phase, open fuse, etc.                                                                                                                                                                                                                       | Single-phasing can lead to unwanted motor vibrations in addition to the results of unbalanced phases as listed above.                                                                                                                         | Fixed protective setting that takes the starter offline if a phase is lost.                                                                                                                                                 |

## Catalog Number Selection

## XT Electronic Overload Relay—IEC ①

**Note**① See **Page V5-T1-146** for Product Selection.

## Product Selection

## XT Electronic Overload Relays

45 mm XT for  
Direct Mount

## XT Electronic Overload Relays for Direct Mount to XT Contactors

| For Use with XT Contactor Frame | For Use with Contactor                                      | Overload Range (Amps) | Contact Sequence | Frame Size | Auxiliary Contact Configuration | Type       | Catalog Number    |
|---------------------------------|-------------------------------------------------------------|-----------------------|------------------|------------|---------------------------------|------------|-------------------|
| B                               | XTCE007B...,<br>XTCE009B...,<br>XTCE012B...,<br>XTCE015B... | 0.33–1.65             |                  | 45 mm      | NO-NC                           | ZEB12-1,65 | <b>XTOE1P6BCS</b> |
|                                 |                                                             | 1–5                   |                  |            |                                 | ZEB12-5    | <b>XTOE005BCS</b> |
|                                 |                                                             | 4–20                  |                  |            |                                 | ZEB12-20   | <b>XTOE020BCS</b> |
| C                               | XTCE018C...,<br>XTCE025C...,<br>XTCE032C                    | 0.33–1.65             |                  | 45 mm      | NO-NC                           | ZEB32-1,65 | <b>XTOE1P6CCS</b> |
|                                 |                                                             | 1–5                   |                  |            |                                 | ZEB32-5    | <b>XTOE005CCS</b> |
|                                 |                                                             | 4–20                  |                  |            |                                 | ZEB32-20   | <b>XTOE020CCS</b> |
|                                 |                                                             | 9–45                  |                  |            |                                 | ZEB32-45   | <b>XTOE045CCS</b> |
| D                               | XTCE040D...,<br>XTCE050D...,<br>XTCE065D...,<br>XTCE072D... | 9–45                  |                  | 45 mm      | NO-NC                           | ZEB65-45   | <b>XTOE045DCS</b> |
|                                 |                                                             | 20–100                |                  | 55 mm      |                                 | ZEB65-100  | <b>XTOE100DCS</b> |
| F                               | XTCE080F...,<br>XTCE095F...                                 | 20–100                |                  | 55 mm      | NO-NC                           | ZEB150-100 | <b>XTOE100GCS</b> |
| G                               | XTCE115G...,<br>XTCE150G...,<br>XTCE170G...                 | 20–100                |                  | 55 mm      | NO-NC                           | ZEB150-100 | <b>XTOE100GCS</b> |
|                                 |                                                             | 35–175                |                  | 110 mm     |                                 | ZEB150-175 | <b>XTOE175GCS</b> |
| H                               | XTCE185H...                                                 | 35–175                |                  | 110 mm     | NO-NC                           | ZEB225-175 | <b>XTOE175HCS</b> |

45 mm XT for  
Direct Mount  
with Ground Fault

## XT Electronic Overload Relays with Ground Fault for Direct Mount to XT Contactors

| For Use with XT Contactor Frame | For Use with Contactor                                      | Overload Range (Amps) | Contact Sequence | Frame Size | Auxiliary Contact Configuration | Type          | Catalog Number    |
|---------------------------------|-------------------------------------------------------------|-----------------------|------------------|------------|---------------------------------|---------------|-------------------|
| B                               | XTCE007B...,<br>XTCE009B...,<br>XTCE012B...,<br>XTCE015B... | 0.33–1.65             |                  | 45 mm      | NO-NC                           | ZEB12-1,65-GF | <b>XTOE1P6BGS</b> |
|                                 |                                                             | 1–5                   |                  |            |                                 | ZEB12-5-GF    | <b>XTOE005BGS</b> |
|                                 |                                                             | 4–20                  |                  |            |                                 | ZEB12-20-GF   | <b>XTOE020BGS</b> |
| C                               | XTCE018C...,<br>XTCE025C...,<br>XTCE032C                    | 0.33–1.65             |                  | 45 mm      | NO-NC                           | ZEB32-1,65-GF | <b>XTOE1P6CGS</b> |
|                                 |                                                             | 1–5                   |                  |            |                                 | ZEB32-5-GF    | <b>XTOE005CGS</b> |
|                                 |                                                             | 4–20                  |                  |            |                                 | ZEB32-20-GF   | <b>XTOE020CGS</b> |
|                                 |                                                             | 9–45                  |                  |            |                                 | ZEB32-45-GF   | <b>XTOE045CGS</b> |
| D                               | XTCE040D...,<br>XTCE050D...,<br>XTCE065D...,<br>XTCE072D... | 9–45                  |                  | 45 mm      | NO-NC                           | ZEB65-45-GF   | <b>XTOE045DGS</b> |
|                                 |                                                             | 20–100                |                  | 55 mm      |                                 | ZEB65-100-GF  | <b>XTOE100DGS</b> |
| F                               | XTCE080F...,<br>XTCE095F...                                 | 20–100                |                  | 55 mm      | NO-NC                           | ZEB150-100-GF | <b>XTOE100GGS</b> |
| G                               | XTCE115G...,<br>XTCE150G...,<br>XTCE170G...                 | 20–100                |                  | 55 mm      | NO-NC                           | ZEB150-100-GF | <b>XTOE100GGS</b> |
|                                 |                                                             | 35–175                |                  | 110 mm     |                                 | ZEB150-175-GF | <b>XTOE175GGS</b> |
| H                               | XTCE185H...                                                 | 35–175                |                  | 110 mm     | NO-NC                           | ZEB225-175-GF | <b>XTOE175HGS</b> |

## 1-5A OL with CTs

**XT Electronic Overload Relays for use with Large Frame XT Contactors (L-R)**

Use CTs and 1-5A **XT** overload relay. CT kit does not include overload relay (order separately).

| XT Contactor Frame | For Use with IEC Contactor Amp Range (AC-3) | CT Range (Amps) | Description                                                    | CT Kit Catalog Number | Terminal Size                           | Overload Relay Catalog Number | Overload Relay with Ground Fault Catalog Number |
|--------------------|---------------------------------------------|-----------------|----------------------------------------------------------------|-----------------------|-----------------------------------------|-------------------------------|-------------------------------------------------|
| L, M               | 185–500A                                    | 60-300          | 300: 5 panel-mount CT kit with integrated lugs                 | <b>ZEB-XCT300</b>     | 750 kcmil<br>(2) 250 kcmil<br>3/0 Cu/Al | <b>XTOE005CCSS</b>            | <b>XTOE005CGSS</b>                              |
| M, N               | 300–820A                                    | 120-600         | 600: 5 panel-mount CT kit with integrated, pass through holes  | <b>ZEB-XCT600</b>     | (2) 750 kcmil<br>3/0 Cu/Al              | <b>XTOE005CCSS</b>            | <b>XTOE005CGSS</b>                              |
| N                  | 580–1000A                                   | 200-1000        | 1000: 5 panel-mount CT kit with integrated, pass through holes | <b>ZEB-XCT1000</b>    | (3) 750 kcmil<br>3/0 Cu/Al              | <b>XTOE005CCSS</b>            | <b>XTOE005CGSS</b>                              |
| R                  | 1600A                                       | 300-1500        | 1500: 5 panel-mount CT kit with integrated, pass through holes | <b>ZEB-XCT1500</b>    | (4) 750 kcmil<br>1/0 Cu/Al              | <b>XTOE005CCSS</b>            | <b>XTOE005CGSS</b>                              |

## 45 mm XT for Separate Mount

**XT Electronic Overload Relays for Separate Mount**

| Overload Range (Amps) | Frame Size | Contact Sequence | Type          | Overload Relay Catalog Number | Overload Relay with Ground Fault Catalog Number |
|-----------------------|------------|------------------|---------------|-------------------------------|-------------------------------------------------|
| <b>Overload Relay</b> |            |                  |               |                               |                                                 |
| 0.33–1.65             | 45 mm      | 1 3 5 97 95      | ZEB32-1,65/KK | <b>XTOE1P6CCSS</b>            | <b>XTOE1P6CGSS</b>                              |
| 1–5                   |            |                  | ZEB32-5/KK    | <b>XTOE005CCSS</b>            | <b>XTOE005CGSS</b>                              |
| 4–20                  |            |                  | ZEB32-20/KK   | <b>XTOE020CCSS</b>            | <b>XTOE020CGSS</b>                              |
| 9–45                  |            |                  | ZEB32-45/KK   | <b>XTOE045CCSS</b>            | <b>XTOE045CGSS</b>                              |
| 20–100                | 55 mm      |                  | ZEB150-100/KK | <b>XTOE100GCSS</b>            | <b>XTOE100GGSS</b>                              |
| 35–175                | 110 mm     |                  | ZEB150-175/KK | <b>XTOE175GCSS</b>            | <b>XTOE175GGSS</b>                              |

**XT Electronic Overload Relay for Pass-Through Design**

Pass-through design does not include any lugs to land wires.  
Terminate motor leads directly on contactor.

| Overload Range (Amps) | Frame Size | Contact Sequence | Type          | Overload Relay Catalog Number | Overload Relay with Ground Fault Catalog Number |
|-----------------------|------------|------------------|---------------|-------------------------------|-------------------------------------------------|
| 35–175                | 110 mm     | 1 3 5 97 95      | ZEB150-175/PT | <b>XTOE175GCSP</b>            | <b>XTOE175GGSP</b>                              |
|                       |            |                  |               |                               |                                                 |

## Accessories

## CT Kits

## Accessories

|                                                                                   | Description                                                                                            | Catalog Number     |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------|
|  | <b>Safety Cover</b>                                                                                    |                    |
|                                                                                   | Clear Lexan cover that mounts on top of the FLA dial and DIP switches when closed.                     | <b>ZEB-XSC</b>     |
|  | <b>Reset Bar</b>                                                                                       |                    |
|                                                                                   | Assembles to the top of the overload to provide a larger target area for door mounted reset operators. | <b>ZEB-XRB</b>     |
|  | <b>Remote Reset</b>                                                                                    |                    |
|                                                                                   | Remote reset module (24 Vdc) ①                                                                         | <b>C440-XCOM</b>   |
|                                                                                   | Remote reset module (120 Vac) ①                                                                        | <b>ZEB-XRR-120</b> |
|                                                                                   | Remote reset module (24 Vac) ①                                                                         | <b>ZEB-XRR-24</b>  |

## Communication

The C440 is provided with two levels of communication capability.

## Basic Communication via Expansion Module—Monitoring Only

Basic communication on the C440 is accomplished using an expansion module. The expansion module plugs into the expansion bay on the C440 overload relay, enabling communications with the overload via their Modbus RTU (RS-485) network. No additional parts are required. See figure below.



**Basic Communication—Modbus**

## Advanced Communication—Monitoring and Control

C440 also has the ability to communicate on industrial protocols such as DeviceNet, PROFIBUS, Modbus RTU and Modbus TCP, and Ethernet (planned) while providing control capability using I/O.

An expansion module (mentioned earlier) combined with a communication adapter and a communication module allows easy integration onto the customer's network. See figure below.



**Advanced Communication—Communication Adapter with Communication Module**

## Advanced Communication—Communication Module

The communication adapter comes standard with four inputs and two outputs (24 Vdc or 120 Vac) while providing the customer with flexible mounting options (DIN rail or panel). See figure below,

## Note

① Customer can wire remote mounted button to reset module (that is, 22 mm pushbutton, catalog number M22-D-B-GB14-K10).

The following information can be viewed using the communication option:

- Motor status—running, stopped, tripped or resetting
- Individual rms phase currents (A, B, C)
- Average of three-phase rms current
- Percent thermal capacity
- Fault codes (only available prior to reset)
- Percent phase unbalance
- Ground fault current and percent
- Overload relay settings—trip class, DIP switch selections, reset selections
- Modbus address (can be set over the network)

### Communication Accessories

|                                                                                    | Description                                                                                        | Catalog Number      |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------|
| <b>Expansion Module</b>                                                            | Expansion module (Remote Reset/Modbus RTU, RS-485 Communication)                                   | <b>C440-XCOM</b>    |
|   |                                                                                                    |                     |
| <b>Communication Adapter</b>                                                       | Communication adapter kit (DIN C Panel mounted adapter, required for advance communication option) | <b>C440-COM-ADP</b> |
|  |                                                                                                    |                     |
|                                                                                    | DeviceNet communication module kit—120V I/O (consists of C440-XCOM + C441K + C440-COM-ADP)         | <b>C440-DN-120</b>  |
|                                                                                    | DeviceNet communication module kit—24 Vdc I/O (consists of C440-XCOM + C441L + C440-COM-ADP)       | <b>C440-DN-24</b>   |
|                                                                                    | PROFIBUS communication module kit—120V I/O (consists of C440-XCOM + C441S + C440-COM-ADP)          | <b>C440-DP-120</b>  |
|                                                                                    | PROFIBUS communication module kit—24V I/O (consists of C440-XCOM + C441Q + C440-COM-ADP)           | <b>C440-DP-24</b>   |
|                                                                                    | Modbus communication module kit—120V I/O (consists of C440-XCOM + C441N + C440-COM-ADP)            | <b>C440-MOD-120</b> |
|                                                                                    | Modbus communication module kit—24 Vdc I/O (consists of C440-XCOM + C441P + C440-COM-ADP)          | <b>C440-MOD-24</b>  |
|                                                                                    | Modbus TCP/Ethernet IP communication module kit—120V I/O (consists of C440-XCOM + C441U)           | <b>C440-ET-120</b>  |
|                                                                                    | Modbus TCP/Ethernet IP communication module kit—24V I/O (consists of C440-XCOM + C441V)            | <b>C440-ET-24</b>   |

**Modbus Communication Module**

The Modbus module combined with an expansion module and a communication adapter provide Modbus communication capability to the C440 electronic overload relay.



**Modbus  
Communication Module**

**Features and Benefits**

- The Modbus communication module is capable of baud rates up to 115K
- The Modbus address and baud rate configuration can be easily changed using the HMI user interface
- Modbus address and baud rate are set via convenient DIP switches; LEDs are provided to display Modbus traffic
- Configuration with common Modbus configuration tools
- Terminals
  - Unique locking mechanism provides for easy removal of the terminal block with the field wiring installed
  - Each terminal is marked for ease of wiring and troubleshooting
- Selectable I/O assemblies
  - 4IN/2OUT
  - Signal types include 24 Vdc I/O and 120 Vac I/O
- Each I/O module is optically isolated between the field I/O and the network adapter to protect the I/O and communication circuits from possible damage due to transients and ground loops
- Input Module features a user-definable input debounce, which limits the effects of transients and electrical noise
- Output Module supports a user-definable safe state for loss of communication; hold last state, ON or OFF

**DeviceNet Communication Modules**

The DeviceNet Communication Module provides monitoring and control for the C440 overload relay from a single DeviceNet node. These modules also offer convenient I/O in two voltage options, 24 Vdc and 120 Vac.



**DeviceNet  
Communication Module**

**Features and Benefits**

- Communication to DeviceNet uses only one DeviceNet MAC ID
- Configuration
  - DeviceNet MAC ID and Baud rate are set via convenient DIP switches with an option to set from the network
  - Advanced configuration available using common DeviceNet tools
- Terminals
  - Unique locking mechanism provides for easy removal of the terminal block with the field wiring installed
  - Each terminal is marked for ease of wiring and troubleshooting
- Selectable I/O assemblies
  - 4IN/2OUT
  - Signal types include 24 Vdc I/O and 120 Vac I/O
- Each I/O module is optically isolated between the field I/O and the network adapter to protect the I/O and communication circuits from possible damage due to transients and ground loops
- Input Module features a user-definable input debounce, which limits the effects of transients and electrical noise
- Output Module supports a user-definable safe state for loss of communication; hold last state, ON or OFF
- Combined status LED

**PROFIBUS Communication Modules**

The PROFIBUS module combined with an expansion module and a communication adapter provide Modbus communication capability to the C440 electronic overload relay.



**PROFIBUS  
Communication Module**

**Features and Benefits**

- The PROFIBUS communication module is capable of baud rates up to 12 Mb
- PROFIBUS address is set via convenient DIP switches; LEDs are provided to display PROFIBUS status
- Intuitive configuration with common PROFIBUS configuration tools
- Terminals
  - Unique locking mechanism provides for easy removal of the terminal block with the field wiring installed
  - Each terminal is marked for ease of wiring and troubleshooting
- Selectable I/O assemblies
  - 4IN/2OUT
  - Signal types include 24 Vdc I/O and 120 Vac I/O
- Each I/O module is optically isolated between the field I/O and the network adapter to protect the I/O and communication circuits from possible damage due to transients and ground loops
- Input Module features a user-definable input debounce, which limits the effects of transients and electrical noise
- Output Module supports a user-definable safe state for loss of communication; hold last state, ON or OFF

## Technical Data and Specifications

## Electronic Overload Relays up to 1500A

| Description                                         | Specification<br>45 mm                                                                                | 55 mm                                                                                                 | 110 mm                                                                                                |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Electrical Ratings</b>                           | <b>Range</b>                                                                                          | <b>Range</b>                                                                                          | <b>Range</b>                                                                                          |
| Operating voltage (three-phase) and frequency       | 690 Vac (60/50 Hz)                                                                                    | 690 Vac (60/50 Hz)                                                                                    | 690 Vac (60/50 Hz)                                                                                    |
| <b>FLA Range</b>                                    |                                                                                                       |                                                                                                       |                                                                                                       |
|                                                     | 0.33–1.65A<br>1–5A<br>4–20A<br>9–45A                                                                  | 20–100A                                                                                               | 28–140A (NEMA)<br>35–175A (IEC)                                                                       |
| <b>Use with Contactors</b>                          |                                                                                                       |                                                                                                       |                                                                                                       |
| XT IEC frames                                       | B, C, D                                                                                               | F, G                                                                                                  | G, H                                                                                                  |
| Freedom NEMA sizes                                  | 00, 0, 1, 2                                                                                           | 3                                                                                                     | 4                                                                                                     |
| <b>Trip Class</b>                                   |                                                                                                       |                                                                                                       |                                                                                                       |
|                                                     | 10A, 10, 20, 30<br>Selectable                                                                         | 10A, 10, 20, 30<br>Selectable                                                                         | 10A, 10, 20, 30<br>Selectable                                                                         |
| <b>Motor Protection</b>                             |                                                                                                       |                                                                                                       |                                                                                                       |
| Thermal overload setting                            | 1.05 x FLA: does not trip<br>1.15 x FLA: overload trip                                                | 1.05 x FLA: does not trip<br>1.15 x FLA: overload trip                                                | 1.05 x FLA: does not trip<br>1.15 x FLA: overload trip                                                |
| <b>Feature</b>                                      | <b>Range</b>                                                                                          | <b>Range</b>                                                                                          | <b>Range</b>                                                                                          |
| Phase loss                                          | Fixed threshold 50%                                                                                   | Fixed threshold 50%                                                                                   | Fixed threshold 50%                                                                                   |
| Phase unbalance (selectable: enable/disable)        | Fixed threshold 50%                                                                                   | Fixed threshold 50%                                                                                   | Fixed threshold 50%                                                                                   |
| Ground fault (selectable: enable/disable)           | 50% of FLA dial setting<br>>150% = 2 sec<br>>250% = 1 sec                                             | 50% of FLA dial setting<br>>150% = 2 sec<br>>250% = 1 sec                                             | 50% of FLA dial setting<br>>150% = 2 sec<br>>250% = 1 sec                                             |
| Reset                                               | Manual/automatic                                                                                      | Manual/automatic                                                                                      | Manual/automatic                                                                                      |
| <b>Indicators</b>                                   |                                                                                                       |                                                                                                       |                                                                                                       |
| Trip status                                         | Orange flag                                                                                           | Orange flag                                                                                           | Orange flag                                                                                           |
| Mode LED                                            | One flash: Overload operating properly<br>Two flashes: Current is above FLA dial setting—pending trip | One flash: Overload operating properly<br>Two flashes: Current is above FLA dial setting—pending trip | One flash: Overload operating properly<br>Two flashes: Current is above FLA dial setting—pending trip |
| <b>Options</b>                                      |                                                                                                       |                                                                                                       |                                                                                                       |
| Remote reset                                        | Yes                                                                                                   | Yes                                                                                                   | Yes                                                                                                   |
| Reset bar                                           | Yes                                                                                                   | Yes                                                                                                   | Yes                                                                                                   |
| Communication expansion module                      | Yes                                                                                                   | Yes                                                                                                   | Yes                                                                                                   |
| Communication adapter                               | Yes                                                                                                   | Yes                                                                                                   | Yes                                                                                                   |
| <b>Capacity</b>                                     |                                                                                                       |                                                                                                       |                                                                                                       |
| Load terminals                                      |                                                                                                       |                                                                                                       |                                                                                                       |
| Terminal capacity                                   | 12–10 AWG (4–6 mm <sup>2</sup> )<br>8–6 AWG (6–16 mm <sup>2</sup> )                                   | 6–1 AWG (16–50 mm <sup>2</sup> )                                                                      | 8–4/0 AWG (10–95 mm <sup>2</sup> )                                                                    |
| Tightening torque                                   | 20–25 lb-in (2.3–2.8 Nm)<br>25–30 lb-in (2.8–3.4 Nm)                                                  | 25–30 lb-in (2.8–3.4 Nm)                                                                              | 124 lb-in (14 Nm)                                                                                     |
| Input, auxiliary contact and remote reset terminals |                                                                                                       |                                                                                                       |                                                                                                       |
| Terminal capacity                                   | 2 x (18–12) AWG                                                                                       | 2 x (18–12) AWG                                                                                       | 2 x (18–12) AWG                                                                                       |
| Tightening torque                                   | 7–11 lb-in (0.8–1.2 Nm)                                                                               | 7–11 lb-in (0.8–1.2 Nm)                                                                               | 7–11 lb-in (0.8–1.2 Nm)                                                                               |
| <b>Voltages</b>                                     |                                                                                                       |                                                                                                       |                                                                                                       |
| Insulation voltage U <sub>i</sub> (three-phase)     | 690 Vac                                                                                               | 690 Vac                                                                                               | 690 Vac                                                                                               |
| Insulation voltage U <sub>i</sub> (control)         | 500 Vac                                                                                               | 500 Vac                                                                                               | 500 Vac                                                                                               |
| Rated impulse withstand voltage                     | 6000 Vac                                                                                              | 6000 Vac                                                                                              | 6000 Vac                                                                                              |
| Overvoltage category/pollution degree               | III/3                                                                                                 | III/3                                                                                                 | III/3                                                                                                 |



## Electronic Overload Relays up to 1500A, continued

| Description                                                          | Specification                         |                                       |                                       |
|----------------------------------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
|                                                                      | 45 mm                                 | 55 mm                                 | 110 mm                                |
| <b>Auxiliary and Control Circuit Ratings</b>                         |                                       |                                       |                                       |
| Conventional thermal continuous current                              | 5A                                    | 5A                                    | 5A                                    |
| Rated operational current—IEC AC-15                                  |                                       |                                       |                                       |
| Make contact (1800 VA)                                               |                                       |                                       |                                       |
| 120V                                                                 | 15A                                   | 15A                                   | 15A                                   |
| 240V                                                                 | 15A                                   | 15A                                   | 15A                                   |
| 415V                                                                 | 0.5A                                  | 0.5A                                  | 0.5A                                  |
| 500V                                                                 | 0.5A                                  | 0.5A                                  | 0.5A                                  |
| Break contact (180 VA)                                               |                                       |                                       |                                       |
| 120V                                                                 | 1.5A                                  | 1.5A                                  | 1.5A                                  |
| 240V                                                                 | 1.5A                                  | 1.5A                                  | 1.5A                                  |
| 415V                                                                 | 0.9A                                  | 0.9A                                  | 0.9A                                  |
| 500V                                                                 | 0.8A                                  | 0.8A                                  | 0.8A                                  |
| IEC DC-13 (L/R F 15 ms1)                                             |                                       |                                       |                                       |
| 0–250V                                                               | 1.0A                                  | 1.0A                                  | 1.0A                                  |
| Rated operational current—UL B600                                    |                                       |                                       |                                       |
| Make contact (3600 VA)                                               |                                       |                                       |                                       |
| 120V                                                                 | 30A                                   | 30A                                   | 30A                                   |
| 240V                                                                 | 15A                                   | 15A                                   | 15A                                   |
| 480V                                                                 | 7.5A                                  | 7.5A                                  | 7.5A                                  |
| 600V                                                                 | 6A                                    | 6A                                    | 6A                                    |
| Break contact (360 VA)                                               |                                       |                                       |                                       |
| 120V                                                                 | 3A                                    | 3A                                    | 3A                                    |
| 240V                                                                 | 1.5A                                  | 1.5A                                  | 1.5A                                  |
| 480V                                                                 | 0.75A                                 | 0.75A                                 | 0.75A                                 |
| 600V                                                                 | 0.6A                                  | 0.6A                                  | 0.6A                                  |
| R300—Vdc ratings (28 VA)                                             |                                       |                                       |                                       |
| 0–120V                                                               | 0.22A                                 | 0.22A                                 | 0.22A                                 |
| 250V                                                                 | 0.11A                                 | 0.11A                                 | 0.11A                                 |
| <b>Short-Circuit Rating without Welding</b>                          |                                       |                                       |                                       |
| Maximum fuse                                                         | 6A gG/gL                              | 6A gG/gL                              | 6A gG/gL                              |
| <b>Environmental Ratings</b>                                         |                                       |                                       |                                       |
| Ambient temperature (operating)                                      | –13° to 149°F (–25° to 65°C)          | –13° to 149°F (–25° to 65°C)          | –13° to 149°F (–25° to 65°C)          |
| Ambient temperature (storage)                                        | –40° to 185°F (–40° to 85°C)          | –40° to 185°F (–40° to 85°C)          | –40° to 185°F (–40° to 85°C)          |
| Operating humidity UL 991 (H3)                                       | 5% to 95% non-condensing              | 5% to 95% non-condensing              | 5% to 95% non-condensing              |
| Altitude (no derating) NEMA ICS1                                     | 2000m                                 | 2000m                                 | 2000m                                 |
| Shock (IEC 600068-2-27)                                              | 15g any direction                     | 15g any direction                     | 15g any direction                     |
| Vibration (IEC 60068-2-6)                                            | 3g any direction                      | 3g any direction                      | 3g any direction                      |
| Pollution degree per IEC 60947-4-1                                   | 3 for product (2 for pcb)             | 3 for product (2 for pcb)             | 3 for product (2 for pcb)             |
| Ingress protection                                                   | IP20                                  | IP20                                  | IP20                                  |
| Protection against direct contact when actuated from front (IEC 536) | Finger- and back-of-hand proof        | Finger- and back-of-hand proof        | Finger- and back-of-hand proof        |
| Mounting position                                                    | Any                                   | Any                                   | Any                                   |
| Climatic proofing                                                    | Damp heat, constant to IEC 60068-2-30 | Damp heat, constant to IEC 60068-2-30 | Damp heat, constant to IEC 60068-2-30 |

## Electronic Overload Relays up to 1500A, continued

| Description                                                                               | Specification                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                           | 45 mm                                                                                                                                                                                                                                            | 55 mm                                                                                                                                                                                                                                            | 110 mm                                                                                                                                                                                                                                           |
| <b>Electrical/EMC</b>                                                                     |                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                  |
| Radiated emissions<br>IEC 60947-4-1-Table 15<br>EN 55011 (CISPR 11) Group 1, Class A, ISM | 30 mHz to 1000 mHz                                                                                                                                                                                                                               | 30 mHz to 1000 mHz                                                                                                                                                                                                                               | 30 mHz to 1000 mHz                                                                                                                                                                                                                               |
| Conducted emissions<br>IEC 60947-4-1-Table 14<br>EN 55011 (CISPR 11) Group 1; Class ISM   | 0.15 mHz to 30 mHz                                                                                                                                                                                                                               | 0.15 mHz to 30 mHz                                                                                                                                                                                                                               | 0.15 mHz to 30 mHz                                                                                                                                                                                                                               |
| ESD immunity<br>IEC 60947-4-1 (Table 13)                                                  | ±8 kV air, ±6 kV contact                                                                                                                                                                                                                         | ±8 kV air, ±6 kV contact                                                                                                                                                                                                                         | ±8 kV air, ±6 kV contact                                                                                                                                                                                                                         |
| Radiated immunity<br>IEC 60947-4-1<br>IEC 61000-4-3                                       | 10 V/m 80 mHz–1000 mHz<br>3 V/m from 1.4 to 2.7 GHz<br>80% amplitude modulated<br>1 kHz sine wave                                                                                                                                                | 10 V/m 80 mHz–1000 mHz<br>3 V/m from 1.4 to 2.7 GHz<br>80% amplitude modulated<br>1 kHz sine wave                                                                                                                                                | 10 V/m 80 mHz–1000 mHz<br>3 V/m from 1.4 to 2.7 GHz<br>80% amplitude modulated<br>1 kHz sine wave                                                                                                                                                |
| Conducted immunity<br>IEC 60947-4-1, IEC 61000-4-6                                        | 140 dub (10V rms)<br>150 kHz–100 mHz                                                                                                                                                                                                             | 140 dub (10V rms)<br>150 kHz–100 mHz                                                                                                                                                                                                             | 140 dub (10V rms)<br>150 kHz–100 mHz                                                                                                                                                                                                             |
| Fast transient immunity<br>IEC 60947-4-1 (Table 13)<br>IEC 61000-4-4                      | ±4 kV using direct method<br>with accessory installed in expansion bay<br>±2 kV using direct method                                                                                                                                              | ±4 kV using direct method<br>with accessory installed in expansion bay<br>±2 kV using direct method                                                                                                                                              | ±4 kV using direct method<br>with accessory installed in expansion bay<br>±2 kV using direct method                                                                                                                                              |
| Surge immunity<br>IEC 60947-4-1 (Table 13)<br>IEC 61000-4-5 a Class 4                     | Three-phase power inputs:<br>±4 kV line-to-line (DM)<br>±4 kV line-to-ground (CM)<br><br>With accessory installed in expansion bay:<br>±2 kV line-to-line (DM) →1.2/50 us;<br>2 kV line-to-earth, 1 kV line-to-line<br>±4 kV line-to-ground (CM) | Three-phase power inputs:<br>±4 kV line-to-line (DM)<br>±4 kV line-to-ground (CM)<br><br>With accessory installed in expansion bay:<br>±2 kV line-to-line (DM) →1.2/50 us;<br>2 kV line-to-earth, 1 kV line-to-line<br>±4 kV line-to-ground (CM) | Three-phase power inputs:<br>±4 kV line-to-line (DM)<br>±4 kV line-to-ground (CM)<br><br>With accessory installed in expansion bay:<br>±2 kV line-to-line (DM) →1.2/50 us;<br>2 kV line-to-earth, 1 kV line-to-line<br>±4 kV line-to-ground (CM) |
| Power freq. magnetic field immunity<br>IEC 60947-4-1, IEC 61000-4-8                       | 30 A/m, 50 Hz                                                                                                                                                                                                                                    | 30 A/m, 50 Hz                                                                                                                                                                                                                                    | 30 A/m, 50 Hz                                                                                                                                                                                                                                    |
| Electromagnetic field<br>IEC 60947-4-1 Table 13, IEC 61000-4-3                            | 10 V/m                                                                                                                                                                                                                                           | 10 V/m                                                                                                                                                                                                                                           | 10 V/m                                                                                                                                                                                                                                           |
| Distortion IEEE 519                                                                       | 5% THD max., 5th harmonic 3% max.                                                                                                                                                                                                                | 5% THD max., 5th harmonic 3% max.                                                                                                                                                                                                                | 5% THD max., 5th harmonic 3% max.                                                                                                                                                                                                                |
| Electrostatic discharge (ESD)<br>IEC 61000-4-2, EN 61131-2                                | 4 kV contact<br>8 kV air discharge                                                                                                                                                                                                               | 4 kV contact<br>8 kV air discharge                                                                                                                                                                                                               | 4 kV contact<br>8 kV air discharge                                                                                                                                                                                                               |
| Electrical fast transient (EFT)<br>IEC 61000-4-4, EN 61131-2                              | ±2 kV using direct method                                                                                                                                                                                                                        | ±2 kV using direct method                                                                                                                                                                                                                        | ±2 kV using direct method                                                                                                                                                                                                                        |
| Surge immunity<br>IEC 61000-4-5, EN 61131-2                                               | ±2 kV line-to-ground (CM)                                                                                                                                                                                                                        | ±2 kV line-to-ground (CM)                                                                                                                                                                                                                        | ±2 kV line-to-ground (CM)                                                                                                                                                                                                                        |

## Communication Modules

| Description                                                                            | Modbus                                                                                                 | DeviceNet                                                                                  | PROFIBUS                                                                                   | Ethernet                                                                                   |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| <b>Electrical/EMC</b>                                                                  |                                                                                                        |                                                                                            |                                                                                            |                                                                                            |
| Radiated emissions<br>IEC 60947-4-1—Table 15, EN 55011<br>(CISPR 11) Group 1, Class A  | 30–1000 mHz                                                                                            | 30–1000 mHz                                                                                | 30–1000 mHz                                                                                | 30–1000 mHz                                                                                |
| Conducted emissions<br>IEC 60947-4-1—Table 14, EN 55011<br>(CISPR 11) Group 1, Class A | 0.15–30 mHz                                                                                            | 0.15–30 mHz                                                                                | 0.15–30 mHz                                                                                | 0.15–30 mHz                                                                                |
| ESD immunity<br>IEC 60947-4-1 (Table 13)                                               | ±8 kV air, ±4 kV contact                                                                               | ±8 kV air, ±4 kV contact                                                                   | ±8 kV air, ±4 kV contact                                                                   | ±8 kV air, ±4 kV contact                                                                   |
| Radiated immunity<br>IEC 60947-4-1                                                     | 10 V/m 80–1000 mHz<br>80% amplitude modulated<br>1 kHz sine wave                                       | 10 V/m 80–1000 mHz<br>80% amplitude modulated<br>1 kHz sine wave                           | 10 V/m 80–1000 mHz<br>80% amplitude modulated<br>1 kHz sine wave                           | 10 V/m 80–1000 mHz<br>80% amplitude modulated<br>1 kHz sine wave                           |
| Conducted immunity<br>IEC 60947-4-1                                                    | 140 dBuV (10V rms)<br>150 kHz–80 mHz                                                                   | 140 dBuV (10V rms)<br>150 kHz–80 mHz                                                       | 140 dBuV (10V rms)<br>150 kHz–80 mHz                                                       | 140 dBuV (10V rms)<br>150 kHz–80 mHz                                                       |
| Fast transient immunity<br>IEC 60947-4-1 (Table 13) IEC 6100-4-4                       | ±2 kV using direct method                                                                              | ±2 kV supply and control,<br>±1 kV communication                                           | ±2 kV supply and control,<br>±1 kV communication                                           | ±2 kV supply and control,<br>±1 kV communication                                           |
| Surge immunity<br>IEC 60947-4-1 (Table 13)<br>IEC 61000-4-5 Class 3                    | User IO and communication lines <sup>①</sup> :<br>±1 kV line-to-line (DM)<br>±2 kV line-to-ground (CM) | User IO and communication lines:<br>±0.5 kV line-to-line (DM)<br>±1 kV line-to-ground (CM) | User IO and communication lines:<br>±0.5 kV line-to-line (DM)<br>±1 kV line-to-ground (CM) | User IO and communication lines:<br>±0.5 kV line-to-line (DM)<br>±1 kV line-to-ground (CM) |
| Electromagnetic field <sup>①</sup><br>IEC 60947-4-1 (Table 13) IEC 61000-4-3           | 10 V/m                                                                                                 | 10 V/m                                                                                     | 10 V/m                                                                                     | 10 V/m                                                                                     |
| <b>Environmental Ratings</b>                                                           |                                                                                                        |                                                                                            |                                                                                            |                                                                                            |
| Ambient temperature (operating)                                                        | –4° to 122°F (–20° to 50°C)                                                                            | –13° to 122°F (–25° to 50°C)                                                               | –13° to 122°F (–25° to 50°C)                                                               | –13° to 122°F (–25° to 50°C)                                                               |
| Ambient temperature (storage)                                                          | –40° to 185°F (–40° to 85°C)                                                                           | –40° to 185°F (–40° to 85°C)                                                               | –40° to 185°F (–40° to 85°C)                                                               | –40° to 185°F (–40° to 85°C)                                                               |
| Operating humidity                                                                     | 5–95% noncondensing                                                                                    | 5–95% noncondensing                                                                        | 5–95% noncondensing                                                                        | 5–95% noncondensing                                                                        |
| Altitude (no derating)                                                                 | 2000m                                                                                                  | 2000m                                                                                      | 2000m                                                                                      | 2000m                                                                                      |
| Shock (IEC 60068-2-27)                                                                 | 15G any direction                                                                                      | 15G any direction                                                                          | 15G any direction                                                                          | 15G any direction                                                                          |
| Vibration (IEC 60068-2-6)                                                              | 3G any direction                                                                                       | 3G any direction                                                                           | 3G any direction                                                                           | 3G any direction                                                                           |
| Pollution degree per IEC 60947-1                                                       | 3                                                                                                      | 3                                                                                          | 3                                                                                          | 3                                                                                          |
| Degree of protection                                                                   | IP20                                                                                                   | IP20                                                                                       | IP20                                                                                       | IP20                                                                                       |
| Overvoltage category per UL 508                                                        | III                                                                                                    | III                                                                                        | III                                                                                        | III                                                                                        |
| <b>DeviceNet</b>                                                                       |                                                                                                        |                                                                                            |                                                                                            |                                                                                            |
| DeviceNet connections                                                                  | —                                                                                                      | Group 2, polling, bit strobe,<br>explicit, no UCMM                                         | —                                                                                          | Group 2, polling, bit strobe,<br>explicit, no UCMM                                         |
| DeviceNet baud rate                                                                    | —                                                                                                      | 125K, 250K, 500K                                                                           | —                                                                                          | 125K, 250K, 500K                                                                           |
| <b>Ethernet</b>                                                                        |                                                                                                        |                                                                                            |                                                                                            |                                                                                            |
| Ethernet connections                                                                   | —                                                                                                      | —                                                                                          | —                                                                                          | Integrated two-port switch with dual<br>RJ45 Ethernet connections                          |
| Ethernet type                                                                          | —                                                                                                      | —                                                                                          | —                                                                                          | Ethernet 10/100 Mbps, AutoMDX,<br>Auto Negotiation                                         |
| <b>PROFIBUS</b>                                                                        |                                                                                                        |                                                                                            |                                                                                            |                                                                                            |
| PROFIBUS connections                                                                   | —                                                                                                      | —                                                                                          | Group 2, polling, bit strobe,<br>explicit, no UCMM                                         | —                                                                                          |
| PROFIBUS baud rate                                                                     | —                                                                                                      | —                                                                                          | 9.6K, 19.2K, 45.45K, 93.75K, 187.5K,<br>500K, 1.5M, 3M, 6M, 12M                            | —                                                                                          |

**Note**

<sup>①</sup> Relates to C441M only.

## Communication Modules, continued

| Description                                     | Modbus                          | DeviceNet                       | PROFIBUS                        | Ethernet                        |
|-------------------------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| <b>C441_ 24 Vdc Input</b>                       |                                 |                                 |                                 |                                 |
| Nominal input voltage                           | 24 Vdc                          | 24 Vdc                          | 24 Vdc                          | 24 Vdc                          |
| Operating voltage                               | 18–30 Vdc                       | 18–30 Vdc                       | 18–30 Vdc                       | 18–30 Vdc                       |
| Number of inputs                                | 4                               | 4                               | 4                               | 4                               |
| Signal delay                                    | 5 ms (programmable to 65 sec)   | 5 ms (programmable to 65 sec)   | 5 ms (programmable to 65 sec)   | 5 ms (programmable to 65 sec)   |
| OFF-state voltage                               | <6 Vdc                          | <6 Vdc                          | <6 Vdc                          | <6 Vdc                          |
| ON-state voltage                                | >18 Vdc                         | >18 Vdc                         | >10 Vdc                         | >18 Vdc                         |
| Nominal input current                           | 5 mA                            | 5 mA                            | 5 mA                            | 5 mA                            |
| Isolation                                       | 1500V                           | 1500V                           | 1500V                           | 1500V                           |
| Terminal screw torque                           | 7–9 in-lb                       | 7–9 in-lb                       | 7–9 in-lb                       | 7–9 in-lb                       |
| 24V source current                              | 50 mA                           | 50 mA                           | 50 mA                           | 50 mA                           |
| <b>Operating Voltage Range—DC Input Modules</b> |                                 |                                 |                                 |                                 |
| OFF state                                       | 0–6 Vdc                         | 0–6 Vdc                         | 0–6 Vdc                         | 0–6 Vdc                         |
| Transition region                               | 6–18 Vdc                        | 6–18 Vdc                        | 6–18 Vdc                        | 6–18 Vdc                        |
| ON state                                        | 18–30 Vdc                       | 18–30 Vdc                       | 18–30 Vdc                       | 18–30 Vdc                       |
| <b>C441_ 120 Vac Input</b>                      |                                 |                                 |                                 |                                 |
| Nominal input voltage                           | 120 Vac                         | 120 Vac                         | 120 Vac                         | 120 Vac                         |
| Operating voltage                               | 80–140 Vac                      | 80–140 Vac                      | 80–140 Vac                      | 80–140 Vac                      |
| Number of inputs                                | 4                               | 4                               | 4                               | 4                               |
| OFF-state voltage                               | <30 Vac                         | <30 Vac                         | <20 Vac                         | <30 Vac                         |
| ON-state voltage                                | >80 Vac                         | >80 Vac                         | >70 Vac                         | >80 Vac                         |
| Nominal input current                           | 15 mA                           | 15 mA                           | 15 mA                           | 15 mA                           |
| Signal delay                                    | 1/2 cycle                       | 1/2 cycle                       | 1/2 cycle                       | 1/2 cycle                       |
| Isolation                                       | 1500V                           | 1500V                           | 1500V                           | 1500V                           |
| Terminal screw torque                           | 7–9 in-lb                       | 7–9 in-lb                       | 7–9 in-lb                       | 7–9 in-lb                       |
| <b>Operating Voltage Range—AC Input Modules</b> |                                 |                                 |                                 |                                 |
| OFF state                                       | 0–30 Vac                        | 0–30 Vac                        | 0–30 Vac                        | 0–30 Vac                        |
| Transition region                               | 30–80 Vac                       | 30–80 Vac                       | 30–80 Vac                       | 30–80 Vac                       |
| ON state                                        | 80–140 Vac                      | 80–140 Vac                      | 80–140 Vac                      | 80–140 Vac                      |
| <b>Output Modules</b>                           |                                 |                                 |                                 |                                 |
| Nominal voltage                                 | 120 Vac<br>24 Vdc               | 120 Vac<br>24 Vdc               | 120 Vac<br>24 Vdc               | 120 Vac<br>24 Vdc               |
| Number of outputs                               | (2) 1NO Form A<br>1NO/NC Form C | (2) 1NO Form A<br>1NO/NC Form C | (2) 1NO Form A<br>1NO/NC Form C | (2) 1NO Form A<br>1NO/NC Form C |
| Relay OFF time                                  | 3 ms                            | 3 ms                            | 3 ms                            | 3 ms                            |
| Relay ON time                                   | 7 ms                            | 7 ms                            | 7 ms                            | 7 ms                            |
| Max. current per point <sup>①</sup>             | 5A (B300 rated)                 | 5A (B300 rated)                 | 5A (B300 rated)                 | 5A (B300 rated)                 |
| Electrical life                                 | 100,000 cycles                  | 100,000 cycles                  | 100,000 cycles                  | 100,000 cycles                  |
| Mechanical life                                 | 1,000,000 cycles                | 1,000,000 cycles                | 1,000,000 cycles                | 1,000,000 cycles                |

**Note**

<sup>①</sup> Relates to C441M only.

**Short Circuit Ratings (North America CSA, cUL)**

Changes to UL 508A and NEC in recent years have brought a focus to control panel safety with regard to short-circuit current ratings (SCCR). Eaton's C440 electronic overload relays combined with **XT** series IEC and Freedom Series NEMA contactors provide a wide variety of SCCR solutions needed for a variety of applications. The SCCR data in this document reflects the latest information as of April 2010.

**C440/XT Standalone Overload Relays (XT, C440)**

| Overload<br>FLA Range | Maximum<br>Operating<br>Voltage | Standard-Fault Short Circuit Data |                                   |                                | High-Fault Short Circuit Data<br>Fuses (RK5, J, CC) |           |                      | Thermal-Magnetic Circuit Breakers |           |                              |
|-----------------------|---------------------------------|-----------------------------------|-----------------------------------|--------------------------------|-----------------------------------------------------|-----------|----------------------|-----------------------------------|-----------|------------------------------|
|                       |                                 | 600V (kA)                         | Maximum<br>Fuse Size (A)<br>(RK5) | Maximum<br>Breaker<br>Size (A) | 480V (kA)                                           | 600V (kA) | Maximum<br>Fuse Size | 480V (kA)                         | 600V (kA) | Maximum<br>Breaker Size      |
|                       |                                 |                                   |                                   |                                |                                                     |           |                      |                                   |           |                              |
| 0.33–1.65A            | 600 Vac                         | 1                                 | 6                                 | 15                             | —                                                   | —         | —                    | —                                 | —         | —                            |
| 1–5A                  | 600 Vac                         | 5                                 | 20                                | 20                             | 100                                                 | 100       | 30                   | 100                               | 35        | 20                           |
| 4–20A                 | 600 Vac                         | 5                                 | 80                                | 80                             | 100                                                 | 100       | 100                  | 100                               | 35        | 80                           |
| 9–45A                 | 600 Vac                         | 5                                 | 175                               | 175                            | 100                                                 | 100       | 100                  | 100                               | 35        | 100/175 (480/600)            |
| 20–100A               | 600 Vac                         | 10                                | 400                               | 400                            | 100                                                 | 100       | 200                  | 150                               | 35        | 250/400 (480/600)            |
| 28–140A               | 600 Vac                         | 10                                | 450                               | 500                            | 100                                                 | 100       | 400                  | 100                               | 65        | 400                          |
| 35–175A               | 690 Vac                         | 10                                | 500 (gG)                          | 350 (690 Vac)<br>320 (415 Vac) | 100                                                 | 100       | 500 (gG)             | 100 (415 Vac)                     | —         | 350 (LGC3350)<br>320 (NZMH3) |

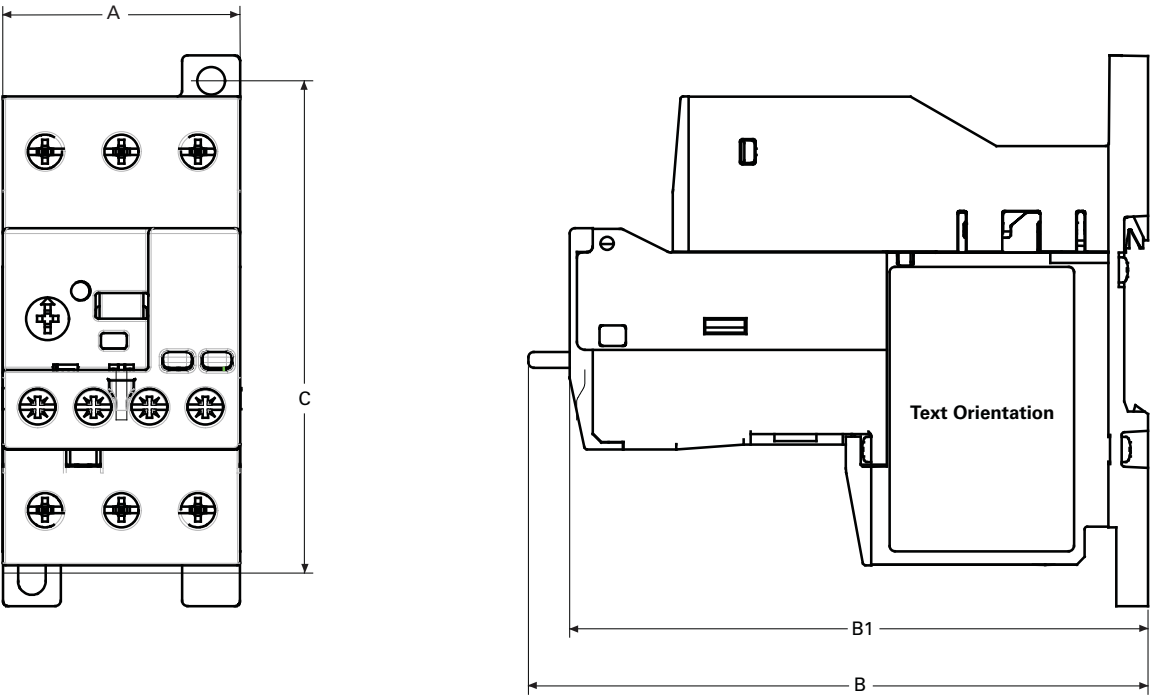
**IEC XT Starters with XT Electronic Overload Relays**

| Contactor<br>Frame Size | Maximum<br>Operating<br>Voltage | High-Fault Short Circuit Data<br>Fuses (RK5, J, CC) |      | Maximum<br>Fuse Size | Thermal-Magnetic Circuit Breakers |      |                                |
|-------------------------|---------------------------------|-----------------------------------------------------|------|----------------------|-----------------------------------|------|--------------------------------|
|                         |                                 | 480V                                                | 600V |                      | 480V                              | 600V | Maximum<br>Breaker Size        |
| B                       | 1–5A                            | 100                                                 | 100  | 30                   | —                                 | —    | —                              |
|                         | 4–20A                           | 100                                                 | 100  | 30                   | —                                 | —    | —                              |
| C                       | 1–5A                            | 100                                                 | 100  | 60                   | —                                 | —    | —                              |
|                         | 4–20A                           | 100                                                 | 100  | 60                   | —                                 | —    | —                              |
|                         | 9–45A                           | 100                                                 | 100  | 60                   | —                                 | —    | —                              |
| D                       | 9–45A                           | 100                                                 | 100  | 200                  | 65                                | 35   | 175                            |
|                         | 20–100A                         | 100                                                 | 100  | 200                  | 65                                | 35   | 175                            |
| F                       | 20–100A                         | 100                                                 | 100  | 200                  | 65                                | 65   | 350                            |
| G                       | 20–100A                         | 100                                                 | 100  | 200                  | 65                                | 65   | 350                            |
|                         | 35–175A                         | 100                                                 | 100  | 400                  | 65                                | 30   | 250 (480 Vac)<br>350 (600 Vac) |
| H                       | 35–175A                         | 100                                                 | 100  | 400                  | 65                                | 30   | 400                            |

Dimensions

Approximate Dimensions in Inches (mm)

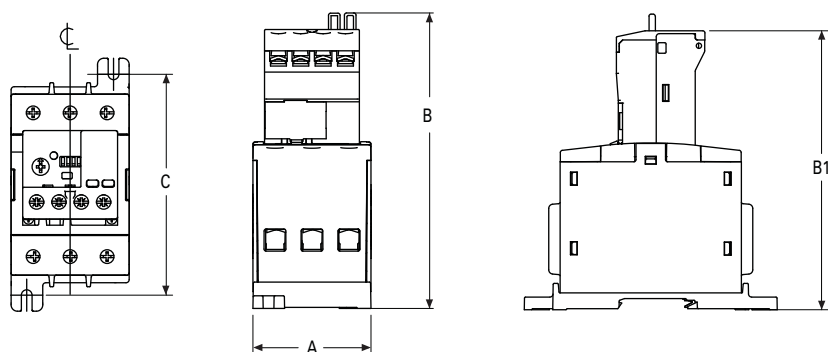
45 mm C440/XT Electronic Overload Relays



|                          | Width<br>A  | Depth<br>B1  | B            | Mounting Holes<br>(Height) C |
|--------------------------|-------------|--------------|--------------|------------------------------|
| <b>NEMA Starter Size</b> |             |              |              |                              |
| 00-2                     | 1.80 (45.7) | 4.32 (109.7) | 4.63 (117.5) | 3.68 (93.5)                  |
| <b>XT IEC Frame Size</b> |             |              |              |                              |
| B, C, D                  | 1.80 (45.7) | 4.00 (101.6) | 4.30 (109.2) | 3.68 (93.5)                  |
| <b>Standalone</b>        |             |              |              |                              |
| 0.35-45A                 | 1.80 (45.7) | 4.30 (109.2) | 4.60 (116.8) | 3.68 (93.5)                  |

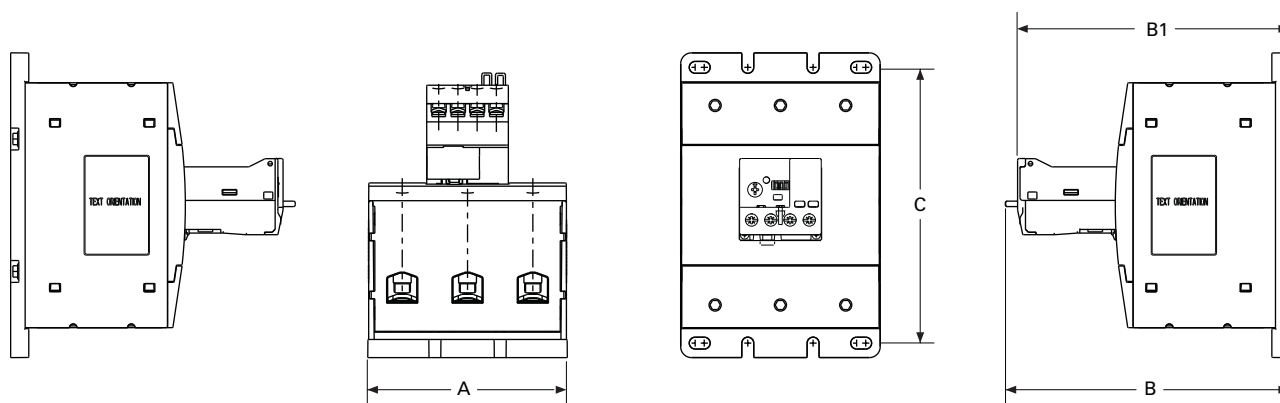
Approximate Dimensions in Inches (mm)

## 55 mm C440/XT Electronic Overload Relays



|                          | Width<br>A  | Height To Reset<br>B | B1           | Mounting Depth<br>C |
|--------------------------|-------------|----------------------|--------------|---------------------|
| <b>NEMA Starter Size</b> |             |                      |              |                     |
| 3                        | 2.21 (56.0) | 5.52 (140.2)         | 5.21 (132.4) | 4.13 (104.8)        |
| <b>XT IEC Frame Size</b> |             |                      |              |                     |
| D, F, G                  | 2.21 (56.0) | 5.52 (140.2)         | 5.21 (132.4) | 4.13 (104.8)        |
| <b>Standalone</b>        |             |                      |              |                     |
| 20–100A                  | 2.21 (56.0) | 5.52 (140.2)         | 5.21 (132.4) | 4.13 (104.8)        |

## 110 mm C440/XT Electronic Overload Relays



|                          | Width<br>A   | Height To Reset<br>B | B1           | Mounting Depth<br>C |
|--------------------------|--------------|----------------------|--------------|---------------------|
| <b>NEMA Starter Size</b> |              |                      |              |                     |
| 4                        | 4.33 (110.0) | 6.20 (157.0)         | 5.90 (150.0) | 6.00 (152.0)        |
| <b>XT IEC Frame Size</b> |              |                      |              |                     |
| G                        | 4.33 (110.0) | 6.20 (157.0)         | 5.90 (150.0) | 6.00 (152.0)        |
| H                        | 4.33 (110.0) | 6.20 (157.0)         | 5.90 (150.0) | 6.00 (152.0)        |
| <b>Standalone</b>        |              |                      |              |                     |
|                          | 4.33 (110.0) | 6.20 (157.0)         | 5.90 (150.0) | 6.00 (152.0)        |
| <b>Pass-Through</b>      |              |                      |              |                     |
|                          | 4.33 (110.0) | 5.90 (149.0)         | 5.60 (142.0) | 4.00 (102.0)        |

## Manual Motor Protectors



## Manual Motor Protectors

## Product Description

Eaton's new **XT** family of manual motor protectors (MMPs) features a pushbutton or rotary ON/OFF manual disconnect, Class 10 adjustable bimetallic overload relay and fixed magnetic short-circuit trip capability in one compact unit. Two frame sizes are available: Frame B (45 mm) for motors with FLA ratings up to 32A and Frame D (55 mm) covers motor FLA ratings up to 65A.

## Application Description

The XTPB and XTPR MMPs can be used in the following applications.

**Motor Protective Circuit Breaker**

In many countries outside of the United States and Canada, especially Europe, the MMPs are tested and classified as thermal-magnetic circuit breakers for use in motor branch circuits. This can be an important consideration for all companies who export their equipment and machines internationally. Both the XTPB and XTPR conform to IEC/EN 60947 and have the CE Mark.

**Manual Motor Protectors**

The XTPB and XTPR MMPs are UL listed under UL 508 as manual motor protectors. They provide an economical solution for applications requiring simple manual starting and stopping of motors. When used as a manual starter, they are typically installed in an enclosure. Many enclosures are offered as accessories for the MMPs. Separate short-circuit protective devices, such as circuit breakers or fuses, are wired ahead of the MMPs. The short-circuit protective device should be sized per the NEC and should not exceed 400% of the maximum FLA dial setting of the MMP.

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**Description**

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| Miniature Controls .....                          | <b>V5-T1-18</b>  |
| Contactors and Starters .....                     | <b>V5-T1-35</b>  |
| XTSE Contactors .....                             | <b>V5-T1-128</b> |
| Thermal Overload Relays .....                     | <b>V5-T1-130</b> |
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| Manual Motor Protectors                           |                  |
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| <b>XT</b> Electronic Manual Motor Protector ..... | <b>V5-T1-219</b> |
| EMS—Electronic Motor Starter .....                | <b>V5-T1-232</b> |
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**Group Motor Installations**

A group motor installation can be defined as more than one motor circuit protected by a single set of fuses or circuit breaker on a motor branch circuit. This eliminates the need for individual fuses or circuit breakers for each motor circuit. Substantial component cost savings, panel space savings and reduced wiring installation time can be achieved in group motor installations.

The MMPs are tested and listed for group installation. If remote operation is required, a magnetic contactor can be wired in series with the MMP.

Article 430.53 of the NEC contains the rules and requirements for group motor installations. Refer to application note AP03402001E for NEC requirement for group motor installation.

**Individual Branch Motor Applications**

A UL 508 Type E self-protected manual combination starter/motor controller consists of a single device possessing four essential elements: disconnect, short circuit protection, motor controller, and motor overload protection. Some MMPs require use of a lineside adapter for this type of approval. When tested as an official combination by UL, this device takes the place of a fuse-starter or breaker-starter, **XT** Type E MMPs are self-protected, meaning they do not need additional short circuit protection of a fuse or breaker. Type E devices can also be used with a contactor or other types of UL approved controllers. If tested with a contactor, the combination motor controller becomes a Type F device. See **Page V5-T1-199** for XTFC Type F devices.



## Features and Benefits

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Class 10 overload protection
- Phase loss sensitivity
- Ambient temperature compensation to IEC/EN 60947, VDE 0660
- Fixed short-circuit trip—14 times maximum setting of overload FLA dial
- Type 2 coordination per IEC 947
- Identification markers standard on starter faceplate
- Motor applications from 0.1A to 65A
- Built-in heater and magnetic trip elements to protect the motor
- Adjustment dial for setting motor FLA
- DIN rail mount
- Terminal types available:
  - Screw terminals
  - Screw (line) and spring cage (load) terminals
  - Spring cage terminals
- Accessories include:
  - Front and side auxiliary contacts
  - Trip indicating contacts
  - Tamperproof cover for OLR dial
  - Undervoltage release
  - Shunt trip
  - Through-the-door operators
  - Enclosures
  - Three-phase line side connecting links

## Standards and Certifications

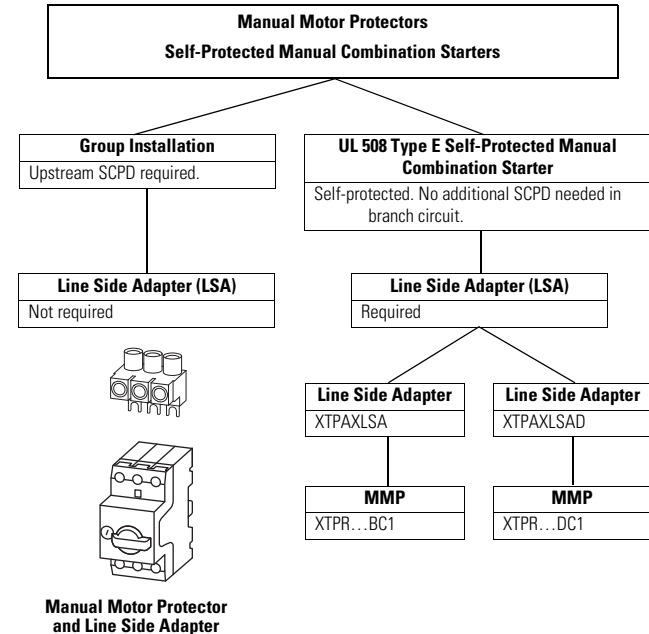
- ATEX
- CE approved
- UL listed File No. E36332
- UL listed File No. E123500
- UL 508 group motor and Type E compliant
- IEC/EN 60947
- CSA File 229767, Class 3211-05
- DIN VDE 0660 Part 100, Part 101 and Part 102



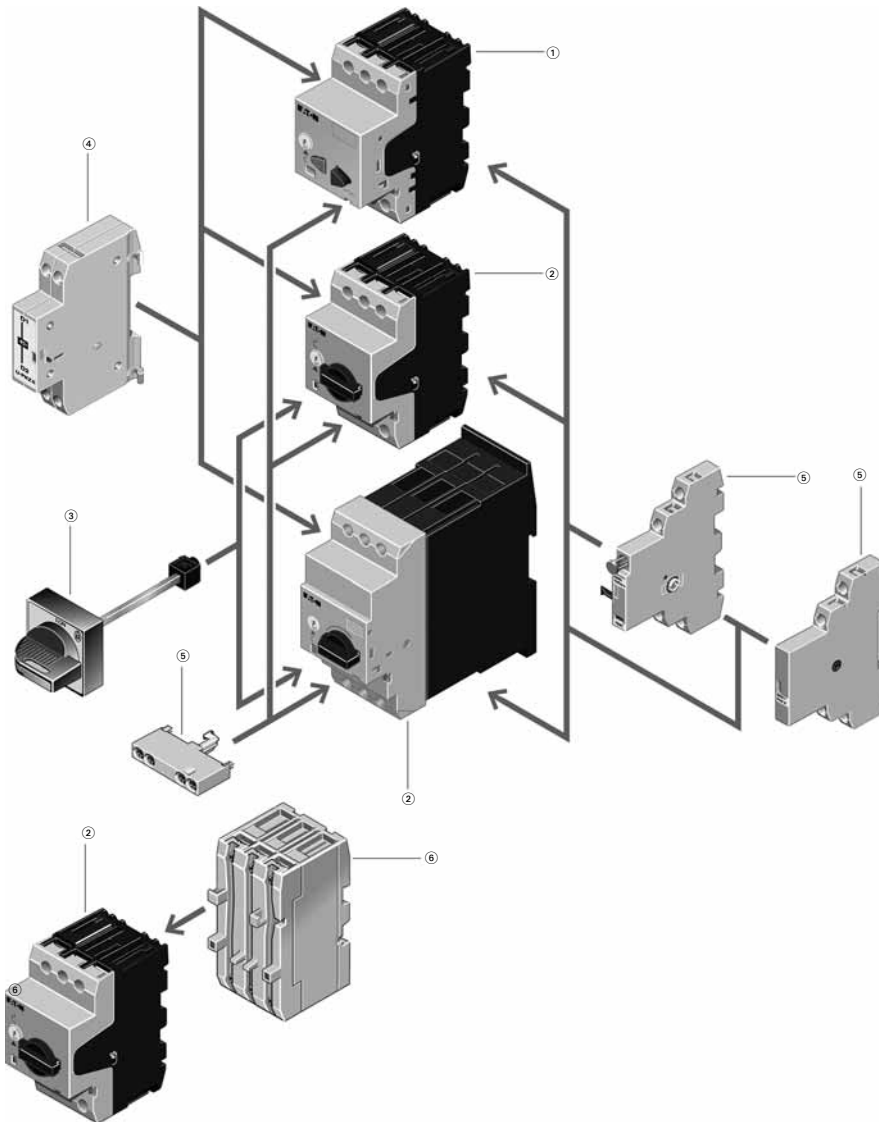
**Note:** For Type 2 Coordination of MMCs, see **Page V5-T1-237**.

## Line Side Adapters—When to Use Them

**Note:** Line side adapters are not required for non-US applications. Most countries outside of the US classify the MMP as a thermal magnetic circuit breaker.



## Product Identification



## Notes

## Basic Units

- ① XTPB pushbutton manual motor protectors (see [Page V5-T1-163](#))
  - Rated operational current up to 25A
  - Switching capacity 50 kA/415V
  - Short-circuit release, adjustable  $0.6-1 \times I_n$
  - Single-phasing sensitive
- ② XTPR rotary manual motor protectors (see [Page V5-T1-164](#))
  - Rated operational current up to 32A, 65A
  - Switching capacity 150/50 kA/415V
  - Short-circuit release, fixed setting to  $14 \times I_n$
  - Overload release, adjustable  $0.6-1 \times I_n$
  - Single-phasing sensitive
  - With screws or spring-loaded terminals

## Mounting Accessories

- ③ Rotary handle mechanism (see [Page V5-T1-169](#))
  - ON/OFF/tripped switch position indication
  - Lockable door/cover interlock
  - Extendable y plug fit extension shaft
  - Handle latched in switch positions
  - Optionally also without locking and door interlock function
- Insulated enclosures (see [Page V5-T1-172](#))
  - Surface mounting, enclosures, IP40, IP55 and IP40 and IP55 front flush mounting enclosure
- Mounting/wiring (see [Page V5-T1-169](#))
  - Component adapter for busbar mounting
  - Three-phase commoning link for side-by-side-mounting
  - Mounting kits for rapid mounting of direct-on-line, reversing and star-delta starters

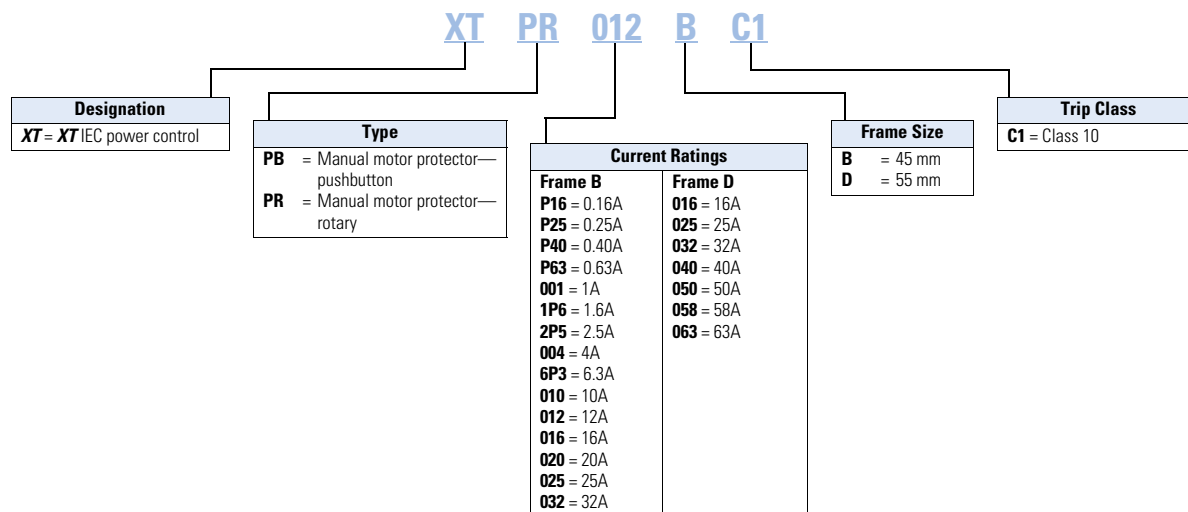
## Add-On Functions

- ④ Voltage releases (see [Page V5-T1-168](#))
  - Undervoltage release
  - Shunt releases
  - With screws or spring-loaded terminals
- ⑤ Standard auxiliary contacts (see [Page V5-T1-166](#))
  - ON/OFF indication
  - Differential fault indication overload/short-circuit release
  - ON/OFF for (high capacity) contact module
  - ON/OFF for starter combination
  - With early-make contacts
  - With screws or spring-loaded terminals
- ⑥ Current limiter (see [Page V5-T1-168](#))
  - Increases the switching capacity of the 10–25A manual motor protectors to 100 kA/440V
  - Can be used for individual group protection

## 1

## Catalog Number Selection

## XT Manual Motor Protectors



## Product Selection

### Product Selection for Manual Motor Starter Applications

When ordering, specify catalog numbers according to the following stipulations:

**XT** manual motor protectors are selected based on the overload current range required for a given motor. This current range is determined from the motor full load ampere rating and motor service factor usually found on the motor nameplate.

**For motors with service factors less than 1.15,** multiply the motor FLA by 0.90 to select appropriate MMP.

Example: For motor having FLA of 6.4A and service factor of 1.0 ( $6.4A \times 0.90 = 5.76A$ ) select catalog number XTPB6P3B01.

See Application Note—  
AP03402001E.

**For motor with service factor of 1.15 or greater,** use motor nameplate full load amperes to select the appropriate MMP.

Example: For motor having FLA of 11A and service factor of 1.15, select catalog number XTPR012BC1.

Frame B



**XTPB Pushbutton Manual Motor Protectors—Global and North American Ratings—Frame B**  
Type 1 and Type 2 Coordination Motor Protective Device with Thermal and Magnetic Trip

| Rated<br>Uninterrupted<br>Current—<br>I <sub>u</sub> = I <sub>e</sub> (Amps) | FLA<br>Adjustment<br>Range/<br>Overload<br>Release—<br>I <sub>r</sub> (Amps)<br> | Short<br>Circuit<br>Release—<br>I <sub>m</sub> (Amps)<br> | Maximum Motor Ratings ①          |              |      |      |              |      |       | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |       |            |  | Screw Terminal<br>Catalog Number |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------|------|------|--------------|------|-------|-----------------------------------------------------|-------|------------|--|----------------------------------|
|                                                                              |                                                                                                                                                                   |                                                                                                                                            | Maximum kW Rating<br>AC-3—P (kW) |              |      |      |              |      |       | Three-Phase                                         |       |            |  |                                  |
|                                                                              |                                                                                                                                                                   |                                                                                                                                            | Three-Phase                      |              |      |      |              |      |       | Three-Phase                                         |       |            |  |                                  |
|                                                                              |                                                                                                                                                                   |                                                                                                                                            | 220–<br>240V                     | 380–<br>415V | 440V | 500V | 660–<br>690V | 200V | 240V  | 480V                                                | 600V  |            |  |                                  |
| 0.16                                                                         | 0.1–0.16                                                                                                                                                          | 2.2                                                                                                                                        | —                                | —            | —    | —    | 0.06         | ②    | ②     | ②                                                   | ②     | XTPBP16BC1 |  |                                  |
| 0.25                                                                         | 0.16–0.25                                                                                                                                                         | 3.5                                                                                                                                        | —                                | 0.06         | 0.06 | 0.06 | 0.12         | ②    | ②     | ②                                                   | ②     | XTPBP25BC1 |  |                                  |
| 0.4                                                                          | 0.25–0.4                                                                                                                                                          | 5.6                                                                                                                                        | 0.06                             | 0.09         | 0.12 | 0.12 | 0.18         | ②    | ②     | ②                                                   | ②     | XTPBP40BC1 |  |                                  |
| 0.63                                                                         | 0.4–0.63                                                                                                                                                          | 8.8                                                                                                                                        | 0.09                             | 0.12         | 0.18 | 0.25 | 0.25         | ②    | ②     | ②                                                   | ②     | XTPBP63BC1 |  |                                  |
| 1                                                                            | 0.63–1                                                                                                                                                            | 14                                                                                                                                         | 0.12                             | 0.25         | 0.25 | 0.37 | 0.55         | ②    | ②     | 2                                                   | 1/2   | XTPB001BC1 |  |                                  |
| 1.6                                                                          | 1–1.6                                                                                                                                                             | 22                                                                                                                                         | 0.25                             | 0.55         | 0.55 | 0.75 | 1.1          | ②    | ②     | 3/4                                                 | 3/4   | XTPB1P6BC1 |  |                                  |
| 2.5                                                                          | 1.6–2.5                                                                                                                                                           | 35                                                                                                                                         | 0.37                             | 0.75         | 1.1  | 1.1  | 1.5          | 1/2  | 1/2   | 1                                                   | 1-1/2 | XTPB2P5BC1 |  |                                  |
| 4                                                                            | 2.5–4                                                                                                                                                             | 56                                                                                                                                         | 0.75                             | 1.5          | 1.5  | 2.2  | 3            | 3/4  | 3/4   | 2                                                   | 3     | XTPB004BC1 |  |                                  |
| 6.3                                                                          | 4–6.3                                                                                                                                                             | 88                                                                                                                                         | 1.1                              | 2.2          | 3    | 3    | 4            | 1    | 1-1/2 | 3                                                   | 5     | XTPB6P3BC1 |  |                                  |
| 10                                                                           | 6.3–10                                                                                                                                                            | 140                                                                                                                                        | 2.2                              | 4            | 4    | 4    | 7.5          | 3    | 3     | 7-1/2                                               | 10    | XTPB010BC1 |  |                                  |
| 12                                                                           | 8–12                                                                                                                                                              | 168                                                                                                                                        | 3                                | 5.5          | 5.5  | 5.5  | 11           | 3    | 3     | 7-1/2                                               | 10    | XTPB012BC1 |  |                                  |
| 16                                                                           | 10–16                                                                                                                                                             | 224                                                                                                                                        | 4                                | 7.5          | 9    | 9    | 12.5         | 3    | 5     | 10                                                  | 10    | XTPB016BC1 |  |                                  |
| 20                                                                           | 16–20                                                                                                                                                             | 280                                                                                                                                        | 5.5                              | 9            | 11   | 12.5 | 15           | 5    | —     | —                                                   | 15    | XTPB020BC1 |  |                                  |
| 25                                                                           | 20–25                                                                                                                                                             | 350                                                                                                                                        | 5.5                              | 12.5         | 12.5 | 15   | 22           | —    | 7-1/2 | 15                                                  | 20    | XTPB025BC1 |  |                                  |

#### Notes

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.

Service Factor (SF)—Setting  $I_r$  of current scale in dependence of load factor:

$$SF = 1.15 \rightarrow I_r = 1 \times I_{n \text{ mot}}$$

$$SF = 1 \rightarrow I_r = 0.9 \times I_{n \text{ mot}}$$

For manual motor protective circuit breaker switching capacity, see **Page V5-T1-181**.

① Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

Frame B



### XTPR Rotary Manual Motor Protectors with Screw Terminals— Global Ratings and North American Ratings—Frame B

Type 1 and Type 2 Coordination Motor Protective Device with Thermal and Magnetic Trip

| Rated<br>Uninterrupted<br>Current—<br>$I_n = I_c$ (Amps) | FLA<br>Adjustment<br>Range/<br>Overload<br>Release—<br>$I_r$ (Amps)               | Short<br>Circuit<br>Release—<br>$I_m$ (Amps)                                      | Maximum Motor Ratings ①          |              |      |      |              |       | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |       |       |            | Screw Terminal<br>Catalog Number |
|----------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|--------------|------|------|--------------|-------|-----------------------------------------------------|-------|-------|------------|----------------------------------|
|                                                          |  |  | Maximum kW Rating<br>AC-3—P (kW) |              |      |      | Three-Phase  |       |                                                     |       |       |            |                                  |
|                                                          |                                                                                   |                                                                                   | 220–<br>240V                     | 380–<br>415V | 440V | 500V | 660–<br>690V | 200V  | 240V                                                | 480V  | 600V  |            |                                  |
| 0.16                                                     | 0.1–0.16                                                                          | 2.2                                                                               | —                                | —            | —    | —    | 0.06         | ②     | ②                                                   | ②     | ②     | XTPRP16BC1 |                                  |
| 0.25                                                     | 0.16–0.25                                                                         | 3.5                                                                               | —                                | 0.06         | 0.06 | 0.06 | 0.12         | ②     | ②                                                   | ②     | ②     | XTPRP25BC1 |                                  |
| 0.4                                                      | 0.25–0.4                                                                          | 5.6                                                                               | 0.06                             | 0.09         | 0.12 | 0.12 | 0.18         | ②     | ②                                                   | ②     | ②     | XTPRP40BC1 |                                  |
| 0.63                                                     | 0.4–0.63                                                                          | 8.8                                                                               | 0.09                             | 0.12         | 0.18 | 0.25 | 0.25         | ②     | ②                                                   | ②     | ②     | XTPRP63BC1 |                                  |
| 1                                                        | 0.63–1                                                                            | 14                                                                                | 0.12                             | 0.25         | 0.25 | 0.37 | 0.55         | ②     | ②                                                   | ②     | ②     | XTPR001BC1 |                                  |
| 1.6                                                      | 1–1.6                                                                             | 22                                                                                | 0.25                             | 0.55         | 0.55 | 0.75 | 1.1          | ②     | ②                                                   | 3/4   | 3/4   | XTPR1P6BC1 |                                  |
| 2.5                                                      | 1.6–2.5                                                                           | 35                                                                                | 0.37                             | 0.75         | 1.1  | 1.1  | 1.5          | 1/2   | 1/2                                                 | 1     | 1-1/2 | XTPR2P5BC1 |                                  |
| 4                                                        | 2.5–4                                                                             | 56                                                                                | 0.75                             | 1.5          | 1.5  | 2.2  | 3            | 3/4   | 3/4                                                 | 2     | 3     | XTPR004BC1 |                                  |
| 6.3                                                      | 4–6.3                                                                             | 88                                                                                | 1.1                              | 2.2          | 3    | 3    | 4            | 1     | 1-1/2                                               | 3     | 5     | XTPR6P3BC1 |                                  |
| 10                                                       | 6.3–10                                                                            | 140                                                                               | 2.2                              | 4            | 4    | 4    | 7.5          | 3     | 3                                                   | 7-1/2 | 10    | XTPR010BC1 |                                  |
| 12                                                       | 8–12                                                                              | 168                                                                               | 3                                | 5.5          | 5.5  | 5.5  | 11           | 3     | 3                                                   | 7-1/2 | 10    | XTPR012BC1 |                                  |
| 16                                                       | 10–16                                                                             | 224                                                                               | 4                                | 7.5          | 9    | 9    | 12.5         | 3     | 5                                                   | 10    | 10    | XTPR016BC1 |                                  |
| 20                                                       | 16–20                                                                             | 280                                                                               | 5.5                              | 9            | 11   | 12.5 | 15           | 5     | —                                                   | —     | 15    | XTPR020BC1 |                                  |
| 25                                                       | 20–25                                                                             | 350                                                                               | 5.5                              | 12.5         | 12.5 | 15   | 22           | —     | 7-1/2                                               | 15    | 20    | XTPR025BC1 |                                  |
| 32                                                       | 25–32                                                                             | 448                                                                               | 7.5                              | 15           | 15   | 22   | 30           | 7-1/2 | 10                                                  | 20    | 25    | XTPR032BC1 |                                  |

Frame D



### XTPR Rotary Manual Motor Protectors with Screw Terminals— Global Ratings and North American Ratings—Frame D

Type 1 and Type 2 Coordination Motor Protective Device with Thermal and Magnetic Trip

| Rated<br>Uninterrupted<br>Current—<br>I <sub>n</sub> = I <sub>e</sub> (Amps) | FLA<br>Adjustment<br>Range/<br>Overload<br>Release—<br>I <sub>r</sub> (Amps)<br> | Short<br>Circuit<br>Release—<br>I <sub>sc</sub> (Amps)<br> | Maximum Motor Ratings ①          |              |      |      |              |                                                     |       |      |      |                                  |
|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------|------|------|--------------|-----------------------------------------------------|-------|------|------|----------------------------------|
|                                                                              |                                                                                                                                                                     |                                                                                                                                               | Maximum kW Rating<br>AC-3—P (kW) |              |      |      |              | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |       |      |      |                                  |
|                                                                              |                                                                                                                                                                     |                                                                                                                                               | Three-Phase                      |              |      |      |              | Three-Phase                                         |       |      |      |                                  |
|                                                                              |                                                                                                                                                                     |                                                                                                                                               | 220—<br>240V                     | 380—<br>415V | 440V | 500V | 660—<br>690V | 200V                                                | 240V  | 480V | 600V | Screw Terminal<br>Catalog Number |
| 16                                                                           | 10–16                                                                                                                                                               | 224                                                                                                                                           | 4                                | 7.5          | 9    | 9    | 12.5         | 3                                                   | 5     | 10   | 15   | XTPR016DC1                       |
| 25                                                                           | 16–25                                                                                                                                                               | 350                                                                                                                                           | 5.5                              | 12.5         | 12.5 | 15   | 22           | 7-1/2                                               | 7-1/2 | 15   | 20   | XTPR025DC1                       |
| 32                                                                           | 25–32                                                                                                                                                               | 448                                                                                                                                           | 7.5                              | 15           | 17.5 | 22   | 22           | 10                                                  | 10    | 20   | 30   | XTPR032DC1                       |
| 40                                                                           | 32–40                                                                                                                                                               | 560                                                                                                                                           | 11                               | 20           | 22   | 24   | 30           | 10                                                  | 15    | 30   | 30   | XTPR040DC1                       |
| 50                                                                           | 40–50                                                                                                                                                               | 700                                                                                                                                           | 14                               | 25           | 30   | 30   | 45           | 10                                                  | 15    | 30   | 40   | XTPR050DC1                       |
| 58                                                                           | 50–58                                                                                                                                                               | 812                                                                                                                                           | 17                               | 30           | 37   | 37   | 55           | 15                                                  | 15    | 40   | 50   | XTPR058DC1                       |
| 65                                                                           | 55–65                                                                                                                                                               | 882                                                                                                                                           | 18.5                             | 34           | 37   | 45   | 55           | 15                                                  | 15    | 40   | 50   | XTPR063DC1                       |

#### Notes

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.

Service Factor (SF)—Setting  $I_r$  of current scale in dependence of load factor:

$$SF = 1.15 \rightarrow I_r = 1 \times I_n \text{ mot}$$

$$SF = 1 \rightarrow I_r = 0.9 \times I_n \text{ mot}$$

For manual motor protective circuit breaker switching capacity, see **Page V5-T1-181**.

① Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

Frame B



### XTPR Manual Self-Protected Motor Starters—North American Ratings, UL 508 Type E—Frame B <sup>①</sup>

Motor Protective Device with Thermal and Magnetic Trip

| Rated<br>Uninterrupted<br>Current—<br>$I_u$ (Amps) | FLA Adjustment<br>Range/<br>Overload<br>Release—<br>$I_r$ (Amps)                  | Short<br>Circuit<br>Release—<br>$I_m$ (Amps) | Maximum Motor Ratings <sup>②</sup>      |       |       |       | Rated Short-Circuit<br>Breaking Capacity (kA)                                     |      |          | Line Side<br>Adapter <sup>①</sup><br>Catalog Number | Manual Motor<br>Protector—<br>Screw Terminal<br>Catalog Number |               |               |              |              |
|----------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------|-------|-------|-------|-----------------------------------------------------------------------------------|------|----------|-----------------------------------------------------|----------------------------------------------------------------|---------------|---------------|--------------|--------------|
|                                                    |  |                                              | Maximum hp Rating—P (hp)<br>Three-Phase |       |       |       |  | 200V | 240V     |                                                     |                                                                | 480V/<br>277V | 600V/<br>247V | 480/<br>277V | 600/<br>347V |
|                                                    |                                                                                   |                                              |                                         |       |       |       |                                                                                   |      |          |                                                     |                                                                |               |               |              |              |
| 0.16                                               | 0.1–0.16                                                                          | 2.2                                          | ③                                       | ③     | 1/2   | 1/2   | 50                                                                                | 50   | XTPAXLSA | XTPRP16BC1                                          |                                                                |               |               |              |              |
| 0.25                                               | 0.16–0.25                                                                         | 3.4                                          | ③                                       | ③     | 1/2   | 1/2   | 50                                                                                | 50   | XTPAXLSA | XTPRP25BC1                                          |                                                                |               |               |              |              |
| 0.4                                                | 0.25–0.4                                                                          | 5.6                                          | ③                                       | ③     | 1/2   | 1/2   | 50                                                                                | 50   | XTPAXLSA | XTPRP40BC1                                          |                                                                |               |               |              |              |
| 0.63                                               | 0.4–0.63                                                                          | 8.8                                          | ③                                       | ③     | 1/2   | 1/2   | 50                                                                                | 50   | XTPAXLSA | XTPRP63BC1                                          |                                                                |               |               |              |              |
| 1                                                  | 0.63–1                                                                            | 14                                           | ③                                       | ③     | 1/2   | 1/2   | 50                                                                                | 50   | XTPAXLSA | XTPR001BC1                                          |                                                                |               |               |              |              |
| 1.6                                                | 1–1.6                                                                             | 22                                           | ③                                       | ③     | 3/4   | 3/4   | 50                                                                                | 50   | XTPAXLSA | XTPR1P6BC1                                          |                                                                |               |               |              |              |
| 2.5                                                | 1.6–2.5                                                                           | 35                                           | 1/2                                     | 1/2   | 1     | 1-1/2 | 50                                                                                | 50   | XTPAXLSA | XTPR2P5BC1                                          |                                                                |               |               |              |              |
| 4                                                  | 2.5–4                                                                             | 56                                           | 3/4                                     | 1     | 2     | 3     | 50                                                                                | 50   | XTPAXLSA | XTPR004BC1                                          |                                                                |               |               |              |              |
| 6.3                                                | 4–6.3                                                                             | 88                                           | 1                                       | 1-1/2 | 3     | 5     | 65                                                                                | 50   | XTPAXLSA | XTPR6P3BC1                                          |                                                                |               |               |              |              |
| 10                                                 | 6.3–11                                                                            | 140                                          | 3                                       | 3     | 7-1/2 | 10    | 65                                                                                | 50   | XTPAXLSA | XTPR010BC1                                          |                                                                |               |               |              |              |
| 12                                                 | 8–12                                                                              | 168                                          | 3                                       | 3     | 7-1/2 | —     | 65                                                                                | —    | XTPAXLSA | XTPR012BC1                                          |                                                                |               |               |              |              |
| 16                                                 | 10–16                                                                             | 224                                          | 3                                       | 5     | 10    | —     | 42                                                                                | —    | XTPAXLSA | XTPR016BC1                                          |                                                                |               |               |              |              |
| 20                                                 | 16–20                                                                             | 280                                          | 5                                       | 5     | —     | —     | 18                                                                                | —    | XTPAXLSA | XTPR020BC1                                          |                                                                |               |               |              |              |
| 25                                                 | 20–25                                                                             | 350                                          | 5                                       | 7-1/2 | 15    | —     | 18                                                                                | —    | XTPAXLSA | XTPR025BC1                                          |                                                                |               |               |              |              |
| 32                                                 | 25–32                                                                             | 448                                          | 7-1/2                                   | 10    | 25    | —     | 18                                                                                | —    | XTPAXLSA | XTPR032BC1                                          |                                                                |               |               |              |              |

Frame D



### XTPR Circuit Breaker According to UL 489—Frame D

| Rated<br>Uninterrupted<br>Current—<br>I <sub>u</sub> (Amps) | FLA Adjustment<br>Range/<br>Overload<br>Release—<br>I <sub>r</sub> (Amps)           | Short<br>Circuit<br>Release—<br>I <sub>rm</sub> (Amps)                              | Maximum Motor Ratings ②                 |       |               |               | Rated Short-Circuit<br>Breaking Capacity (kA) |              |              | Manual Motor<br>Protector—<br>Screw Terminal<br>Catalog Number |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------|---------------|-----------------------------------------------|--------------|--------------|----------------------------------------------------------------|
|                                                             |  |  | Maximum hp Rating—P (hp)<br>Three-Phase |       |               |               |                                               |              |              |                                                                |
|                                                             |                                                                                     |                                                                                     | 200V                                    | 240V  | 480V/<br>277V | 600V/<br>247V | 240V                                          | 480/<br>277V | 600/<br>347V |                                                                |
| 16                                                          | 10–16                                                                               | 224                                                                                 | 3                                       | 5     | 10            | 10            | 65                                            | 65           | 25           | XTPR016DCB                                                     |
| 25                                                          | 16–25                                                                               | 350                                                                                 | 7-1/2                                   | 7-1/2 | 20            | 25            | 65                                            | 65           | 25           | XTPR025DCB                                                     |
| 32                                                          | 24–32                                                                               | 448                                                                                 | 10                                      | 10    | 25            | 30            | 65                                            | 65           | 25           | XTPR032DCB                                                     |

Frame D



### XTPR Manual Self-Protected Motor Starters—North American Ratings, UL 508 Type E—Frame D <sup>①</sup>

Motor Protective Device with Thermal and Magnetic Trip

| Rated<br>Uninterrupted<br>Current—<br>$I_u$ (Amps) | FLA Adjustment<br>Range/<br>Overload<br>Release—<br>$I_r$ (Amps)                    | Short<br>Circuit<br>Release—<br>$I_m$ (Amps)                                        | Maximum Motor Ratings <sup>②</sup>      |               |      |              | Rated Short-Circuit<br>Breaking Capacity (kA) |    |    | Line Side<br>Adapter <sup>①</sup><br>Catalog Number | Manual Motor<br>Protector—<br>Screw Terminal<br>Catalog Number |
|----------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|---------------|------|--------------|-----------------------------------------------|----|----|-----------------------------------------------------|----------------------------------------------------------------|
|                                                    |  |  | Maximum hp Rating—P (hp)<br>Three-Phase |               |      |              |                                               |    |    |                                                     |                                                                |
|                                                    | 200V                                                                                | 240V                                                                                | 480V/<br>277V                           | 600V/<br>247V | 240V | 480/<br>277V | 600/<br>347V                                  |    |    |                                                     |                                                                |
| 16                                                 | 10–16                                                                               | 224                                                                                 | 3                                       | 5             | 10   | 10           | 65                                            | 65 | 25 | XTPAXLSAD                                           | XTPR016DC1                                                     |
| 25                                                 | 16–25                                                                               | 350                                                                                 | 7-1/2                                   | 7-1/2         | 20   | 25           | 65                                            | 65 | 25 | XTPAXLSAD                                           | XTPR025DC1                                                     |
| 32                                                 | 25–32                                                                               | 448                                                                                 | 10                                      | 10            | 25   | 30           | 65                                            | 65 | 25 | XTPAXLSAD                                           | XTPR032DC1                                                     |
| 40                                                 | 32–40                                                                               | 560                                                                                 | 10                                      | —             | 30   | 30           | 65                                            | 65 | 25 | XTPAXLSAD                                           | XTPR040DC1                                                     |
| 50                                                 | 40–50                                                                               | 700                                                                                 | —                                       | 15            | 30   | —            | 65                                            | 65 | —  | XTPAXLSAD                                           | XTPR050DC1                                                     |
| 58                                                 | 50–58                                                                               | 812                                                                                 | —                                       | —             | 40   | —            | 65                                            | 65 | —  | XTPAXLSAD                                           | XTPR058DC1                                                     |
| 65                                                 | 55–65                                                                               | 882                                                                                 | —                                       | —             | 40   | —            | 65                                            | 65 | —  | XTPAXLSAD                                           | XTPR063DC1                                                     |

#### Notes

A UL 508 Type E self-protected manual combination starter (XTPR) consists of a manual motor protector (XTPR) and a UL Listed line side adapter (for example, XTPAXLSA). The Type E self-protected manual combination starter alone is a legitimate short-circuit protective device and disconnect means for the downstream motor, while the contactor has been added to provide remote operation of the motor circuit. Conductor size for XTPAXLSA is 14–6 AWG, XTPAXLSAD is 8 AWG–1/0.

① UL 508 Type E starters are assembled from a standard XTPR and a special incoming terminal line side adapter (XTPAXLSA or XTPAXLSAD).

② Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

③ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

## Accessories

## Auxiliary Contacts

## XTPAXSA\_



## Side-Mount Auxiliary Contacts

| Contact Configuration | Contact Sequence | Pkg. Qty. ① | Screw Terminal Catalog Number |
|-----------------------|------------------|-------------|-------------------------------|
| 1NO-1NC               |                  | 5           | XTPAXSA11                     |
| 1NO-2NC               |                  | 5           | XTPAXSA12                     |
| 2NO-1NC               |                  | 5           | XTPAXSA21                     |

Can be fitted on the right side of manual motor protectors (XTPB, XTPR, XTPM) and manual transformer protectors (XTPT) and can be combined with XTPAXSATR\_ and XTPAXFA\_ trip indicating auxiliary contact.

## XTPAXFA11



## Front-Mount Auxiliary Contacts

| Contact Configuration | Contact Sequence | Pkg. Qty. ① | Screw Terminal Catalog Number |
|-----------------------|------------------|-------------|-------------------------------|
| 1NO-1NC               |                  | 5           | XTPAXFA11                     |

Can be fitted to manual motor protectors (XTPB, XTPR, XTPM) and manual transformer protectors (XTPT). 45 mm (XTPR...B and XTPB) or 55 mm (XTPR...D) widths of manual motor protectors remain unchanged.

**Note**

① Orders must be placed in multiples of package quantity listed.

## XTPAXSATR\_



## Side-Mount Trip Indicating Auxiliary Contacts

| Contact Configuration | Contact Sequence              | Pkg. Qty. ① | For Use with...        | Catalog Number     |
|-----------------------|-------------------------------|-------------|------------------------|--------------------|
| 2 x 1NO               | <p>On/Off</p> <p>Trip "+"</p> | 2           | XTPB, XTPR, XTPM, XTPT | <b>XTPAXSATR20</b> |
| 2 x 1NC               | <p>On/Off</p> <p>Trip "+"</p> | 2           | XTPB, XTPR, XTPM, XTPT | <b>XTPAXSATR02</b> |

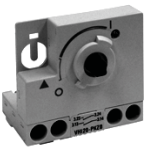
Can be fitted on the right side of manual motor protectors. Can be combined with standard auxiliary contacts. Trip indication: A. General trip indication (overload) B. Short-circuit trip. Local short-circuit indication by red indicator, manually resettable.

## Early-Make Front-Mount Auxiliary Contacts

## XTPBXFAEM20



## XTPAXFAEM20



| Contact Configuration | Contact Sequence | Pkg. Qty. ① | For Use with...  | Catalog Number        |
|-----------------------|------------------|-------------|------------------|-----------------------|
| 2NO                   |                  | 5           | XTPB             | <b>XTPBXFAEM20</b>    |
| 2NO                   |                  | 2           | XTPR... NL, PKZM | <b>XTPAXFAEM20</b> ②③ |

For use with XTPB\_, Frame B XTPR and XTPT. Can be fitted to the front of a manual motor protector. 45 mm width of manual motor protector remains unchanged. For early energization of undervoltage release, for example, in emergency-stop circuits to EN 60204.

**Notes**

- ① Orders must be placed in multiples of package quantity listed.
- ② Not for use with rotary handle mechanism.
- ③ Not compatible with XTPR lockable handle, order PKZM0 or XTPR... NL. NL is the non-lockable handle version.

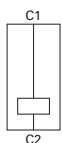


## Additional Accessories

## XTPAXSR\_



## Contact Sequence



## Shunt Release

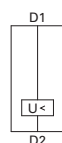
| Pkg. Qty. ① | Screw Terminal Catalog Number |
|-------------|-------------------------------|
| 2           | XTPAXSR24V50H                 |
| 2           | XTPAXSR48V50H                 |
| 2           | XTPAXSR110V50H                |
| 2           | XTPAXSR120V60H                |
| 2           | XTPAXSR208V60H                |
| 2           | XTPAXSR220V50H                |
| 2           | XTPAXSR230V50H                |
| 2           | XTPAXSR240V50H                |
| 2           | XTPAXSR240V60H                |
| 2           | XTPAXSR380V50H                |
| 2           | XTPAXSR400V50H                |
| 2           | XTPAXSR415V50H                |
| 2           | XTPAXSR440V60H                |
| 2           | XTPAXSR480V60H                |
| 2           | XTPAXSR24VDC                  |
| 2           | XTPAXSR48VDC                  |
| 2           | XTPAXSR60VDC                  |
| 2           | XTPAXSR110VDC                 |
| 2           | XTPAXSR125VDC                 |
| 2           | XTPAXSR220VDC                 |
| 2           | XTPAXSR250VDC                 |

Can be used to trip the manual motor protector from a remote location. Can be fitted on the left side of manual motor protectors. Cannot be combined with the XTPAXUVR. DC: Intermittent operation 5 sec.

## XTPAXUVR\_



## Contact Sequence



## Undervoltage Release

| Pkg. Qty. ① | Screw Terminal Catalog Number |
|-------------|-------------------------------|
| 2           | XTPAXUVR24V50H                |
| 2           | XTPAXUVR24V60H                |
| 2           | XTPAXUVR48V50H                |
| 2           | XTPAXUVR60V50H                |
| 2           | XTPAXUVR110V50H               |
| 2           | XTPAXUVR120V60H               |
| 2           | XTPAXUVR208V60H               |
| 2           | XTPAXUVR220V50H               |
| 2           | XTPAXUVR230V50H               |
| 2           | XTPAXUVR240V50H               |
| 2           | XTPAXUVR240V60H               |
| 2           | XTPAXUVR380V50H               |
| 2           | XTPAXUVR400V50H               |
| 2           | XTPAXUVR415V50H               |
| 2           | XTPAXUVR440V60H               |
| 2           | XTPAXUVR480V60H               |
| 2           | XTPAXUVR600V60H               |

Can be used to trip the manual motor protector from a remote location. Can be fitted on left side manual motor protectors. Cannot be combined with XTPAXSR. When combined with a circuit breaker, it can be used as emergency-stop device to IEC/EN 60204.

## XTPAXCL



## Current Limiter ②

| Description                                                                                            | Contact Sequence | Pkg. Qty. ① | Catalog Number |
|--------------------------------------------------------------------------------------------------------|------------------|-------------|----------------|
| To enhance the switching capacity of non-inherently safe 10–25A manual motor protectors to 150 kA/440V |                  | 1           | XTPAXCL        |

The XTPAXCL enhances the switching capacity of the XT manual motor protectors. It can be used with the XTPB, XTPR...BC1, XTPR...DC1 for individual or group protections. The rated uninterrupted current is 63A for IEC and 25A for UL/CSA. It can be mounted next to or behind the manual motor protector. See **Page V5-T1-181** for ratings when using the current limiter.

## Notes

- ① Orders must be placed in multiples of package quantity listed.
- ② Max. rated operation voltage  $U_e = 690V$ , rated uninterrupted current  $I_n = 63A$ . Can be used for individual and group protection. For group protection and in combination with the XTPR...D order additional XTPAXIT incoming terminal if required. Mounting next to or behind the manual motor protector. 16–63A XTPR...D: 100 kA/400V, 10 kA/690V.

## IP65 Rotary Handle Mechanism ①②③④

|                                                                                   | Description                                                       | Enclosure Rating     | Pkg. Qty. ⑤ | Catalog Number      |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------|-------------|---------------------|
|  | <b>Complete Kits—Includes Handle, Shaft and Required Hardware</b> |                      |             |                     |
|                                                                                   | Rotary handle mechanism—black ⑥                                   | IP65                 | 1           | <b>XTPAXRHMB</b>    |
|                                                                                   | Rotary handle mechanism—red/yellow ⑦                              | NEMA 12<br>UL/CSA 4X | 1           | <b>XTPAXRHMRY</b>   |
|                                                                                   | Rotary handle mechanism—black—rotated 90° from vertical ⑥         |                      | 1           | <b>XTPAXRHM90B</b>  |
|                                                                                   | Rotary handle mechanism—red/yellow—rotated 90° from vertical ⑦    |                      | 1           | <b>XTPAXRHM90RY</b> |
|  | <b>Separate Parts</b>                                             |                      |             |                     |
|                                                                                   | Shaft only—includes shaft to mount to XTPR, 175 mm length         | —                    | 10          | <b>XTPAXRHMSFT</b>  |
|                                                                                   | MMP shaft support, metal, D-frame MMP only                        | —                    | 20          | <b>XTPAXMBM</b>     |
|                                                                                   | Replacement lockable handle for XTPR                              | —                    | 1           | <b>XTPAXLRH</b>     |

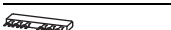
## XTPAXSW



## Sealing Facility

| Description                                                                                                                                                             | Pkg. Qty. ⑤ | Catalog Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------|
| To prevent tampering with the overload release and the test function. It can be sealed using industry standard sealing wire. For use with XTPR manual motor protectors. | 5           | <b>XTPAXSW</b> |

## Three-Phase Commoning Links ⑤

| For Use with...                                                                                                                                                                                                                                                                                                                                                                                                                                 | Qty.<br>MMP | MMP<br>Frame Size | Pkg.<br>Qty. ⑤     | Catalog Number     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------|--------------------|--------------------|
| <br><br><br><br>  | 2           | B                 | 10                 | <b>XTPAXCLKA2</b>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             | D                 | 1                  | <b>XTPAXCLKA2D</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3           | B                 | 10                 | <b>XTPAXCLKA3</b>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             | D                 | 1                  | <b>XTPAXCLKA3D</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4           | B                 | 10                 | <b>XTPAXCLKA4</b>  |
| D                                                                                                                                                                                                                                                                                                                                                                                                                                               |             | 1                 | <b>XTPAXCLKA4D</b> |                    |
| <br><br><br><br> | 2           | B                 | 10                 | <b>XTPAXCLKB2</b>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             | D                 | 1                  | <b>XTPAXCLKB2D</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3           | B                 | 10                 | <b>XTPAXCLKB3</b>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             | D                 | 1                  | <b>XTPAXCLKB3D</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4           | B                 | 10                 | <b>XTPAXCLKB4</b>  |
| D                                                                                                                                                                                                                                                                                                                                                                                                                                               |             | 1                 | <b>XTPAXCLKB4D</b> |                    |
|                                                                                                                                                                                                                                                                                                                                                              | 5           | B                 | 10                 | <b>XTPAXCLKB5</b>  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2           | B                 | 10                 | <b>XTPAXCLKC2</b>  |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                               |             | D                 | 1                  | <b>XTPAXCLKC4D</b> |

For parallel power feed to several manual motor protectors on terminals 1, 3 and 5.

## Notes

- ① Plug-in connection shafts, XTPAXRHMSFT\_ can be cut to desired length for mounting depths of 100–240 mm. Carrier with extension shaft included.
- ② With ON/OFF switch position and “+” (tripped), lockable with 3 padlocks, 4–8 mm hasp. Can be locked in the OFF position, if required.
- ③ Rotary handle mechanisms ship with door interlock disabled. See instruction publication with product for how to enable door interlock.
- ④ Not for use with XTPAXFAEM20 early-make front-mount auxiliary contact.
- ⑤ Orders must be placed in multiples of package quantity listed.
- ⑥ For use on main switches to IEC/EN 60204.
- ⑦ For use on main switches with emergency-stop function to IEC/EN 60204.
- ⑧ Protected against accidental contact. Frame B short-circuit proof  $U_b = 690V$ ,  $I_b = 63A$ . Frame B links can be combined by rotating mounting.

**XTPAXUTS****Shroud for Unused Terminals of Three-Phase Commoning Links**

| For Use with... | Description                                                                                | Pkg. Qty. ① | Catalog Number  |
|-----------------|--------------------------------------------------------------------------------------------|-------------|-----------------|
| Frame B XTPR    | To cover unused terminals on three-phase commoning link. Protected against direct contact. | 20          | <b>XTPAXUTS</b> |

**XTPAXIT****Incoming Terminals for Three-Phase Commoning Link ②**

| For Use with...    | Pkg. Qty. ① | Catalog Number |
|--------------------|-------------|----------------|
| Frame B XTPR, XTPB | 5           | <b>XTPAXIT</b> |

**Line-Side Adapters ③****XTPAXLSA**

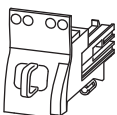
| For Use with...                                                     | Catalog Number  |
|---------------------------------------------------------------------|-----------------|
| Frame B XTPR to create a UL 508 Type E/F manual combination starter | <b>XTPAXLSA</b> |

**XTPAXLSAD**

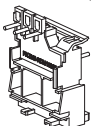
| For Use with...                                                     | Catalog Number     |
|---------------------------------------------------------------------|--------------------|
| Frame D XTPR to create a UL 508 Type E/F manual combination starter | <b>XTPAXLSAD ④</b> |

**XTPAXIP2X**

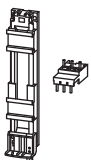
|                                                                                                                                |                  |
|--------------------------------------------------------------------------------------------------------------------------------|------------------|
| Reduced size Frame D XTPR to create a UL 508 Type E/F manual combination starter (not to be used with 3-phase commoning links) | <b>XTPAXIP2X</b> |
|--------------------------------------------------------------------------------------------------------------------------------|------------------|

**Combination Connection Kits****Non-Reversing Starters****XTPAXTPCB**

| For Use with...     | Description/Comprised of ...                                                                                                                                                              | Std. Pack ① | Catalog Number   |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|
| XTPR...B + XTCE...B | Mechanical connection element for XTPR...B and contactor                                                                                                                                  | 1           | <b>XTPAXTPCB</b> |
|                     | Main current wiring between XTPR...B and contactor in toolless plug connection                                                                                                            | 1           |                  |
|                     | Use contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. six cables up to 2.5 mm <sup>2</sup> external diameter or four cables up to 3.5 mm <sup>2</sup> external diameter. |             |                  |

**XTPAXEMC\_**

|                     |                                                                 |   |                  |
|---------------------|-----------------------------------------------------------------|---|------------------|
| XTPR...B + XTCE...B | Mechanical and electrical connection for XTPR...B and contactor | 5 | <b>XTPAXEMCB</b> |
| XTPR...B + XTCE...C |                                                                 | 5 | <b>XTPAXEMCC</b> |

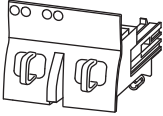
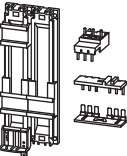
**XTPAXTPCD**

|                     |                                                                          |   |                  |
|---------------------|--------------------------------------------------------------------------|---|------------------|
| XTPR...D + XTCE...D | DIN rail adapter plate<br>Main current wiring between XTPR and contactor | 1 | <b>XTPAXTPCD</b> |
|---------------------|--------------------------------------------------------------------------|---|------------------|

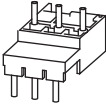
**Notes**

- ① Orders must be placed in multiples of package quantity listed.
- ② For three-phase commoning link, protected against accidental contact,  $U_b = 690V$ ,  $I_b = 63A$ ;  
For conductor cross-sections: 2.5–25 mm<sup>2</sup> stranded; 2.5–16 mm<sup>2</sup> flexible with ferrules, AWG 14-6.
- ③ XTPAXLSA is for three-phase commoning link, finger and back-of-hand proof,  
 $U_b = 690V$ ,  $I_b = 60A$  for conductor cross sections: 2.5–25 mm<sup>2</sup> stranded,  
2.5–16 mm<sup>2</sup> flexible with ferrule, AWG 14-6.
- ④ XTPAXLSAD cannot be combined with three-phase commoning links. Conductor size 8 AWG–1/0.

## Reversing Starters

|                                                                                                        | For Use with...        | Description/Comprised of ...                                                                                                                                                              | Std. Pack ① | Catalog Number    |
|--------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------|
| <b>XTPAXTPCRB</b><br> | XTPR...B + XTCE...B01_ | Mechanical connection element for XTPR...B and contactor                                                                                                                                  | 1           | <b>XTPAXTPCRB</b> |
|                                                                                                        |                        | Reversing starter main current wiring in toolless plug connection                                                                                                                         | 1           |                   |
|                                                                                                        |                        | Control cables for electrical interlocking in toolless plug connection:<br>– K1M: A1–K2M: 21<br>– K1M: 21–K2M: A1<br>– K1M: A2–K2M: A2                                                    | 1           |                   |
|                                                                                                        |                        | Cable guidance                                                                                                                                                                            | 1           |                   |
|                                                                                                        |                        | Use contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. six cables up to 2.5 mm <sup>2</sup> external diameter or four cables up to 3.5 mm <sup>2</sup> external diameter. |             |                   |
| <b>XTPAXTPCRC</b><br> | XTPR...B + XTCE...C    | DIN rail adapter plate                                                                                                                                                                    | 1           | <b>XTPAXTPCRC</b> |
|                                                                                                        |                        | Reversing starter main current wiring                                                                                                                                                     | 1           |                   |

## Electrical Connection Module

|                                                                                                       | For Use with...     | Description/Comprised of ...                       | Std. Pack ① | Catalog Number   |
|-------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------|-------------|------------------|
| <b>XTPAXECM_</b><br> | XTPR...B + XTCE...C | Main current wiring between XTPR...B and contactor | 5           | <b>XTPAXECMC</b> |
|                                                                                                       | XTPR...D + XTCE...D | Main current wiring between XTPR...D and contactor | 5           | <b>XTPAXECMD</b> |

## DIN Rail Adapter Plates

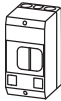
|                                                                                                          | For Use with...     | Description/Comprised of ...                                      | Std. Pack ① | Catalog Number    |
|----------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------|-------------|-------------------|
| <b>XTPAXTPCPB</b><br> | XTPAXTPCB           | 45 mm wide adapter plate with one DIN rail                        | 4           | <b>XTPAXTPCPB</b> |
|                                                                                                          | XTPAXTPCRB          | Connection element for side-by-side positioning of further plates |             |                   |
| <b>XTPAXTPCPD</b><br> | XTPAXECMD           | 55 mm wide adapter plate with two DIN rails                       | 4           | <b>XTPAXTPCPD</b> |
|                                                                                                          | XTPR...D + XTCE...C | Connection cams for further plates                                |             |                   |
|                                                                                                          | XTPR...D + XTCE...D | For use with reversing and star-delta starters                    |             |                   |

**Note**

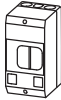
① Orders must be placed in multiples of package quantity listed.

## Pushbutton MMP Enclosures

Insulated Enclosures for Surface Mounting of XTPB Pushbutton Motor-Protective Circuit Breakers—Global Usage <sup>①</sup>

|                                                                                    | Degree of Protection        | For Use with...                                                                      | Description                                                                                       | Catalog Number    |
|------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------|
|   | IP40<br>NEMA 1              | XTPB MMP only or with:<br>XTPAXFA_, XTPBXFAEM20,<br>XTPAXSA_, XTPAXUVR_,<br>XTPAXSR_ | —                                                                                                 | <b>XTPBXENC40</b> |
|   | IP65<br>NEMA 3R, 4X, 12, 13 |                                                                                      | With actuation membrane.                                                                          | <b>XTPBXENC65</b> |
|   | IP65<br>NEMA 3R, 4X, 12, 13 | XTPB MMP only or with:<br>XTPAXFA_, XTPAXUVR_,<br>XTPAXSR_, XTPAXCL                  | Lockable in OFF position.                                                                         | <b>XTPBXENC65</b> |
|   | IP65<br>NEMA 3R, 4X, 12, 13 | XTPB MMP only or with:<br>XTPAXFA_, XTPBXFAEM20,<br>XTPAXUVR_, XTPAXSR_,<br>XTPAXCL  | Lockable in OFF position in combination with XTPBXFAEM20 early-make front-mount auxiliary contact | <b>XTPBXENC65</b> |
|   | IP65<br>NEMA 3R, 4X, 12, 13 |                                                                                      | With emergency-stop (e-stop) pushbutton actuator, red-yellow                                      | <b>XTPBXENC65</b> |
|  | IP65<br>NEMA 3R, 4X, 12, 13 |                                                                                      | With emergency-stop (e-stop) pushbutton actuator, red-yellow key release                          | <b>XTPBXENC65</b> |

Insulated Enclosures for Surface Mounting of XTPB Pushbutton Manual Motor Protectors—North American Usage <sup>②③</sup>

|                                                                                     | Degree of Protection        | For Use with...                                                                      | Description                                                                                       | Catalog Number     |
|-------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------|
|  | IP41<br>NEMA 1              | XTPB MMP only or with:<br>XTPAXFA_, XTPBXFAEM20,<br>XTPAXSA_, XTPAXUVR_,<br>XTPAXSR_ | —                                                                                                 | <b>XTPBXENAS41</b> |
|  | IP65<br>NEMA 3R, 4X, 12, 13 |                                                                                      | With actuating diaphragm                                                                          | <b>XTPBXENAS65</b> |
|  | IP65<br>NEMA 3R, 4X, 12, 13 | XTPB MMP only or with:<br>XTPAXFA_, XTPAXUVR_,<br>XTPAXSR_, XTPAXCL                  | Lockable in OFF position                                                                          | <b>XTPBXENAS65</b> |
|  | IP65<br>NEMA 3R, 4X, 12, 13 | XTPB MMP only or with:<br>XTPAXFA_, XTPBXFAEM20,<br>XTPAXUVR_, XTPAXSR_,<br>XTPAXCL  | Lockable in OFF position in combination with XTPBXFAEM20 early-make front-mount auxiliary contact | <b>XTPBXENAS65</b> |
|  | IP65<br>NEMA 3R, 4X, 12, 13 |                                                                                      | With emergency-stop (e-stop) pushbutton actuator, red-yellow                                      | <b>XTPBXENAS65</b> |
|  | IP65<br>NEMA 3R, 4X, 12, 13 |                                                                                      | With emergency-stop (e-stop) pushbutton actuator, red-yellow key release                          | <b>XTPBXENAS65</b> |

**Notes**

① Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.

② Built-in terminal for PE(N).

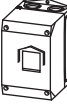
③ North American enclosures come with conduit adapters for use with 1/2 in NPT.

### Insulated Enclosures for Surface Mounting of XTPB Pushbutton Manual Motor Protectors—North American Usage <sup>①</sup>

|                                                                                   | Degree of Protection                 | For Use with...                                                                      | Description                                                                                          | Catalog Number       |
|-----------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------|
|  | Front IP40<br>NEMA 1                 | XTPB MMP only or with:<br>XTPAXFA_, XTPBXFAEM20,<br>XTPAXSA_, XTPAXUVR_,<br>XTPAXSR_ | —                                                                                                    | <b>XTPBXENCF40</b>   |
|  | Front IP65<br>NEMA<br>3R, 4X, 12, 13 |                                                                                      | With actuating diaphragm                                                                             | <b>XTPBXENCF55</b>   |
|  | Front IP65<br>NEMA<br>3R, 4X, 12, 13 | XTPB MMP only or with:<br>XTPAXFA_, XTPAXUVR_,<br>XTPAXSR_, XTPAXCL                  | Lockable in OFF position                                                                             | <b>XTPBXENCFL055</b> |
|                                                                                   | Front IP65<br>NEMA<br>3R, 4X, 12, 13 | XTPB MMP only or with:<br>XTPAXFA_, XTPBXFAEM20,<br>XTPAXUVR_, XTPAXSR_,<br>XTPAXCL  | Lockable in OFF position in combination with XTPBXFAEM20<br>early-make front-mount auxiliary contact | <b>XTPBXENCFL055</b> |
|  | Front IP65<br>NEMA<br>3R, 4X, 12, 13 |                                                                                      | With emergency-stop (e-stop) pushbutton actuator, red-yellow                                         | <b>XTPBXENCFS55</b>  |
|                                                                                   | Front IP65<br>NEMA<br>3R, 4X, 12, 13 |                                                                                      | With emergency-stop (e-stop) pushbutton actuator, red-yellow<br>key release                          | <b>XTPBXENCFS55</b>  |

### Rotary MMP Enclosures

### Insulated Enclosures for Surface Mounting of Frame B (0.1–32A) XTPR Motor-Protective Circuit Breakers—Global Usage

|                                                                                     | Degree of Protection           | For Use with...                                                                                  | Description                                                                                                         | Catalog Number                    |
|-------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------|
|  | IP41 with vertical<br>mounting | Frame B XTPR only or with:<br>XTPAXFA_, XTPAXSA_,<br>XTPAXSATR_, XTPAXUVR_,<br>XTPAXSR_, XTPAXCL | Cover with aperture dimensioned to accommodate front of<br>MMP. IP40, when mounted turned through 90° to left/right | <b>XTPAXENC541</b> <sup>①</sup>   |
|  | IP65                           |                                                                                                  | With black/grey rotary handle                                                                                       | <b>XTPAXENC565B</b> <sup>①</sup>  |
|                                                                                     | IP65                           |                                                                                                  | With red/yellow rotary handle for use as emergency-stop<br>switches to IEC/EN 60204                                 | <b>XTPAXENC565RY</b> <sup>①</sup> |
|  | IP40                           | Frame B XTPR only or with:<br>XTPAXSA_, XTPAXUVR_,<br>XTPAXSR_, XTPAXCL                          | Cover with aperture dimensioned to accommodate front of MMP                                                         | <b>XTPAXENC540</b> <sup>②</sup>   |
|  | IP55                           | Frame B XTPR only or with:<br>XTPAXFA_, XTPAXSA_,<br>XTPAXUVR_, XTPAXSR_,<br>XTPAXCL             | With black/gray rotary handle                                                                                       | <b>XTPAXENC555B</b> <sup>②</sup>  |
|                                                                                     | IP55                           |                                                                                                  | With red/yellow rotary handle for use as emergency-stop<br>switches to IEC/EN 60204                                 | <b>XTPAXENC555RY</b> <sup>②</sup> |

#### Note

<sup>①</sup> Integrated terminal for PE(N) connection.

### Insulated Enclosures for Surface Mounting of Frame B (0.1–32A) XTPR Rotary Manual Motor Protectors—North American Usage <sup>③</sup>

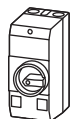


| Degree of Protection   | For Use with...                                                                                                      | Description                                                                | Catalog Number       |
|------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------|
| IP55<br>NEMA 1, 12, 3R | Frame B XTPR only or with:<br>XTPAXSA_ and XTPAXFA_,<br>XTPAXUVR_ and XTPAXFA_,<br>XTPAXSR_ and XTPAXFA_,<br>XTPAXCL | With black/gray rotary handle                                              | <b>XTPAXENAS55B</b>  |
|                        |                                                                                                                      | With red/yellow rotary handle for use as emergency-stop switch to VDE 0113 | <b>XTPAXENAS55RY</b> |

### Insulated Enclosures for Surface Mounting of Frame B XTPR (0.1–32A) Rotary Motor-Protective Circuit Breakers with XTPAXFAEM20 Early-Make Front-Mount Auxiliary Contact—Global Usage



| Degree of Protection | For Use with...                                                                                                  | Description                                                                      | Catalog Number         |
|----------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------|
| IP65                 | Frame B XTPR and XTPAXFAEM20 only or with: XTPAXFA_,<br>XTPAXSA_, XTPAXSATR_,<br>XTPAXUVR_, XTPAXSR_,<br>XTPAXCL | With black/gray rotary handle                                                    | <b>XTPAXENCSEM65B</b>  |
| IP65                 |                                                                                                                  | With red/yellow rotary handle for use as emergency-stop switches to IEC/EN 60204 | <b>XTPAXENCSEM65RY</b> |



|      |                                                                                         |                                                                                  |                        |
|------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------|
| IP55 | Frame B XTPR and XTPAXFAEM20 only or with: XTPAXFA_,<br>XTPAXUVR_, XTPAXSR_,<br>XTPAXCL | With black/gray rotary handle                                                    | <b>XTPAXENCSEM55B</b>  |
| IP55 |                                                                                         | With red/yellow rotary handle for use as emergency-stop switches to IEC/EN 60204 | <b>XTPAXENCSEM55RY</b> |

### Insulated Enclosures for Surface Mounting of Frame B XTPR (0.1–32A) Rotary Manual Motor Protectors with XTPAXFAEM20 Early-Make Front-Mount Auxiliary Contact—North American Usage <sup>④</sup>



| Degree of Protection   | For Use with...                                               | Description                                                                | Catalog Number         |
|------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------|------------------------|
| IP55<br>NEMA 1, 12, 3R | Frame B XTPR only or with:<br>XTPAXSA_, XTPAXUVR_,<br>XTPAXCL | With black/gray rotary handle                                              | <b>XTPAXENASEM55B</b>  |
|                        |                                                               | With red/yellow rotary handle for use as emergency-stop switch to VDE 0113 | <b>XTPAXENASEM55RY</b> |

### Insulated Enclosures for Flush Mounting of Frame B (0.1–32A) XTPR Rotary Manual Motor Protectors—Global Usage <sup>⑤</sup>



| Degree of Protection | For Use with...                                                         | Description                                                 | Catalog Number     |
|----------------------|-------------------------------------------------------------------------|-------------------------------------------------------------|--------------------|
| Front IP40           | Frame B XTPR only or with:<br>XTPAXSA_, XTPAXUVR_,<br>XTPAXSR_, XTPAXCL | Cover with aperture dimensioned to accommodate front of MMP | <b>XTPAXENCF40</b> |



|            |                                                                                      |                                                                                  |                      |
|------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----------------------|
| Front IP55 | Frame B XTPR only or with:<br>XTPAXSA_, XTPAXUVR_,<br>XTPAXSR_, XTPAXFA_,<br>XTPAXCL | With black/gray rotary handle                                                    | <b>XTPAXENCF55B</b>  |
|            |                                                                                      | With red/yellow rotary handle for use as emergency-stop switches to IEC/EN 60204 | <b>XTPAXENCF55RY</b> |

### Insulated Enclosures for Surface Mounting of Frame D (10–65A) Rotary Motor-Protective Circuit Breakers



| Degree of Protection          | For Use with...                                                                                                  | Description                                                                      | Catalog Number        |
|-------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------|
| IP65<br>NEMA 1, 12,<br>3R, 4X | Frame D XTPR only or with:<br>XTPAXFA_, XTPAXFAEM20,<br>XTPAXSA_, XTPAXSATR_,<br>XTPAXUVR_, XTPAXSR_,<br>XTPAXCL | With black/gray rotary handle                                                    | <b>XTPAXENCSD65B</b>  |
| IP65<br>NEMA 1, 12,<br>3R, 4X |                                                                                                                  | With red/yellow rotary handle for use as emergency-stop switches to IEC/EN 60204 | <b>XTPAXENCSD65RY</b> |

#### Notes

- ① M25 metric cable entry knock-out, top and bottom. Cable push-through membrane, top and bottom, in the back plate and as a control line entry. Includes N and PE terminals.
- ② Integrated terminal for PE(N) connection, two M25 cable entry knockouts at the top and bottom.
- ③ Built-in N and PE terminal, lower part without knockouts.
- ④ Built-in N and PE terminal, lower part without knockouts.
- ⑤ Integrated terminal for PE(N) connection.

## MMP Enclosure Accessories

## XTPAXPL\_



## XTPR Manual Motor Protector Enclosure Padlock Attachment

| For Use with...                                                                                                                 | Description                                                                                                    | Pkg. Qty. <sup>①</sup> | Catalog Number               |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------|------------------------------|
| XTPAXENC65B, XTPAXENC65RY,<br>XTPAXENCSEM65B, XTPAXENCSEM65RY,<br>XTPAXENC55B, XTPAXENC55RY,<br>XTPAXENCSEM55B, XTPAXENCSEM55RY | Padlocking feature. Up to three padlocks with 3–6 mm hasp thickness.<br>For use as main switch to IEC/EN 60204 | 3                      | <b>XTPAXPL1</b> <sup>②</sup> |
| XTPAXENCSD65B, XTPAXENCSD65RY                                                                                                   |                                                                                                                | 1                      | <b>XTPAXPL2</b> <sup>②</sup> |
| XTPAXENCF55B, XTPAXENCF55RY                                                                                                     |                                                                                                                | 3                      | <b>XTPAXPL3</b> <sup>③</sup> |

## XTPAXNT



## Neutral Terminal for Use with XTPB and Frame B XTPR Flush-Mount Enclosures

| For Use with...                                                       | Description                         | Pkg. Qty. <sup>①</sup> | Catalog Number |
|-----------------------------------------------------------------------|-------------------------------------|------------------------|----------------|
| XTPBXENCF40, XTPBXENCF55, XTPAXENCF40,<br>XTPAXENCF55B, XTPAXENCF55RY | For connection of a fifth conductor | 20                     | <b>XTPAXNT</b> |

## XTPAXIL\_

Indicating Lights with Neon Bulb <sup>④</sup>

| Color | Description—<br>Indicating Light | Pkg. Qty. <sup>①</sup> | Catalog Number   |
|-------|----------------------------------|------------------------|------------------|
| White | 110–230V                         | 10                     | <b>XTPAXILWB</b> |
|       | 230–400V                         | 10                     | <b>XTPAXILWN</b> |
|       | 415–500V                         | 10                     | <b>XTPAXILWC</b> |
| Green | 110–230V                         | 10                     | <b>XTPAXILGB</b> |
|       | 230–400V                         | 10                     | <b>XTPAXILGN</b> |
|       | 415–500V                         | 10                     | <b>XTPAXILGC</b> |
| Red   | 110–230V                         | 10                     | <b>XTPAXILRB</b> |
|       | 230–400V                         | 10                     | <b>XTPAXILRN</b> |

For use with XTPR and XTPB enclosures.

Lights do not carry individual IP or NEMA rating. All enclosure ratings remain valid when using indicating lights.

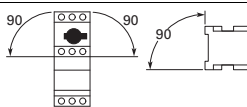
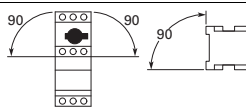
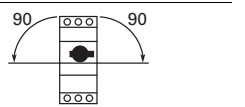
**Notes**

- <sup>①</sup> Orders must be placed in multiples of package quantity listed.
- <sup>②</sup> Lockable in the 0-position of the XTPR manual motor protector.
- <sup>③</sup> Lockable in the OFF position of the Frame B XTPR manual motor protector.
- <sup>④</sup> Product is not UL Listed/Registered.



## Technical Data and Specifications

## XT Manual Motor Protectors

| Description                                                                           | XTPBP16B–<br>XTPB025B                                                             | XTPRP16B–<br>XTPR032B                                                              | XTPR016D–<br>XTPR063D                                                               |
|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>General</b>                                                                        |                                                                                   |                                                                                    |                                                                                     |
| Standards                                                                             | IEC/EN 60947,<br>VDE 0660, UL 508,<br>CSA C22.2 No. 14                            | IEC/EN 60947,<br>VDE 0660, UL 508,<br>CSA C22.2 No. 14                             | IEC/EN 60947,<br>VDE 0660, UL 508,<br>CSA C22.2 No. 14                              |
| Climatic proofing                                                                     | ①                                                                                 | ①                                                                                  | ①                                                                                   |
| Ambient temperature, °C                                                               |                                                                                   |                                                                                    |                                                                                     |
| Storage                                                                               | –25/80                                                                            | –25/80                                                                             | –25/70                                                                              |
| Open                                                                                  | –25/55                                                                            | –25/55                                                                             | –25/55                                                                              |
| Enclosed                                                                              | –25/40                                                                            | –25/40                                                                             | –25/40                                                                              |
| Mounting position                                                                     |  |  |  |
| Direction of incoming supply                                                          | As required                                                                       | As required                                                                        | As required                                                                         |
| Degree of protection                                                                  |                                                                                   |                                                                                    |                                                                                     |
| Device                                                                                | IP20                                                                              | IP20                                                                               | IP20                                                                                |
| Terminals                                                                             | IP00                                                                              | IP00                                                                               | IP00                                                                                |
| Protection against direct contact                                                     | Finger and<br>back-of-hand proof                                                  | Finger and<br>back-of-hand proof                                                   | Finger and<br>back-of-hand proof                                                    |
| Shock resistance half-sinusoidal shock<br>10 ms to IEC 60068-2-27 (g)                 | 25                                                                                | 25                                                                                 | 15                                                                                  |
| Altitude (m), maximum                                                                 | 2000                                                                              | 2000                                                                               | 2000                                                                                |
| Terminal capacity                                                                     |                                                                                   |                                                                                    |                                                                                     |
| Solid (mm <sup>2</sup> )                                                              | 1 x (1–6)<br>2 x (1–6)                                                            | 1 x (1–6)<br>2 x (1–6)                                                             | 1 x (1–50)<br>2 x (1–35)                                                            |
| Flexible with ferrule to DIN 46228, (mm <sup>2</sup> )                                | 1 x (1–6)<br>2 x (1–6)                                                            | 1 x (1–6)<br>2 x (1–6)                                                             | 1 x (1–35)<br>2 x (1–35)                                                            |
| Solid or stranded (AWG)                                                               | 18–10                                                                             | 18–10                                                                              | 14–2                                                                                |
| Terminal screw tightening torque                                                      |                                                                                   |                                                                                    |                                                                                     |
| Main cable, Nm                                                                        | 1.7                                                                               | 1.                                                                                 | 3                                                                                   |
| Main cable, lb-in                                                                     | 15.0                                                                              | 15.0                                                                               | 26.6                                                                                |
| Control circuit cable, Nm                                                             | 1                                                                                 | 1                                                                                  | 1                                                                                   |
| Control circuit cable, lb-in                                                          | 8.9                                                                               | 8.9                                                                                | 8.9                                                                                 |
| <b>Main Contacts</b>                                                                  |                                                                                   |                                                                                    |                                                                                     |
| Rated impulse withstand voltage ( $U_{imp}$ ), Vac                                    | 6000                                                                              | 6000                                                                               | 6000                                                                                |
| Overvoltage category/pollution degree                                                 | III/3                                                                             | III/3                                                                              | III/3                                                                               |
| Rated operational voltage ( $U_e$ ), Vac                                              | 690                                                                               | 690                                                                                | 690                                                                                 |
| Rated uninterrupted current = rated operational<br>current ( $I_u = I_o$ ) in amperes | 25 or current setting of<br>the overcurrent release                               | 25 or current setting of<br>the overcurrent release                                | 25 or current setting of<br>the overcurrent release                                 |
| Rated frequency, Hz                                                                   | 40–60                                                                             | 40–60                                                                              | 40–60                                                                               |
| Current heat loss (three-pole at operating temperature), W                            | 6                                                                                 | 6                                                                                  | 22                                                                                  |
| Lifespan, mechanical (ops)                                                            | 50,000                                                                            | 100,000                                                                            | 30,000                                                                              |
| Lifespan, electrical (AC-3 at 400V) (ops)                                             | 50,000                                                                            | 100,000                                                                            | 30,000                                                                              |
| Maximum operating frequency, operations/hr                                            | 25                                                                                | 40                                                                                 | 40                                                                                  |
| Short-circuit rating                                                                  |                                                                                   |                                                                                    |                                                                                     |
| AC                                                                                    | See <b>Page V5-T1-181</b>                                                         | See <b>Page V5-T1-181</b>                                                          | See <b>Page V5-T1-181</b>                                                           |
| DC (kA)                                                                               | 60                                                                                | 60 (up to XTPR016B)<br>40 (XTPR020B–XTPR032B)                                      | 60                                                                                  |
| Motor switching capacity                                                              |                                                                                   |                                                                                    |                                                                                     |
| AC-3 (up to 690V) in amperes                                                          | 25                                                                                | 32                                                                                 | 65                                                                                  |
| DC-5 (up to 250V) in amperes                                                          | 25                                                                                | 25 (3 contacts in series)                                                          | 63 (3 contacts in series)                                                           |

**Note**

① Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60068-2-30.

## XT Manual Motor Protectors, continued

| Description                                                                | XTPBP16B–<br>XTPB025B                  | XTPRP16B–<br>XTPR032B                  | XTPR016D–<br>XTPR063D                  |
|----------------------------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| <b>Releases</b>                                                            |                                        |                                        |                                        |
| Overload release setting range ( $\times I_{\Delta}$ )                     | 0.6–1.0                                | 0.6–1.0                                | 0.6–1.0                                |
| Fixed short-circuit release ( $\times I_{\Delta}$ )                        | 14                                     | 14                                     | 14                                     |
| Short-circuit release tolerance                                            | $\pm 20\%$                             | $\pm 20\%$                             | $\pm 20\%$                             |
| Phase-failure sensitivity                                                  | IEC/EN 60947-1-1,<br>VDE 0660 Part 102 | IEC/EN 60947-1-1,<br>VDE 0660 Part 102 | IEC/EN 60947-1-1,<br>VDE 0660 Part 102 |
| Temperature compensation<br>to IEC/EN 60947, VDE 0660, °C                  | –5/40                                  | –5/40                                  | –5/40                                  |
| operating range, °C                                                        | –25/55                                 | –25/55                                 | –25/55                                 |
| Temperature compensation residual error for $T > 20^{\circ}\text{C}$ , %/K | $\leq 0.25$                            | $\leq 0.25$                            | $\leq 0.25$                            |

## Auxiliary Contacts

| Description                                                                                                                                           | XTPAXSA _ _                                           | XTPAXFA _ _                                           | XTPA(B)XFAEM _ _                                      | XTPAXSATR _ _                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| Rated impulse withstand voltage, $U_{\text{imp}}$ (Vac)                                                                                               | 6000                                                  | 4000                                                  | 4000                                                  | 6000                                                  |
| Overvoltage category/pollution degree                                                                                                                 | III/3                                                 | III/3                                                 | III/3                                                 | III/3                                                 |
| Rated operational voltage                                                                                                                             |                                                       |                                                       |                                                       |                                                       |
| $U_{\text{e}}$ (Vac)                                                                                                                                  | 500                                                   | 440                                                   | 440                                                   | 500                                                   |
| $U_{\text{e}}$ (Vdc)                                                                                                                                  | 250                                                   | 250                                                   | 250                                                   | 250                                                   |
| Safe isolation to VDE 0106 Part 101 and<br>Part 101/A1 between auxiliary contacts<br>and main contacts (Vac)                                          | 690                                                   | 690                                                   | 690                                                   | 690                                                   |
| Rated operational current                                                                                                                             |                                                       |                                                       |                                                       |                                                       |
| AC-15                                                                                                                                                 |                                                       |                                                       |                                                       |                                                       |
| 220–240 V, $I_{\text{e}}$ (A)                                                                                                                         | 3.5                                                   | 1                                                     | 1                                                     | 3.5                                                   |
| 380–415 V, $I_{\text{e}}$ (A)                                                                                                                         | 2                                                     | —                                                     | —                                                     | 2                                                     |
| 440–500 V, $I_{\text{e}}$ (A)                                                                                                                         | 1                                                     | —                                                     | —                                                     | 1                                                     |
| DC-13 L/R <100 ms                                                                                                                                     |                                                       |                                                       |                                                       |                                                       |
| 24 V, $I_{\text{e}}$ (A)                                                                                                                              | 2                                                     | 2                                                     | 2                                                     | 2                                                     |
| 60 V, $I_{\text{e}}$ (A)                                                                                                                              | 1.5                                                   | —                                                     | —                                                     | 1.5                                                   |
| 110 V, $I_{\text{e}}$ (A)                                                                                                                             | 1                                                     | —                                                     | —                                                     | 1                                                     |
| 220 V, $I_{\text{e}}$ (A)                                                                                                                             | 0.25                                                  | —                                                     | —                                                     | 0.25                                                  |
| <b>Lifespan</b>                                                                                                                                       |                                                       |                                                       |                                                       |                                                       |
| Mechanical, operations ( $\times 10^6$ )                                                                                                              | 0.1                                                   | 0.1                                                   | 0.1                                                   | 0.01                                                  |
| Electrical, operations ( $\times 10^6$ )                                                                                                              | 0.05                                                  | 0.1                                                   | 0.1                                                   | 0.005                                                 |
| Contact reliability (at $U_{\text{e}} = 24 \text{ Vdc}$ , $U_{\text{min}} = 17 \text{ V}$ ,<br>$I_{\text{min}} = 5.4 \text{ mA}$ , fault probability) | $< 10^{-8}$ <1 fault<br>at $1 \times 10^8$ operations | $< 10^{-8}$ <1 fault<br>at $1 \times 10^8$ operations | $< 10^{-8}$ <1 fault<br>at $1 \times 10^8$ operations | $< 10^{-8}$ <1 fault<br>at $1 \times 10^8$ operations |
| Positively driven contacts to ZH 1/457                                                                                                                | Yes                                                   | —                                                     | —                                                     | —                                                     |
| <b>Short-Circuit Rating without Welding</b>                                                                                                           |                                                       |                                                       |                                                       |                                                       |
| Fuseless                                                                                                                                              | FAZ-B4/1-HI                                           | —                                                     | —                                                     | FAZ-B4/1-HI                                           |
| Fuse (A gG/gL)                                                                                                                                        | 10                                                    | 10                                                    | 10                                                    | 10                                                    |
| <b>Terminal Capacity</b>                                                                                                                              |                                                       |                                                       |                                                       |                                                       |
| Solid or flexible conductor with ferrule ( $\text{mm}^2$ )                                                                                            | 0.75–2.5                                              | 0.75–1.5                                              | 0.75–1.5                                              | 0.75–2.5                                              |
| Solid or stranded (AWG)                                                                                                                               | 18–14                                                 | 18–16                                                 | 18–16                                                 | 18–14                                                 |

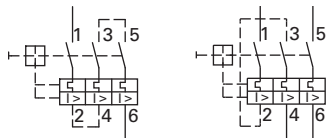
## Undervoltage Release

| Description                                                 | XTPAXUVR_                        |
|-------------------------------------------------------------|----------------------------------|
| <b>Cross-Section</b>                                        |                                  |
| Solid or flexible conductor with ferrule (mm <sup>2</sup> ) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                     | 1 x (18–14)<br>2 x (18–14)       |
| <b>Main Contact</b>                                         |                                  |
| Rated operational voltage, $U_e$ (Vac)                      | 42–480                           |
| Rated operational voltage, $U_e$ (Vdc)                      | 24–250                           |
| Pickup voltage, x $U_s$                                     | 0.85–1.1                         |
| Dropout voltage, x $U_s$                                    | 0.7–0.35                         |
| <b>Power Consumption</b>                                    |                                  |
| Pickup AC (VA)                                              | 5                                |
| Sealing AC (VA)                                             | 3                                |

## Current Limiter

| Description                                                                      | XTPAXCL |
|----------------------------------------------------------------------------------|---------|
| Rated impulse withstand voltage ( $U_{imp}$ ), Vac                               | 6000    |
| Overvoltage category/pollution degree                                            | III/3   |
| Rated operational voltage, $U_e$ (Vac)                                           | 690     |
| Rated interrupted current = Rated operational current ( $I_u = I_e$ ) in amperes | 63      |

## XTPB, XTPR Single- and Two-Pole Circuits with DC and AC Current



## Protection of PVC Insulated Cables Against Thermal Overload at Short-Circuit

| Min. Cross-Section Protected<br>380–415V, 50 Hz, Cu mm <sup>2</sup> |     |     |   |      | Device<br>Type |
|---------------------------------------------------------------------|-----|-----|---|------|----------------|
| 4                                                                   | 2.5 | 1.5 | 1 | 0.75 |                |
|                                                                     |     |     |   |      | XTPRP16BC1     |
|                                                                     |     |     |   |      | ⋮              |
|                                                                     |     |     |   |      | XTPR6P3BC1     |
|                                                                     |     |     |   |      | XTPR010BC1     |
|                                                                     |     |     |   |      | XTPR016BC1     |
|                                                                     |     |     |   |      | XTPR020BC1     |
|                                                                     |     |     |   |      | XTPR025BC1     |
|                                                                     |     |     |   |      | XTPR016DC1     |
|                                                                     |     |     |   |      | XTPR025DC1     |
|                                                                     |     |     |   |      | XTPR032DC1     |
|                                                                     |     |     |   |      | XTPR040DC1     |
|                                                                     |     |     |   |      | XTPR050DC1     |
|                                                                     |     |     |   |      | XTPR058DC1     |
|                                                                     |     |     |   |      | XTPR063DC1     |

The chart above indicates which minimum cable cross-sections are protected by XTPR motor protective circuit breakers up to their rated conditional short-circuit current  $I_q$ .

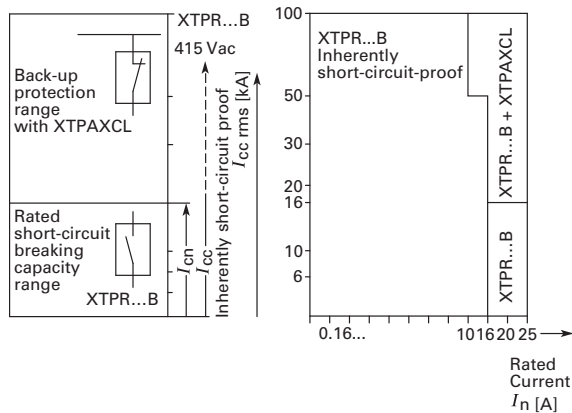
## Shunt Release

| Description                                                 | XTPAXSR_                         |
|-------------------------------------------------------------|----------------------------------|
| <b>Cross-Section</b>                                        |                                  |
| Solid or flexible conductor with ferrule (mm <sup>2</sup> ) | 1 x (0.75–2.5)<br>2 x (0.75–2.5) |
| Solid or stranded (AWG)                                     | 1 x (18–14)<br>2 x (18–14)       |
| <b>Main Contact</b>                                         |                                  |
| Rated operational voltage, $U_e$ (Vac)                      | 42–480                           |
| Rated operational voltage, $U_e$ (Vdc)                      | 24–250                           |
| AC operating range, x $U_s$                                 | 0.7–1.1                          |
| DC operating range, x $U_s$ (intermittent operation 5s)     | 0.7–1.1                          |
| <b>Power Consumption</b>                                    |                                  |
| Pickup AC (VA)                                              | 5                                |
| Sealing AC (VA)                                             | 3                                |
| Pickup DC (VA)                                              | 3                                |
| Sealing DC (VA)                                             | 3                                |

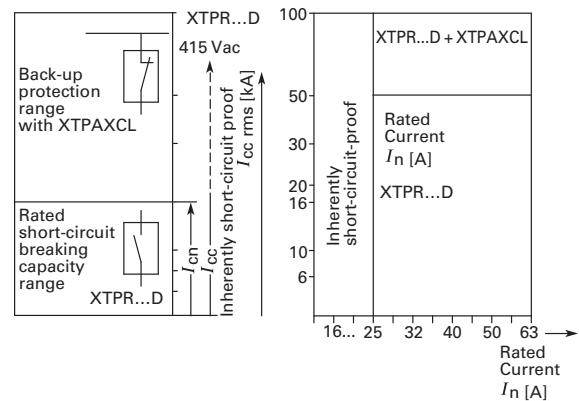
## Wiring Diagrams

### Fuseless Installation with XTPR

#### Backup Protection Diagram—XTPR...B



#### Backup Protection Diagram—XTPR...D



## Time/Current Curves

### Characteristics

The time/current characteristic, the current limiting characteristics and the  $I^2t$  characteristics were determined in accordance with DIN VDE 0660 and IEC 60 947.

The tripping characteristic of the **inverse-time delayed overload releases** (thermal overload releases or "a" releases) for DC and AC with a frequency of 0 to 400 Hz also apply to the time/current characteristic.

The characteristics apply to the cold state. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25%.

Under normal operating conditions, all three-poles of the device must be loaded. The three main conducting paths must be connected in series in order to protect single-phase or DC loads.

With three-pole loading, the maximum deviation in the tripping time for 3 times the setting current and upwards is  $\pm 20\%$  and thus in accordance with DIN VDE 0165.

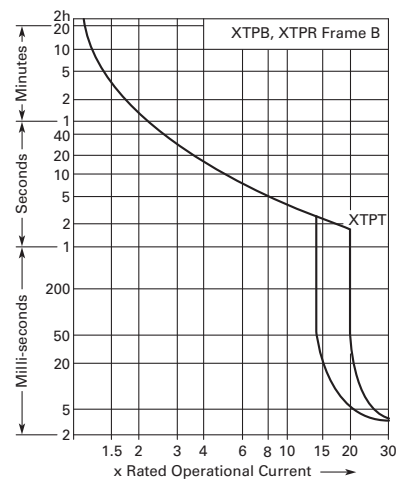
The tripping characteristics for the instantaneous, electromagnetic overcurrent releases (short-circuit releases or "n" releases) are based on the rated current  $I_n$ , which is also the maximum value of the setting range for circuit breakers with adjustable overload releases. If the current is set to a lower value, the tripping current of the "n" release is increased by a corresponding factor.

The characteristics of the electromagnetic overcurrent releases apply to frequencies of 50/60 Hz. Appropriate correction factors must be used for lower frequencies up to 16-2/3 Hz, for higher frequencies up to 400 Hz and for DC.

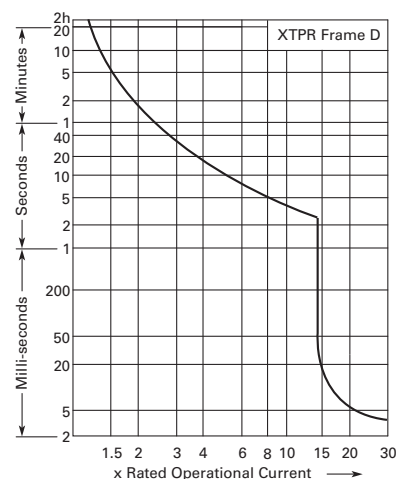
Time/current characteristics, current limiting characteristics and  $I^2t$  characteristics are available on request.

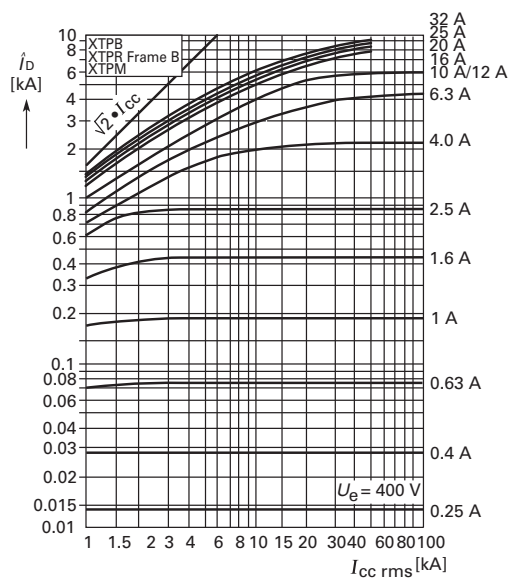
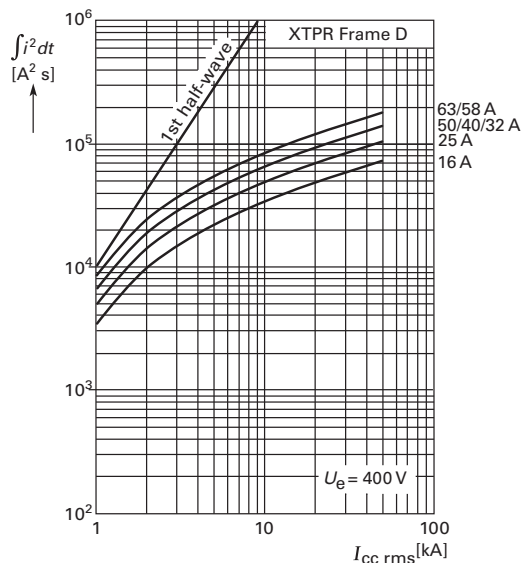
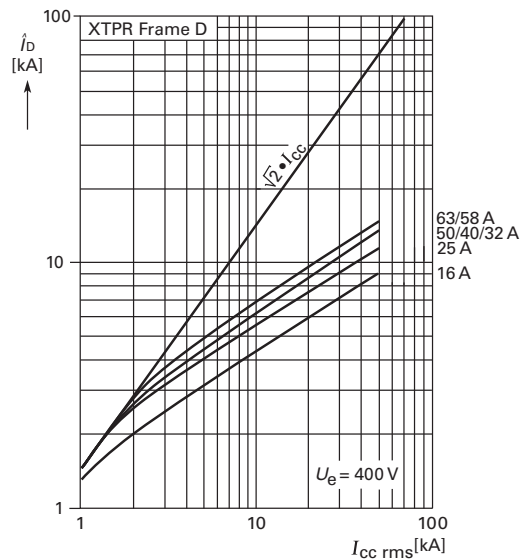
### MMP Tripping Characteristics

#### XTPB, XTPR Frame B



#### XTPR Frame D



**MMP Let-Through Tripping Characteristics****XTPB, XTPR Frame B****XTPR Frame D****XTPR Frame D**

**Manual Motor Protector Short-Circuit Ratings**

Rated uninterrupted current  $I_u$  = Rated operational current  $I_e$ .

Rated conditional short-circuit current  $I_q$ —IEC/EN 60947-4-1.

Rated ultimate short-circuit breaking capacity  $I_{cu}$ —IEC/EN 60947-2.

Rated operational short-circuit breaking capacity  $I_{cs}$ —IEC/EN 60947-2.

**Global Use, IEC/EN 60947—XTPB with Classification Type “1” and Type “2”**

| $I_u$<br>A | 230V        |                |                |                         | 400V        |                |                |                         | 440V        |                |                |                         | 500V        |                |                |                         | 690V        |                |                |                         |
|------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|
|            | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A |
| 0.16–1     | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 1.6        | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 2.5        | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 4          | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 6.3        | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 10         | 50          | 50             | 50             | 50                      | 50          | 50             | 50             | 50                      | 42          | 42             | 10             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 12         | 50          | 50             | 10             | 50                      | 50          | 50             | 10             | 50                      | 15          | 15             | 10             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 16         | 50          | 50             | 10             | 50                      | 50          | 50             | 10             | 50                      | 15          | 15             | 10             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 20         | 50          | 50             | 10             | 50                      | 50          | 50             | 10             | 50                      | 10          | 10             | 10             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |
| 25         | 50          | 50             | 10             | 50                      | 50          | 50             | 10             | 50                      | 10          | 10             | 10             | 50                      | —           | —              | —              | —                       | —           | —              | —              | —                       |

**Global Use, IEC/EN 60947—XTPR...BC1 with Classification Type “1” and Type “2”**

| $I_u$<br>A | 230V             |                  |                  |                         | 400V             |                  |                  |                         | 440V        |                |                |                         | 500V        |                |                |                         | 690V        |                |                |                         |
|------------|------------------|------------------|------------------|-------------------------|------------------|------------------|------------------|-------------------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|
|            | $I_q$<br>kA      | $I_{cu}$<br>kA   | $I_{cs}$<br>kA   | Fuse <sup>①②</sup><br>A | $I_q$<br>kA      | $I_{cu}$<br>kA   | $I_{cs}$<br>kA   | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A |
| 0.16–1     | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | ③           | ③              | ③              | N                       | ③           | ③              | ③              | N                       | ③           | ③              | ③              | N                       |
| 1.6        | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | ③           | ③              | ③              | N                       | ③           | ③              | ③              | N                       | ③           | ③              | ③              | N                       |
| 2.5        | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | ③           | ③              | ③              | N                       | ③           | ③              | ③              | N                       | 5           | 5              | 5              | 50                      |
| 4          | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | ③           | ③              | ③              | N                       | ③           | ③              | ③              | N                       | 3           | 3              | 3              | 50                      |
| 6.3        | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | ③           | ③              | ③              | N                       | 42          | 42             | 6              | 50                      | 3           | 3              | 2              | 50                      |
| 10         | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 150 <sup>③</sup> | N                       | 42          | 42             | 10             | 50                      | 42          | 42             | 6              | 50                      | 3           | 3              | 2              | 50                      |
| 12         | 50               | 50               | 10               | 50                      | 50               | 50               | 10               | 50                      | 15          | 15             | 10             | 50                      | 15          | 15             | 6              | 50                      | 3           | 3              | 2              | 50                      |
| 16         | 50               | 50               | 10               | 50                      | 50               | 50               | 10               | 50                      | 15          | 15             | 10             | 50                      | 15          | 15             | 6              | 50                      | 3           | 3              | 2              | 50                      |
| 20         | 50               | 50               | 10               | 50                      | 50               | 50               | 10               | 50                      | 15          | 15             | 10             | 50                      | 6           | 6              | 6              | 50                      | 3           | 3              | 2              | 50                      |
| 25         | 50               | 50               | 10               | 50                      | 50               | 50               | 10               | 50                      | 10          | 10             | 10             | 50                      | 6           | 6              | 6              | 50                      | 3           | 3              | 2              | 50                      |
| 32         | 50               | 50               | 10               | 50                      | 50               | 50               | 10               | 50                      | 10          | 10             | 10             | 50                      | 6           | 6              | 6              | 50                      | 3           | 3              | 2              | 50                      |

**Notes**

① N = Not required.

② XTPR...BC1, XTPT, XTPM—Required back-up fuse if the short-circuit current exceeds the rated conditional short-circuit current ( $I_{cc} > I_q$ ); XTPB, XTPR...DC1—Fuse (A gG/gL) for enhancing the switching capacity of the motor protective circuit breaker to 100 kA.

③ No upstream protective device required, as it is the auto-protected range (100/150 kA—Frame B, 150 kA—Frame D).

## Global Use, IEC/EN 60947—XTPR...DC1 with Classification Type “1” and Type “2”

| $I_u$<br>A | 230V             |                  |                |                         | 400V             |                  |                |                         | 440V        |                |                |                         | 500V        |                |                |                         | 690V        |                |                |                         |
|------------|------------------|------------------|----------------|-------------------------|------------------|------------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|-------------|----------------|----------------|-------------------------|
|            | $I_q$<br>kA      | $I_{cu}$<br>kA   | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA      | $I_{cu}$<br>kA   | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A | $I_q$<br>kA | $I_{cu}$<br>kA | $I_{cs}$<br>kA | Fuse <sup>①②</sup><br>A |
| 16         | 150 <sup>③</sup> | 150 <sup>③</sup> | 25             | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 25             | N                       | 45          | 45             | 25             | 100                     | 15          | 15             |                | 100                     | 8           | 8              | 2.5            | 100                     |
| 25         | 150 <sup>③</sup> | 150 <sup>③</sup> | 25             | N                       | 150 <sup>③</sup> | 150 <sup>③</sup> | 25             | N                       | 45          | 45             | 25             | 100                     | 15          | 15             |                | 100                     | 8           | 8              | 2.5            | 100                     |
| 32         | 50               | 50               | 25             | 100                     | 50               | 50               | 25             | 100                     | 45          | 45             | 25             | 100                     | 15          | 15             |                | 100                     | 5           | 5              | 2.5            | 100                     |
| 40         | 50               | 50               | 25             | 100                     | 50               | 50               | 25             | 100                     | 45          | 45             | 25             | 100                     | 15          | 15             |                | 100                     | 5           | 5              | 2.5            | 100                     |
| 50         | 50               | 50               | 25             | 100                     | 50               | 50               | 25             | 100                     | 45          | 45             | 25             | 100                     | 15          | 15             |                | 100                     | 5           | 5              | 2.5            | 100                     |
| 58         | 50               | 50               | 25             | 160                     | 50               | 50               | 25             | 160                     | 45          | 45             | 25             | 160                     | 15          | 15             |                | 160                     | 5           | 5              | 2.5            | 160                     |
| 63         | 50               | 50               | 25             | 160                     | 50               | 50               | 25             | 160                     | 45          | 45             | 25             | 160                     | 15          | 15             |                | 160                     | 5           | 5              | 2.5            | 160                     |

## Ratings for Group Motor Applications

## UL 508/CSA C22.2 No. 14—XTPB—Frame B, Manual Motor Protector with Thermal and Magnetic Trip

| Catalog Number          | Rated<br>Uninterrupted<br>Current—<br>$I_u$ (Amps) | FLA<br>Adjustment<br>Range/Overload<br>Release—<br>$I_r$ (Amps) | Short<br>Circuit<br>Release—<br>$I_m$ (Amps) | Maximum Protective Device for UL/CSA Group Protection |                                  |                            |                                  |                                |                                  |
|-------------------------|----------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------|----------------------------------|----------------------------|----------------------------------|--------------------------------|----------------------------------|
|                         |                                                    |                                                                 |                                              | Maximum rms<br>Sym Current—<br>480V (kA)              | w/Current<br>Limiter—<br>XTPAXCL | Maximum Fuse<br>Rating (A) | w/Current<br>Limiter—<br>XTPAXCL | Circuit Breaker<br>Maximum (A) | w/Current<br>Limiter—<br>XTPAXCL |
| XTPBP16BC1              | 0.16                                               | 0.1–0.16                                                        | 2.2                                          | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPBP25BC1              | 0.25                                               | 0.16–0.25                                                       | 3.5                                          | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPBP40BC1              | 0.4                                                | 0.25–0.4                                                        | 5.6                                          | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPBP63BC1              | 0.63                                               | 0.4–0.63                                                        | 8.8                                          | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPB001BC1              | 1                                                  | 0.63–1                                                          | 14                                           | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPB1P6BC1              | 1.6                                                | 1–1.6                                                           | 22                                           | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPB2P5BC1              | 2.5                                                | 1.6–2.5                                                         | 35                                           | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPB004BC1              | 4                                                  | 2.5–4                                                           | 56                                           | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPB6P3BC1              | 6.3                                                | 4–6.3                                                           | 88                                           | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPB010BC1              | 10                                                 | 6.3–10                                                          | 140                                          | 30                                                    | 50                               | 600                        | 600                              | 600                            | 600                              |
| XTPB012BC1              | 12                                                 | 8–12                                                            | 168                                          | 10                                                    | 50                               | 150                        | 600                              | 125 <sup>⑤</sup>               | 600                              |
| XTPB016BC1              | 16                                                 | 10–16                                                           | 224                                          | 10                                                    | 50                               | 150                        | 600                              | 125 <sup>⑤</sup>               | 600                              |
| XTPB020BC1 <sup>④</sup> | 20                                                 | 16–20                                                           | 280                                          | 10                                                    | 18                               | 150                        | 600                              | 125                            | 600                              |
| XTPB025BC1 <sup>④</sup> | 25                                                 | 20–25                                                           | 350                                          | 10                                                    | 18                               | 150                        | 600                              | 125                            | 600                              |

## Notes

① N = Not required.

② XTPR...BC1, XTPT, XTPM—Required back-up fuse if the short-circuit current exceeds the rated conditional short-circuit current ( $I_{cc} > I_q$ ); XTPB, XTPR...DC1—Fuse (A gG/gL) for enhancing the switching capacity of the motor protective circuit breaker to 100 kA.

③ No upstream protective device required, as it is the auto-protected range (100/150 kA—Frame B, 150 kA—Frame D).

④ IEC/EN 60947-4-1.

⑤ 22 kA 600 Vac.

**UL 508/CSA C22.2 No. 14—XTPR—Frame B (all Screw and Spring Cage Terminal Options), Manual Motor Protector with Thermal and Magnetic Trip**

| Catalog Number | Rated<br>Uninterrupted<br>Current—<br>$I_u$ (Amps) | FLA<br>Adjustment<br>Range/Overload<br>Release—<br>$I_r$ (Amps)                   | Short<br>Circuit<br>Release—<br>$I_m$ (Amps)                                      | Maximum Protective Device for UL/CSA Group Protection |                                  |                            |                                  |                                |                                  |
|----------------|----------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------|----------------------------|----------------------------------|--------------------------------|----------------------------------|
|                |                                                    |  |  | Maximum rms<br>Sym Current—<br>480V (kA)              | w/Current<br>Limiter—<br>XTPAXCL | Maximum Fuse<br>Rating (A) | w/Current<br>Limiter—<br>XTPAXCL | Circuit Breaker<br>Maximum (A) | w/Current<br>Limiter—<br>XTPAXCL |
| XTPRP16BC1     | 0.16                                               | 0.1–0.16                                                                          | 2.2                                                                               | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPRP25BC1     | 0.25                                               | 0.16–0.25                                                                         | 3.5                                                                               | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPRP40BC1     | 0.4                                                | 0.25–0.4                                                                          | 5.6                                                                               | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPRP63BC1     | 0.63                                               | 0.4–0.63                                                                          | 8.8                                                                               | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR001BC1     | 1                                                  | 0.63–1                                                                            | 14                                                                                | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR1P6BC1     | 1.6                                                | 1–1.6                                                                             | 22                                                                                | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR2P5BC1     | 2.5                                                | 1.6–2.5                                                                           | 35                                                                                | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR004BC1     | 4                                                  | 2.5–4                                                                             | 56                                                                                | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR6P3BC1     | 6.3                                                | 4–6.3                                                                             | 88                                                                                | 50                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR010BC1     | 10                                                 | 6.3–10                                                                            | 140                                                                               | 30                                                    | 50                               | 600                        | 600                              | 600                            | 600                              |
| XTPR012BC1     | 12                                                 | 8–12                                                                              | 168                                                                               | 10                                                    | 50                               | 150                        | 600                              | 125                            | 600                              |
| XTPR016BC1     | 16                                                 | 10–16                                                                             | 224                                                                               | 10                                                    | 50                               | 150                        | 600                              | 125 ①                          | 600                              |
| XTPR032BC1     | 32                                                 | 25–32                                                                             | 448                                                                               | 10                                                    | 18                               | 150                        | 600                              | 125                            | 600                              |
| XTPR025BC1     | 25                                                 | 20–25                                                                             | 350                                                                               | 10                                                    | 18                               | 150                        | 600                              | 125                            | 600                              |
| XTPR032BC1     | 32                                                 | 25–32                                                                             | 448                                                                               | 10                                                    | 18                               | 150                        | 600                              | 125                            | 600                              |

**UL 508/CSA C22.2 No. 14—XTPR—Frame D, Manual Motor Protector with Thermal and Magnetic Trip**

| Catalog Number | Rated<br>Uninterrupted<br>Current—<br>$I_u$ (Amps) | FLA<br>Adjustment<br>Range/Overload<br>Release—<br>$I_r$ (Amps)                     | Short<br>Circuit<br>Release—<br>$I_m$ (Amps)                                        | Maximum Protective Device for UL/CSA Group Protection |                                  |                            |                                  |                                |                                  |
|----------------|----------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------|----------------------------|----------------------------------|--------------------------------|----------------------------------|
|                |                                                    |  |  | Maximum rms<br>Sym Current—<br>480V (kA)              | w/Current<br>Limiter—<br>XTPAXCL | Maximum Fuse<br>Rating (A) | w/Current<br>Limiter—<br>XTPAXCL | Circuit Breaker<br>Maximum (A) | w/Current<br>Limiter—<br>XTPAXCL |
| XTPR016DC1     | 16                                                 | 10–16                                                                               | 224                                                                                 | 65                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR025DC1     | 25                                                 | 16–25                                                                               | 350                                                                                 | 65                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR032DC1     | 32                                                 | 25–32                                                                               | 448                                                                                 | 65                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR040DC1     | 40                                                 | 32–40                                                                               | 560                                                                                 | 65                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR050DC1     | 50                                                 | 40–50                                                                               | 700                                                                                 | 65                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR058DC1     | 58                                                 | 50–58                                                                               | 812                                                                                 | 65                                                    | —                                | 600                        | —                                | 600                            | —                                |
| XTPR063DC1     | 65                                                 | 55–63                                                                               | 882                                                                                 | 65                                                    | —                                | 600                        | —                                | 600                            | —                                |

**Note**

① 22 kA 600 Vac.



## 1 UL 508 Type E Ratings—XTPR Frame B + XTPAXLSA

| Manual Motor<br>Protector—<br>Screw Terminal<br>Catalog Number | Line Side Adapter<br>Catalog Number | FLA Adjustment<br>Range/Overload<br>Release—<br>$I_r$ (Amps) | Short Circuit<br>Release—<br>$I_{rm}$ (Amps) | UL 508 Type E Application<br>Maximum rms Symmetrical<br>Short-Circuit Ratings (kA) |          | Maximum Upstream<br>Protective Device (A) ① |                                    |
|----------------------------------------------------------------|-------------------------------------|--------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------|----------|---------------------------------------------|------------------------------------|
|                                                                |                                     |                                                              |                                              | 480/277V                                                                           | 600/347V | Maximum Fuse<br>600V                        | Maximum<br>Circuit Breaker<br>600V |
| XTPRP16BB1                                                     | XTPAXLSA                            | 0.1–0.16                                                     | 2.2                                          | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPRP25BC1                                                     | XTPAXLSA                            | 0.16–0.25                                                    | 3.5                                          | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPRP40BC1                                                     | XTPAXLSA                            | 0.25–0.4                                                     | 5.6                                          | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPRP63BC1                                                     | XTPAXLSA                            | 0.4–0.63                                                     | 8.82                                         | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPR01BC1                                                      | XTPAXLSA                            | 0.63–1                                                       | 14                                           | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPR1P6BC1                                                     | XTPAXLSA                            | 1–1.6                                                        | 22.4                                         | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPR2P5BC1                                                     | XTPAXLSA                            | 1.6–2.5                                                      | 35                                           | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPR04BC1                                                      | XTPAXLSA                            | 2.5–4                                                        | 56                                           | 50                                                                                 | 50       | Not required                                | Not required                       |
| XTPR6P3BC1                                                     | XTPAXLSA                            | 4–6.3                                                        | 88.2                                         | 65                                                                                 | 50       | Not required                                | Not required                       |
| XTPR010BC1                                                     | XTPAXLSA                            | 6.3–10                                                       | 140                                          | 65                                                                                 | 50       | Not required                                | Not required                       |
| XTPR012BC1                                                     | XTPAXLSA                            | 8–12                                                         | 168                                          | 65                                                                                 | —        | Not required                                | Not required                       |
| XTPR016BC1                                                     | XTPAXLSA                            | 10–16                                                        | 224                                          | 42                                                                                 | —        | Not required                                | Not required                       |
| XTPR020BC1                                                     | XTPAXLSA                            | 16–20                                                        | 280                                          | 18                                                                                 | —        | Not required                                | Not required                       |
| XTPR025BC1                                                     | XTPAXLSA                            | 20–25                                                        | 350                                          | 18                                                                                 | —        | Not required                                | Not required                       |
| XTPR032BC1                                                     | XTPAXLSA                            | 25–32                                                        | 448                                          | 18                                                                                 | —        | Not required                                | Not required                       |

## UL 508 Type E Ratings—XTPR Frame D + XTPAXLSAD

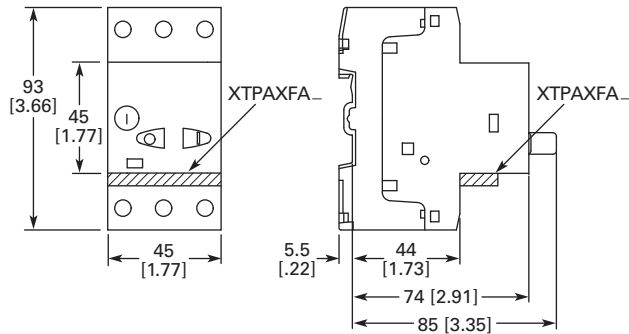
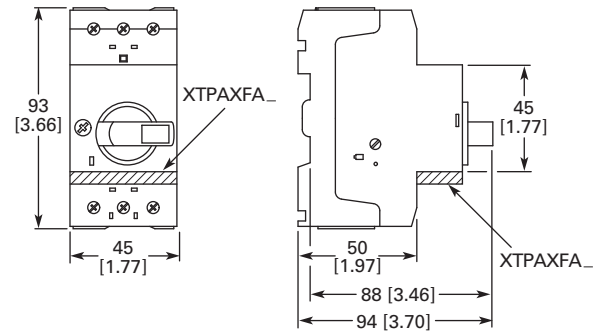
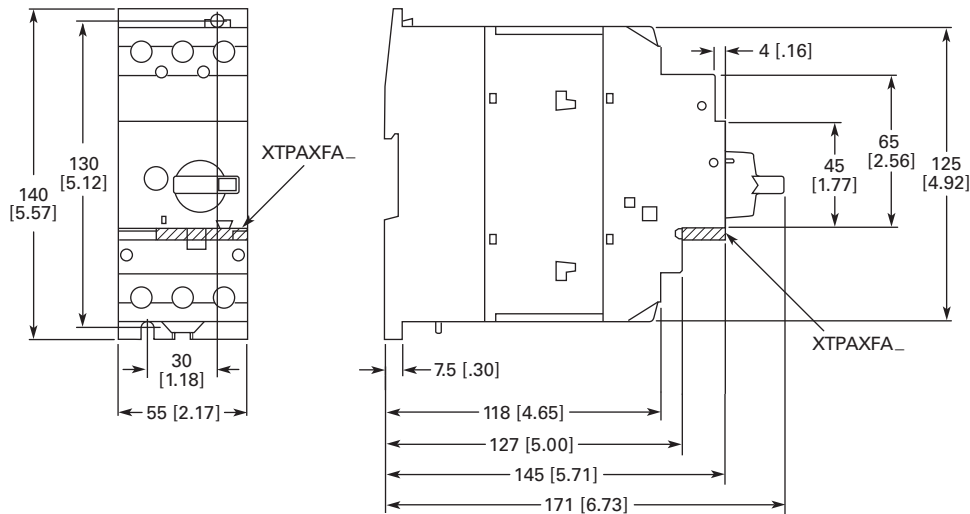
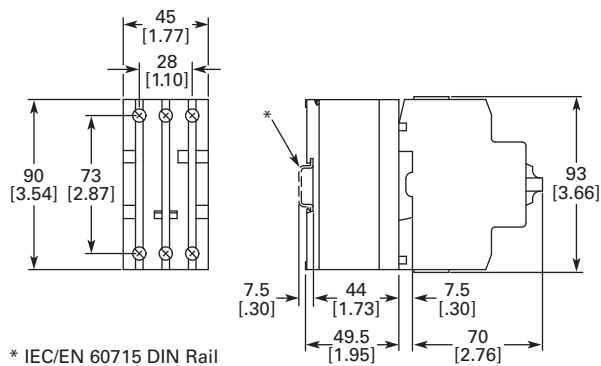
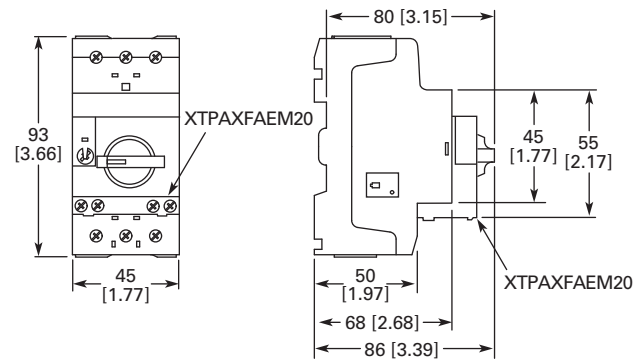
| Manual Motor<br>Protector—<br>Screw Terminal<br>Catalog Number | Line Side<br>Adapter<br>Catalog Number | FLA<br>Adjustment<br>Range/Overload<br>Release—<br>$I_r$ (Amps) | Short<br>Circuit<br>Release—<br>$I_{rm}$ (Amps) | UL 508 Type E Application<br>Maximum rms Symmetrical Short-Circuit Ratings (kA) |          |          | Maximum Upstream<br>Protective Device (A) ① |                                    |
|----------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------|----------|----------|---------------------------------------------|------------------------------------|
|                                                                |                                        |                                                                 |                                                 | 240V                                                                            | 480/277V | 600/347V | Maximum Fuse<br>600V                        | Maximum<br>Circuit Breaker<br>600V |
| XTPR016DC1                                                     | XTPAXLSAD                              | 10–16                                                           | 224                                             | 65                                                                              | 65       | 25       | Not required                                | Not required                       |
| XTPR025DC1                                                     | XTPAXLSAD                              | 16–25                                                           | 350                                             | 65                                                                              | 65       | 25       | Not required                                | Not required                       |
| XTPR032DC1                                                     | XTPAXLSAD                              | 25–32                                                           | 448                                             | 65                                                                              | 65       | 25       | Not required                                | Not required                       |
| XTPR040DC1                                                     | XTPAXLSAD                              | 32–40                                                           | 560                                             | 65                                                                              | 65       | 25       | Not required                                | Not required                       |
| XTPR050DC1                                                     | XTPAXLSAD                              | 40–50                                                           | 700                                             | 65                                                                              | 65       | —        | Not required                                | Not required                       |
| XTPR058DC1                                                     | XTPAXLSAD                              | 50–58                                                           | 812                                             | 65                                                                              | 65       | —        | Not required                                | Not required                       |
| XTPR063DC1                                                     | XTPAXLSAD                              | 55–65                                                           | 882                                             | 65                                                                              | 65       | —        | Not required                                | Not required                       |

**Note**

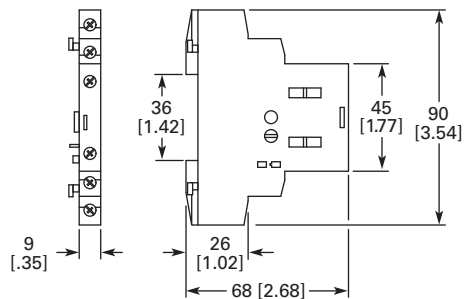
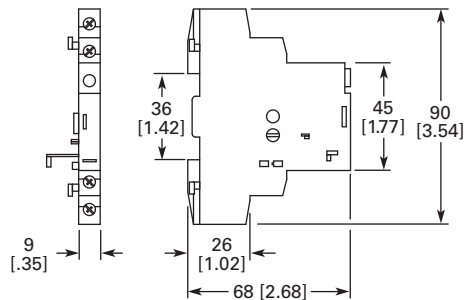
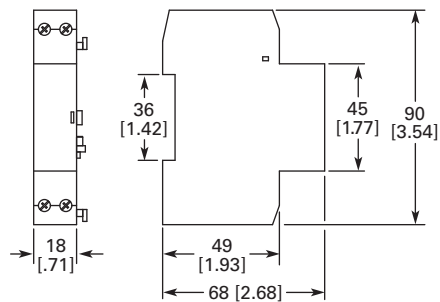
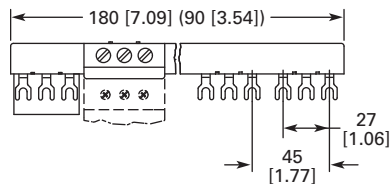
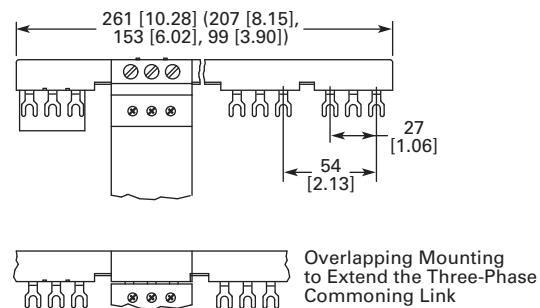
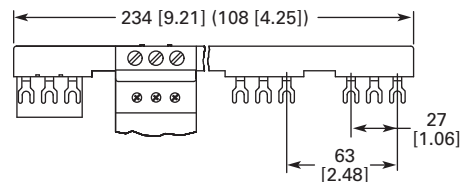
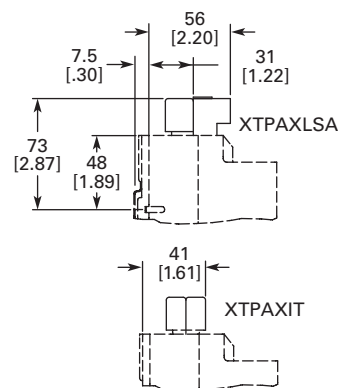
① For UL 508 Type E applications, the manual motor protector assembly does not require a dedicated upstream protective device in the panel, thus a maximum rating is not required.

**Dimensions**

Approximate Dimensions in mm [in]

**Manual Motor Protectors—XTPB****Manual Motor Protectors, Manual Transformer Protectors—XTPR...B****Manual Motor Protector—XTPR...DC1****Current Limiter—XTPAXCL****MMPs with Early-Make Auxiliary Contacts—XTPR...BC1 + XTPAXFAEM20**

Approximate Dimensions in mm [in]

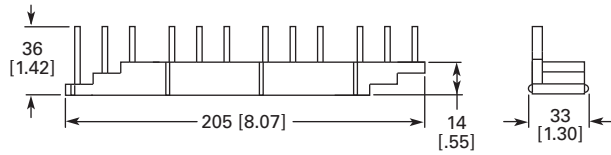
**Standard Auxiliary Contact—XTPAXSA\_****Trip Indicating Auxiliary Contact—XTPAXSATR\_****Undervoltage/Shunt Release—XTPAXUVR\_, XTPAXSR\_****Three-Phase Commoning Link—XTPAXCLKA4, XTPAXCLKA2****Three-Phase Commoning Link—XTPAXCLKB5, XTPAXCLKB4, XTPAXCLKB3 and XTPAXCLKB2****Three-Phase Commoning Link—XTPAXCLKC4, XTPAXCLKC2****Incoming Terminal, Line Side Adapter—XTPAXIT, XTPAXLSA**

Approximate Dimensions in mm [in]

### Three-Phase Commoning Link

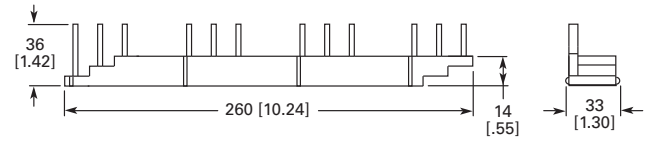
#### XTPAXCLKA4D, XTPAXCLKA3D and XTPAXCLKA2D

##### XTPAXCLKA4D

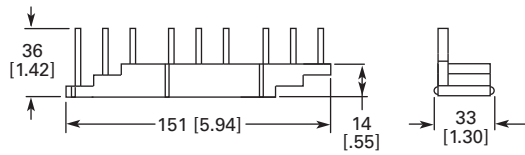


#### XTPAXCLKC4D and XTPAXCLKC2D

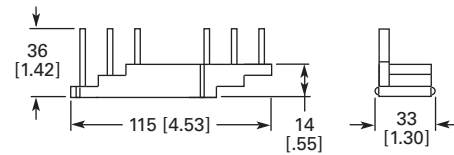
##### XTPAXCLKC4D



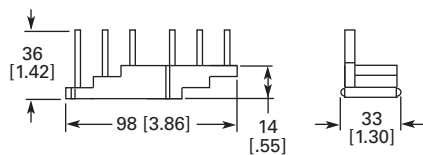
##### XTPAXCLKA3D



##### XTPAXCLKC2D

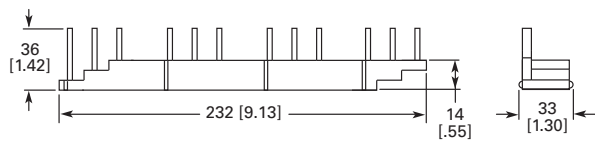


##### XTPAXCLKA2D

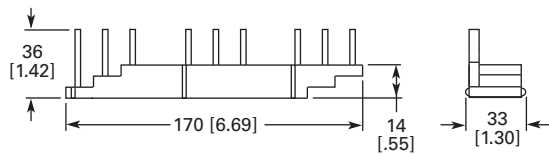


#### XTPAXCLKB4D, XTPAXCLKB3D and XTPAXCLKB2D

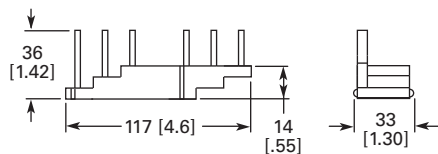
##### XTPAXCLKB4D



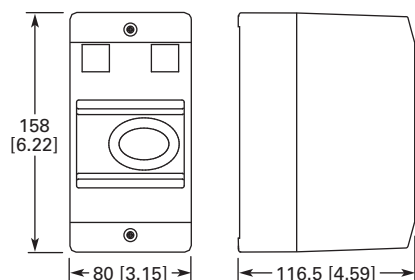
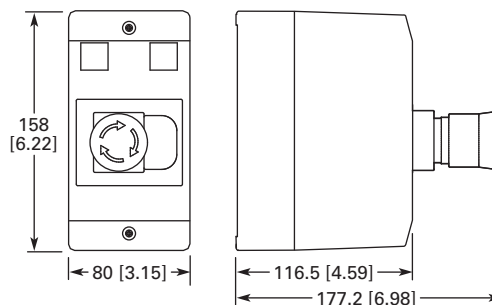
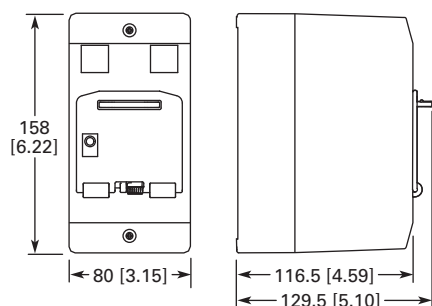
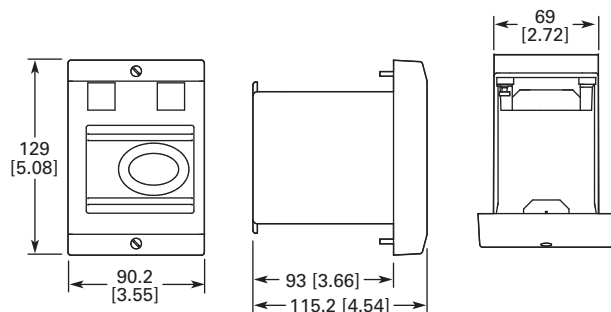
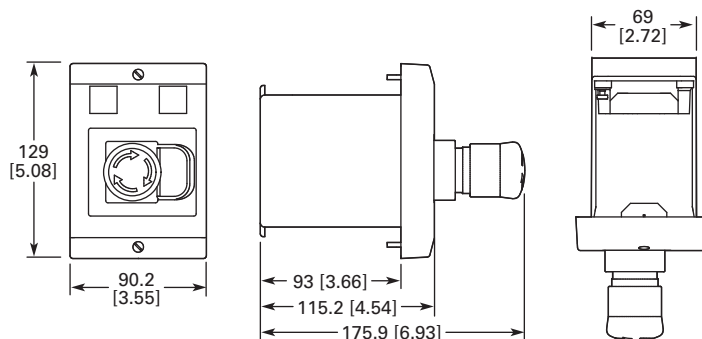
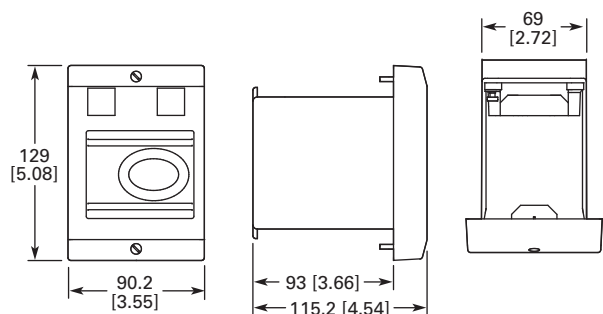
##### XTPAXCLKB3D



##### XTPAXCLKB2D

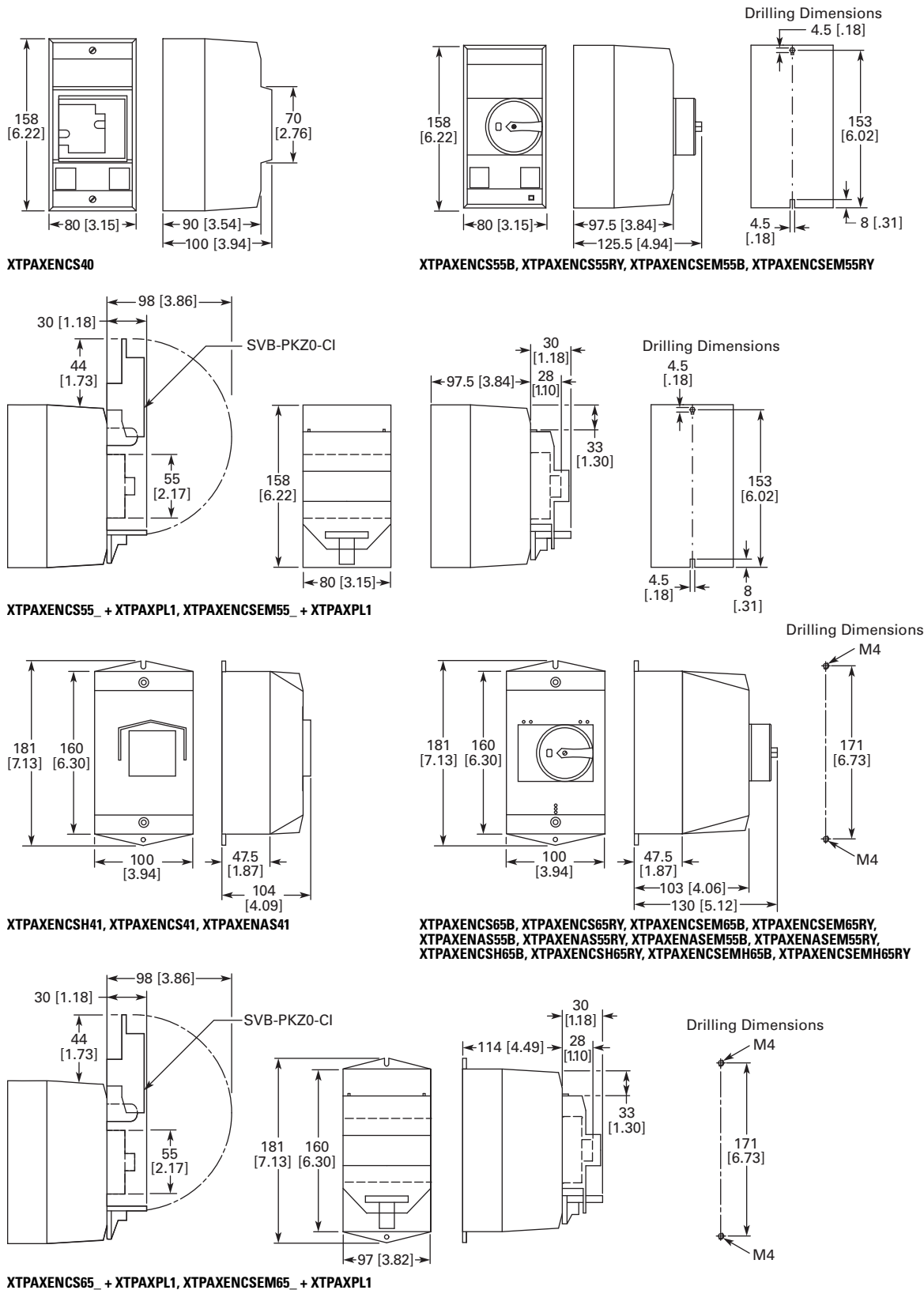


Approximate Dimensions in mm [in]

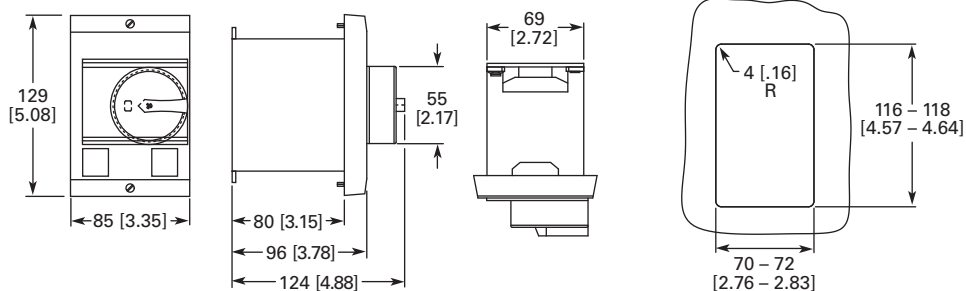
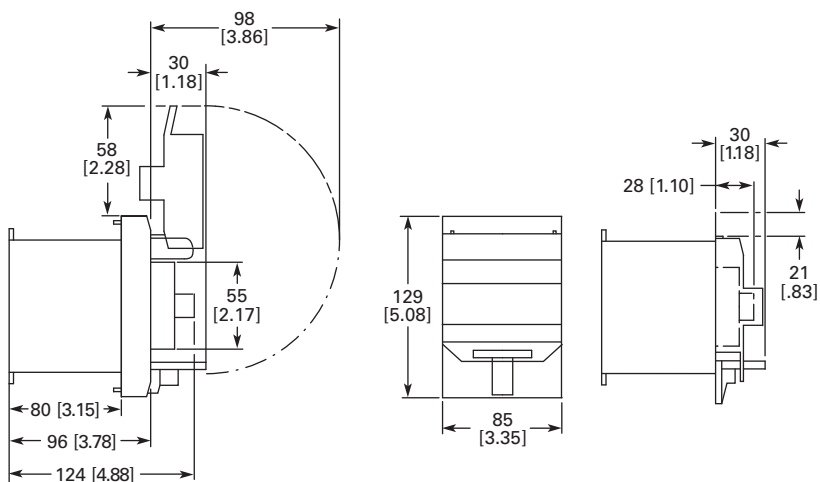
**Insulated Enclosures for Surface Mounting of XTPB Manual Motor Protectors****XTPBXENCS40, XTPBXENCS65, XTPBXENAS41, XTPBXENAS65****XTPBXENCSEK65, XTPBXENCSES65, XTPBXENASEK65, XTPBXENASES65****XTPBXENCSL65, XTPBXENCSL065, XTPBXENASL65, XTPBXENAS0065****Insulated Enclosures for Flush Mounting of XTPB Manual Motor Protectors****XTPBXENC40, XTPBXENC55****XTPBXENC55, XTPBXENC555****XTPBXENC55, XTPBXENC555**

Approximate Dimensions in mm [in]

## Insulated Enclosures for Surface Mounting of XTPR...B Manual Motor Protectors

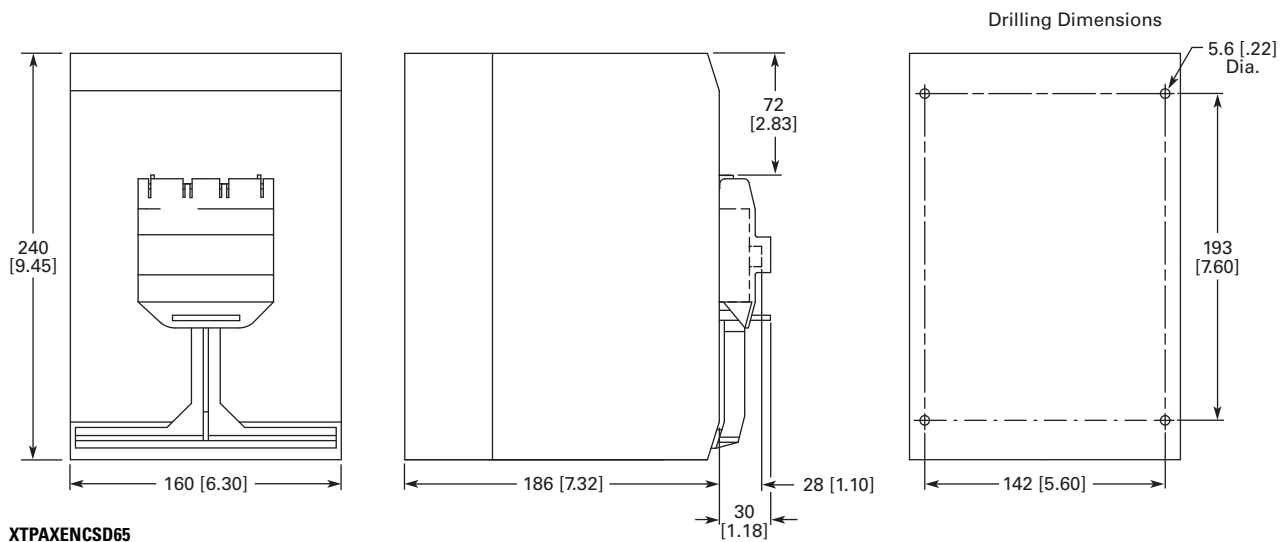
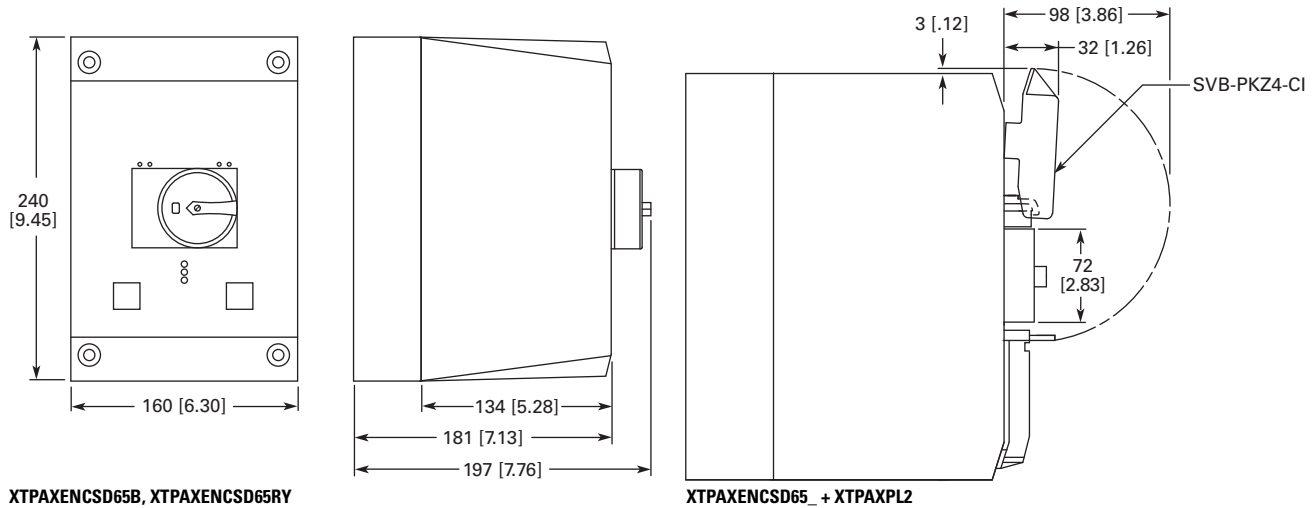


Approximate Dimensions in mm [in]

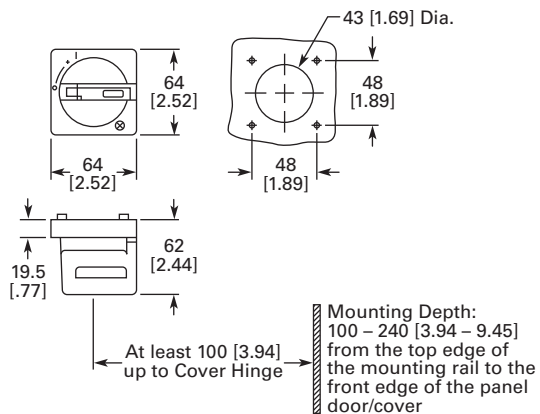
**Insulated Enclosures for Flush Mounting of XTPR...B Manual Motor Protectors****XTPAXENCF40, XTPAXENCF55B, XTPAXENCF55RY****Mounting Cutout XTPAXENCF\_****XTPAXENCF55\_ + XTPAXPL3**

Approximate Dimensions in mm [in]

### Insulated Enclosures for Surface Mounting of XTPR...D Manual Motor Protectors



### Rotary Handle Mechanism—XTPAXRHM\_





Approximate Dimensions in mm [in]

**Pushbutton MMP Enclosures****Insulated Enclosures for Surface Mounting****XTPB Pushbutton Motor-Protective Circuit Breakers**

| Catalog Number       | H x W x D                                |
|----------------------|------------------------------------------|
| <b>Global Usage</b>  |                                          |
| <b>XTPBXENC540</b>   | 158 x 80 x 116.5<br>[6.22 x 3.15 x 4.59] |
| <b>XTPBXENC65</b>    | 158 x 80 x 116.5<br>[6.22 x 3.15 x 4.59] |
| <b>XTPBXENC5L065</b> | 158 x 80 x 129.5<br>[6.22 x 3.15 x 5.10] |
| <b>XTPBXENC5LE65</b> | 158 x 80 x 129.5<br>[6.22 x 3.15 x 5.10] |
| <b>XTPBXENC5ES65</b> | 158 x 80 x 177.2<br>[6.22 x 3.15 x 6.98] |
| <b>XTPBXENC5EK65</b> | 158 x 80 x 177.2<br>[6.22 x 3.15 x 6.98] |

**XTPB Pushbutton Manual Motor Protectors**

| Catalog Number              | H x W x D                                |
|-----------------------------|------------------------------------------|
| <b>North American Usage</b> |                                          |
| <b>XTPBXENAS41</b>          | 158 x 80 x 116.5<br>[6.22 x 3.15 x 4.59] |
| <b>XTPBXENAS65</b>          | 158 x 80 x 116.5<br>[6.22 x 3.15 x 4.59] |
| <b>XTPBXENASL065</b>        | 158 x 80 x 129.5<br>[6.22 x 3.15 x 5.10] |
| <b>XTPBXENASLE65</b>        | 158 x 80 x 129.5<br>[6.22 x 3.15 x 5.10] |
| <b>XTPBXENASES65</b>        | 158 x 80 x 177.2<br>[6.22 x 3.15 x 6.98] |
| <b>XTPBXENASEK65</b>        | 158 x 80 x 177.2<br>[6.22 x 3.15 x 6.98] |

**Frame B (0.1–32A) XTPR Motor-Protective Circuit Breakers**

| Catalog Number      | H x W x D                                |
|---------------------|------------------------------------------|
| <b>Global Usage</b> |                                          |
| <b>XTPAXENC541</b>  | 160 x 100 x 104<br>[6.30 x 3.94 x 4.09]  |
| <b>XTPAXENC65B</b>  | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12]  |
| <b>XTPAXENC65RY</b> | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12]  |
| <b>XTPAXENC540</b>  | 158 x 80 x 100<br>[6.22 x 3.15 x 3.94]   |
| <b>XTPAXENC55B</b>  | 158 x 80 x 125.5<br>[6.22 x 3.15 x 4.94] |
| <b>XTPAXENC55RY</b> | 158 x 80 x 125.5<br>[6.22 x 3.15 x 4.94] |

**Frame B (0.1–32A) XTPR Rotary Manual Motor Protectors**

| Catalog Number              | H x W x D                               |
|-----------------------------|-----------------------------------------|
| <b>North American Usage</b> |                                         |
| <b>XTPAXENAS55B</b>         | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12] |
| <b>XTPAXENAS55RY</b>        | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12] |

**Frame B XTPR (0.1–32A) Rotary Motor-Protective Circuit Breakers with XTPAXFAEM20 Early-Make Front-Mount Auxiliary Contact**

| Catalog Number         | H x W x D                               |
|------------------------|-----------------------------------------|
| <b>Global Usage</b>    |                                         |
| <b>XTPAXENCSEM65B</b>  | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12] |
| <b>XTPAXENCSEM65RY</b> | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12] |
| <b>XTPAXENCSEM55B</b>  | 158 x 80 x 100<br>[6.22 x 3.15 x 3.94]  |
| <b>XTPAXENCSEM55RY</b> | 158 x 80 x 100<br>[6.22 x 3.15 x 3.94]  |

**Frame B XTPR (0.1–32A) Rotary Manual Motor Protectors with XTPAXFAEM20 Early-Make Front-Mount Auxiliary Contact**

| Catalog Number              | H x W x D                               |
|-----------------------------|-----------------------------------------|
| <b>North American Usage</b> |                                         |
| <b>XTPAXENCSEM55B</b>       | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12] |
| <b>XTPAXENCSEM55RY</b>      | 160 x 100 x 130<br>[6.30 x 3.94 x 5.12] |

**Frame D (10–65A) Rotary Motor-Protective Circuit Breakers**

| Catalog Number                         | H x W x D                               |
|----------------------------------------|-----------------------------------------|
| <b>Global and North American Usage</b> |                                         |
| <b>XTPAXENCSD65B</b>                   | 240 x 160 x 197<br>[9.45 x 6.30 x 7.76] |
| <b>XTPAXENCSD65RY</b>                  | 240 x 160 x 197<br>[9.45 x 6.30 x 7.76] |

**Insulated Enclosures for Flush Mounting****XTPB Pushbutton Manual Motor Protectors**

| Catalog Number                         | H x W x D                                  |
|----------------------------------------|--------------------------------------------|
| <b>Global and North American Usage</b> |                                            |
| <b>XTPBXENC40</b>                      | 129 x 90.2 x 115.2<br>[5.08 x 3.55 x 4.54] |
| <b>XTPBXENC55</b>                      | 129 x 90.2 x 115.2<br>[5.08 x 3.55 x 4.54] |
| <b>XTPBXENC5FLO55</b>                  | 129 x 90.2 x 115.2<br>[5.08 x 3.55 x 4.54] |
| <b>XTPBXENC5FLE55</b>                  | 129 x 90.2 x 115.2<br>[5.08 x 3.55 x 4.54] |
| <b>XTPBXENC5FES55</b>                  | 129 x 90.2 x 175.9<br>[5.08 x 3.55 x 6.93] |
| <b>XTPBXENC5FEK55</b>                  | 129 x 90.2 x 175.9<br>[5.08 x 3.55 x 6.93] |

**Frame B (0.1–32A) XTPR Rotary Manual Motor Protectors**

| Catalog Number      | H x W x D                              |
|---------------------|----------------------------------------|
| <b>Global Usage</b> |                                        |
| <b>XTPAXENC40</b>   | 129 x 85 x 96<br>[5.08 x 3.35 x 3.78]  |
| <b>XTPAXENC55B</b>  | 129 x 85 x 124<br>[5.08 x 3.35 x 4.88] |
| <b>XTPAXENC55RY</b> | 129 x 85 x 124<br>[5.08 x 3.35 x 4.88] |

## Combination Motor Controllers



## Combination Motor Controllers

## Product Description

Eaton's **XT** IEC open non-reversing and reversing manual motor controllers combine a manual motor protector with an IEC contactor(s) to provide a complete motor protection solution by combining motor disconnect function, thermal overload protection, magnetic short-circuit protection and remote control operation in one compact, assembled unit. These assembled manual motor controllers cover motors with FLA ratings from 0.10A to 65A.

The UL 508 Type F or Type E labeled combination motor controller (CMC) includes a line side adapter (LSA). These assembled combination motor controllers cover motors with FLA ratings from 0.10A to 65A.

## Application Description

The **XT** IEC non-reversing and reversing manual and combination motor controllers can be used in the following applications:

## Group Motor Control

Manual motor controllers (MMCs) are ideal for group motor applications where an upstream breaker or fuse provides protection for two or more motors. **XT** manual motor controllers (MMC) combine a manual motor protector, a wiring connector link and IEC contactor.

## Contents

## Description

|                                           | Page      |
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| Relays and Timers                         | V5-T1-3   |
| Miniature Controls                        | V5-T1-18  |
| Contactors and Starters                   | V5-T1-35  |
| XTSE Contactors                           | V5-T1-128 |
| Thermal Overload Relays                   | V5-T1-130 |
| C440/ <b>XT</b> Electronic Overload Relay | V5-T1-143 |
| Manual Motor Protectors                   | V5-T1-159 |
| Combination Motor Controllers             |           |
| Features                                  | V5-T1-194 |
| Catalog Number Selection                  | V5-T1-195 |
| Product Selection                         | V5-T1-195 |
| Accessories                               | V5-T1-205 |
| Technical Data and Specifications         | V5-T1-207 |
| Dimensions                                | V5-T1-214 |



An Eaton  
Green Solution

|                                             |           |
|---------------------------------------------|-----------|
| <b>XT</b> Electronic Manual Motor Protector | V5-T1-219 |
| EMS—Electronic Motor Starter                | V5-T1-232 |
| <b>XT</b> DC Contactors                     | V5-T1-234 |
| Reference Data                              | V5-T1-236 |

## Individual Branch Circuit for Motor Loads

Combination motor controller (CMC), consisting of a line side adapter, manual motor protector, wiring connector link and IEC contactor, provide an efficient means to build an entire branch circuit. The **XT** CMC is UL 508 Type F and Type E approved, meaning it is "self-protected" and doesn't require the use of an additional fuse or breaker for short circuit protection. This approval means CMC's can be used in place of a traditional fuse-starter and breaker-starter motor circuit.

Based around two key functional components (MMP and contactor), the CMC is a very cost effective means to build a branch circuit. Fuses and breakers must be oversized to prevent tripping during motor start up, and thus these oversized devices can no longer protect the motor. To compensate for this, a motor overload relay is necessary to protect the motor.

The manual motor protector was invented in Germany by Moeller to correct this inefficiency. The MMP operates similarly to a circuit breaker, except the inrush (magnetic) protection is set to 14 times the running current, thus accounting for motor start-up current without the necessity to oversize. A overcurrent dial was added to the face of the MMP to serve as the motor overload protection. This "motor protective circuit breaker", as it is referred to in Europe, now accomplishes all four key functions of a motor branch circuit: disconnect, short circuit, motor controller and motor overload protection. With the addition of a contactor, users have the ability to remotely control the starter device.

Whether a single motor application or a multiple motor application, CMC's are an ideal solution for machinery OEMs and panel builders.

## Features

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Test trip function
- Motor applications from 0.10A to 65A
- Class 10 overload protection
- Built-in heater and magnetic trip elements to protect the motor
- Phase loss sensitivity
- Type 2 coordination
- Ambient compensated up to 55°C [140°F]
- Control inputs located at front of starter for easy access and wiring
- Wide range of coils
- DIN rail mount—XTSC...BB\_
- Mounting plates—XTSC...BC\_, XTSC...D motor controllers
- Adjustment dial for setting motor FLA
- Short-circuit trip at 14 times the maximum setting of the FLA adjustment dial
- UL 508 Type F and Type E CMC high fault short-circuit ratings
- 1NO-1NC auxiliary contact as standard on manual motor controller and combination motor controller

## Standards and Certifications

UL 508 Type F combination motor controller

- IEC Type 2 Approved per IEC 60947-4-1
- UL Listed File No. E245398
- CE Mark



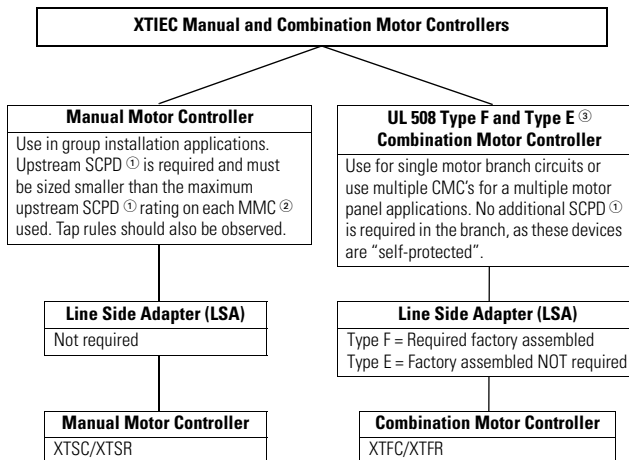
**Note:** For Type 2 Coordination of MMCs, see **Page V5-T1-237**. Protection in different controller types

UL 508 Type E self-protected combination motor controller

- UL Listed File No. E123500



## MMC and CMC Applications



### Notes

Technical Paper AP03402001E.

Line side adapters are not required for non-U.S. applications. Most countries outside of the U.S. classify the MMP as a motor-protective circuit breaker.

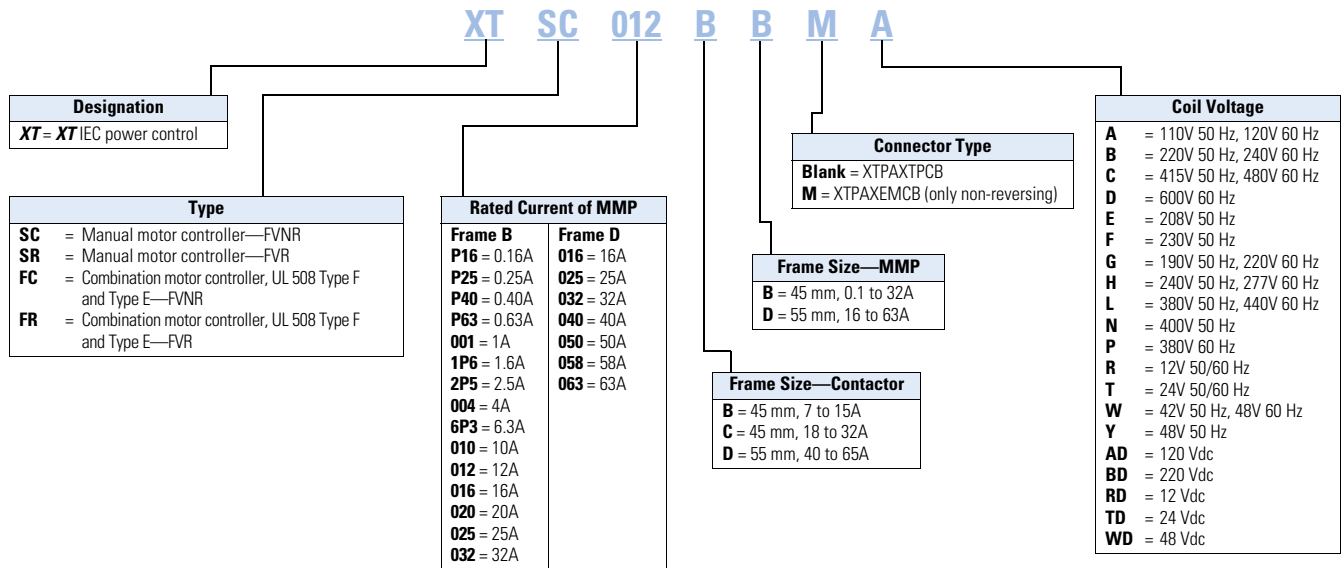
<sup>①</sup> SCPD = Short-circuit protective device (circuit breaker, fuses).

<sup>②</sup> MMC = Manual motor controller

<sup>③</sup> Type E self-protected combination controller is the combination of a Type E self-protected device with a contactor.

## Catalog Number Selection

## Combination Motor Controllers



## Product Selection

## XTSC and XTSP Manual Motor Controllers (MMC)/Starter Combinations

Frame B MMP +  
Frame B Contactor



### Factory-Assembled Manual Motor Controller—Frame B MMP + Frame B Contactor—Maximum UL Ratings <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release—I <sub>r</sub><br>(Amps) | Short-Circuit<br>Release—I <sub>m</sub> (Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW)<br>Three-Phase |       |       |       | Assembled Manual Motor Controller <sup>②</sup> |                             |
|----------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------|-------|-------|-------|------------------------------------------------|-----------------------------|
|                                                                      |                                                | 200V                                                                     | 240V  | 480V  | 600V  | Non-Reversing<br>Catalog Number <sup>③</sup>   | Reversing<br>Catalog Number |
| 0.1–0.16                                                             | 3.2                                            | ④                                                                        | ④     | 1/2   | 1/2   | XTSCP16BB_                                     | XTSRP16BB_                  |
| 0.16–0.25                                                            | 3.5                                            | ④                                                                        | ④     | 1/2   | 1/2   | XTSCP25BB_                                     | XTSRP25BB_                  |
| 0.25–0.4                                                             | 5.6                                            | ④                                                                        | ④     | 1/2   | 1/2   | XTSCP40BB_                                     | XTSRP40BB_                  |
| 0.4–0.63                                                             | 8.82                                           | ④                                                                        | ④     | 1/2   | 1/2   | XTSCP63BB_                                     | XTSRP63BB_                  |
| 0.63–1                                                               | 14                                             | ④                                                                        | ④     | 1/2   | 1/2   | XTSC001BB_                                     | XTSR001BB_                  |
| 1–1.6                                                                | 22.4                                           | ④                                                                        | ④     | 3/4   | 1     | XTSC1P6BB_                                     | XTSR1P6BB_                  |
| 1.6–2.5                                                              | 35                                             | 1/2                                                                      | 1/2   | 1     | 1-1/2 | XTSC2P5BB_                                     | XTSR2P5BB_                  |
| 2.5–4                                                                | 56                                             | 1                                                                        | 1     | 2     | 3     | XTSC004BB_                                     | XTSR004BB_                  |
| 4–6.3                                                                | 88.2                                           | 1-1/2                                                                    | 1-1/2 | 3     | 5     | XTSC6P3BB_                                     | XTSR6P3BB_                  |
| 6.3–10                                                               | 140                                            | 3                                                                        | 3     | 7-1/2 | 7.5   | XTSC010BB_                                     | XTSR010BB_                  |
| 8–12                                                                 | 168                                            | 3                                                                        | 3     | 7-1/2 | 7.5   | XTSC012BB_                                     | XTSR012BB_                  |
| 10–16                                                                | 224                                            | 3                                                                        | 3     | 10    | 7.5   | XTSC016BB_                                     | —                           |

**Notes**

- ① Select manual motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.
- ② Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.
- ③ "M" prior to ( \_ ) coil suffix will be assembled with standard connector XTPAXEMCB, non-reversing only.
- ④ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

Frame B MMP +  
Frame B Contactor**Factory-Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor—  
Maximum IEC Ratings<sup>①</sup>**

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$<br>(Amps) | Short-Circuit<br>Release— $I_{sc}$<br>(Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14<br>Three-Phase |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                              |                                              | 220–<br>240V                                                       | 380–<br>415V | 500V | 660–<br>690V | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
| 0.1–0.16                                                     | 3.2                                          | —                                                                  | —            | —    | 0.06         | XTSCP16BB_                                     | XTSRP16BB_                  |
| 0.16–0.25                                                    | 3.5                                          | —                                                                  | 0.06         | 0.06 | 0.12         | XTSCP25BB_                                     | XTSRP25BB_                  |
| 0.25–0.4                                                     | 5.6                                          | 0.06                                                               | 0.09         | 0.12 | 0.18         | XTSCP40BB_                                     | XTSRP40BB_                  |
| 0.4–0.63                                                     | 8.82                                         | 0.09                                                               | 0.18         | 0.25 | 0.25         | XTSCP63BB_                                     | XTSRP63BB_                  |
| 0.63–1                                                       | 14                                           | 0.12                                                               | 0.25         | 0.37 | 0.55         | XTSC001BB_                                     | XTSR001BB_                  |
| 1–1.6                                                        | 22.4                                         | 0.25                                                               | 0.55         | 0.75 | 1.1          | XTSC1P6BB_                                     | XTSR1P6BB_                  |
| 1.6–2.5                                                      | 35                                           | 0.37                                                               | 0.75         | 1.1  | 1.5          | XTSC2P5BB_                                     | XTSR2P5BB_                  |
| 2.5–4                                                        | 56                                           | 0.75                                                               | 1.5          | 2.2  | 3            | XTSC004BB_                                     | XTSR004BB_                  |
| 4–6.3                                                        | 88.2                                         | 1.1                                                                | 2.2          | 3    | 4            | XTSC6P3BB_                                     | XTSR6P3BB_                  |
| 6.3–10                                                       | 140                                          | 2.2                                                                | 4            | 4    | 7.5          | XTSC010BB_                                     | XTSR010BB_                  |
| 8–12                                                         | 168                                          | 3                                                                  | 5.5          | 5.5  | 11           | XTSC012BB_                                     | XTSR012BB_                  |
| 10–16                                                        | 224                                          | 4                                                                  | 7.5          | 9    | 12.5         | XTSC016BB_                                     | —                           |

Frame B MMP +  
Frame C Contactor**Factory-Assembled Manual Motor Controller—Frame B MMP + Frame C Contactor—  
Maximum UL Ratings<sup>①</sup>**

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$<br>(Amps) | Short-Circuit<br>Release— $I_{sc}$<br>(Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW)<br>Three-Phase |       |      |      | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------|-------|------|------|------------------------------------------------|-----------------------------|
|                                                              |                                              | 200V                                                                     | 240V  | 480V | 600V | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
| 10–16                                                        | 224                                          | 3                                                                        | 3     | 10   | 10   | XTSC016BC_                                     | XTSR016BC_                  |
| 16–20                                                        | 280                                          | 5                                                                        | 5     | 10   | 15   | XTSC020BC_                                     | XTSR020BC_                  |
| 20–25                                                        | 350                                          | 5                                                                        | 7-1/2 | 15   | 20   | XTSC025BC_                                     | XTSR025BC_                  |
| 25–32                                                        | 448                                          | 7-1/2                                                                    | 10    | 20   | 25   | XTSC032BC_                                     | XTSR032BC_                  |

Frame B MMP +  
Frame C Contactor**Factory-Assembled Manual Motor Controller—Frame B MMP + Frame C Contactor—  
Maximum IEC Ratings<sup>①</sup>**

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$<br>(Amps) | Short-Circuit<br>Release— $I_{sc}$<br>(Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14<br>Three-Phase |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                              |                                              | 220–<br>240V                                                       | 380–<br>415V | 500V | 660–<br>690V | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
| 10–16                                                        | 224                                          | 4                                                                  | 7.5          | 9    | 12.5         | XTSC016BC_                                     | XTSR016BC_                  |
| 16–20                                                        | 280                                          | 5.5                                                                | 9            | 12.5 | 15           | XTSC020BC_                                     | XTSR020BC_                  |
| 20–25                                                        | 350                                          | 5.5                                                                | 11           | 15   | 22           | XTSC025BC_                                     | XTSR025BC_                  |
| 25–32                                                        | 448                                          | 7.5                                                                | 15           | 22   | 30           | XTSC032BC_                                     | XTSR032BC_                  |

**Notes**

① Select manual motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

Frame D MMP +  
Frame C Contactor**Factory-Assembled Manual Motor Controller—Frame D MMP + Frame C Contactor—  
Maximum UL Ratings** <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$<br>(Amps) | Short-Circuit<br>Release— $I_{rm}$<br>(Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW) |       |      |      | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------|-------|------|------|------------------------------------------------|-----------------------------|
|                                                              |                                              | Three-Phase                                               |       |      |      | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                              |                                              | 200V                                                      | 240V  | 480V | 600V |                                                |                             |
| 10–16                                                        | 224                                          | 3                                                         | 5     | 10   | 15   | XTSC016DC_                                     | XTSR016DC_                  |
| 16–25                                                        | 350                                          | 5                                                         | 7-1/2 | 15   | 20   | XTSC025DC_                                     | XTSR025DC_                  |
| 25–32                                                        | 448                                          | 7-1/2                                                     | 10    | 20   | 30   | XTSC032DC_                                     | XTSR032DC_                  |

Frame D MMP +  
Frame C Contactor**Factory-Assembled Manual Motor Controller—Frame D MMP + Frame C Contactor—  
Maximum IEC Ratings** <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$<br>(Amps) | Short-Circuit<br>Release— $I_{rm}$<br>(Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                              |                                              | Three-Phase                                         |              |      |              | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                              |                                              | 220–<br>240V                                        | 380–<br>415V | 500V | 660–<br>690V |                                                |                             |
| 10–16                                                        | 224                                          | 4                                                   | 7.5          | 9    | 12.5         | XTSC016DC_                                     | XTSR016DC_                  |
| 16–25                                                        | 350                                          | 5.5                                                 | 12.5         | 12.5 | 22           | XTSC025DC_                                     | XTSR025DC_                  |
| 25–32                                                        | 448                                          | 7.5                                                 | 15           | 17.5 | 22           | XTSC032DC_                                     | XTSR032DC_                  |

Frame D MMP +  
Frame D Contactor**Factory-Assembled Manual Motor Controller—Frame D MMP + Frame D Contactor—  
Maximum UL Ratings** <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$<br>(Amps) | Short-Circuit<br>Release— $I_{rm}$<br>(Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW) |      |      |      | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------|------|------|------|------------------------------------------------|-----------------------------|
|                                                              |                                              | Three-Phase                                               |      |      |      | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                              |                                              | 200V                                                      | 240V | 480V | 600V |                                                |                             |
| 32–40                                                        | 560                                          | 10                                                        | 15   | 30   | 30   | XTSC040DD_                                     | XTSR040DD_                  |
| 40–50                                                        | 700                                          | 15                                                        | 15   | 30   | —    | XTSC050DD_                                     | XTSR050DD_                  |
| 50–58                                                        | 812                                          | 15                                                        | 15   | 40   | —    | XTSC058DD_                                     | XTSR058DD_                  |
| 55–65                                                        | 882                                          | 15                                                        | 15   | 40   | —    | XTSC063DD_                                     | XTSR063DD_                  |

**Notes**

<sup>①</sup> Select manual motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

<sup>②</sup> Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

**Frame D MMP +  
Frame D Contactor**

**Factory-Assembled Manual Motor Controller—Frame D MMP + Frame D Contactor—  
Maximum IEC Ratings <sup>①</sup>**

| FLA Adjustment<br>Range/Overload<br>Release—I <sub>r</sub> (Amps) | Short-Circuit<br>Release—<br>I <sub>sc</sub> (Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|-------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                                   |                                                     | Three-Phase                                         |              |      |              | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                                   |                                                     | 220–<br>240V                                        | 380–<br>415V | 500V | 660–<br>690V |                                                |                             |
| 32–40                                                             | 560                                                 | 11                                                  | 20           | 22   | 30           | XTSC040DD_                                     | XTSR040DD_                  |
| 40–50                                                             | 700                                                 | 14                                                  | 25           | 30   | 45           | XTSC050DD_                                     | XTSR050DD_                  |
| 50–58                                                             | 812                                                 | 17                                                  | 30           | 37   | 55           | XTSC058DD_                                     | XTSR058DD_                  |
| 55–65                                                             | 882                                                 | 18.5                                                | 34           | 37   | 55           | XTSC063DD_                                     | XTSR063DD_                  |

**AC and DC Coil Suffixes**

| Coil Voltage              | Suffix Code            |
|---------------------------|------------------------|
| <b>Frame B Contactors</b> |                        |
| 110V 50 Hz, 120V 60 Hz    | <b>A</b>               |
| 220V 50 Hz, 240V 60 Hz    | <b>B</b>               |
| 230V 50 Hz                | <b>F</b>               |
| 24V 50/60 Hz              | <b>T</b>               |
| 24 Vdc                    | <b>TD</b> <sup>③</sup> |
| 415V 50 Hz, 480V 60 Hz    | <b>C</b>               |
| 600V 60 Hz                | <b>D</b>               |
| 208V 60 Hz                | <b>E</b>               |
| 190V 50 Hz, 220V 60 Hz    | <b>G</b>               |
| 240V 50 Hz, 277V 60 Hz    | <b>H</b>               |

| Coil Voltage           | Suffix Code            |
|------------------------|------------------------|
| 380V 50 Hz, 440V 60 Hz | <b>L</b>               |
| 400V 50 Hz             | <b>N</b>               |
| 380V 60 Hz             | <b>P</b>               |
| 12V 50/60 Hz           | <b>R</b>               |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>               |
| 48V 50 Hz              | <b>Y</b>               |
| 120 Vdc                | <b>AD</b> <sup>③</sup> |
| 220 Vdc                | <b>BD</b> <sup>③</sup> |
| 12 Vdc                 | <b>RD</b> <sup>③</sup> |
| 48 Vdc                 | <b>WD</b> <sup>③</sup> |

| Coil Voltage                    | Suffix Code            |
|---------------------------------|------------------------|
| <b>Frame C and D Contactors</b> |                        |
| 110V 50 Hz, 120V 60 Hz          | <b>A</b>               |
| 220V 50 Hz, 240V 60 Hz          | <b>B</b>               |
| 230V 50 Hz                      | <b>F</b>               |
| 24V 50/60 Hz                    | <b>T</b>               |
| 24–27 Vdc                       | <b>TD</b> <sup>③</sup> |
| 415V 50 Hz, 480V 60 Hz          | <b>C</b>               |
| 550V 50 Hz, 600V 60 Hz          | <b>D</b>               |
| 208V 60 Hz                      | <b>E</b>               |
| 190V 50 Hz, 220V 60 Hz          | <b>G</b>               |
| 240V 50 Hz, 277V 60 Hz          | <b>H</b>               |

| Coil Voltage           | Suffix Code            |
|------------------------|------------------------|
| 380V 50 Hz, 440V 60 Hz | <b>L</b>               |
| 400V 50 Hz             | <b>N</b>               |
| 380V 60 Hz             | <b>P</b>               |
| 12V 50/60 Hz           | <b>R</b>               |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>               |
| 48V 50 Hz              | <b>Y</b>               |
| 110–130 Vdc            | <b>AD</b> <sup>③</sup> |
| 200–240 Vdc            | <b>BD</b> <sup>③</sup> |
| 12–14 Vdc              | <b>RD</b> <sup>③</sup> |
| 48–60 Vdc              | <b>WD</b> <sup>③</sup> |

**Notes**

The assembled manual motor controller (MMC) consists of an XTPR manual motor protector (MMP) and an XTCE contactor. For Frame B MMP + Frame B contactor assemblies, the XTSC and XTSR can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB, XTPAXRPCRB). For MMCs using a Frame C or Frame D contactor, the assembly is mounted via a DIN rail adapter plate (XTPAXTPCPC, XTPAXTPCPD) and the electrical connection is made with electrical contact modules (XTPAXECMC, XTPAXECMD), both included in XTPAXTPCC and XTPAXTPCD.

Service Factor (SF)—Setting I<sub>r</sub> of current scale in dependence of load factor:

$$SF = 1.15 \rightarrow I_r = 1 \times I_{n \text{ mot}}$$

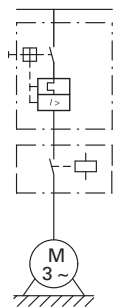
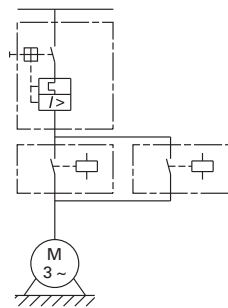
$$SF = 1 \rightarrow I_r = 0.9 \times I_{n \text{ mot}}$$

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

① Select manual motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② Underscore (\_) indicates magnetic coil suffix required. See AC and DC coil suffixes above.

③ With DC operation: Integrated diode-resistor combination, coil rating 2.6W.

**Non-Reversing Manual  
Motor Controller Power  
Circuit**

**Reversing Manual  
Motor Controller Power  
Circuit**


**XTFC and XTFR Combination Motor Controllers (CMC), UL 508 Type F**Frame B MMP + Two  
Frame B Contactors**Factory-Assembled Type F Combination Motor Controller—Frame B MMP + Frame B Contactor—  
Maximum UL Ratings <sup>①</sup>**

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$<br>(Amps) | Short-Circuit<br>Release— $I_{sc}$<br>(Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW) |       |       |       | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------|-------|-------|-------|------------------------------------------------|-----------------------------|
|                                                              |                                              | Three-Phase                                               |       |       |       | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                              |                                              | 200V                                                      | 240V  | 480V  | 600V  |                                                |                             |
| 0.16–0.25                                                    | 3.5                                          | ③                                                         | ③     | 1/2   | 1/2   | XTFCP25BB_                                     | XTFRP25BB_                  |
| 0.25–0.4                                                     | 5.6                                          | ③                                                         | ③     | 1/2   | 1/2   | XTFCP40BB_                                     | XTFRP40BB_                  |
| 0.4–0.63                                                     | 8.82                                         | ③                                                         | ③     | 1/2   | 1/2   | XTFCP63BB_                                     | XTFRP63BB_                  |
| 0.63–1                                                       | 14                                           | ③                                                         | ③     | 1/2   | 1/2   | XTFC001BB_                                     | XTFR001BB_                  |
| 1–1.6                                                        | 22.4                                         | ③                                                         | ③     | 3/4   | 1     | XTFC1P6BB_                                     | XTFR1P6BB_                  |
| 1.6–2.5                                                      | 35                                           | 1/2                                                       | 1/2   | 1     | 1-1/2 | XTFC2P5BB_                                     | XTFR2P5BB_                  |
| 2.5–4                                                        | 56                                           | 1                                                         | 1     | 2     | 3     | XTFC004BB_                                     | XTFR004BB_                  |
| 4–6.3                                                        | 88.2                                         | 1-1/2                                                     | 1-1/2 | 3     | 5     | XTFC6P3BB_                                     | XTFR6P3BB_                  |
| 6.3–10                                                       | 140                                          | 3                                                         | 3     | 7-1/2 | 7.5   | XTFC010BB_                                     | XTFR010BB_                  |
| 8–12                                                         | 168                                          | 3                                                         | 3     | 7-1/2 | —     | XTFC012BB_                                     | XTFR012BB_                  |
| 10–16                                                        | 224                                          | 3                                                         | 5     | 10    | —     | XTFC016BB_                                     | —                           |

**Factory-Assembled Type F Combination Motor Controller—Frame B MMP + Frame B Contactor—  
Maximum IEC Ratings <sup>①</sup>**

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$ (Amps) | Short-Circuit<br>Release— $I_{sc}$<br>(Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|-----------------------------------------------------------|----------------------------------------------|-----------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                           |                                              | Three-Phase                                         |              |      |              | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                           |                                              | 220–<br>240V                                        | 380–<br>415V | 500V | 660–<br>690V |                                                |                             |
| 0.1–0.16                                                  | 2.2                                          | —                                                   | —            | —    | 0.06         | XTFCP16BB_                                     | XTFRP16BB_                  |
| 0.16–0.25                                                 | 3.5                                          | —                                                   | 0.06         | 0.06 | 0.12         | XTFCP25BB_                                     | XTFRP25BB_                  |
| 0.25–0.4                                                  | 5.6                                          | 0.06                                                | 0.09         | 0.12 | 0.18         | XTFCP40BB_                                     | XTFRP40BB_                  |
| 0.4–0.63                                                  | 8.82                                         | 0.09                                                | 0.18         | 0.25 | 0.25         | XTFCP63BB_                                     | XTFRP63BB_                  |
| 0.63–1                                                    | 14                                           | 0.12                                                | 0.25         | 0.37 | 0.55         | XTFC001BB_                                     | XTFR001BB_                  |
| 1–1.6                                                     | 22.4                                         | 0.25                                                | 0.55         | 0.75 | 1.1          | XTFC1P6BB_                                     | XTFR1P6BB_                  |
| 1.6–2.5                                                   | 35                                           | 0.37                                                | 0.75         | 1.1  | 1.5          | XTFC2P5BB_                                     | XTFR2P5BB_                  |
| 2.5–4                                                     | 56                                           | 0.75                                                | 1.5          | 2.2  | 3            | XTFC004BB_                                     | XTFR004BB_                  |
| 4–6.3                                                     | 88.2                                         | 1.1                                                 | 2.2          | 3    | 4            | XTFC6P3BB_                                     | XTFR6P3BB_                  |
| 6.3–10                                                    | 140                                          | 2.2                                                 | 4            | 4    | 7.5          | XTFC010BB_                                     | XTFR010BB_                  |
| 8–12                                                      | 168                                          | 3                                                   | 5.5          | 5.5  | 11           | XTFC012BB_                                     | XTFR012BB_                  |
| 10–16                                                     | 224                                          | 4                                                   | 7.5          | 9    | 12.5         | XTFC016BB_                                     | —                           |

**Notes**

① Select combination motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② Underscore (\_) indicates magnetic coil suffix required. See **Page V5-T1-198**.

③ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).



### Factory-Assembled Type F Combination Motor Controller—Frame B MMP + Frame C Contactor— Maximum UL Ratings <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$ (Amps)<br> | Short-Circuit<br>Release— $I_{sc}$ (Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW) |       |      |      | Assembled Manual Motor Controller <sup>②</sup> |                             |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|-------|------|------|------------------------------------------------|-----------------------------|
|                                                                                                                                                |                                           | Three-Phase                                               |       |      |      | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                                                                                                                |                                           | 200V                                                      | 240V  | 480V | 600V |                                                |                             |
| 10–16                                                                                                                                          | 224                                       | 3                                                         | 5     | 10   | —    | XTFC016BC_                                     | XTFR016BC_                  |
| 16–20                                                                                                                                          | 280                                       | 5                                                         | 5     | —    | —    | XTFC020BC_                                     | XTFR020BC_                  |
| 20–25                                                                                                                                          | 350                                       | 5                                                         | 7-1/2 | 15   | —    | XTFC025BC_                                     | XTFR025BC_                  |
| 25–32                                                                                                                                          | 448                                       | 7-1/2                                                     | 10    | 20   | —    | XTFC032BC_                                     | XTFR032BC_                  |

### Factory-Assembled Type F Combination Motor Controller—Frame B MMP + Frame C Contactor— Maximum IEC Ratings <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$ (Amps)<br> | Short-Circuit<br>Release— $I_{sc}$ (Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                                                                                                                |                                           | Three-Phase                                         |              |      |              | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                                                                                                                |                                           | 220–<br>240V                                        | 380–<br>415V | 500V | 660–<br>690V |                                                |                             |
| 10–16                                                                                                                                          | 224                                       | 4                                                   | 7.5          | 9    | 12.5         | XTFC016BC_                                     | XTFR016BC_                  |
| 16–20                                                                                                                                          | 280                                       | 5.5                                                 | 9            | 12.5 | 15           | XTFC020BC_                                     | XTFR020BC_                  |
| 20–25                                                                                                                                          | 350                                       | 5.5                                                 | 11           | 15   | 22           | XTFC025BC_                                     | XTFR025BC_                  |
| 25–32                                                                                                                                          | 448                                       | 7.5                                                 | 15           | 22   | 30           | XTFC032BC_                                     | XTFR032BC_                  |

### Factory-Assembled Type F Combination Motor Controller—Frame D MMP + Frame C Contactor— Maximum UL Ratings <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$ (Amps)<br> | Short-Circuit<br>Release— $I_{sc}$ (Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW) |       |      |      | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|-------|------|------|------------------------------------------------|-----------------------------|
|                                                                                                                                                  |                                           | Three-Phase                                               |       |      |      | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                                                                                                                  |                                           | 200V                                                      | 240V  | 480V | 600V |                                                |                             |
| 10–16                                                                                                                                            | 224                                       | 3                                                         | 5     | 10   | 10   | XTFC016DC_                                     | XTFR016DC_                  |
| 16–25                                                                                                                                            | 350                                       | 5                                                         | 7-1/2 | 15   | 20   | XTFC025DC_                                     | XTFR025DC_                  |
| 25–32                                                                                                                                            | 448                                       | 7-1/2                                                     | 10    | 25   | 30   | XTFC032DC_                                     | XTFR032DC_                  |

### Factory-Assembled Type F Combination Motor Controller—Frame D MMP + Frame C Contactor— Maximum IEC Ratings <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release— $I_r$ (Amps)<br> | Short-Circuit<br>Release— $I_{sc}$ (Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                                                                                                                  |                                           | Three-Phase                                         |              |      |              | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                                                                                                                  |                                           | 220–<br>240V                                        | 380–<br>415V | 500V | 660–<br>690V |                                                |                             |
| 10–16                                                                                                                                            | 224                                       | 4                                                   | 7.5          | 9    | 12.5         | XTFC016DC_                                     | XTFR016DC_                  |
| 16–25                                                                                                                                            | 350                                       | 5.5                                                 | 12.5         | 12.5 | 22           | XTFC025DC_                                     | XTFR025DC_                  |
| 25–32                                                                                                                                            | 448                                       | 7.5                                                 | 15           | 17.5 | 22           | XTFC032DC_                                     | XTFR032DC_                  |

#### Notes

<sup>①</sup> Select combination motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

<sup>②</sup> Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

**Factory-Assembled Type F Combination Motor Controller—Frame D MMP + Frame D Contactor—  
Maximum UL Ratings** <sup>①</sup>

| <b>FLA Adjustment<br/>Range/Overload<br/>Release—I<sub>r</sub> (Amps)</b><br> | <b>Short-Circuit<br/>Release—<br/>I<sub>sc</sub> (Amps)</b> | <b>Maximum Motor Ratings<br/>Maximum kW Rating<br/>AC-3—P (kW)</b> |    |    |    | <b>Assembled Manual Motor Controller</b> <sup>②</sup> |                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|----|----|----|-------------------------------------------------------|-------------------------------------|
|                                                                                                                                                                |                                                             | <b>Three-Phase</b>                                                 |    |    |    | <b>Non-Reversing<br/>Catalog Number</b>               | <b>Reversing<br/>Catalog Number</b> |
| 32–40                                                                                                                                                          | 560                                                         | 10                                                                 | 15 | 30 | 30 | XTFC040DD_                                            | XTFR040DD_                          |
| 40–50                                                                                                                                                          | 700                                                         | 10                                                                 | 15 | 30 | —  | XTFC050DD_                                            | XTFR050DD_                          |
| 50–58                                                                                                                                                          | 812                                                         | 15                                                                 | 15 | 40 | —  | XTFC058DD_                                            | XTFR058DD_                          |
| 55–65                                                                                                                                                          | 882                                                         | 15                                                                 | 15 | 40 | —  | XTFC063DD_                                            | XTFR063DD_                          |

**Factory-Assembled Type F Combination Motor Controller—Frame D MMP + Frame D Contactor—  
Maximum IEC Ratings** <sup>①</sup>

| <b>FLA Adjustment<br/>Range/Overload<br/>Release—I<sub>r</sub> (Amps)</b><br> | <b>Short-Circuit<br/>Release—<br/>I<sub>sc</sub> (Amps)</b> | <b>Maximum hp Rating—P (hp)<br/>UL 508/CSA C22.2 No. 14</b> |    |    |    | <b>Assembled Manual Motor Controller</b> <sup>②</sup> |                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|----|----|----|-------------------------------------------------------|-------------------------------------|
|                                                                                                                                                                |                                                             | <b>Three-Phase</b>                                          |    |    |    | <b>Non-Reversing<br/>Catalog Number</b>               | <b>Reversing<br/>Catalog Number</b> |
| 32–40                                                                                                                                                          | 560                                                         | 11                                                          | 20 | 22 | 30 | XTFC040DD_                                            | XTFR040DD_                          |
| 40–50                                                                                                                                                          | 700                                                         | 14                                                          | 25 | 30 | 45 | XTFC050DD_                                            | XTFR050DD_                          |
| 50–58                                                                                                                                                          | 812                                                         | 17                                                          | 30 | 37 | 55 | XTFC058DD_                                            | XTFR058DD_                          |
| 55–65                                                                                                                                                          | 882                                                         | 18.5                                                        | 34 | 37 | 55 | XTFC063DD_                                            | XTFR063DD_                          |

**Notes**

① Select combination motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

## 1 XTFC and XTFR Combination Motor Controllers (CMC), UL 508 Type E

Frame B MMP + Two  
Frame B ContactorsFactory-Assembled Type E Combination Motor Controller—Frame B MMP + Frame B Contactor—  
Maximum UL Ratings <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release—I <sub>r</sub><br>(Amps) | Short-Circuit<br>Release—<br>I <sub>sc</sub> (Amps) | Maximum Motor Ratings<br>Maximum kW Rating<br>AC-3—P (kW) |      |      |       | Assembled Manual Motor Controller <sup>②</sup> |                             |
|----------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|------|------|-------|------------------------------------------------|-----------------------------|
|                                                                      |                                                     | Three-Phase                                               |      |      |       | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                                      |                                                     | 200V                                                      | 240V | 480V | 600V  |                                                |                             |
| 0.16–0.25                                                            | 3.5                                                 | ③                                                         | ③    | 1/2  | 1/2   | XTFCP25BB_                                     | XTFRP25BB_                  |
| 0.25–0.4                                                             | 5.6                                                 | ③                                                         | ③    | 1/2  | 1/2   | XTFCP40BB_                                     | XTFRP40BB_                  |
| 0.4–0.63                                                             | 8.82                                                | ③                                                         | ③    | 1/2  | 1/2   | XTFCP63BB_                                     | XTFRP63BB_                  |
| 0.63–1                                                               | 14                                                  | ③                                                         | ③    | 1/2  | 1/2   | XTFC001BB_                                     | XTFR001BB_                  |
| 1–1.6                                                                | 22.4                                                | ③                                                         | ③    | 3/4  | 1     | XTFC1P6BB_                                     | XTFR1P6BB_                  |
| 1.6–2.5                                                              | 35                                                  | 1/2                                                       | 1/2  | 1    | 1-1/2 | XTFC2P5BB_                                     | XTFR2P5BB_                  |
| 2.5–4                                                                | 56                                                  | 1                                                         | 1    | 2    | 3     | XTFC004BB_                                     | XTFR004BB_                  |

Factory-Assembled Type E Combination Motor Controller—Frame B MMP + Frame B Contactor—  
Maximum IEC Ratings <sup>①</sup>

| FLA Adjustment<br>Range/Overload<br>Release—I <sub>r</sub> (Amps) | Short-Circuit<br>Release—<br>I <sub>sc</sub> (Amps) | Maximum hp Rating—P (hp)<br>UL 508/CSA C22.2 No. 14 |              |      |              | Assembled Manual Motor Controller <sup>②</sup> |                             |
|-------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|--------------|------|--------------|------------------------------------------------|-----------------------------|
|                                                                   |                                                     | Three-Phase                                         |              |      |              | Non-Reversing<br>Catalog Number                | Reversing<br>Catalog Number |
|                                                                   |                                                     | 220–<br>240V                                        | 380–<br>415V | 500V | 660–<br>690V |                                                |                             |
| 0.1–0.16                                                          | 2.2                                                 | —                                                   | —            | —    | 0.06         | XTFCP16BB_                                     | XTFRP16BB_                  |
| 0.16–0.25                                                         | 3.5                                                 | —                                                   | 0.06         | 0.06 | 0.12         | XTFCP25BB_                                     | XTFRP25BB_                  |
| 0.25–0.4                                                          | 5.6                                                 | 0.06                                                | 0.09         | 0.12 | 0.18         | XTFCP40BB_                                     | XTFRP40BB_                  |
| 0.4–0.63                                                          | 8.82                                                | 0.09                                                | 0.18         | 0.25 | 0.25         | XTFCP63BB_                                     | XTFRP63BB_                  |
| 0.63–1                                                            | 14                                                  | 0.12                                                | 0.25         | 0.37 | 0.55         | XTFC001BB_                                     | XTFR001BB_                  |
| 1–1.6                                                             | 22.4                                                | 0.25                                                | 0.55         | 0.75 | 1.1          | XTFC1P6BB_                                     | XTFR1P6BB_                  |
| 1.6–2.5                                                           | 35                                                  | 0.37                                                | 0.75         | 1.1  | 1.5          | XTFC2P5BB_                                     | XTFR2P5BB_                  |
| 2.5–4                                                             | 56                                                  | 0.75                                                | 1.5          | 2.2  | 3            | XTFC004BB_                                     | XTFR004BB_                  |

## Notes

① Select combination motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.

② Underscore ( ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

**Factory-Assembled Type E Combination Motor Controller—Frame B MMP + Frame C Contactor—Maximum UL Ratings** <sup>①</sup>

| FLA Adjustment | Short-Circuit Release—<br>I <sub>rm</sub> (Amps) | Max. Motor hp Rating <sup>①</sup> |      |      |      | Compact 2 Component Combination Motor Controller |                             |
|----------------|--------------------------------------------------|-----------------------------------|------|------|------|--------------------------------------------------|-----------------------------|
|                |                                                  | 200V                              | 230V | 460V | 575V | Catalog Number <sup>②</sup>                      | Catalog Number <sup>②</sup> |
| 4–6.3          | 88.2                                             | 1.5                               | 1.5  | 3.0  | 50   | XTFC6P3BC_                                       | XTFR6P3BC_                  |
| 6.3–10         | 140                                              | 3.0                               | 3.0  | 7.5  | 7.5  | XTFC010BC_                                       | XTFR010BC_                  |
| 8–12           | 168                                              | 3.0                               | 3.0  | 7.5  | —    | XTFC012BC_                                       | XTFR012BC_                  |
| 10–16          | 224                                              | 3.0                               | 5.0  | 10.0 | —    | XTFC016BC_                                       | XTFR016BC_                  |

**Factory-Assembled Type E Combination Motor Controller—Frame B MMP + Frame C Contactor—Maximum IEC Ratings** <sup>①</sup>

| FLA Adjustment | Short-Circuit Release—<br>I <sub>rm</sub> (Amps) | Max. Motor kW Rating <sup>①</sup> |      |      |      | Compact 2 Component Combination Motor Controller |                             |
|----------------|--------------------------------------------------|-----------------------------------|------|------|------|--------------------------------------------------|-----------------------------|
|                |                                                  | 200V                              | 230V | 460V | 575V | Catalog Number <sup>②</sup>                      | Catalog Number <sup>②</sup> |
| 4–6.3          | 88.2                                             | 1.1                               | 2.2  | 3.0  | 4.0  | XTFC6P3BC_                                       | XTFR6P3BC_                  |
| 6.3–10         | 140                                              | 2.2                               | 4.0  | 4.0  | 7.5  | XTFC010BC_                                       | XTFR010BC_                  |
| 8–12           | 168                                              | 3.0                               | 5.5  | 5.5  | 11.0 | XTFC012BC_                                       | XTFR012BC_                  |
| 10–16          | 224                                              | 4.0                               | 7.5  | 9.0  | 12.5 | XTFC016BC_                                       | XTFR016BC_                  |

**Factory-Assembled Type E Combination Motor Controller—Frame D MMP + Frame D Contactor—Maximum UL Ratings** <sup>①</sup>

| FLA Adjustment | Short-Circuit Release—<br>I <sub>rm</sub> (Amps) | Max. Motor hp Rating <sup>①</sup> |      |      |      | Compact 2 Component Combination Motor Controller |                             |
|----------------|--------------------------------------------------|-----------------------------------|------|------|------|--------------------------------------------------|-----------------------------|
|                |                                                  | 200V                              | 230V | 460V | 575V | Catalog Number <sup>②</sup>                      | Catalog Number <sup>②</sup> |
| 10–16          | 224                                              | 3.0                               | 5.0  | 10.0 | 10.0 | XTFC016DD_                                       | XTFR016DD_                  |
| 16–25          | 350                                              | 5.0                               | 7.5  | 15.0 | 20.0 | XTFC025DD_                                       | XTFR025DD_                  |
| 25–32          | 448                                              | 7.5                               | 10.0 | 25.0 | 20.0 | XTFC032DD_                                       | XTFR032DD_                  |
| 32–40          | 560                                              | 11.0                              | 20.0 | 22.0 | 30.0 | XTFC040DD_                                       | XTFR040DD_                  |
| 40–50          | 700                                              | 14.0                              | 25.0 | 30.0 | 45.0 | XTFC050DD_                                       | XTFR050DD_                  |
| 50–58          | 812                                              | 17.0                              | 30.0 | 37.0 | 55.0 | XTFC058DD_                                       | XTFR058DD_                  |

**Factory-Assembled Type E Combination Motor Controller—Frame D MMP + Frame D Contactor—Maximum IEC Ratings** <sup>①</sup>

| FLA Adjustment | Short-Circuit Release—<br>I <sub>rm</sub> (Amps) | Max. Motor kW Rating <sup>①</sup> |      |      |      | Compact 2 Component Combination Motor Controller |                             |
|----------------|--------------------------------------------------|-----------------------------------|------|------|------|--------------------------------------------------|-----------------------------|
|                |                                                  | 200V                              | 230V | 460V | 575V | Catalog Number <sup>②</sup>                      | Catalog Number <sup>②</sup> |
| 10–16          | 224                                              | 4.0                               | 7.5  | 9.0  | 12.5 | XTFC016DD_                                       | XTFR016DD_                  |
| 16–25          | 350                                              | 5.5                               | 12.5 | 12.5 | 22.0 | XTFC025DD_                                       | XTFR025DD_                  |
| 25–32          | 448                                              | 7.5                               | 15.0 | 17.5 | 22.0 | XTFC032DD_                                       | XTFR032DD_                  |
| 32–40          | 560                                              | 10.0                              | 15.0 | 30.0 | 30.0 | XTFC040DD_                                       | XTFR040DD_                  |
| 40–50          | 700                                              | 10.0                              | 15.0 | 30.0 | —    | XTFC050DD_                                       | XTFR050DD_                  |
| 50–58          | 812                                              | 15.0                              | 15.0 | 40.0 | —    | XTFC058DD_                                       | XTFR058DD_                  |

**Notes**

- ① Select combination motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.  
 ② Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.  
 ③ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

## AC and DC Coil Suffixes

| Coil Voltage              | Suffix Code            |
|---------------------------|------------------------|
| <b>Frame B Contactors</b> |                        |
| 110V 50 Hz, 120V 60 Hz    | <b>A</b>               |
| 220V 50 Hz, 240V 60 Hz    | <b>B</b>               |
| 230V 50 Hz                | <b>F</b>               |
| 24V 50/60 Hz              | <b>T</b>               |
| 24 Vdc                    | <b>TD</b> <sup>①</sup> |
| 415V 50 Hz, 480V 60 Hz    | <b>C</b>               |
| 600V 60 Hz                | <b>D</b>               |
| 208V 60 Hz                | <b>E</b>               |
| 190V 50 Hz, 220V 60 Hz    | <b>G</b>               |
| 240V 50 Hz, 277V 60 Hz    | <b>H</b>               |

| Coil Voltage           | Suffix Code            |
|------------------------|------------------------|
| 380V 50 Hz, 440V 60 Hz | <b>L</b>               |
| 400V 50 Hz             | <b>N</b>               |
| 380V 60 Hz             | <b>P</b>               |
| 12V 50/60 Hz           | <b>R</b>               |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>               |
| 48V 50 Hz              | <b>Y</b>               |
| 120 Vdc                | <b>AD</b> <sup>①</sup> |
| 220 Vdc                | <b>BD</b> <sup>①</sup> |
| 12 Vdc                 | <b>RD</b> <sup>①</sup> |
| 48 Vdc                 | <b>WD</b> <sup>①</sup> |

| Coil Voltage                    | Suffix Code            |
|---------------------------------|------------------------|
| <b>Frame C and D Contactors</b> |                        |
| 110V 50 Hz, 120V 60 Hz          | <b>A</b>               |
| 220V 50 Hz, 240V 60 Hz          | <b>B</b>               |
| 230V 50 Hz                      | <b>F</b>               |
| 24V 50/60 Hz                    | <b>T</b>               |
| 24–27 Vdc                       | <b>TD</b> <sup>①</sup> |
| 415V 50 Hz, 480V 60 Hz          | <b>C</b>               |
| 550V 50 Hz, 600V 60 Hz          | <b>D</b>               |
| 208V 60 Hz                      | <b>E</b>               |
| 190V 50 Hz, 220V 60 Hz          | <b>G</b>               |
| 240V 50 Hz, 277V 60 Hz          | <b>H</b>               |

| Coil Voltage           | Suffix Code            |
|------------------------|------------------------|
| 380V 50 Hz, 440V 60 Hz | <b>L</b>               |
| 400V 50 Hz             | <b>N</b>               |
| 380V 60 Hz             | <b>P</b>               |
| 12V 50/60 Hz           | <b>R</b>               |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>               |
| 48V 50 Hz              | <b>Y</b>               |
| 110–130 Vdc            | <b>AD</b> <sup>①</sup> |
| 200–240 Vdc            | <b>BD</b> <sup>①</sup> |
| 12–14 Vdc              | <b>RD</b> <sup>①</sup> |
| 48–60 Vdc              | <b>WD</b> <sup>①</sup> |

**Notes**

The assembled manual motor controller (MMC) consists of an XTPR manual motor protector (MMP) and an XTCE contactor. For Frame B MMP + Frame B contactor assemblies, the XTSC and XTSR can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB, XTPAXRPCRB). For 16A and above, the assembly is mounted via a DIN rail adapter plate (XTPAXTPCPC, XTPAXTPCPD) and the electrical connection is made with electrical contact modules (XTPAXECMC, XTPAXECMD), both included in XTPAXTPCC and XTPAXTPCD.

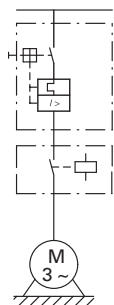
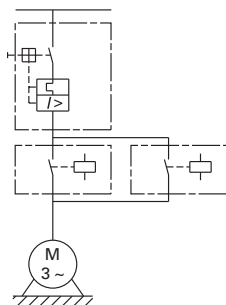
Service Factor (SF)—Setting  $I_r$  of current scale in dependence of load factor:

$$SF = 1.15 \rightarrow I_r = 1 \times I_{n \text{ mot}}$$

$$SF = 1 \rightarrow I_r = 0.9 \times I_{n \text{ mot}}$$

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

<sup>①</sup> With DC operation: Integrated diode-resistor combination, coil rating 2.6W.

**XTFC Manual Motor Controller****XTFR Manual Motor Controller**

## Accessories

### Line Side Adapters

Line side adapters are required for use with XTPR MMPs only when used as Type E self-protected manual combination starters or as part of XTFC or XTFR Type F combination motor controllers. Not required for group installation.

#### Line-Side Adapters <sup>②</sup>

|                                                                                                       | For Use with...                                                                                                                | Catalog Number   |                                                                                                       | For Use with...                                                     | Catalog Number     |
|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------|
| <b>XTPAXLSA</b><br>  | Frame B XTPR to create a UL 508 Type E/F manual combination starter                                                            | <b>XTPAXLSA</b>  | <b>XTPAXLSAD</b><br> | Frame D XTPR to create a UL 508 Type E/F manual combination starter | <b>XTPAXLSAD</b> ④ |
| <b>XTPAXIP2X</b><br> | Reduced size Frame D XTPR to create a UL 508 Type E/F manual combination starter (not to be used with 3-phase commoning links) | <b>XTPAXIP2X</b> |                                                                                                       |                                                                     |                    |

### Combination Connection Kits

Combination connection kits include the necessary components to field assemble a manual motor controller with an MMP (XTPR) and contactor (XTCE).

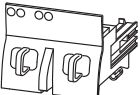
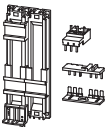
#### Non-Reversing Starters

|                  | For Use with ...    | Description/Composed of ...                                                                                                                                                                 | Std. Pack <sup>①</sup> | Catalog Number   |
|------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|
| <b>XTPAXTPCB</b> | XTPR...B + XTCE...B | Mechanical connection element for XTPR...B and contactor                                                                                                                                    | 1                      | <b>XTPAXTPCB</b> |
|                  |                     | Main current wiring between XTPR...B and contactor in toolless plug connection                                                                                                              | 1                      |                  |
|                  |                     | Cable guidance                                                                                                                                                                              | 1                      |                  |
|                  |                     | Use as contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. six cables up to 2.5 mm <sup>2</sup> external diameter or four cables up to 3.5 mm <sup>2</sup> external diameter |                        |                  |
| <b>XTPAXEMC_</b> | XTPR...B + XTCE...B | Mechanical and electrical connection for XTPR...B and contactor                                                                                                                             | 5                      | <b>XTPAXEMCB</b> |
|                  | XTPR...B + XTCE...C |                                                                                                                                                                                             | 5                      | <b>XTPAXEMCC</b> |
| <b>XTPAXTPCD</b> | XTPR...D + XTCE...D | DIN rail adapter plate<br>Main current wiring between XTPR and contactor                                                                                                                    | 1                      | <b>XTPAXTPCD</b> |

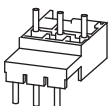
#### Note

<sup>①</sup> Orders must be placed in multiples of package quantity listed.

## Reversing Starters

|                                                                                                        | For Use with ...       | Description/Composed of ...                                                                                                                                                                    | Std. Pack <sup>①</sup> | Catalog Number    |
|--------------------------------------------------------------------------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|
| <b>XTPAXTPCRB</b><br> | XTPR...B + XTCE...B01_ | Mechanical connection element for XTPR...B and contactor                                                                                                                                       | 1                      | <b>XTPAXTPCRB</b> |
|                                                                                                        |                        | Reversing starter main current wiring in toolless plug connection                                                                                                                              | 1                      |                   |
|                                                                                                        |                        | Control cables for electrical interlocking in toolless plug connection—<br>K1M: A1–K2M: 21, K1M: 21–K2M: A1, K1M: A2–K2M: A2                                                                   | 1                      |                   |
|                                                                                                        |                        | Cable guidance                                                                                                                                                                                 | 1                      |                   |
|                                                                                                        |                        | Use as contactor auxiliary switch XTCEXFAT_... Control cable guidance: max. six cables up to 2.5 mm <sup>2</sup> external diameter or four cables up to 3.5 mm <sup>2</sup> external diameter. |                        |                   |
| <b>XTPAXTPCRC</b><br> | XTPR...B + XTCE...C    | DIN rail adapter plate                                                                                                                                                                         | 1                      | <b>XTPAXTPCRC</b> |
|                                                                                                        |                        | Reversing starter main current wiring                                                                                                                                                          | 1                      |                   |

## Electric Contact Module

|                                                                                                      | For Use with ...    | Description/Composed of ...                        | Std. Pack <sup>①</sup> | Catalog Number   |
|------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------|------------------------|------------------|
| <b>XTPAXEC_</b><br> | XTPR...B + XTCE...C | Main current wiring between XTPR...B and contactor | 5                      | <b>XTPAXECMC</b> |
|                                                                                                      |                     | Use only in combination with busbar adapter        |                        |                  |
|                                                                                                      | XTPR...D + XTCE...D | Main current wiring between XTPR...D and contactor | 5                      | <b>XTPAXECMD</b> |
|                                                                                                      |                     | Use only in combination with busbar adapter        |                        |                  |

## DIN Rail Adapter Plates

|                                                                                                           | For Use with ...                 | Description/Composed of ...                                       | Std. Pack <sup>①</sup> | Catalog Number     |
|-----------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------|------------------------|--------------------|
| <b>XTPAXTPCPB</b><br>  | XTPAXTPCB<br>XTPAXTPCRB          | 45 mm wide adapter plate with one DIN rail                        | 4                      | <b>XTPAXTPCPB</b>  |
|                                                                                                           |                                  | Connection element for side-by-side positioning of further plates |                        |                    |
| <b>XTPAXTPCRPB</b><br> | XTPR...B + XTCE...C<br>XTPAXECMC | 45 mm wide adapter plate with one DIN rail                        | 4                      | <b>XTPAXTPCRPB</b> |
|                                                                                                           |                                  | Connection element for side-by-side positioning of further plates |                        |                    |
| <b>XTPAXTPCPD</b><br>  | XTPAXECMD                        | 55 mm wide adapter plate with two DIN rails                       | 4                      | <b>XTPAXTPCPD</b>  |
|                                                                                                           | XTPR...D + XTCE...C              | Connection cams for further plates                                | 4                      |                    |
|                                                                                                           | XTPR...D + XTCE...D              | For use with reversing and star-delta starters                    |                        |                    |

## Lateral Module

| For Use with ... | Description/Composed of ...             | Std. Pack <sup>①</sup> | Catalog Number  |
|------------------|-----------------------------------------|------------------------|-----------------|
| —                | Can be grouped on the DIN rail adapter  | 10                     | <b>XTPAXLIM</b> |
|                  | Expansion of the mounting width by 9 mm |                        |                 |

## Connection Element

| For Use with ... | Description/Composed of ...                 | Std. Pack <sup>①</sup> | Catalog Number  |
|------------------|---------------------------------------------|------------------------|-----------------|
| —                | For connection of several DIN rail adapters | 50                     | <b>XTPAXCNE</b> |

## Note

<sup>①</sup> Orders must be placed in multiples of package quantity listed.

## Technical Data and Specifications

## XTSC Non-Reversing Manual Motor Controllers (MMC)—Component Bill of Material

## Factory Assembled Manual Motor Protector + Contactor

| Assembled Manual<br>Motor Controller ① | FLA Adjustment<br>Range/Overload<br>Release—I <sub>r</sub> (Amps) | Component Catalog Numbers |                               | Contactor ① | Manual Motor Protector<br>Auxiliary Contact |
|----------------------------------------|-------------------------------------------------------------------|---------------------------|-------------------------------|-------------|---------------------------------------------|
|                                        |                                                                   | Manual Motor<br>Protector | Combination<br>Connection Kit |             |                                             |
| XTSC Frame B MMP + Frame B Contactor   |                                                                   |                           |                               |             |                                             |
| XTSCP16BB_                             | 0.1–0.16                                                          | XTPRP16BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSCP25BB_                             | 0.16–0.25                                                         | XTPRP25BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSCP40BB_                             | 0.25–0.4                                                          | XTPRP40BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSCP63BB_                             | 0.4–0.63                                                          | XTPRP63BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSC001BB_                             | 0.63–1                                                            | XTPR001BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSC1P6BB_                             | 1–1.6                                                             | XTPR1P6BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSC2P5BB_                             | 1.6–2.5                                                           | XTPR2P5BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSC004BB_                             | 2.5–4                                                             | XTPR004BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSC6P3BB_                             | 4–6.3                                                             | XTPR6P3BC1                | XTPAXTPCB                     | XTCE007B10_ | XTPAXFA11                                   |
| XTSC10BB_                              | 6.3–10                                                            | XTPR010BC1                | XTPAXTPCB                     | XTCE009B10_ | XTPAXFA11                                   |
| XTSC12BB_                              | 8–12                                                              | XTPR012BC1                | XTPAXTPCB                     | XTCE012B10_ | XTPAXFA11                                   |
| XTSC16BB_                              | 10–16                                                             | XTPR016BC1                | XTPAXTPCB                     | XTCE015B10_ | XTPAXFA11                                   |
| XTSC Frame B MMP + Frame C Contactor   |                                                                   |                           |                               |             |                                             |
| XTSC020BC_                             | 16–20                                                             | XTPR020BC1                | XTPAXTPCC                     | XTCE025C10_ | XTPAXFA11                                   |
| XTSC025BC_                             | 20–25                                                             | XTPR025BC1                | XTPAXTPCC                     | XTCE025C10_ | XTPAXFA11                                   |
| XTSC032BC_                             | 25–32                                                             | XTPR032BC1                | XTPAXTPCC                     | XTCE032C10_ | XTPAXFA11                                   |
| XTSC Frame D MMP + Frame C Contactor   |                                                                   |                           |                               |             |                                             |
| XTSC016DC_                             | 10–16                                                             | XTPR016DC1                | ②                             | XTCE018C10_ | XTPAXFA1                                    |
| XTSC025DC_                             | 16–25                                                             | XTPR025DC1                | ②                             | XTCE025C10_ | XTPAXFA11                                   |
| XTSC032DC_                             | 25–32                                                             | XTPR032DC1                | ②                             | XTCE032C10_ | XTPAXFA11                                   |
| XTSC Frame D MMP + Frame D Contactor   |                                                                   |                           |                               |             |                                             |
| XTSC040DD_                             | 32–40                                                             | XTPR040DC1                | XTPAXTPCD ③                   | XTCE040D00_ | XTPAXFA11                                   |
| XTSC050DD_                             | 40–50                                                             | XTPR050DC1                | XTPAXTPCD ③                   | XTCE050D00_ | XTPAXFA11                                   |
| XTSC058DD_                             | 50–58                                                             | XTPR058DC1                | XTPAXTPCD ③                   | XTCE065D00_ | XTPAXFA11                                   |
| XTSC063DD_                             | 55–65                                                             | XTPR063DC1                | XTPAXTPCD ③                   | XTCE065D00_ | XTPAXFA11                                   |

## Notes

① Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

② The connection between the XTPR...DC1 and the XTCE...C\_ contactor will be made with flexible wire and mounted to the DIN rail adapter plate (XTPAXTPCPD).

③ The reversing connection between the XTPR...DC1 and the (2) XTCE...C\_ contactors will be accomplished by using the non-reversing combination connection kit (XTPAXTPCD), Frame D reversing link kit (XTCEXRLD), additional DIN rail adapter plate (XTPAXTPCPD) and DIN adapter connection element (XTPAXCNE).



## XTSR Reversing Manual Motor Controllers (MMC)—Component Bill of Material

## Factory Assembled Manual Motor Protector + Contactor

| Assembled Manual<br>Motor Controller ① | FLA Adjustment<br>Range/Overload<br>Release—I <sub>r</sub> (Amps) | Component Catalog Numbers |                               | Contactor ①     | Manual Motor Protector<br>Auxiliary Contact |
|----------------------------------------|-------------------------------------------------------------------|---------------------------|-------------------------------|-----------------|---------------------------------------------|
|                                        |                                                                   | Manual Motor<br>Protector | Combination<br>Connection Kit |                 |                                             |
| XTSR Frame B MMP + Frame B Contactor   |                                                                   |                           |                               |                 |                                             |
| XTSRP16BB_                             | 0.1–0.16                                                          | XTPRP16BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSRP25BB_                             | 0.16–0.25                                                         | XTPRP25BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSRP40BB_                             | 0.25–0.4                                                          | XTPRP40BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSRP63BB_                             | 0.4–0.63                                                          | XTPRP63BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSR001BB_                             | 0.63–1                                                            | XTPR001BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSR1P6BB_                             | 1–1.6                                                             | XTPR1P6BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSR2P5BB_                             | 1.6–2.5                                                           | XTPR2P5BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSR004BB_                             | 2.5–4                                                             | XTPR004BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSR6P3BB_                             | 4–6.3                                                             | XTPR6P3BC1                | XTPAXTPCRB                    | (2) XTCE007B01_ | XTPAXFA11                                   |
| XTSR010BB_                             | 6.3–10                                                            | XTPR010BC1                | XTPAXTPCRB                    | (2) XTCE009B01_ | XTPAXFA11                                   |
| XTSR012BB_                             | 8–12                                                              | XTPR012BC1                | XTPAXTPCRB                    | (2) XTCE012B01_ | XTPAXFA11                                   |
| XTSR Frame B MMP + Frame C Contactor   |                                                                   |                           |                               |                 |                                             |
| XTSR016BC_                             | 10–16                                                             | XTPR016BC1                | XTPAXTPCRC                    | (2) XTCE018C01  | XTPAXFA11                                   |
| XTSR020BC_                             | 16–20                                                             | XTPR020BC1                | XTPAXTPCRC                    | (2) XTCE025C01_ | XTPAXFA11                                   |
| XTSR025BC_                             | 20–25                                                             | XTPR025BC1                | XTPAXTPCRC                    | (2) XTCE025C01_ | XTPAXFA11                                   |
| XTSR032BC_                             | 25–32                                                             | XTPR032BC1                | XTPAXTPCRC                    | (2) XTCE032C01_ | XTPAXFA11                                   |
| XTSR Frame D MMP + Frame C Contactor   |                                                                   |                           |                               |                 |                                             |
| XTSR016DC_                             | 10–16                                                             | XTPR016DC1                | ②                             | (2) XTCE018C01  | XTPAXFA11                                   |
| XTSR025DC_                             | 16–25                                                             | XTPR025DC1                | ②                             | (2) XTCE025C01_ | XTPAXFA11                                   |
| XTSR032DC_                             | 25–32                                                             | XTPR032DC1                | ②                             | (2) XTCE032C01_ | XTPAXFA11                                   |
| XTSR Frame D MMP + Frame D Contactor   |                                                                   |                           |                               |                 |                                             |
| XTSR040DD_                             | 32–40                                                             | XTPR040DC1                | ③                             | (2) XTCE040D00_ | XTPAXFA11                                   |
| XTSR050DD_                             | 40–50                                                             | XTPR050DC1                | ③                             | (2) XTCE050D00_ | XTPAXFA11                                   |
| XTSR058DD_                             | 50–58                                                             | XTPR058DC1                | ③                             | (2) XTCE065D00_ | XTPAXFA11                                   |
| XTSR063DD_                             | 55–65                                                             | XTPR063DC1                | ③                             | (2) XTCE065D00_ | XTPAXFA11                                   |

**Notes**

① Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

② The connection between the XTPR...DC1 and the XTCE...C\_ contactor will be made with flexible wire and mounted to the DIN rail adapter plate (XTPAXTPCPD).

③ The reversing connection between the XTPR...DC1 and the (2) XTCE...C\_ contactors will be accomplished by using the non-reversing combination connection kit (XTPAXTPCD), Frame D reversing link kit (XTCEXRLD), additional DIN rail adapter plate (XTPAXTPCPD) and DIN adapter connection element (XTPAXCNE).

## XTFC Non-Reversing Combination Motor Controllers—Component Bill of Material

## Factory Assembled Manual Motor Protector + Contactor + Line Side Adapter

| Assembled Combination Motor Controller <sup>①</sup> | FLA Adjustment Range/<br>Overload Release— $I_r$<br>(Amps) | Component Catalog Numbers<br>Line Side Adapter | Manual Motor Protector | Combination Connection Kit | Contactor <sup>①</sup> | Manual Motor Protector Auxiliary Contact |
|-----------------------------------------------------|------------------------------------------------------------|------------------------------------------------|------------------------|----------------------------|------------------------|------------------------------------------|
| <b>XTFC Frame B MMP + Frame B Contactor</b>         |                                                            |                                                |                        |                            |                        |                                          |
| XTFCP16BB_ <sup>②</sup>                             | 0.1–0.16                                                   | XTPAXLSA                                       | XTPRP16BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFCP25BB_ <sup>②</sup>                             | 0.16–0.25                                                  | XTPAXLSA                                       | XTPRP25BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFCP40BB_ <sup>②</sup>                             | 0.25–0.4                                                   | XTPAXLSA                                       | XTPRP40BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFCP63BB_ <sup>②</sup>                             | 0.4–0.63                                                   | XTPAXLSA                                       | XTPRP63BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFC001BB_ <sup>②</sup>                             | 0.63–1                                                     | XTPAXLS                                        | XTPR001BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFC1P6BB_ <sup>②</sup>                             | 1–1.6                                                      | XTPAXLSA                                       | XTPR1P6BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFC2P5BB_ <sup>②</sup>                             | 1.6–2.5                                                    | XTPAXLSA                                       | XTPR2P5BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFC004BB_ <sup>②</sup>                             | 2.5–4                                                      | XTPAXLSA                                       | XTPR004BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFC6P3BB_ <sup>②</sup>                             | 4–6.3                                                      | XTPAXLSA                                       | XTPR6P3BC1             | XTPAXTPCB                  | XTCE007B10_            | XTPAXFA11                                |
| XTFC010BB_ <sup>②</sup>                             | 6.3–10                                                     | XTPAXLSA                                       | XTPR010BC1             | XTPAXTPCB                  | XTCE009B10_            | XTPAXFA11                                |
| XTFC012BB_ <sup>②</sup>                             | 8–12                                                       | XTPAXLSA                                       | XTPR012BC1             | XTPAXTPCB                  | XTCE012B10_            | XTPAXFA11                                |
| XTFC016BB_ <sup>②</sup>                             | 10–16                                                      | XTPAXLSA                                       | XTPR016BC1             | XTPAXTPCB                  | XTCE015B10_            | XTPAXFA11                                |
| <b>XTFC Frame B MMP + Frame C Contactor</b>         |                                                            |                                                |                        |                            |                        |                                          |
| XTFC6P3BC_ <sup>②</sup>                             | 4–6.3                                                      | XTPAXLSA                                       | XTPR6P3BC1             | XTPAXTPCC                  | XTCE018C10_            | XTPAXFA11                                |
| XTFC010BC_ <sup>②</sup>                             | 6.3–10                                                     | XTPAXLSA                                       | XTPR010BC1             | XTPAXTPCC                  | XTCE018C10_            | XTPAXFA11                                |
| XTFC012BC_ <sup>②</sup>                             | 8–12                                                       | XTPAXLSA                                       | XTPR012BC1             | XTPAXTPCC                  | XTCE018C10_            | XTPAXFA11                                |
| XTFC016BC_ <sup>②</sup>                             | 10–16                                                      | XTPAXLSA                                       | XTPR016BC1             | XTPAXTPCC                  | XTCE018C10_            | XTPAXFA11                                |
| XTFC020BC_ <sup>②</sup>                             | 16–20                                                      | XTPAXLSA                                       | XTPR020BC1             | XTPAXTPCC                  | XTCE025C10_            | XTPAXFA11                                |
| XTFC025BC_ <sup>②</sup>                             | 20–25                                                      | XTPAXLSA                                       | XTPR025BC1             | XTPAXTPCC                  | XTCE025C10_            | XTPAXFA11                                |
| XTFC032BC_ <sup>②</sup>                             | 25–32                                                      | XTPAXLSA                                       | XTPR032BC1             | XTPAXTPCC                  | XTCE032C10_            | XTPAXFA11                                |
| <b>XTFC Frame D MMP + Frame C Contactor</b>         |                                                            |                                                |                        |                            |                        |                                          |
| XTFC016DC_ <sup>②</sup>                             | 10–16                                                      | XTPAXLSAD                                      | XTPR016DC1             | ③                          | XTCE018C10_            | XTPAXFA11                                |
| XTFC025DC_ <sup>②</sup>                             | 16–25                                                      | XTPAXLSAD                                      | XTPR025DC1             | ③                          | XTCE025C10_            | XTPAXFA11                                |
| XTFC032DC_ <sup>②</sup>                             | 25–32                                                      | XTPAXLSAD                                      | XTPR032DC1             | ③                          | XTCE032C10_            | XTPAXFA11                                |
| <b>XTFC Frame D MMP + Frame D Contactor</b>         |                                                            |                                                |                        |                            |                        |                                          |
| XTFC016DD_ <sup>②</sup>                             | 10–16                                                      | XTPAXLSAD                                      | XTPR016DC1             | XTPAXTPCD                  | XTCE040D00_            | XTPAXFA11                                |
| XTFC025DD_ <sup>②</sup>                             | 16–20                                                      | XTPAXLSAD                                      | XTPR025DC1             | XTPAXTPCD                  | XTCE040D00_            | XTPAXFA11                                |
| XTFC032DD_ <sup>②</sup>                             | 20–25                                                      | XTPAXLSAD                                      | XTPR032DC1             | XTPAXTPCD                  | XTCE040D00_            | XTPAXFA11                                |
| XTFC040DD_ <sup>②</sup>                             | 32–40                                                      | XTPAXLSAD                                      | XTPR040DC1             | XTPAXTPCD <sup>④</sup>     | XTCE040D00_            | XTPAXFA11                                |
| XTFC050DD_ <sup>②</sup>                             | 40–50                                                      | XTPAXLSAD                                      | XTPR050DC1             | XTPAXTPCD <sup>④</sup>     | XTCE050D00_            | XTPAXFA11                                |
| XTFC058DD_ <sup>②</sup>                             | 50–58                                                      | XTPAXLSAD                                      | XTPR058DC1             | XTPAXTPCD <sup>④</sup>     | XTCE065D00_            | XTPAXFA11                                |
| XTFC063DD_ <sup>②</sup>                             | 55–65                                                      | XTPAXLSAD                                      | XTPR063DC1             | XTPAXTPCD <sup>④</sup>     | XTCE065D00_            | XTPAXFA11                                |

## Notes

① Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

② Indicates Type E with contactor UL 508 combination. Not all XTFC part numbers feature UL 508 Type E with contactor combinations.

③ The connection between the XTPR...DC1 and the XTCE...C\_ contactor will be made with flexible wire and mounted to the DIN rail adapter plate (XTPAXTPCPD).

④ The reversing connection between the XTPR...DC1 and the (2) XTCE...C\_ contactors will be accomplished by using the non-reversing combination connection kit (XTPAXTPCD), Frame D reversing link kit (XTCEXRDL), additional DIN rail adapter plate (XTPAXTPCPD) and DIN adapter connection element (XTPAXCNE).

**Note:** Type E UL 508 combinations can be assembled in the field and DO NOT require the manual motor protector auxiliary contact XTPAXFA11. The connection can also be wired and does not require use of the XT connector.

## XTFR Reversing Combination Motor Controllers—Component Bill of Material

### Factory Assembled Manual Motor Protector + Contactor + Line Side Adapter

| Assembled Combination<br>Motor Controller <sup>①</sup> | FLA Adjustment Range/<br>Overload Release— <i>I<sub>r</sub></i><br>(Amps) | Component Catalog Numbers |                           | Combination<br>Connection Kit | Contactor <sup>①</sup>   | Manual Motor Protector<br>Auxiliary Contact |
|--------------------------------------------------------|---------------------------------------------------------------------------|---------------------------|---------------------------|-------------------------------|--------------------------|---------------------------------------------|
|                                                        |                                                                           | Line Side<br>Adapter      | Manual Motor<br>Protector |                               |                          |                                             |
| XTFR Frame B MMP + Frame B Contactor                   |                                                                           |                           |                           |                               |                          |                                             |
| XTFRP16BB_ <sup>②</sup>                                | 0.1–0.16                                                                  | XTPAXLSA                  | XTPRP16BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>③</sup> | XTPAXFA11                                   |
| XTFRP25BB_ <sup>②</sup>                                | 0.16–0.25                                                                 | XTPAXLSA                  | XTPRP25BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>③</sup> | XTPAXFA11                                   |
| XTFRP40BB_ <sup>②</sup>                                | 0.25–0.4                                                                  | XTPAXLSA                  | XTPRP40BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>③</sup> | XTPAXFA11                                   |
| XTFRP63BB_ <sup>②</sup>                                | 0.4–0.63                                                                  | XTPAXLSA                  | XTPRP63BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>③</sup> | XTPAXFA11                                   |
| XTFR001BB_ <sup>②</sup>                                | 0.63–1                                                                    | XTPAXLSA                  | XTPR001BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>③</sup> | XTPAXFA11                                   |
| XTFR1P6BB_ <sup>②</sup>                                | 1–1.6                                                                     | XTPAXLSA                  | XTPR1P6BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>③</sup> | XTPAXFA11                                   |
| XTFR2P5BB_ <sup>②</sup>                                | 1.6–2.5                                                                   | XTPAXLSA                  | XTPR2P5BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>③</sup> | XTPAXFA11                                   |
| XTFR004BB_ <sup>②</sup>                                | 2.5–4                                                                     | XTPAXLSA                  | XTPR004BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR6P3BB_ <sup>②</sup>                                | 4–6.3                                                                     | XTPAXLSA                  | XTPR6P3BC1                | XTPAXTPCRB                    | XTCE007B01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR010BB_ <sup>②</sup>                                | 6.3–10                                                                    | XTPAXLSA                  | XTPR010BC                 | XTPAXTPCRB                    | XTCE009B01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR012BB_ <sup>②</sup>                                | 8–12                                                                      | XTPAXLSA                  | XTPR012BC1                | XTPAXTPCRB                    | XTCE012B01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR Frame B MMP + Frame C Contactor                   |                                                                           |                           |                           |                               |                          |                                             |
| XTFR6P3BC_ <sup>②</sup>                                | 4–6.3                                                                     | XTPAXLSA                  | XTPR6P3BC1                | XTPAXTPCRC                    | XTCE018C10_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR010BC_ <sup>②</sup>                                | 6.3–10                                                                    | XTPAXLSA                  | XTPR103BC1                | XTPAXTPCRC                    | XTCE018C10_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR012BC_ <sup>②</sup>                                | 8–12                                                                      | XTPAXLSA                  | XTPR123BC1                | XTPAXTPCRC                    | XTCE018C10_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR016BC_ <sup>②</sup>                                | 10–16                                                                     | XTPAXLSA                  | XTPR016BC1                | XTPAXTPCRC                    | XTCE018C01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR020BC_ <sup>②</sup>                                | 16–20                                                                     | XTPAXLSA                  | XTPR020BC1                | XTPAXTPCRC                    | XTCE025C01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR025BC_ <sup>②</sup>                                | 20–25                                                                     | XTPAXLSA                  | XTPR025BC1                | XTPAXTPCRC                    | XTCE025C01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR032BC_ <sup>②</sup>                                | 25–32                                                                     | XTPAXLSA                  | XTPR032BC1                | XTPAXTPCRC                    | XTCE032C01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR Frame D MMP + Frame C Contactor                   |                                                                           |                           |                           |                               |                          |                                             |
| XTFR016DC_ <sup>②</sup>                                | 10–16                                                                     | XTPAXLSAD                 | XTPR016DC1                | ③                             | XTCE018C01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR025DC_ <sup>②</sup>                                | 16–25                                                                     | XTPAXLSAD                 | XTPR025DC1                | ③                             | XTCE025C01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR032DC_ <sup>②</sup>                                | 25–32                                                                     | XTPAXLSAD                 | XTPR032DC1                | ③                             | XTCE032C01_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR Frame D MMP + Frame D Contactor                   |                                                                           |                           |                           |                               |                          |                                             |
| XTFR016DD_ <sup>②</sup>                                | 10–16                                                                     | XTPAXLSAD                 | XTPR016DC1                | ③                             | XTCE040D00_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR025DD_ <sup>②</sup>                                | 16–25                                                                     | XTPAXLSAD                 | XTPR025DC1                | ③                             | XTCE040D00_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR026DD_ <sup>②</sup>                                | 25–32                                                                     | XTPAXLSAD                 | XTPR032DC1                | ③                             | XTCE040D00_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR040DD_ <sup>②</sup>                                | 32–40                                                                     | XTPAXLSAD                 | XTPR040DC1                | ④                             | XTCE040D00_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR050DD_ <sup>②</sup>                                | 40–50                                                                     | XTPAXLSAD                 | XTPR050DC1                | ④                             | XTCE050D00_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR058DD_ <sup>②</sup>                                | 50–58                                                                     | XTPAXLSAD                 | XTPR058DC1                | ④                             | XTCE065D00_ <sup>④</sup> | XTPAXFA11                                   |
| XTFR063DD_ <sup>②</sup>                                | 55–65                                                                     | XTPAXLSAD                 | XTPR063DC1                | ④                             | XTCE065D00_ <sup>④</sup> | XTPAXFA11                                   |

#### Notes

- ① Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.
- ② Indicates Type E with contactor UL 508 combination. Not all XTFR part numbers feature UL 508 Type E with contactor combinations.
- ③ The connection between the XTPR...DC1 and the XTCE...C\_ contactor will be made with flexible wire and mounted to the DIN rail adapter plate (XTPAXTPCPD).
- ④ The reversing connection between the XTPR...DC1 and the (2) XTCE...C\_ contactors will be accomplished by using the non-reversing combination connection kit (XTPAXTPCD), Frame D reversing link kit (XTCEXRLD), additional DIN rail adapter plate (XTPAXTPCPD) and DIN adapter connection element (XTPAXCNE).

**Note:** Type E UL 508 combinations can be assembled in the field and DO NOT require the manual motor protector auxiliary contact XTPAXFA11. The connection can also be wired and does not require use of the XT connector.

## Manual Motor Controllers Short-Circuit Ratings for UL/CSA Group Installations

## XTSC and XTSR Manual Motor Controllers (MMC)

|                                               |            |                                                                       |                                                    | Group Installation, UL/CSA                                                 |           |           |                                                                  |                                 |
|-----------------------------------------------|------------|-----------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------|-----------|-----------|------------------------------------------------------------------|---------------------------------|
| Assembled Controller ①                        |            | FLA Adjustment<br>Range/Overload<br>Release—<br>I <sub>r</sub> (Amps) | Short-Circuit<br>Release—<br>I <sub>m</sub> (Amps) | Max. rms Symmetrical Short-Circuit<br>Ratings (kA/kA with Current Limiter) |           |           | Maximum Upstream Protective Device<br>(A/A with Current Limiter) |                                 |
| Non-Reversing                                 | Reversing  |                                                                       |                                                    | 240V                                                                       | 480Y/277V | 600Y/347V | Maximum Fuse<br>600V                                             | Maximum Circuit<br>Breaker 600V |
| XTSC and XTSR Frame B MMP + Frame B Contactor |            |                                                                       |                                                    |                                                                            |           |           |                                                                  |                                 |
| XTSCP16BB_                                    | XTSRP16BB_ | 0.1–0.16                                                              | 2.2                                                | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSCP25BB_                                    | XTSRP25BB_ | 0.16–0.25                                                             | 3.5                                                | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSCP40BB_                                    | XTSRP40BB_ | 0.25–0.4                                                              | 5.6                                                | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSCP63BB_                                    | XTSRP63BB_ | 0.4–0.36                                                              | 8.82                                               | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSC001BB_                                    | XTSR001BB_ | 0.36–1                                                                | 14.0                                               | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSC1P6BB_                                    | XTSR1P6BB_ | 1–1.6                                                                 | 22.4                                               | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSC2P5BB_                                    | XTSR2P5BB_ | 1.6–2                                                                 | 5                                                  | 35                                                                         | 65        | 65        | 50                                                               | 600                             |
| XTSC004BB_                                    | XTSR004BB_ | 2.5–4                                                                 | 56                                                 | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSC6P3BB_                                    | XTSR6P3BB_ | 4–6.3                                                                 | 88.2                                               | 65                                                                         | 65        | 50        | 600                                                              | 600                             |
| XTSC010BB_                                    | XTSR010BB_ | 6.3–10                                                                | 140                                                | 65                                                                         | 65        | 22        | 10/600                                                           | 15/600                          |
| XTSC012BB_                                    | XTSR012BB_ | 8–12                                                                  | 168                                                | 65                                                                         | 65        | 22        | 10/600                                                           | 15/600                          |
| XTSC and XTSR Frame B MMP + Frame C Contactor |            |                                                                       |                                                    |                                                                            |           |           |                                                                  |                                 |
| XTSC016BC_                                    | XTSR016BC_ | 10–16                                                                 | 224                                                | 42                                                                         | 42        | 50        | 10/600                                                           | 15/600                          |
| XTSC020BC_                                    | XTSR020BC_ | 16–20                                                                 | 280                                                | 18                                                                         | 18        | 18        | 10/600                                                           | 15/600                          |
| XTSC025BC_                                    | XTSR025BC_ | 20–25                                                                 | 350                                                | 18                                                                         | 18        | 18        | 10/600                                                           | 15/600                          |
| XTSC032BC_                                    | XTSR032BC_ | 25–32                                                                 | 448                                                | 18                                                                         | 18        | 18        | 10/600                                                           | 15/600                          |
| XTSC and XTSR Frame D MMP + Frame C Contactor |            |                                                                       |                                                    |                                                                            |           |           |                                                                  |                                 |
| XTSC016DC_                                    | XTSR016DC_ | 10–16                                                                 | 224                                                | 65                                                                         | 65        | 22        | 600                                                              | 600                             |
| XTSC025DC_                                    | XTSR025DC_ | 16–25                                                                 | 350                                                | 65                                                                         | 65        | 22        | 600                                                              | 600                             |
| XTSC032DC_                                    | XTSR032DC_ | 25–32                                                                 | 448                                                | 65                                                                         | 65        | 22        | 600                                                              | 600                             |
| XTSC and XTSR Frame D MMP + Frame D Contactor |            |                                                                       |                                                    |                                                                            |           |           |                                                                  |                                 |
| XTSC040DD_                                    | XTSR040DD_ | 32–40                                                                 | 560                                                | 65                                                                         | 65        | 22        | 600                                                              | 600                             |
| XTSC050DD_                                    | XTSR050DD_ | 40–50                                                                 | 700                                                | 65                                                                         | 65        | 22        | 600                                                              | 600                             |
| XTSC058DD_                                    | XTSR058DD_ | 50–58                                                                 | 812                                                | 65                                                                         | 65        | 22        | —                                                                | —                               |
| XTSC063DD_                                    | XTSR063DD_ | 58–63                                                                 | 882                                                | 65                                                                         | 65        | —         | —                                                                | —                               |

**Note**

<sup>①</sup> Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

## Combination Motor Controllers (Line Side Adapter + Manual Motor Protector + Contactor) UL 508 Type F Self-Protected

XTFC and XTFR Combination Motor Controllers (CMC), UL 508 Type F

Assembled Controller <sup>①</sup>

UL 508 Type F Application <sup>②</sup>

|                                               |              | FLA Adjustment<br>Range/Overload<br>Release—<br>I <sub>r</sub> (Amps) | Short-Circuit<br>Release—<br>I <sub>rm</sub> (Amps) | Max. rms Symmetrical Short-Circuit Ratings (kA) |           |           | Maximum Upstream<br>Protective Device (A) ② |                                 |
|-----------------------------------------------|--------------|-----------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|-----------|-----------|---------------------------------------------|---------------------------------|
| Non-Reversing                                 | Reversing    |                                                                       |                                                     | 240V                                            | 480Y/277V | 600Y/347V | Maximum Fuse<br>600V                        | Maximum Circuit<br>Breaker 600V |
| XTFC and XTFR Frame B MMP + Frame B Contactor |              |                                                                       |                                                     |                                                 |           |           |                                             |                                 |
| XTFCP16BB_                                    | XTFRP16BB_   | 0.1–0.16                                                              | 2.2                                                 | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFCP25BB_                                    | XTFRP25BB_   | 0.16–0.25                                                             | 3.5                                                 | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFCP40BB_                                    | XTFRP40BB_   | 0.25–0.4                                                              | 5.6                                                 | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFCP63BB_                                    | XTFRP40BB_   | 0.4–0.63                                                              | 8.82                                                | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC001BB_                                    | XTFRP63BB_   | 0.63–1                                                                | 14                                                  | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC1P6BB_                                    | XTFR1P6BB_   | 1–1.6                                                                 | 22.4                                                | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC2P5BB_                                    | XTFR2P5BB_   | 1.6–2.5                                                               | 35                                                  | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC001BB_                                    | XTFR004BB_   | 2.5–4.0                                                               | 56                                                  | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC6P3BB_                                    | XTFR6P3BB_   | 4.0–6.3                                                               | 88.2                                                | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC010BB_                                    | XTFR010BB_   | 6.3–10                                                                | 140                                                 | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC012BB_                                    | XTFR012BB_   | 8–12                                                                  | 168                                                 | 65                                              | 65        | 18        | Not required                                | Not required                    |
| XTFC016BB_                                    | —            | 10–16                                                                 | 224                                                 | 18                                              | 18        | —         | Not required                                | Not required                    |
| XTFC and XTFR Frame B MMP + Frame C Contactor |              |                                                                       |                                                     |                                                 |           |           |                                             |                                 |
| XTFC016BC_ ③                                  | XTFR016BC_ ③ | 10–16                                                                 | 224                                                 | 18                                              | 18        | —         | Not required                                | Not required                    |
| XTFC020BC_                                    | XTFR020BC_   | 16–20                                                                 | 280                                                 | 18                                              | 18        | —         | Not required                                | Not required                    |
| XTFC025BC_                                    | XTFR025BC_   | 20–25                                                                 | 350                                                 | 18                                              | 18        | —         | Not required                                | Not required                    |
| XTFC032BC_                                    | XTFR032BC_   | 25–32                                                                 | 448                                                 | 18                                              | 18        | —         | Not required                                | Not required                    |
| XTFC and XTFR Frame D MMP + Frame C Contactor |              |                                                                       |                                                     |                                                 |           |           |                                             |                                 |
| XTFC016DC_                                    | XTFR016DC_   | 10–16                                                                 | 224                                                 | 65                                              | 65        | 30        | Not required                                | Not required                    |
| XTFC025DC_                                    | XTFR025DC_   | 16–25                                                                 | 350                                                 | 65                                              | 65        | 30        | Not required                                | Not required                    |
| XTFC032DC_                                    | XTFR032DC_   | 25–32                                                                 | 448                                                 | 65                                              | 65        | 50        | Not required                                | Not required                    |
| XTFC and XTFR Frame D MMP + Frame D Contactor |              |                                                                       |                                                     |                                                 |           |           |                                             |                                 |
| XTFC040DD_                                    | XTFR040DD_   | 32–40                                                                 | 560                                                 | 65                                              | 65        | 50        | Not required                                | Not required                    |
| XTFC050DD_                                    | XTFR050DD_   | 40–50                                                                 | 700                                                 | 65                                              | 65        | —         | Not required                                | Not required                    |
| XTFC058DD_                                    | XTFR058DD_   | 50–58                                                                 | 812                                                 | 65                                              | 65        | —         | Not required                                | Not required                    |
| XTFC063DD_                                    | XTFR063DD_   | 55–65                                                                 | 882                                                 | 65                                              | 65        | —         | Not required                                | Not required                    |

### Notes

<sup>①</sup> Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.

<sup>②</sup> For UL 508 Type F applications, the combination motor controller assembly does not require a dedicated upstream protective device in the panel, thus a maximum rating is not required.

<sup>③</sup> For 65 kA UL rating, use Type E rating with contactor.

**Note:** A **Type F** combination motor controller consists of a Type E manual self-protected motor controller and a magnetic motor controller.

## Combination Motor Controllers Short-Circuit Ratings for UL 508 Type E Application

XTFC and XTFR Combination Motor Controllers (CMC), UL 508 Type F/Type E

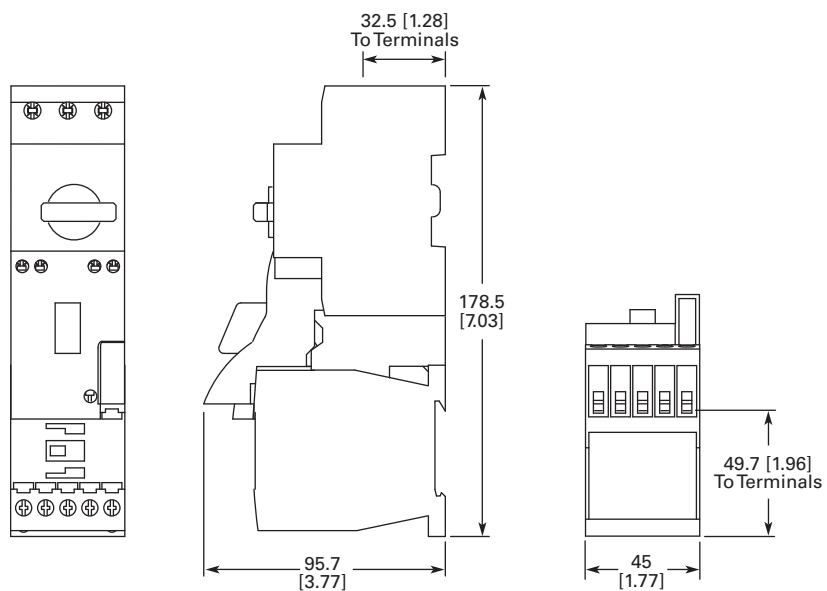
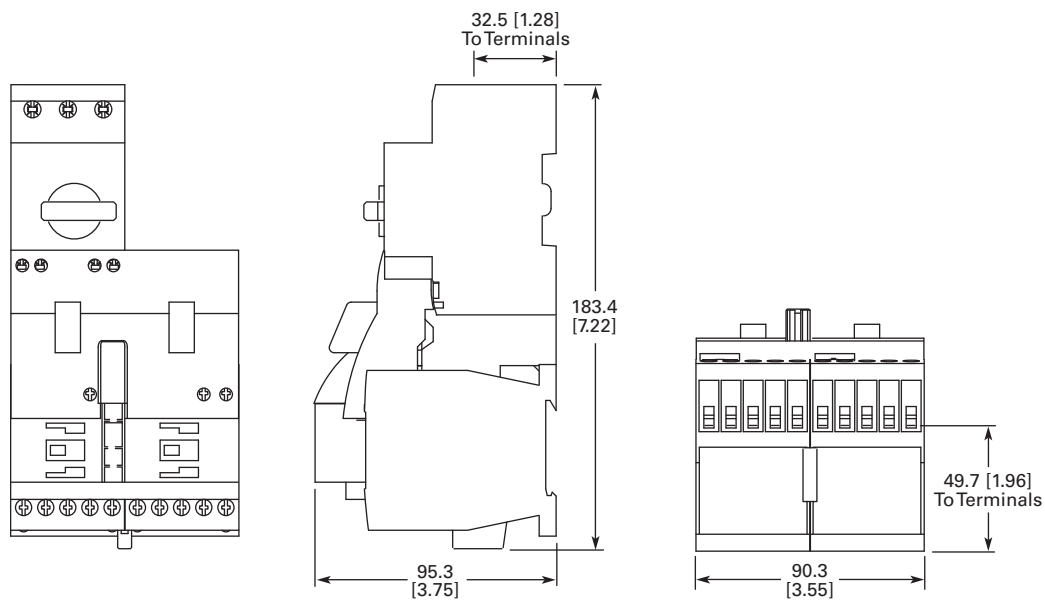
|                                               |            |                                                                       |                                                     | UL 508 Type F Application                          |           |           |                                                        |                                 |
|-----------------------------------------------|------------|-----------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------|-----------|-----------|--------------------------------------------------------|---------------------------------|
| Assembled Controller <sup>①</sup>             |            | FLA Adjustment<br>Range/Overload<br>Release—<br>I <sub>r</sub> (Amps) | Short-Circuit<br>Release—<br>I <sub>rm</sub> (Amps) | Max. rms Symmetrical Short-Circuit<br>Ratings (kA) |           |           | Maximum Upstream<br>Protective Device (A) <sup>②</sup> |                                 |
| Non-Reversing                                 | Reversing  |                                                                       |                                                     | 240V                                               | 480Y/277V | 600Y/347V | Maximum Fuse<br>600V                                   | Maximum Circuit<br>Breaker 600V |
| XTFC and XTFR Frame B MMP + Frame B Contactor |            |                                                                       |                                                     |                                                    |           |           |                                                        |                                 |
| XTFCP16BB_                                    | XTFRP16BB_ | 0.1–0.16                                                              | 2.2                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFCP25BB_                                    | XTFRP25BB_ | 0.16–0.25                                                             | 3.5                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFCP40BB_                                    | XTFRP40BB_ | 0.25–0.4                                                              | 5.6                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFCP63BB_                                    | XTFRP63BB_ | 0.4–0.63                                                              | 8.82                                                | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC001BB_                                    | XTFR001BB_ | 0.63–1                                                                | 14                                                  | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC1P6BB_                                    | XTFR1P6BB_ | 1–1.6                                                                 | 22.4                                                | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC2P5BB_                                    | XTFR2P5BB_ | 1.6–2.5                                                               | 35                                                  | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC004BB_                                    | XTFR004BB_ | 2.5–4                                                                 | 56                                                  | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC and XTFR Frame B MMP + Frame C Contactor |            |                                                                       |                                                     |                                                    |           |           |                                                        |                                 |
| XTFC6P3BC_                                    | XTFR6P3BC_ | 4–6.3                                                                 | 88.2                                                | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC010BC_                                    | XTFR010BC_ | 6.3–10                                                                | 140                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC012BC_                                    | XTFR012BC_ | 8–12                                                                  | 168                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC016BC_                                    | XTFR016BC_ | 10–16                                                                 | 224                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC and XTFR Frame D MMP + Frame D Contactor |            |                                                                       |                                                     |                                                    |           |           |                                                        |                                 |
| XTFC016DD_                                    | XTFR016DD_ | 10–16                                                                 | 224                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC025DD_                                    | XTFR025DD_ | 16–25                                                                 | 350                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC032DD_                                    | XTFR032DD_ | 25–32                                                                 | 448                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC040DD_                                    | XTFR040DD_ | 32–40                                                                 | 560                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC050DD_                                    | XTFR050DD_ | 40–50                                                                 | 700                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC058DD_                                    | XTFR058DD_ | 50–58                                                                 | 812                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |
| XTFC063DD_                                    | XTFR063DD_ | 55–65                                                                 | 882                                                 | 65                                                 | 65        | —         | Not required                                           | Not required                    |

**Notes**<sup>①</sup> Underscore ( \_ ) indicates magnetic coil suffix required. See **Page V5-T1-198**.<sup>②</sup> For UL 508 Type E applications, the assembly does not require a dedicated upstream protective device in the panel, thus a maximum rating is not required.

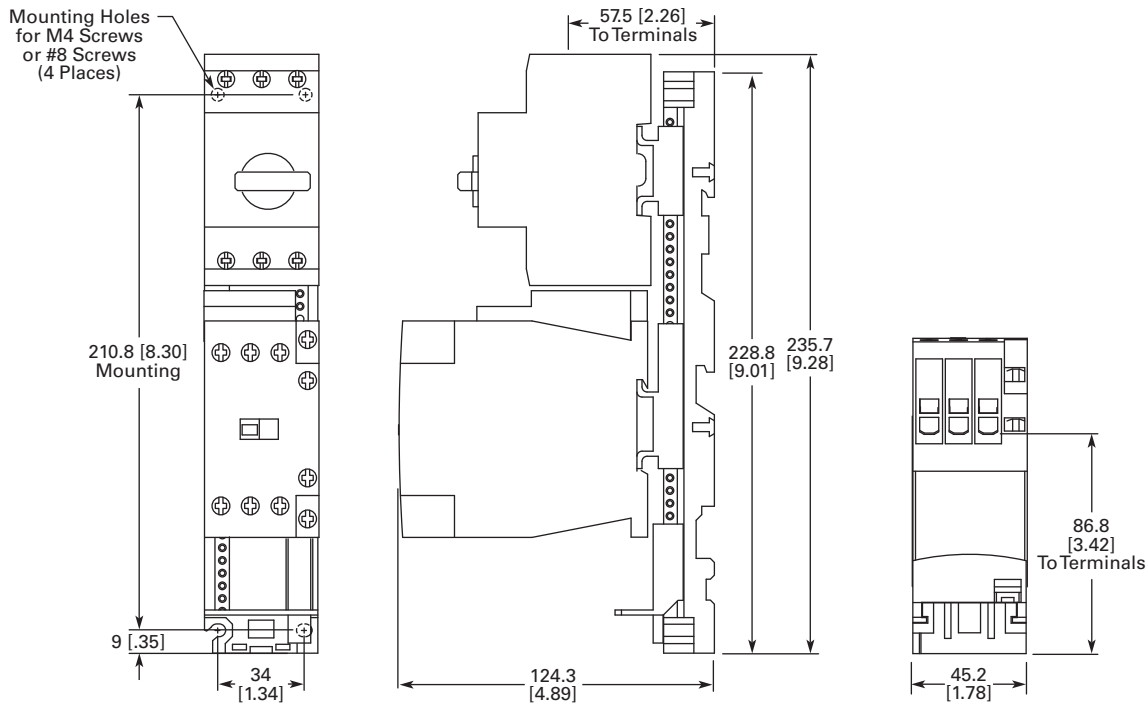
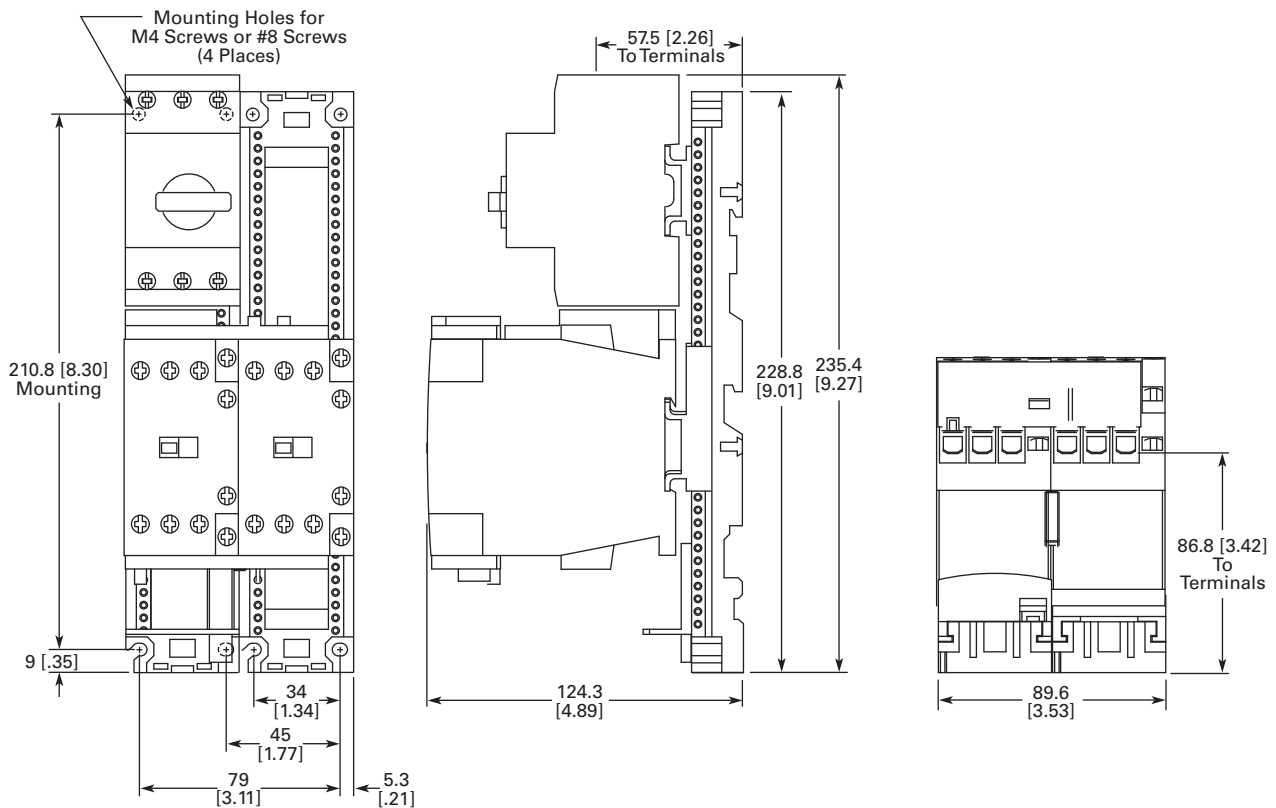
## 1

**Dimensions**

Approximate Dimensions in mm [in]

**XTSC...BB\_****XTSR...BB\_**

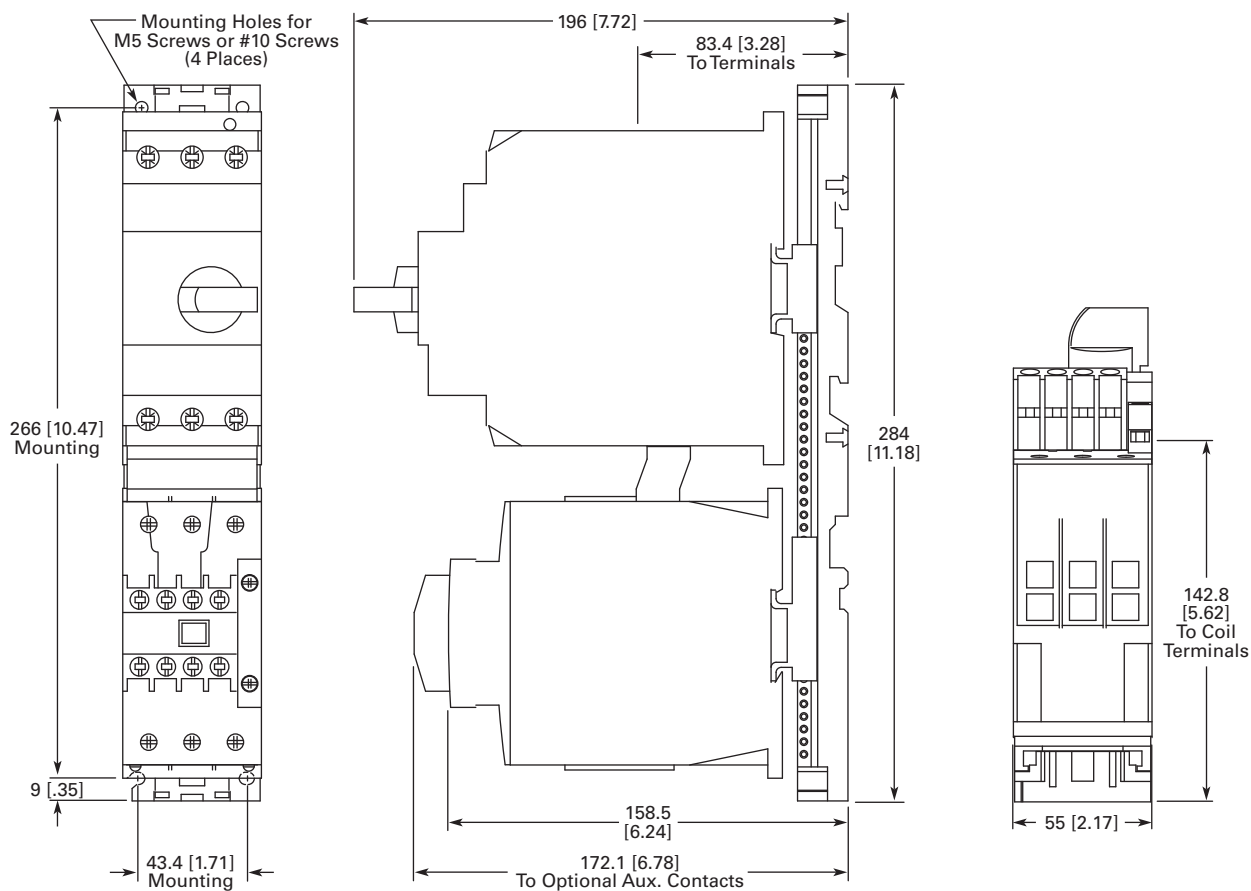
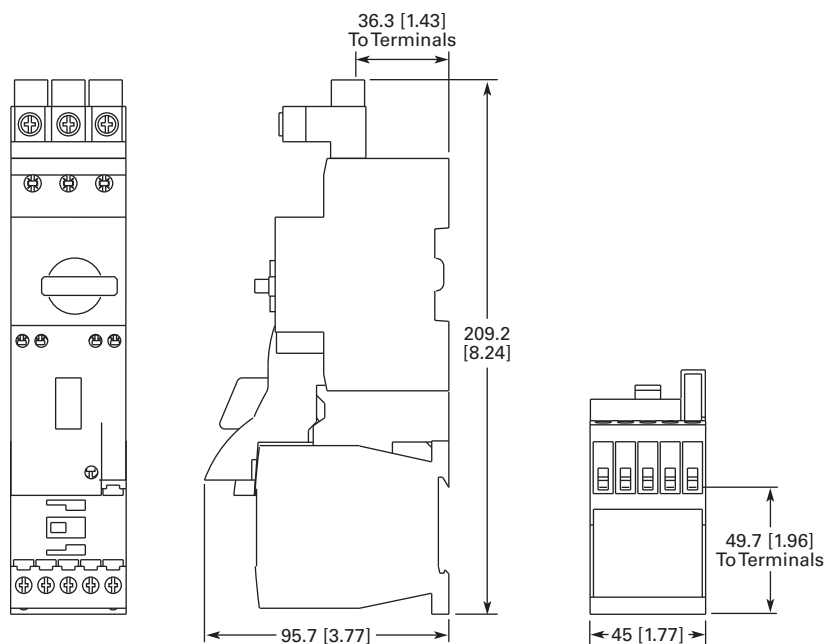
Approximate Dimensions in mm [in]

**XTSC...BC\_****XTSR...BC\_**

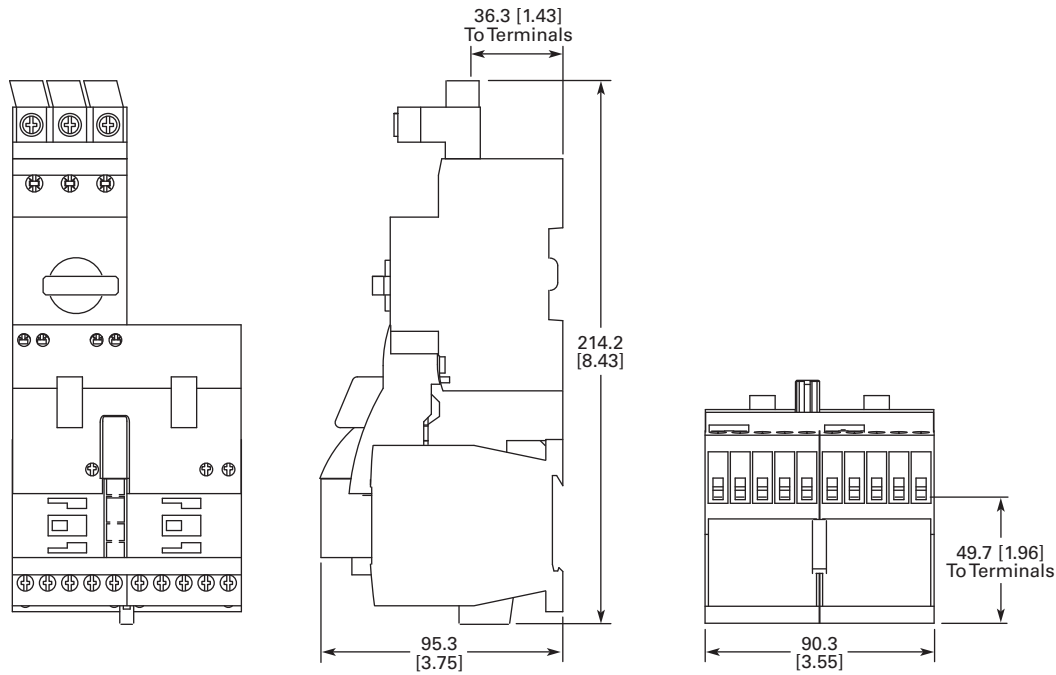
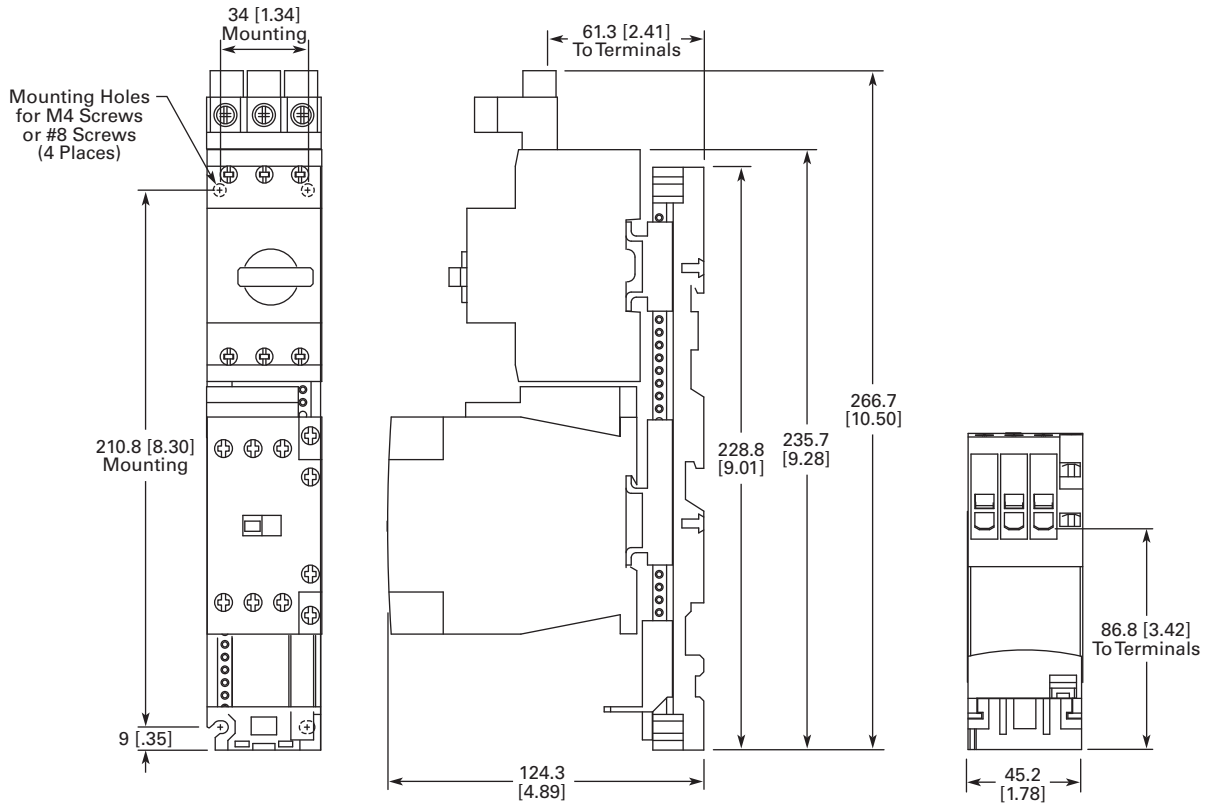


1

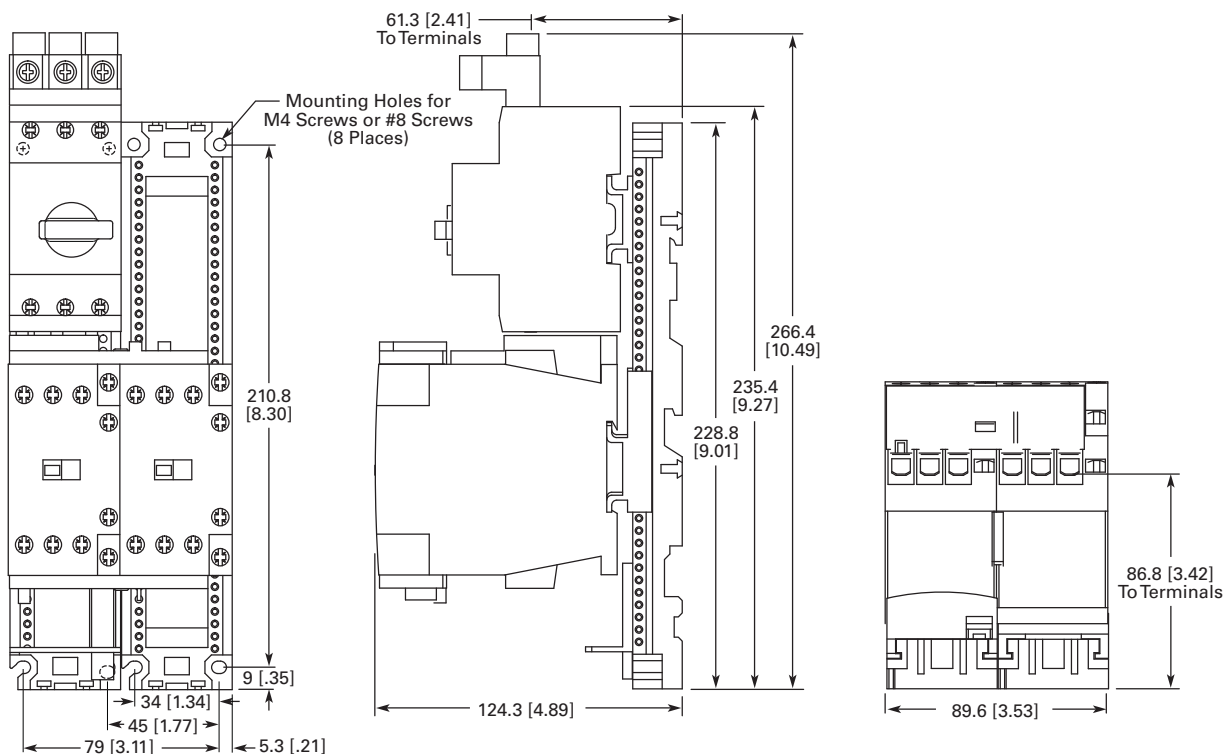
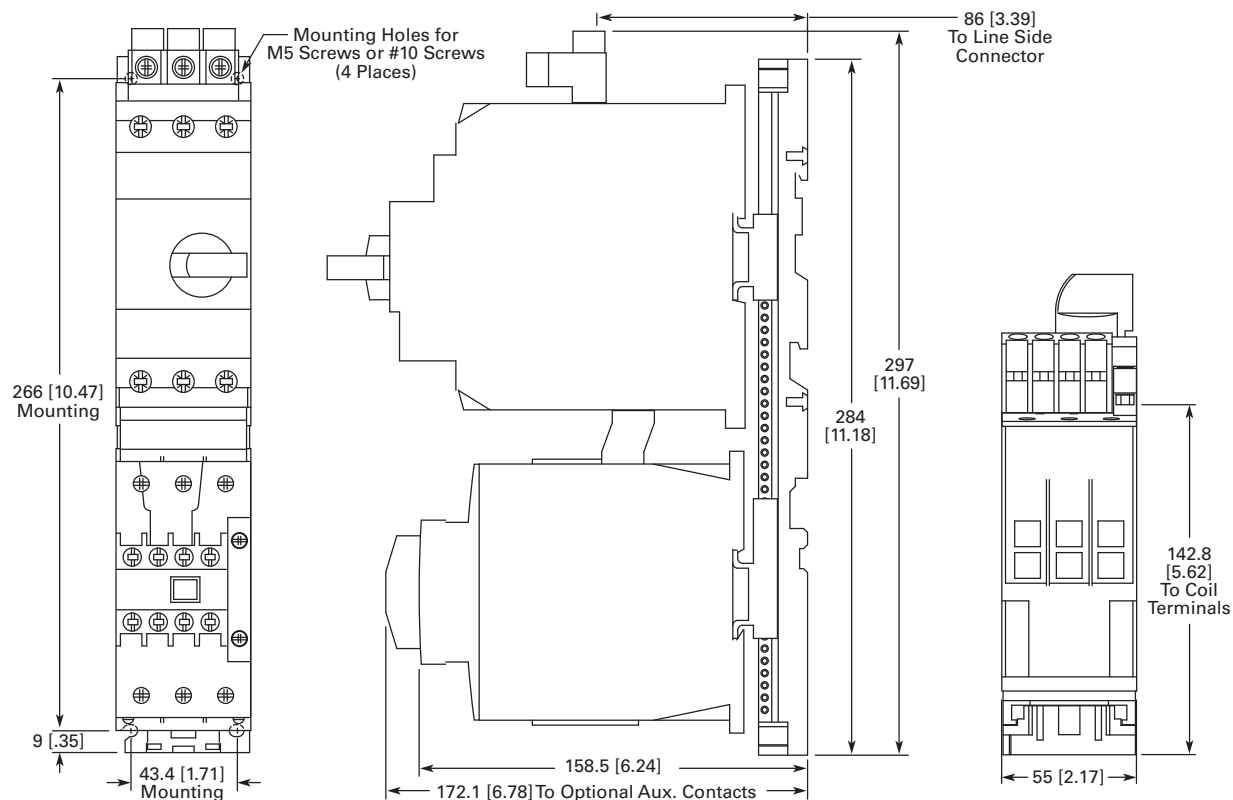
Approximate Dimensions in mm [in]

**XTSC...DD\_****XTFC...BB\_**

Approximate Dimensions in mm [in]

**XTFR...BB\_****XTFC...BC\_**

Approximate Dimensions in mm [in]

**XTFR...BC\_****XTFC...DD\_**

**XT Electronic Manual Motor Protector****XT Electronic Manual Motor Protector****Product Description**

The **XT** Electronic Manual Motor Protector provides the same functionality as the **XT** thermal manual motor protector, but with an added level of flexibility and selectability. The XTPE incorporates electronic control technology to enable more options and larger dial setting ranges. The trip units are interchangeable, allowing users to exchange as needed using the same base. The reduced number of part numbers decreases bill of material complexity while reducing inventory demands. The XTPE electronic manual motor protector includes the following features:

- 4:1 max to min overcurrent dial setting range
- Selectable trip class (5, 10, 15, 20)
- Interchangeable trip units
- Three base units (12, 32 and 65A)
- Common accessories with the XTPR

**Features and Benefits****Advanced Trip Unit**

In addition to the selectability, the XTPE is also available with an advanced trip unit that can communicate system data and protector data thru SmartWire-DT. SmartWire-DT is an innovative cost effective connection technology that enables quick installation of control wiring to the starter through a single green cable. When on SmartWire-DT, the XTPE can communicate the following:

- Current Values
  - Maximum phase current
  - Overload warning

**Contents****Description**

|                                                 | <b>Page</b>      |
|-------------------------------------------------|------------------|
| Relays and Timers .....                         | <b>V5-T1-3</b>   |
| Miniature Controls .....                        | <b>V5-T1-18</b>  |
| Contactors and Starters .....                   | <b>V5-T1-35</b>  |
| Thermal Overload Relays .....                   | <b>V5-T1-130</b> |
| C440/ <b>XT</b> Electronic Overload Relay ..... | <b>V5-T1-143</b> |
| Manual Motor Protectors .....                   | <b>V5-T1-159</b> |
| Combination Motor Controllers .....             | <b>V5-T1-193</b> |
| <b>XT</b> Electronic Manual Motor Protector     |                  |
| Catalog Number Selection .....                  | <b>V5-T1-220</b> |
| Product Selection .....                         | <b>V5-T1-221</b> |
| Accessories .....                               | <b>V5-T1-223</b> |
| Technical Data and Specifications .....         | <b>V5-T1-229</b> |
| Dimensions .....                                | <b>V5-T1-231</b> |
| EMS—Electronic Motor Starter .....              | <b>V5-T1-232</b> |
| <b>XT</b> DC Contactors .....                   | <b>V5-T1-234</b> |
| Reference Data .....                            | <b>V5-T1-236</b> |

**Standards and Certifications**

- CE approved
- UL Listed File No. E36332
- UL 508 group motor and Type E
- IEC/EN 60947
- CSA File 012528, Class 3211-05



- Diagnostics Data
  - Overload fault
  - Cause of trip (overcurrent or short circuit)
  - Phase loss
  - Trip via TEST
- Status Messages
  - Control unit type
  - Overload setting
  - Time-lag
  - Switching status

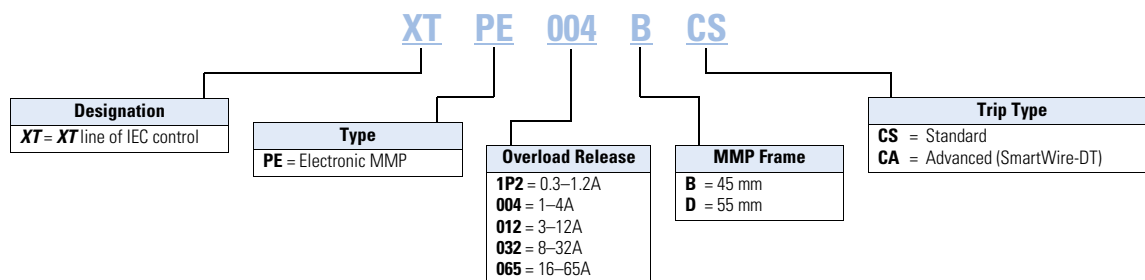
**XTPE Electronic MMP**

The XTPE Electronic MMP provides the selectability, control, and insight options that give panel builders and OEMs the solutions necessary to enhance motor control designs while reducing total costs.

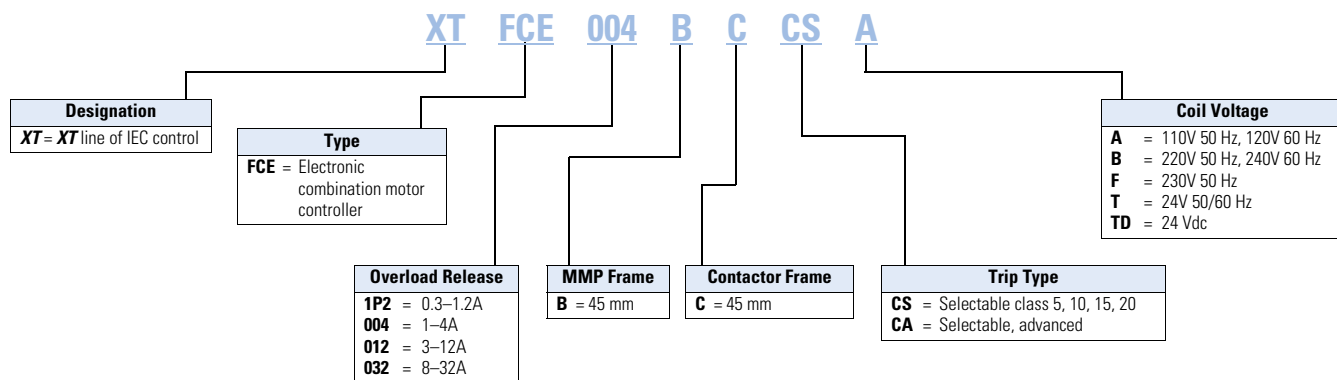
## 1

## Catalog Number Selection

## XT—Manual Motor Protector



## XT—Combinations



## Product Selection

## XT Electronic Manual Motor Protector

## B Frame

## MMP Base



| Maximum Amperage | UL/CSA<br>Maximum Three-Phase hp Ratings |      |      |      | IEC<br>Maximum Motor kW Ratings |                      |      |      |              | Base Unit   |                |
|------------------|------------------------------------------|------|------|------|---------------------------------|----------------------|------|------|--------------|-------------|----------------|
|                  | 200V                                     | 240V | 480V | 600V | 220V<br>230V<br>240V            | 380V<br>400V<br>415V | 440V | 500V | 600V<br>690V | Type Number | Catalog Number |
| 12               | 3                                        | 3    | 7.5  | 10   | 3                               | 5.5                  | 5.5  | 5.5  | 7.5          | PKE12       | XTPE012B       |
| 32               | 5                                        | 7.5  | 15   | 20   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE32       | XTPE032B       |
| 65               | 15                                       | 15   | 40   | 40   | 18.5                            | 30                   | 37   | 45   | 55           | PKE65       | XTPE065D       |

## B Frame

## MMP Trip Units



| Overload Release Setting Amp Range | For Use with Base Catalog Number | UL/CSA<br>Maximum Three-Phase hp Ratings |      |      |      | IEC<br>Maximum Motor kW Ratings |                      |      |      |              | Trip Unit   |                |
|------------------------------------|----------------------------------|------------------------------------------|------|------|------|---------------------------------|----------------------|------|------|--------------|-------------|----------------|
|                                    |                                  | 200V                                     | 240V | 480V | 600V | 220V<br>230V<br>240V            | 380V<br>400V<br>415V | 440V | 500V | 600V<br>690V | Type Number | Catalog Number |
| 0.3–1.2                            | XTPE012B                         | ①                                        | ①    | 0.5  | 0.5  | 0.18                            | 0.37                 | 0.37 | 0.37 | 0.75         | PKE-XTU-1,2 | XTPEXT012B     |
| 1–4                                | XTPE012B                         | 0.75                                     | 0.75 | 2    | 3    | 0.75                            | 1.5                  | 1.5  | 2.2  | 3            | PKE-XTU-4   | XTPEXT004B     |
| 3–12                               | XTPE012B<br>XTPE032B             | 3                                        | 3    | 7.5  | 10   | 3                               | 5.5                  | 5.5  | 5.5  | 7.5          | PKE-XTU-12  | XTPEXT012B     |
| 8–32                               | XTPE032B                         | 5                                        | 7.5  | 15   | 20   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE-XTU-32  | XTPEXT032B     |
| 8–32                               | XTPE065D                         | 7.5                                      | 7.5  | 20   | 25   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE-XTUW-32 | XTPEXT032D     |
| 16–65                              | XTPE065D                         | 15                                       | 15   | 40   | 40   | 18.5                            | 30                   | 37   | 45   | 55           | PKE-XTU-65  | XTPEXT065D     |

## B Frame

## MMP Advanced Trip Units Used with SmartWire-DT



| Overload Release Setting Amp Range | For Use with Base Catalog Number | UL/CSA<br>Maximum Three-Phase hp Ratings |      |      |      | IEC<br>Maximum Motor kW Ratings |                      |      |      |              | Trip Unit    |                |
|------------------------------------|----------------------------------|------------------------------------------|------|------|------|---------------------------------|----------------------|------|------|--------------|--------------|----------------|
|                                    |                                  | 200V                                     | 240V | 480V | 600V | 220V<br>230V<br>240V            | 380V<br>400V<br>415V | 440V | 500V | 600V<br>690V | Type Number  | Catalog Number |
| 0.3–1.2                            | XTPE012B                         | ①                                        | ①    | 0.5  | 0.5  | 0.18                            | 0.37                 | 0.37 | 0.37 | 0.75         | PKE-XTUA-1,2 | XTPEXTA012B    |
| 1–4                                | XTPE012B                         | 0.75                                     | 0.75 | 2    | 3    | 0.75                            | 1.5                  | 1.5  | 2.2  | 3            | PKE-XTUA-4   | XTPEXTA004B    |
| 3–12                               | XTPE012B<br>XTPE032B             | 3                                        | 3    | 7.5  | 10   | 3                               | 5.5                  | 5.5  | 5.5  | 7.5          | PKE-XTUA-12  | XTPEXTA012B    |
| 8–32                               | XTPE032B                         | 5                                        | 7.5  | 15   | 20   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE-XTUA-32  | XTPEXTA032B    |
| 8–32                               | XTPE065D                         | 7.5                                      | 7.5  | 20   | 25   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE-XTUWA-32 | XTPEXTA032D    |
| 16–65                              | XTPE065D                         | 15                                       | 15   | 40   | 40   | 18.5                            | 30                   | 37   | 45   | 55           | PKE-XTUA-65  | XTPEXTA065D    |

## D Frame

## MMP Complete Assembly



| Overload Release Setting Amp Range | UL/CSA<br>Maximum Three-Phase hp Ratings |      |      |      | IEC<br>Maximum Motor kW Ratings |                      |      |      |              | Complete Manual Motor Protector |                |
|------------------------------------|------------------------------------------|------|------|------|---------------------------------|----------------------|------|------|--------------|---------------------------------|----------------|
|                                    | 200V                                     | 240V | 480V | 600V | 220V<br>230V<br>240V            | 380V<br>400V<br>415V | 440V | 500V | 600V<br>690V | Type Number                     | Catalog Number |
| 0.3–1.2                            | ①                                        | ①    | 0.5  | 0.5  | 0.18                            | 0.37                 | 0.37 | 0.37 | 0.75         | PKE12/XTU-1,2                   | XTPE1P2BCS     |
| 1–4                                | 0.75                                     | 0.75 | 2    | 3    | 0.75                            | 1.5                  | 1.5  | 2.2  | 3            | PKE12/XTU-4                     | XTPE004BCS     |
| 3–12                               | 3                                        | 3    | 7.5  | 10   | 3                               | 5.5                  | 5.5  | 5.5  | 7.5          | PKE12/XTU-12                    | XTPE012BCS     |
| 8–32                               | 5                                        | 7.5  | 15   | 20   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE32/XTU-32                    | XTPE032BCS     |
| 8–32                               | 7.5                                      | 7.5  | 20   | 25   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE65/XTUW-32                   | XTPE032DCS     |
| 16–65                              | 15                                       | 15   | 40   | 40   | 18.5                            | 30                   | 37   | 45   | 55           | PKE65/XTU-65                    | XTPE065DCS     |

## Note

① In this range, calculate motor rating according to rated current. Specified values to NEC 430.6 (A) (1).

## B Frame

## MMP Used with SmartWire-DT—Complete Assembly



| Overload Release Setting<br>Amp Range | UL/CSA<br>Maximum Motor hp Ratings |      |      |      | IEC<br>Maximum Motor kW Ratings |                      |      |      |              | Complete Manual Motor Protector |                |
|---------------------------------------|------------------------------------|------|------|------|---------------------------------|----------------------|------|------|--------------|---------------------------------|----------------|
|                                       |                                    |      |      |      |                                 |                      |      |      |              | Type Number                     | Catalog Number |
|                                       | 200V                               | 230V | 460V | 575V | 220V<br>230V<br>240V            | 380V<br>400V<br>415V | 440V | 500V | 600V<br>690V |                                 |                |
| 0.3–1.2                               | ①                                  | ①    | 0.5  | 0.5  | 0.18                            | 0.37                 | 0.37 | 0.37 | 0.75         | PKE12/XTUA-1,2                  | XTPE1P2BCA     |
| 1–4                                   | 0.75                               | 0.75 | 2    | 3    | 0.75                            | 1.5                  | 1.5  | 2.2  | 3            | PKE12/XTUA-4                    | XTPE004BCA     |
| 3–12                                  | 3                                  | 3    | 7.5  | 10   | 3                               | 5.5                  | 5.5  | 5.5  | 7.5          | PKE12/XTUA-12                   | XTPE012BCA     |
| 8–32                                  | 5                                  | 7.5  | 15   | 20   | 7.5                             | 15                   | 15   | 18.5 | 30           | PKE32/XTUA-32                   | XTPE032BCA     |

## UL 508 Type E XT Electronic Combination Motor Controllers—Complete Assembly Including Trip Unit

## B Frame

## B Frame Electronic MMP with C Frame Contactor



| Overload<br>Release Setting<br>Amp Range | UL/CSA<br>Maximum Three-Phase hp Ratings |      |               |               |               | Maximum Single-Phase hp Ratings |      |      | Catalog Number<br>Standard | Catalog Number<br>With SmartWire-DT |
|------------------------------------------|------------------------------------------|------|---------------|---------------|---------------|---------------------------------|------|------|----------------------------|-------------------------------------|
|                                          | 200V                                     | 240V | 380V/<br>415V | 480V/<br>277V | 600V/<br>347V | 115V                            | 200V | 240V |                            |                                     |
|                                          |                                          |      |               |               |               |                                 |      |      |                            |                                     |
| 0.3–1.2                                  | ①                                        | ①    | ①             | ①             | 0.5           | ①                               | ①    | ①    | XTFCE1P2BCCS_③             | XTFCE1P2BCCATD ③                    |
| 1–4                                      | 0.75                                     | 0.75 | 1.5           | 2             | —             | 0.125                           | 0.25 | 0.33 | XTFCE004BCCS_④             | XTFCE004BCCATD ④                    |
| 3–12                                     | 3                                        | 3    | 5             | 7.5           | —             | 0.5                             | 1    | 1.5  | XTFCE012BCCS_④             | XTFCE012BCCATD ④                    |
| 8–32                                     | 5                                        | 5    | 10            | 15            | —             | 1.5                             | 3    | 3    | XTFCE032BCCS_④             | XTFCE032BCCATD ④                    |

## Notes

- ① In this range, calculate motor rating according to rated current. Specified values to NEC 430.6 (A) (1).  
 ② Complete the catalog number by replacing the underscore ( ) with the coil suffix from **Page V5-T1-245**.  
 ③ SCCR: 14 kA, 600 Vac  
 ④ SCCR: 18 kA, 480 Vac

## Accessories

## Auxiliary Contacts

## XTPAXSA\_



## Side-Mount Auxiliary Contacts

| Contact Configuration | Contact Sequence                                                                                                                                                                                                                                                                            | Pkg. Qty. ① | Screw Terminal Catalog Number |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------|
| 1NO-1NC               | <p>Diagram showing the contact sequence for XTPAXSA11. It features a common terminal (O) and a normally closed terminal (I). The contact sequence is L1 L2 L3 for the NO contact and 1.13 1.21 for the NC contact. The terminal block shows terminals 1.14 and 1.22.</p>                    | 5           | XTPAXSA11                     |
| 1NO-2NC               | <p>Diagram showing the contact sequence for XTPAXSA12. It features a common terminal (O) and two normally closed terminals (I). The contact sequence is L1 L2 L3 for the NO contact and 1.13 1.21 1.31 for the NC contacts. The terminal block shows terminals 1.14 1.22 1.32.</p>          | 5           | XTPAXSA12                     |
| 2NO-1NC               | <p>Diagram showing the contact sequence for XTPAXSA21. It features two normally open terminals (O) and one normally closed terminal (I). The contact sequence is L1 L2 L3 for the NO contacts and 1.13 1.21 1.33 for the NC contact. The terminal block shows terminals 1.14 1.22 1.34.</p> | 5           | XTPAXSA21                     |

Can be fitted on the right side of manual motor protectors (XTPB, XTPR, XTPM) and manual transformer protectors (XTPT) and can be combined with XTPAXSATR\_ and XTPAXFA\_ trip indicating auxiliary contact.

## XTPAXFA11



## Front-Mount Auxiliary Contacts

| Contact Configuration | Contact Sequence                                                                                                                                                                                                                                                         | Pkg. Qty. ① | Screw Terminal Catalog Number |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------|
| 1NO-1NC               | <p>Diagram showing the contact sequence for XTPAXFA11. It features a common terminal (O) and a normally closed terminal (I). The contact sequence is L1 L2 L3 for the NO contact and 1.53 1.61 for the NC contact. The terminal block shows terminals 1.54 and 1.62.</p> | 5           | XTPAXFA11                     |

Can be fitted to manual motor protectors (XTPB, XTPR, XTPM) and manual transformer protectors (XTPT). 45 mm (XTPR...B and XTPB) or 55 mm (XTPR...D) widths of manual motor protectors remain unchanged.

**Note**

① Orders must be placed in multiples of package quantity listed.



1

XTPAXSATR\_



## Side-Mount Trip Indicating Auxiliary Contacts

| Contact Configuration | Contact Sequence | Pkg. Qty. ① | For Use with... | Catalog Number |
|-----------------------|------------------|-------------|-----------------|----------------|
| 2 x 1NO               | <p>On/Off</p>    | 2           | XTPE            | XTPAXSATR20    |
| 2 x 1NC               | <p>On/Off</p>    | 2           | XTPE            | XTPAXSATR02    |

Can be fitted on the right side of manual motor protectors. Can be combined with standard auxiliary contacts. Trip indication: A. General trip indication (overload) B. Short-circuit trip. Local short-circuit indication by red indicator, manually resettable.

**Note**

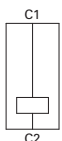
① Orders must be placed in multiples of package quantity listed.

## Additional Accessories

## XTPAXSR\_



## Contact Sequence



## Shunt Release

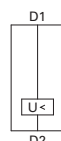
| Pkg. Qty. ① | Screw Terminal Catalog Number |
|-------------|-------------------------------|
| 2           | XTPAXSR24V50H                 |
| 2           | XTPAXSR48V50H                 |
| 2           | XTPAXSR110V50H                |
| 2           | XTPAXSR120V60H                |
| 2           | XTPAXSR208V60H                |
| 2           | XTPAXSR220V50H                |
| 2           | XTPAXSR230V50H                |
| 2           | XTPAXSR240V50H                |
| 2           | XTPAXSR240V60H                |
| 2           | XTPAXSR380V50H                |
| 2           | XTPAXSR400V50H                |
| 2           | XTPAXSR415V50H                |
| 2           | XTPAXSR440V60H                |
| 2           | XTPAXSR480V60H                |
| 2           | XTPAXSR24VDC                  |
| 2           | XTPAXSR48VDC                  |
| 2           | XTPAXSR60VDC                  |
| 2           | XTPAXSR110VDC                 |
| 2           | XTPAXSR125VDC                 |
| 2           | XTPAXSR220VDC                 |
| 2           | XTPAXSR250VDC                 |

Can be used to trip the manual motor protector from a remote location. Can be fitted on the left side of manual motor protectors. Cannot be combined with the XTPAXUVR. DC: Intermittent operation 5 sec.

## XTPAXUVR\_



## Contact Sequence



## Undervoltage Release

| Pkg. Qty. ① | Screw Terminal Catalog Number |
|-------------|-------------------------------|
| 2           | XTPAXUVR24V50H                |
| 2           | XTPAXUVR24V60H                |
| 2           | XTPAXUVR48V50H                |
| 2           | XTPAXUVR60V50H                |
| 2           | XTPAXUVR110V50H               |
| 2           | XTPAXUVR120V60H               |
| 2           | XTPAXUVR208V60H               |
| 2           | XTPAXUVR220V50H               |
| 2           | XTPAXUVR230V50H               |
| 2           | XTPAXUVR240V50H               |
| 2           | XTPAXUVR240V60H               |
| 2           | XTPAXUVR380V50H               |
| 2           | XTPAXUVR400V50H               |
| 2           | XTPAXUVR415V50H               |
| 2           | XTPAXUVR440V60H               |
| 2           | XTPAXUVR480V60H               |
| 2           | XTPAXUVR600V60H               |

Can be used to trip the manual motor protector from a remote location. Can be fitted on left side manual motor protectors. Cannot be combined with XTPAXSR. When combined with a circuit breaker, it can be used as emergency-stop device to IEC/EN 60204.

**Note**

① Orders must be placed in multiples of package quantity listed.

## IP65 Rotary Handle Mechanism ①②③

| Description                                                       | Enclosure Rating     | Pkg. Qty. ④ | Catalog Number      |
|-------------------------------------------------------------------|----------------------|-------------|---------------------|
| <b>Complete Kits—Includes Handle, Shaft and Required Hardware</b> |                      |             |                     |
| Rotary handle mechanism—black ⑤                                   | IP65                 | 1           | <b>XTPEXRHMB</b>    |
| Rotary handle mechanism—red/yellow ⑥                              | NEMA 12<br>UL/CSA 4X | 1           | <b>XTPEXRHMRY</b>   |
| Rotary handle mechanism—black—rotated 90° from vertical ⑤         |                      | 1           | <b>XTPEXRHM90B</b>  |
| Rotary handle mechanism—red/yellow—rotated 90° from vertical ⑥    |                      | 1           | <b>XTPEXRHM90RY</b> |



## Three-Phase Commoning Links ⑦

| For Use with...                                                                                                                         | Qty. MMP | Length of Link (mm) | Unit Width (mm) | Pkg. Qty. ④ | Catalog Number    |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------|-----------------|-------------|-------------------|
| MMP with no side-mounted auxiliaries or voltage releases                                                                                | 2        | 90                  | 45              | 10          | <b>XTPAXCLKA2</b> |
|                                                                                                                                         | 3        | 135                 | 45              | 10          | <b>XTPAXCLKA3</b> |
|                                                                                                                                         | 4        | 180                 | 45              | 10          | <b>XTPAXCLKA4</b> |
|                                                                                                                                         | 5        | 225                 | 45              | 10          | <b>XTPAXCLKA5</b> |
| Each MMP with one auxiliary contact or trip-indicating auxiliary contact fitted on the right                                            | 2        | 99                  | 45 + 9          | 10          | <b>XTPAXCLKB2</b> |
|                                                                                                                                         | 3        | 153                 | 45 + 9          | 10          | <b>XTPAXCLKB3</b> |
|                                                                                                                                         | 4        | 207                 | 45 + 9          | 10          | <b>XTPAXCLKB4</b> |
|                                                                                                                                         | 5        | 261                 | 45 + 9          | 10          | <b>XTPAXCLKB5</b> |
| Each MMP with an auxiliary contact and trip-indicating auxiliary contact mounted on the right or a voltage release mounted on the left. | 2        | 108                 | 45 + 18         | 10          | <b>XTPAXCLKC2</b> |

For parallel power feed to several manual motor protectors on terminals 1, 3 and 5.

## XTPAXUTS



## Shroud for Unused Terminals of Three-Phase Commoning Links

| For Use with... | Description                                                                                | Pkg. Qty. ④ | Catalog Number  |
|-----------------|--------------------------------------------------------------------------------------------|-------------|-----------------|
| Frame B<br>XTPE | To cover unused terminals on three-phase commoning link. Protected against direct contact. | 20          | <b>XTPAXUTS</b> |

## XTPAXIT



## Incoming Terminals for Three-Phase Commoning Link ⑧

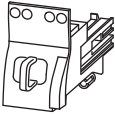
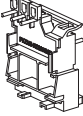
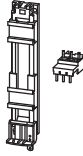
| For Use with... | Pkg. Qty. ④ | Catalog Number |
|-----------------|-------------|----------------|
| Frame B XTPE    | 5           | <b>XTPAXIT</b> |

## Notes

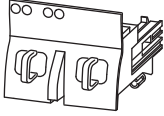
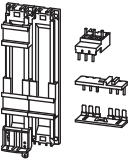
- ① Plug-in connection shafts, XTPAXRHMSFT\_ can be cut to desired length for mounting depths of 100–240 mm. Carrier with extension shaft included.
- ② With ON/OFF switch position and “+” (tripped), lockable with 3 padlocks, 4–8 mm hasp. Can be locked in the OFF position, if required.
- ③ Rotary handle mechanisms ship with door interlock disabled. See instruction publication with product for how to enable door interlock.
- ④ Orders must be placed in multiples of package quantity listed.
- ⑤ For use on main switches to IEC/EN 60204.
- ⑥ For use on main switches with emergency-stop function to IEC/EN 60204.
- ⑦ Protected against accidental contact. Frame B short-circuit proof  $U_e = 690V$ ,  $I_u = 63A$ . Frame B links can be combined by rotating mounting.
- ⑧ For three-phase commoning link, protected against accidental contact,  $U_e = 690V$ ,  $I_u = 63A$ ;  
For conductor cross-sections: 2.5–25 mm<sup>2</sup> stranded; 2.5–16 mm<sup>2</sup> flexible with ferrules, AWG 14-6.

## Combination Connection Kits

## Non-Reversing Starters

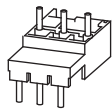
|                                                                                                       | For Use with...     | Description/Comprised of ...                                                                                                                                                              | Std. Pack <sup>①</sup> | Catalog Number   |
|-------------------------------------------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|
| <b>XTPAXTPCB</b><br> | XTPR...B + XTCE...B | Mechanical connection element for XTPR...B and contactor                                                                                                                                  | 1                      | <b>XTPAXTPCB</b> |
|                                                                                                       |                     | Main current wiring between XTPR...B and contactor in toolless plug connection                                                                                                            | 1                      |                  |
|                                                                                                       |                     | Use contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. six cables up to 2.5 mm <sup>2</sup> external diameter or four cables up to 3.5 mm <sup>2</sup> external diameter. |                        |                  |
| <b>XTPAXEMC</b><br>  | XTPR...B + XTCE...B | Mechanical and electrical connection for XTPR...B and contactor                                                                                                                           | 5                      | <b>XTPAXEMCB</b> |
|                                                                                                       | XTPR...B + XTCE...C |                                                                                                                                                                                           | 5                      | <b>XTPAXEMCC</b> |
| <b>XTPAXTPCD</b><br> | XTPR...D + XTCE...D | DIN rail adapter plate<br>Main current wiring between XTPR and contactor                                                                                                                  | 1                      | <b>XTPAXTPCD</b> |

## Reversing Starters

|                                                                                                          | For Use with...        | Description/Comprised of ...                                                                                                                                                              | Std. Pack <sup>①</sup> | Catalog Number    |
|----------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------|
| <b>XTPAXTPCRB</b><br> | XTPR...B + XTCE...B01_ | Mechanical connection element for XTPR...B and contactor                                                                                                                                  | 1                      | <b>XTPAXTPCRB</b> |
|                                                                                                          |                        | Reversing starter main current wiring in toolless plug connection                                                                                                                         | 1                      |                   |
|                                                                                                          |                        | Control cables for electrical interlocking in toolless plug connection:                                                                                                                   | 1                      |                   |
|                                                                                                          |                        | – K1M: A1–K2M: Z1<br>– K1M: Z1–K2M: A1<br>– K1M: A2–K2M: A2                                                                                                                               |                        |                   |
|                                                                                                          |                        | Cable guidance                                                                                                                                                                            | 1                      |                   |
| <b>XTPAXTPCRC</b><br> | XTPR...B + XTCE...C    | Use contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. six cables up to 2.5 mm <sup>2</sup> external diameter or four cables up to 3.5 mm <sup>2</sup> external diameter. |                        |                   |
|                                                                                                          |                        | DIN rail adapter plate<br>Reversing starter main current wiring                                                                                                                           | 1<br>1                 | <b>XTPAXTPCRC</b> |

## Note

<sup>①</sup> Orders must be placed in multiples of package quantity listed.

**XTPAXECM\_****Electrical Connection Module**

| For Use with...     | Description/Comprised of ...                       | Std. Pack <sup>①</sup> | Catalog Number   |
|---------------------|----------------------------------------------------|------------------------|------------------|
| XTPE...B + XTCE...C | Main current wiring between XTPR...B and contactor | 5                      | <b>XTPAXECMC</b> |

**DIN Rail Adapter Plates****XTPAXTPCPB**

| For Use with... | Description/Comprised of ...                                      | Std. Pack <sup>①</sup> | Catalog Number    |
|-----------------|-------------------------------------------------------------------|------------------------|-------------------|
| XTPAXTPCB       | 45 mm wide adapter plate with one DIN rail                        | 4                      | <b>XTPAXTPCPB</b> |
| XTPAXTPCRB      | Connection element for side-by-side positioning of further plates |                        |                   |

**PKE-SWD-32**

|                             |                                 |   |                   |
|-----------------------------|---------------------------------|---|-------------------|
| XTPE...B +<br>XTCE...B or C | SmartWire-DT communication link | 1 | <b>PKE-SWD-32</b> |
|-----------------------------|---------------------------------|---|-------------------|

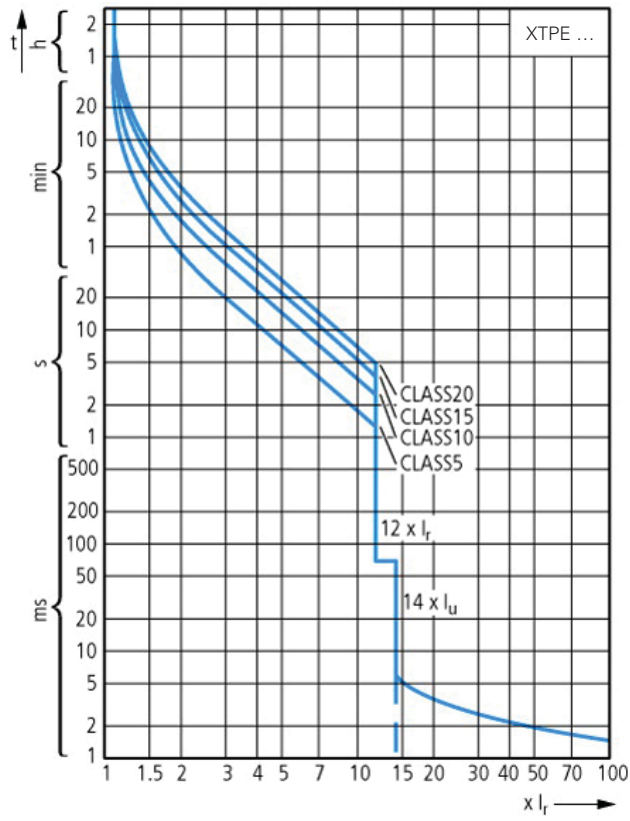
**Note**

<sup>①</sup> Orders must be placed in multiples of package quantity listed.

## Technical Data and Specifications

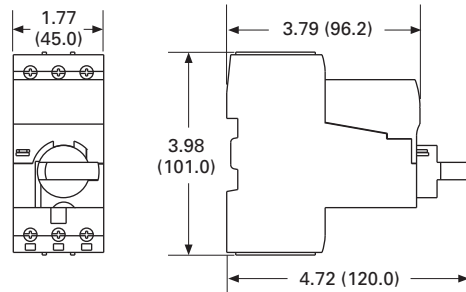
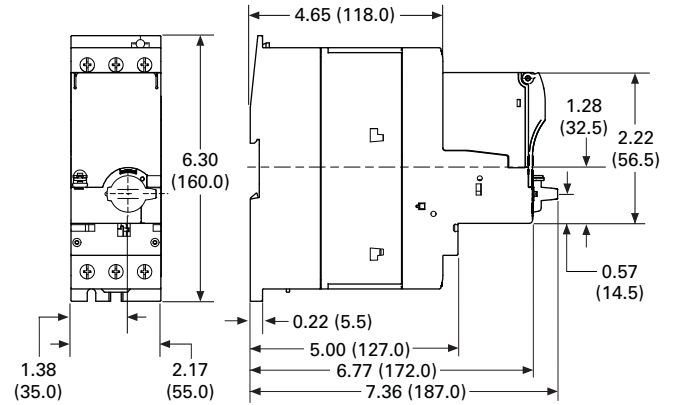
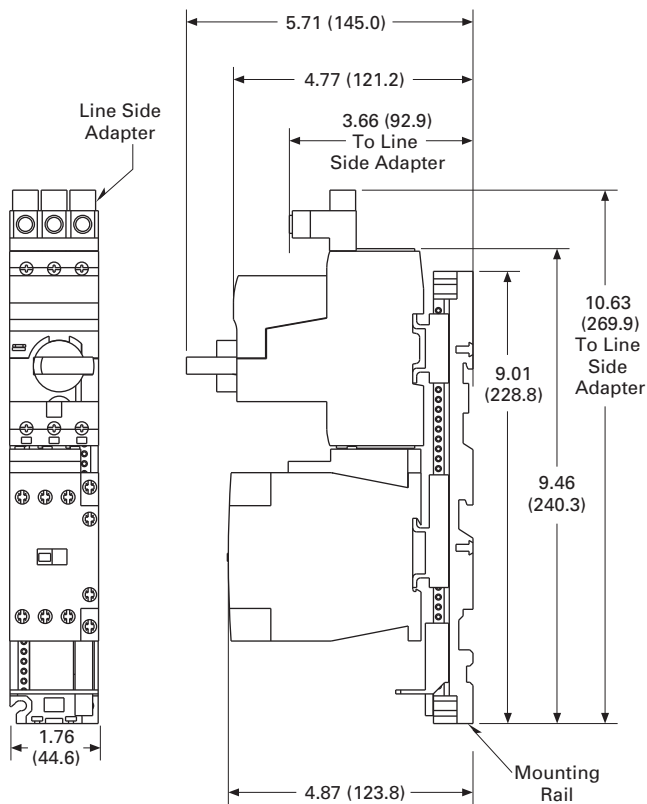
## XT Electronic Manual Motor Controllers

| Description                                                                | Specification                      | XTPE012B                                                    | XTPE032B                                                    | XTPE065D                                                    |
|----------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| <b>General</b>                                                             |                                    |                                                             |                                                             |                                                             |
| Standards and regulations                                                  |                                    | IEC/EN 60947-4-1, VDE 0600, UL 508, CSA C 22.2 No. 14       |                                                             |                                                             |
| Climatic proofing                                                          |                                    | Damp heat, constant, to IEC 60068-2-78                      |                                                             |                                                             |
|                                                                            |                                    | Damp heat, cyclic, to IEC 60068-2-30                        |                                                             |                                                             |
| Ambient temperature                                                        |                                    |                                                             |                                                             |                                                             |
| Storage                                                                    |                                    | –40° to 80°C                                                | –40° to 80°C                                                | –40° to 80°C                                                |
| Open                                                                       |                                    | –25° to 55°C                                                | –25° to 55°C                                                | –25° to 55°C                                                |
| Enclosed                                                                   |                                    | –25° to 40°C                                                | –25° to 40°C                                                | –25° to 40°C                                                |
| Direction of incoming supply                                               |                                    | Any                                                         | Any                                                         | Any                                                         |
| Degree of protection                                                       | Device                             | IP20                                                        | IP20                                                        | IP20                                                        |
|                                                                            | Terminals                          | IP00                                                        | IP00                                                        | IP00                                                        |
| Touch protection                                                           |                                    |                                                             |                                                             |                                                             |
| Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27 |                                    | 25g                                                         | 25g                                                         | 25g                                                         |
| Altitude                                                                   |                                    | Max. 2000m                                                  | Max. 2000m                                                  | Max. 2000m                                                  |
| <b>Conductor Cross-Sections</b>                                            |                                    |                                                             |                                                             |                                                             |
| Screw terminals                                                            | Solid                              | 1 x (1–6) mm <sup>2</sup>                                   | 1 x (1–6) mm <sup>2</sup>                                   | 1 x (0.75–16) mm <sup>2</sup>                               |
|                                                                            |                                    | 2 x (1–6) mm <sup>2</sup>                                   | 2 x (1–6) mm <sup>2</sup>                                   | 2 x (0.75–16) mm <sup>2</sup>                               |
|                                                                            | Stranded with ferrule to DIN 46228 | 1 x (1–6) mm <sup>2</sup>                                   | 1 x (1–6) mm <sup>2</sup>                                   | 1 x (0.75–35) mm <sup>2</sup>                               |
|                                                                            |                                    | 2 x (1–6) mm <sup>2</sup>                                   | 2 x (1–6) mm <sup>2</sup>                                   | 2 x (0.75–25) mm <sup>2</sup>                               |
|                                                                            | Solid or stranded                  | 18–10 AWG                                                   | 18–10 AWG                                                   | 14–2 AWG                                                    |
| <b>Screw Terminal Tightening Torque</b>                                    |                                    |                                                             |                                                             |                                                             |
| Main conductor                                                             |                                    | 1.7 Nm                                                      | 1.7 Nm                                                      | 3.3 Nm                                                      |
| Auxiliary conductor                                                        |                                    | 1 Nm                                                        | 1 Nm                                                        | 1 Nm                                                        |
| <b>Main Circuit</b>                                                        |                                    |                                                             |                                                             |                                                             |
| Rated impulse withstand voltage                                            | U <sub>mp</sub>                    | 6,000 Vac                                                   | 6,000 Vac                                                   | 6,000 Vac                                                   |
| Overvoltage category/pollution degree                                      |                                    | III/3                                                       | III/3                                                       | III/3                                                       |
| Rated operational voltage                                                  | U <sub>e</sub>                     | 690V                                                        | 690V                                                        | 690V                                                        |
| Rated uninterrupted current = rated output current                         | I <sub>u</sub> = I <sub>e</sub>    | 12A                                                         | 32A                                                         | 65A                                                         |
| Rated frequency                                                            |                                    | 40–60 Hz                                                    | 40–60 Hz                                                    | 40–60 Hz                                                    |
| Current heating losses (three-pole at operating temperature)               |                                    | 6W                                                          | 6W                                                          | 6W                                                          |
| Lifespan, mechanical                                                       | Operations                         | 0.05 x 10 <sup>6</sup>                                      | 0.05 x 10 <sup>6</sup>                                      | 0.05 x 10 <sup>6</sup>                                      |
| Lifespan, electrical (AC-3 at 400V)                                        | Operations                         | 0.05 x 10 <sup>6</sup>                                      | 0.05 x 10 <sup>6</sup>                                      | 0.05 x 10 <sup>6</sup>                                      |
| Maximum operating frequency                                                | Operations/h                       | 60                                                          | 60                                                          | 60                                                          |
| <b>Short-Circuit Rating</b>                                                |                                    |                                                             |                                                             |                                                             |
| Motor switching capacity AC                                                | AC-3 up to 690V                    | 12A                                                         | 32A                                                         | 65A                                                         |
| <b>Trip Unit</b>                                                           |                                    |                                                             |                                                             |                                                             |
| Temperature compensation to IEC/EN 60947, VDE 0660                         |                                    | –5° to 40°C                                                 | –5° to 40°C                                                 | –5° to 40°C                                                 |
| Operating range                                                            |                                    | –25° to 55°C                                                | –25° to 55°C                                                | –25° to 55°C                                                |
| Temperature compensation residual error for T > 40°C                       |                                    | ≤0.1%/K                                                     | ≤0.1%/K                                                     | ≤0.1%/K                                                     |
| Overload release setting range                                             |                                    | 0.25–1 x I <sub>u</sub>                                     | 0.25–1 x I <sub>u</sub>                                     | 0.25–1 x I <sub>u</sub>                                     |
| Fixed short-circuit trip setting                                           |                                    | 12 x I <sub>f</sub> (trip unit), 14 x I <sub>u</sub> (base) | 12 x I <sub>f</sub> (trip unit), 14 x I <sub>u</sub> (base) | 12 x I <sub>f</sub> (trip unit), 14 x I <sub>u</sub> (base) |
| Short circuit release tolerance                                            |                                    | ±20%                                                        | ±20%                                                        | ±20%                                                        |
| Phase failure sensitivity                                                  |                                    | Yes                                                         | Yes                                                         | Yes                                                         |

**Trip Characteristics****XT Electronic Manual Motor Controllers**

**Dimensions**

Approximate Dimensions in Inches (mm)

**XT Electronic MMP—B Frame****XT Electronic MMP—D Frame****XT Electronic CMC With C Frame Contactor**



## EMS—Electronic Motor Starter



## EMS—Electronic Motor Starter

## Product Description

The electronic motor starter (EMS) is the latest technology in safe and efficient motor starting from Eaton's Electrical Sector. The EMS is a full starter with built-in solid-state contacts and integral overload protection. Its compact size and high-electrical life make it an ideal replacement for the traditional contactor/overload relay starter configuration.

## Applications

A versatile solution, the EMS also supports the following installation applications:

- Logistics
- Conveyor control
- Production machines
- Tooling machines
- Packaging machines
- Small elevators

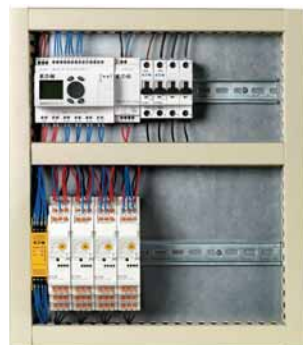
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## Description

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| Thermal Overload Relays              | V5-T1-130 |
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| Manual Motor Protectors              | V5-T1-159 |
| Combination Motor Controllers        | V5-T1-193 |
| XT Electronic Manual Motor Protector |           |
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Panel with four traditional starters installed:  
FVNR, FVR, FVNR with E-stop and FVR with E-stop



Identical panel with four EMS starters installed, producing the same functionality

## Features and Benefits

## Multifunctional

The EMS comes with an optional reversing start feature, eliminating the need for an additional contactor. The optional E-stop functionality eliminates the need for a separate E-stop contactor.

## Extended Life

High-electrical life provides up to 30 million operations. The EMS is ideal for customer applications requiring multiple motor start/stops per hour.

## Easy Installation

The EMS comes equipped with push-in terminals for quick and easy wiring of power and control circuits. Push-in terminals provide 60% time savings over screw-in terminals and better contact against vibrations.

## Standards and Certifications

## Safety Rated

Functional safety is growing in importance for the machinery OEM. The EMS is rated at SIL3 per IEC 62061 and PLe per ISO® 13849, meeting the most stringent of safety requirements.

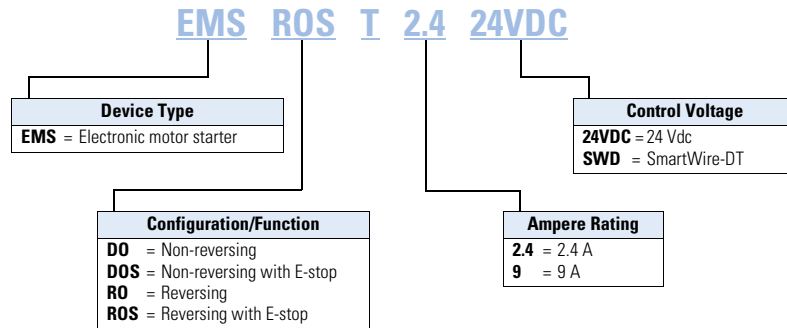
The EMS carries IEC and UL short-circuit ratings, with 100 kAIC UL short-circuit rating when mated with 30 A Class J fuse.

- UL



## Catalog Number Selection

## EMS—Electronic Motor Starter



## Product Selection

EMS\_



## EMS—Electronic Motor Starters

| Function                   | Current Range<br>AC-51a (A) | Current Range<br>AC-53a (A) | Motor Rating AC-53a<br>380 V, 400 V, 415 V (kW) | Catalog Number      |
|----------------------------|-----------------------------|-----------------------------|-------------------------------------------------|---------------------|
| Non-reversing              | 0.18–2.4                    | 0.18–2.4                    | 0.06–0.75                                       | EMS-DO-T-2.4-24VDC  |
| Reversing                  | 0.18–2.4                    | 0.18–2.4                    | 0.06–0.75                                       | EMS-RO-T-2.4-24VDC  |
| Non-reversing, with E-stop | 0.18–2.4                    | 0.18–2.4                    | 0.06–0.75                                       | EMS-DOS-T-2.4-24VDC |
| Reversing, with E-stop     | 0.18–2.4                    | 0.18–2.4                    | 0.06–0.75                                       | EMS-ROS-T-2.4-24VDC |
| Non-reversing              | 1.5–9                       | 1.5–6.5                     | 0.55–3.0                                        | EMS-DO-T-9-24VDC    |
| Reversing                  | 1.5–9                       | 1.5–6.5                     | 0.55–3.0                                        | EMS-RO-T-9-24VDC    |
| Non-reversing, with E-stop | 1.5–9                       | 1.5–6.5                     | 0.55–3.0                                        | EMS-DOS-T-9-24VDC   |
| Reversing, with E-stop     | 1.5–9                       | 1.5–6.5                     | 0.55–3.0                                        | EMS-ROS-T-9-24VDC   |

EMS-DOS-...,  
EMS-ROS-...

## EMS with SmartWire-DT

Electronic Motor Starters with SmartWire-DT built in do not require a separate module for connection to the SmartWire-DT network. Connection is made directly to the SmartWire-DT flat cable.

| Description                                                                                                                                                              | Max. Equivalent hp Rating for Three-Phase Motors, 60 Hz |        |            |            | Setting Range of Overload Releases<br>$I_r$<br>A | DC Operation<br>24 Vdc<br>Catalog Number |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------|------------|------------|--------------------------------------------------|------------------------------------------|
|                                                                                                                                                                          | 208 V                                                   | 480 V  | AC1        | AC3        |                                                  |                                          |
| DOL starting,<br>Motor protection,<br>For connecting to SmartWire-DT.<br>Circuit design: Safety output stage with bypass,<br>three-phase disconnect.                     | —<br>2                                                  | 1<br>5 | 2.4<br>9.0 | 2.4<br>7.6 | 0.18–2.4<br>1.5–9<br>7 (AC–53a)                  | EMS-DO-T-2.4-SWD<br>EMS-DO-T-9-SWD       |
| DOL starting,<br>Motor protection,<br>Emergency-stop actuator.<br>Circuit design: Safety output stage with bypass,<br>three-phase disconnect.                            | —<br>2                                                  | 1<br>5 | 2.4<br>9.0 | 2.4<br>7.6 | 0.18–2.4<br>1.5–9<br>7 (AC–53a)                  | EMS-DOS-T-2.4-SWD ①<br>EMS-DOS-T-9-SWD ① |
| DOL starting,<br>Reversing start,<br>Motor protection,<br>For connecting to SmartWire-DT.<br>Circuit design: Safety output stage with bypass,<br>three-phase disconnect. | —<br>2                                                  | 1<br>5 | 2.4<br>9.0 | 2.4<br>7.6 | 0.18–2.4<br>1.5–9<br>7 (AC–53a)                  | EMS-RO-T-2.4-SWD<br>EMS-RO-T-9-SWD       |
| DOL starting,<br>Reversing start,<br>Motor protection,<br>Emergency-stop actuator.<br>Circuit design: Safety output stage with bypass,<br>three-phase disconnect.        | —<br>2                                                  | 1<br>5 | 2.4<br>9.0 | 2.4<br>7.6 | 0.18–2.4<br>1.5–9<br>7 (AC–53a)                  | EMS-ROS-T-2.4-SWD ①<br>EMS-ROS-T-9-SWD ① |

**Note**

① EMS-DOS and EMS-ROS starters with emergency stop function have an additional terminal that needs to be connected to 0 V / 24 Vdc to provide an enable signal. (This is in addition to the SmartWire-DT signal.) Actuation of an E-stop will interrupt the 0 V / 24 Vdc connection and also override the SmartWire-DT signal.

## XT DC Contactors



## XT DC Contactors

## Product Description

The **XT** DC contactors for the current range 300 A to 600 A can be used in a variety of applications. The proven hybrid technology ensures a long life span of the devices. Compared to similar DC contactors, Eaton contactors are characterized by much higher electrical switching cycles. This makes the **XT** DC contactors a maintenance-free and reliable part of any machine or system.

## Application Description

Best suited for a breadth of DC non-motor applications that require frequent switching or switching under load:

- Solar energy
- Energy storage
- Railway transportation
- Automotive infrastructure
- Marine and offshore DC
- DC-grids
- Testing equipment

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| <b>XT</b> Electronic Manual Motor Protector |           |
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| EMS—Electronic Motor Starter                | V5-T1-232 |
| <b>XT</b> DC Contactors                     | V5-T1-234 |
| Reference Data                              | V5-T1-236 |

## Features and Benefits

## Maintenance Free

The **XT** DC contactors hybrid switching technology allows for nearly arc-free switching under load and an electrical life of 150,000 operations—the best in the industry by 6x. This feature greatly reduces maintenance cost while extending the life of the device.

## Reliable and Flexible

The contactors feature wide coil range and also direct PLC control, making them suitable for most systems. A wide temperature range of –40 °C to +70 °C allows them to handle any environment and their low coil consumption and switching energy means less heat output than standard DC contactors.

## Space Savings

The contactors are true two-pole units—they are compact, take up less space and do not require series wiring. They also allow bi-directional switching, meaning they are polarity independent.

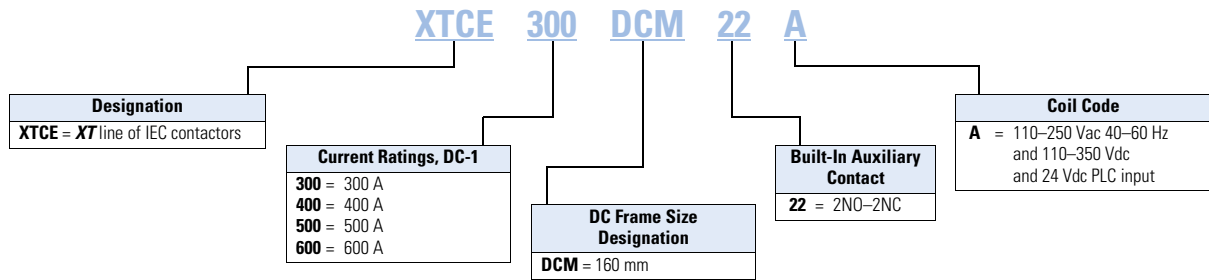
## Standards and Certifications

- CE approved
- UL Listed
- IEC/EN 60947-4-1, 60947-5-1
- CSA File 70044143



## Catalog Number Selection

## XT DC Contactors



## Product Selection

## Frame M DC



## Two-Pole Contactors, Frame M—UL/CSA Ratings

| Thermal Current ( $I_{th}$ )<br>Ampere Rating | Voltage | Article<br>Number | Auxiliary<br>Contacts | Catalog Number <sup>①</sup> |
|-----------------------------------------------|---------|-------------------|-----------------------|-----------------------------|
| 300                                           | 1000    | 183314            | 2NO-2NC               | XTCE300DCM22A               |
| 400                                           | 1000    | 186872            | 2NO-2NC               | XTCE400DCM22A               |
| 500                                           | 1000    | 186873            | 2NO-2NC               | XTCE500DCM22A               |
| 600                                           | 1000    | 183315            | 2NO-2NC               | XTCE600DCM22A               |

**Note**

<sup>①</sup> Does not include lugs.

**Reference Data**

|                                                                     |                  |
|---------------------------------------------------------------------|------------------|
| Type 2 Coordination . . . . .                                       | <b>V5-T1-237</b> |
| Approvals for World Markets . . . . .                               | <b>V5-T1-246</b> |
| IEC Utilization Categories . . . . .                                | <b>V5-T1-249</b> |
| Motor Ratings Data . . . . .                                        | <b>V5-T1-252</b> |
| Ampacities of Insulated Conductors<br>(Based on 2005 NEC) . . . . . | <b>V5-T1-256</b> |

**Type 1 and Type 2 Coordination****What is it?**

The International Electrotechnical Commission (IEC) developed short-circuit performance criteria for contactors and starters called Type 1 coordination and Type 2 coordination. This defines motor controller protection levels following a short-circuit fault. In order to achieve this performance, the combination of a motor controller (contactor or starter) and short-circuit protective device (manual motor protector, circuit breaker or fuse) must meet the following criteria as specified by IEC 60947-4-1—Low voltage switchgear and controlgear—Part 4-1: Contactors and motor-starters—Electromechanical contactors and motor-starters:

**Type 1 Coordination**

Type 1 Coordination requires that under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and may not be suitable for further service without repair and replacement of parts.

In this case, *significant damage is allowed* to the contactor/starter (for example, contact welding, burning or disintegration) and the overload relay (for example, component harm or heater element burn-out).

**Type 2 Coordination**

Type 2 Coordination requires that under short-circuit conditions, the contactor or starter shall cause no danger to persons or installation and shall be suitable for further use. The risk of contact welding is recognized, in which case the manufacturer shall indicate the measures to be taken as regards to the maintenance of the equipment.

## Type 2 Coordination

## 400, xx415V Type 2 Coordination—MMC

| P<br>(kW) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | MMP<br>Catalog Number | Contactor<br>Catalog Number ② | MMC<br>Catalog Number ② |
|-----------|-----------------------|------------------------|-----------------------|-------------------------------|-------------------------|
| 0.06      | 0.21                  | 50 (150) ①             | XTPRP25BC1            | XTCE007B10_                   | XTSCP25BB_              |
| 0.09      | 0.31                  | 50 (150) ①             | XTPRP40BC1            | XTCE007B10_                   | XTSCP40BB_              |
| 0.12      | 0.41                  | 50 (150) ①             | XTPRP63BC1            | XTCE007B10_                   | XTSCP63BB_              |
| 0.18      | 0.60                  | 50 (150) ①             | XTPRP63BC1            | XTCE007B10_                   | XTSCP63BB_              |
| 0.25      | 0.80                  | 50 (150) ①             | XTPR01BC1             | XTCE007B10_                   | XTSC001BB_              |
| 0.37      | 1.10                  | 50 (150) ①             | XTPR1P6BC1            | XTCE007B10_                   | XTSC1P6BB_              |
| 0.55      | 1.50                  | 50 (150) ①             | XTPR1P6BC1            | XTCE007B10_                   | XTSC1P6BB_              |
| 0.75      | 1.90                  | 50 (150) ①             | XTPR2P5BC1            | XTCE007B10_                   | XTSC2P5BB_              |
| 1.10      | 2.60                  | 50 (150) ①             | XTPR004BC1            | XTCE007B10_                   | XTSC004BB_              |
| 1.50      | 3.60                  | 50 (150) ①             | XTPR004BC1            | XTCE007B10_                   | XTSC004BB_              |
| 2.20      | 5.00                  | 50 (150) ①             | XTPR6P3BC1            | XTCE007B10_                   | XTSC6P3BB_              |
| 3.00      | 6.60                  | 50 (150) ①             | XTPR010BC1            | XTCE018C10_                   | XTSC010BC_              |
| 4.00      | 8.50                  | 50 (150) ①             | XTPR010BC1            | XTCE018C10_                   | XTSC010BC_              |
| 5.50      | 11.3                  | 50                     | XTPR012BC1            | XTCE018C10_                   | XTSC012BC_              |
| 7.50      | 16.0                  | 50                     | XTPR016BC1            | XTCE018C10_                   | XTSC016BC_              |
| 11.0      | 21.7                  | 50                     | XTPR025BC1            | XTCE025C10_                   | XTSC025BC_              |
| 15.0      | 29.3                  | 50                     | XTPR032BC1            | XTCE032C10_                   | XTSC032BC_              |
| 5.50      | 11.3                  | 50                     | XTPR016DC1            | XTCE018C10_                   | XTSC016DC_              |
| 7.50      | 16.0                  | 50                     | XTPR016DC1            | XTCE018C10_                   | XTSC016DC_              |
| 11.0      | 21.7                  | 50                     | XTPR025DC1            | XTCE025C10_                   | XTSC025DC_              |
| 15.0      | 29.3                  | 50                     | XTPR032DC1            | XTCE032C10_                   | XTSC032DC_              |
| 18.5      | 36.0                  | 50                     | XTPR040DC1            | XTCE040D00_                   | XTSC040DD_              |
| 22.0      | 41.0                  | 50                     | XTPR050DC1            | XTCE050D00_                   | XTSC050DD_              |
| 30.0      | 55.0                  | 50                     | XTPR058DC1            | XTCE065D00_                   | XTSC058DD_              |
| 34.0      | 63.0                  | 50                     | XTPR063DC1            | XTCE065D00_                   | XTSC063DD_              |

**Notes**

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

① Values in parentheses ( ) are for Type 1 Coordination.

② Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-245**.

## 480V Type 2 Coordination—MMC

| P<br>(hp) | I <sub>e</sub><br>(A) | I <sub>g</sub><br>(kA) | MMP<br>Catalog Number | Current Limiter<br>Catalog Number | Contactor<br>Catalog Number ② | MMC<br>Catalog Number ② |
|-----------|-----------------------|------------------------|-----------------------|-----------------------------------|-------------------------------|-------------------------|
| 1/2       | 0.24                  | 65                     | XTPRP25BC1            | —                                 | XTCE007B10_                   | XTSCP25BB_              |
| 1/2       | 0.32                  | 65                     | XTPRP40BC1            | —                                 | XTCE007B10_                   | XTSCP40BB_              |
| 1/2       | 0.51                  | 65                     | XTPRP63BC1            | —                                 | XTCE007B10_                   | XTSCP63BB_              |
| 1/2       | 0.74                  | 65                     | XTPR001BC1            | —                                 | XTCE007B10_                   | XTSC001BB_              |
| 1/2       | 0.94                  | 65                     | XTPR001BC1            | —                                 | XTCE007B10_                   | XTSC001BB_              |
| 3/4       | 1.32                  | 65                     | XTPR1P6BC1            | —                                 | XTCE007B10_                   | XTSC1P6BB_              |
| 1         | 1.72                  | 65                     | XTPR2P5BC1            | —                                 | XTCE018C10_                   | XTSC2P5BC_              |
| 2         | 2.55                  | 65                     | XTPR004BC1            | —                                 | XTCE018C10_                   | XTSC004BC_              |
| 2         | 3.10                  | 65                     | XTPR004BC1            | —                                 | XTCE018C10_                   | XTSC004BC_              |
| 3         | 4.55                  | 65 (50) ①              | XTPR6P3BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC6P3BC_              |
| 3         | 6.15                  | 65 (50) ①              | XTPR6P3BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC6P3BC_              |
| 7-1/2     | 8.40                  | 65 (50) ①              | XTPR010BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC010BC_              |
| 7-1/2     | 11.0                  | 65 (50) ①              | XTPR012BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC012BC_              |
| 10        | 14.5                  | 65 (50) ①              | XTPR016BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC016BC_              |
| 10        | 20.0                  | 65 (50) ①              | XTPR020BC1            | XTPAXCL                           | XTCE025C10_                   | XTSC020BC_              |
| 20        | 20.0                  | 65                     | XTPR025DC1            | —                                 | XTCE040D00_                   | XTSC025DD_              |
| 25        | 27.0                  | 65                     | XTPR032DC1            | —                                 | XTCE040D00_                   | XTSC032DD_              |
| 25        | 32.0                  | 65                     | XTPR032DC1            | —                                 | XTCE040D00_                   | XTSC032DD_              |
| 30        | 37.5                  | 65                     | XTPR040DC1            | —                                 | XTCE040D00_                   | XTSC040DD_              |
| 40        | 40.5                  | 65                     | XTPR050DC1            | —                                 | XTCE050D00_                   | XTSC050DD_              |
| 40        | 50.5                  | 65                     | XTPR058DC1            | —                                 | XTCE065D00_                   | XTSC058DD_              |
| 40        | 64.0                  | 65                     | XTPR063DC1            | —                                 | XTCE065D00_                   | XTSC063DD_              |

## 600V Type 2 Coordination—MMC

| P<br>(hp) | I <sub>e</sub><br>(A) | I <sub>g</sub><br>(kA) | MMP<br>Catalog Number | Current Limiter<br>Catalog Number | Contactor<br>Catalog Number ② | MMC<br>Catalog Number ② |
|-----------|-----------------------|------------------------|-----------------------|-----------------------------------|-------------------------------|-------------------------|
| 1/2       | 0.19                  | 50                     | XTPRP25BC1            | —                                 | XTCE007B10_                   | XTSCP25BB_              |
| 1/2       | 0.26                  | 50                     | XTPRP40BC1            | —                                 | XTCE007B10_                   | XTSCP40BB_              |
| 1/2       | 0.41                  | 50                     | XTPRP63BC1            | —                                 | XTCE007B10_                   | XTSCP63BB_              |
| 1/2       | 0.59                  | 50                     | XTPRP63BC1            | —                                 | XTCE007B10_                   | XTSCP63BB_              |
| 1/2       | 0.75                  | 50                     | XTPR001BC1            | —                                 | XTCE007B10_                   | XTSC001BB_              |
| 1         | 1.06                  | 50                     | XTPR1P6BC1            | —                                 | XTCE007B10_                   | XTSC1P6BB_              |
| 1         | 1.38                  | 50                     | XTPR1P6BC1            | —                                 | XTCE007B10_                   | XTSC1P6BB_              |
| 1-1/2     | 2.04                  | 50                     | XTPR2P5BC1            | —                                 | XTCE018C10_                   | XTSC2P5BC_              |
| 1-1/2     | 2.48                  | 50                     | XTPR2P5BC1            | —                                 | XTCE018C10_                   | XTSC2P5BC_              |
| 3         | 3.64                  | 50                     | XTPR004BC1            | —                                 | XTCE018C10_                   | XTSC004BC_              |
| 5         | 4.92                  | 50 (18) ①              | XTPR6P3BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC6P3BC_              |
| 10        | 6.72                  | 50 (18) ①              | XTPR010BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC010BC_              |
| 10        | 8.60                  | 50 (18) ①              | XTPR010BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC010BC_              |
| 10        | 11.5                  | 50 (18) ①              | XTPR012BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC012BC_              |
| 10        | 16.0                  | 50 (18) ①              | XTPR016BC1            | XTPAXCL                           | XTCE018C10_                   | XTSC016BC_              |
| 25        | 21.5                  | 50                     | XTPR025DC1            | —                                 | XTCE040D00_                   | XTSC025DD_              |
| 30        | 25.5                  | 50                     | XTPR032DC1            | —                                 | XTCE040D00_                   | XTSC032DD_              |
| 30        | 30.0                  | 50                     | XTPR032DC1            | —                                 | XTCE040D00_                   | XTSC032DD_              |
| 30        | 37.5                  | 50                     | XTPR040DC1            | —                                 | XTCE040D00_                   | XTSC050DD_              |
| 40        | 40.5                  | 50                     | XTPR050DC1            | —                                 | XTCE050D00_                   | XTSC050DD_              |
| 40        | 51.0                  | 42                     | XTPR058DC1            | —                                 | XTCE065D00_                   | XTSC058DD_              |
| 50        | 61.0                  | 42                     | XTPR063DC1            | —                                 | XTCE065D00_                   | XTSC063DD_              |

## Notes

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

① Values in parentheses ( ) are achieved without the current limiter.

② Underscore ( \_ ) indicates magnet coil suffix required. See **Page V5-T1-245**.

## 400, 415V Type 2 Coordination—Contactor and Overload Relay (Motor Starter) with Fused Disconnect

| P<br>(kW) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | Fuses<br>Class gG/gL | Contactor<br>Catalog Number ① | Overload Relay<br>Catalog Number | Assembled Starter<br>Catalog Number ① |
|-----------|-----------------------|------------------------|----------------------|-------------------------------|----------------------------------|---------------------------------------|
| 0.12      | 0.41                  | 100                    | 2                    | XTCE007B10_                   | XTOBP60BC1                       | XTAE007B10_P60                        |
| 0.18      | 0.60                  | 100                    | 2                    | XTCE007B10_                   | XTOB001BC1                       | XTAE007B10_001                        |
| 0.25      | 0.80                  | 100                    | 4                    | XTCE007B10_                   | XTOB001BC1                       | XTAE007B10_001                        |
| 0.37      | 1.10                  | 100                    | 4                    | XTCE007B10_                   | XTOB1P6BC1                       | XTAE007B10_1P6                        |
| 0.55      | 1.50                  | 100                    | 4                    | XTCE007B10_                   | XTOB1P6BC1                       | XTAE007B10_1P6                        |
| 0.75      | 1.90                  | 100                    | 6                    | XTCE007B10_                   | XTOB2P4BC1                       | XTAE007B10_2P4                        |
| 1.10      | 2.60                  | 100                    | 6                    | XTCE007B10_                   | XTOB004BC1                       | XTAE007B10_004                        |
| 1.50      | 3.60                  | 100                    | 6                    | XTCE007B10_                   | XTOB004BC1                       | XTAE007B10_004                        |
| 2.20      | 5.00                  | 100                    | 10                   | XTCE007B10_                   | XTOB006BC1                       | XTAE007B10_006                        |
| 3.00      | 6.60                  | 100                    | 16                   | XTCE007B10_                   | XTOB010BC1                       | XTAE007B10_010                        |
| 4.00      | 8.50                  | 100                    | 20                   | XTCE009B10_                   | XTOB010BC1                       | XTAE009B10_010                        |
| 5.50      | 11.3                  | 100                    | 25                   | XTCE018C10_                   | XTOB016CC1                       | XTAE018C10_016                        |
| 7.50      | 16.0                  | 100                    | 32                   | XTCE018C10_                   | XTOB016CC1                       | XTAE018C10_016                        |
| 11.0      | 21.7                  | 100                    | 40                   | XTCE025C10_                   | XTOB024CC1                       | XTAE032C10_024                        |
| 15.0      | 29.3                  | 100                    | 63                   | XTCE032C10_                   | XTOB032CC1                       | XTAE032C10_032                        |
| 18.5      | 36.0                  | 100                    | 63                   | XTCE040D00_                   | XTOB040DC1                       | XTAE040D00_040                        |
| 22.0      | 41.0                  | 100                    | 80                   | XTCE050D00_                   | XTOB057DC1                       | XTAE065D00_057                        |
| 30.0      | 55.0                  | 100                    | 100                  | XTCE065D00_                   | XTOB057DC1                       | XTAE065D00_057                        |
| 37.0      | 68.0                  | 100                    | 125                  | XTCE080F00_                   | XTOB070GC1                       | XTAE080F00_070                        |
| 45.0      | 81.0                  | 100                    | 160                  | XTCE095F00_                   | XTOB100GC1                       | XTAE095F00_100                        |
| 55.0      | 99.0                  | 100                    | 200                  | XTCE115G00_                   | XTOB100GC1                       | XTAE115G00_100                        |
| 75.0      | 134.0                 | 100                    | 200                  | XTCE150G00_                   | XTOB150GC1                       | XTAE150G00_150                        |
| 90.0      | 161.0                 | 100                    | 250                  | XTCE185L22_                   | XTOB220LC1                       | XTAE185L22_220                        |
| 110.0     | 196.0                 | 100                    | 315                  | XTCE225L22_                   | XTOB220LC1                       | XTAE225L22_220                        |
| 132.0     | 231.0                 | 100                    | 400                  | XTCE250L22_                   | XTOB250LC1                       | XTAE250L22_250                        |
| 160.0     | 279.0                 | 100                    | 400                  | XTCE300M22_                   | XTOT290C35                       | XTAE300M22_290                        |
| 200.0     | 349.0                 | 100                    | 500                  | XTCE400M22_                   | XTOT400C35                       | XTAE400M22_400                        |
| 250.0     | 437.0                 | 100                    | 630                  | XTCE500M22_                   | XTOT540C35                       | XTAE500M22_540                        |

**Notes**

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

① Underscore ( \_ ) indicates magnet coil code required. See **Page V5-T1-245**.



## 500V Type 2 Coordination—Contactor and Overload Relay (Motor Starter) with Fused Disconnect

| P<br>(kW) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | Fuses<br>Class gG/gL | Contactor<br>Catalog Number <sup>①</sup> | Overload Relay<br>Catalog Number | Assembled Starter<br>Catalog Number <sup>①</sup> |
|-----------|-----------------------|------------------------|----------------------|------------------------------------------|----------------------------------|--------------------------------------------------|
| 0.12      | 0.33                  | 100                    | 2                    | XTCE007B10_                              | XTOBP40BC1                       | XTAE007B10_P40                                   |
| 0.18      | 0.48                  | 100                    | 2                    | XTCE007B10_                              | XTOBP60BC1                       | XTAE007B10_P60                                   |
| 0.25      | 0.70                  | 100                    | 2                    | XTCE007B10_                              | XTOB001BC1                       | XTAE007B10_001                                   |
| 0.37      | 0.90                  | 100                    | 2                    | XTCE007B10_                              | XTOB001BC1                       | XTAE007B10_001                                   |
| 0.55      | 1.20                  | 100                    | 4                    | XTCE007B10_                              | XTOB1P6BC1                       | XTAE007B10_1P6                                   |
| 0.75      | 1.50                  | 100                    | 4                    | XTCE007B10_                              | XTOB1P6BC1                       | XTAE007B10_1P6                                   |
| 1.10      | 2.10                  | 100                    | 6                    | XTCE007B10_                              | XTOB2P4BC1                       | XTAE007B10_2P4                                   |
| 1.50      | 2.90                  | 100                    | 6                    | XTCE007B10_                              | XTOB004BC1                       | XTAE007B10_004                                   |
| 2.20      | 4.00                  | 100                    | 10                   | XTCE007B10_                              | XTOB006BC1                       | XTAE007B10_006                                   |
| 3.00      | 5.30                  | 100                    | 16                   | XTCE009B10_                              | XTOB006BC1                       | XTAE009B10_006                                   |
| 4.00      | 6.80                  | 100                    | 16                   | XTCE009B10_                              | XTOB010BC1                       | XTAE009B10_010                                   |
| 5.50      | 9.00                  | 100                    | 20                   | XTCE012B10_                              | XTOB010BC1                       | XTAE012B10_010                                   |
| 7.50      | 12.1                  | 100                    | 25                   | XTCE018C10_                              | XTOB016CC1                       | XTAE018C10_016                                   |
| 11.0      | 17.4                  | 100                    | 32                   | XTCE025C10_                              | XTOB024CC1                       | XTAE025C10_024                                   |
| 15.0      | 23.4                  | 100                    | 50                   | XTCE040D00_                              | XTOB024DC1                       | XTAE040D00_024                                   |
| 18.5      | 28.9                  | 100                    | 50                   | XTCE040D00_                              | XTOB040DC1                       | XTAE040D00_040                                   |
| 22.0      | 33.0                  | 100                    | 63                   | XTCE050D00_                              | XTOB040DC1                       | XTAE050D00_040                                   |
| 30.0      | 44.0                  | 100                    | 80                   | XTCE065D00_                              | XTOB057DC1                       | XTAE065D00_057                                   |
| 37.0      | 54.0                  | 100                    | 100                  | XTCE080F00_                              | XTOB070GC1                       | XTAE080F00_070                                   |
| 45.0      | 65.0                  | 100                    | 125                  | XTCE095F00_                              | XTOB070GC1                       | XTAE095F00_070                                   |
| 55.0      | 79.0                  | 100                    | 160                  | XTCE115G00_                              | XTOB100GC1                       | XTAE115G00_100                                   |
| 75.0      | 107.0                 | 100                    | 200                  | XTCE185L22_                              | XTOB125LC1                       | XTAE185L22_125                                   |
| 90.0      | 129.0                 | 100                    | 200                  | XTCE185L22_                              | XTOB125LC1                       | XTAE185L22_125                                   |
| 110.0     | 157.0                 | 100                    | 250                  | XTCE185L22_                              | XTOB160LC1                       | XTAE185L22_160                                   |
| 132.0     | 184.0                 | 100                    | 250                  | XTCE185L22_                              | XTOB220LC1                       | XTAE185L22_220                                   |
| 160.0     | 224.0                 | 100                    | 315                  | XTCE225L22_                              | XTOB250LC1                       | XTAE225L22_250                                   |

**Notes**

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

<sup>①</sup> Underscore ( ) indicates magnet coil code required. See **Page V5-T1-245**.

## 690V Type 2 Coordination—Contactor and Overload Relay (Motor Starter) with Fused Disconnect

| P<br>(kW) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | Fuses<br>Class gG/gL | Contactor<br>Catalog Number ① | Overload Relay<br>Catalog Number | Assembled Starter<br>Catalog Number ① |
|-----------|-----------------------|------------------------|----------------------|-------------------------------|----------------------------------|---------------------------------------|
| 0.12      | 0.24                  | 100                    | 1                    | XTCE007B10_                   | XTOBP40BC1                       | XTAE007B10_P40                        |
| 0.18      | 0.35                  | 100                    | 2                    | XTCE007B10_                   | XTOBP40BC1                       | XTAE007B10_P40                        |
| 0.25      | 0.50                  | 100                    | 2                    | XTCE007B10_                   | XTOBP60BC1                       | XTAE007B10_P60                        |
| 0.37      | 0.70                  | 100                    | 2                    | XTCE007B10_                   | XTOB001BC1                       | XTAE007B10_001                        |
| 0.55      | 0.90                  | 100                    | 4                    | XTCE007B10_                   | XTOB001BC1                       | XTAE007B10_001                        |
| 0.75      | 1.10                  | 100                    | 4                    | XTCE007B10_                   | XTOB1P6BC1                       | XTAE007B10_1P6                        |
| 1.10      | 1.50                  | 100                    | 4                    | XTCE007B10_                   | XTOB1P6BC1                       | XTAE007B10_1P6                        |
| 1.50      | 2.10                  | 100                    | 6                    | XTCE007B10_                   | XTOB2P4BC1                       | XTAE007B10_2P4                        |
| 2.20      | 2.90                  | 100                    | 10                   | XTCE007B10_                   | XTOB004BC1                       | XTAE007B10_004                        |
| 3.00      | 3.80                  | 100                    | 10                   | XTCE007B10_                   | XTOB004BC1                       | XTAE007B10_004                        |
| 4.00      | 4.90                  | 100                    | 16                   | XTCE009B10_                   | XTOB006BC1                       | XTAE009B10_006                        |
| 5.50      | 6.50                  | 100                    | 16                   | XTCE012B10_                   | XTOB010BC1                       | XTAE012B10_010                        |
| 7.50      | 8.80                  | 100                    | 20                   | XTCE018C10_                   | XTOB010CC1                       | XTAE018C10_010                        |
| 11.0      | 12.6                  | 100                    | 25                   | XTCE025C10_                   | XTOB016CC1                       | XTAE025C10_016                        |
| 15.0      | 17.0                  | 100                    | 32                   | XTCE032C10_                   | XTOB024CC1                       | XTAE032C10_024                        |
| 18.5      | 20.9                  | 100                    | 32                   | XTCE040D00_                   | XTOB024DC1                       | XTAE040D00_024                        |
| 22.0      | 23.8                  | 100                    | 50                   | XTCE040D00_                   | XTOB040DC1                       | XTAE040D00_040                        |
| 30.0      | 32.0                  | 100                    | 63                   | XTCE065D00_                   | XTOB040DC1                       | XTAE065D00_040                        |
| 37.0      | 39.0                  | 100                    | 80                   | XTCE080F00_                   | XTOB050GC1                       | XTAE080F00_050                        |
| 45.0      | 47.0                  | 100                    | 80                   | XTCE080F00_                   | XTOB050GC1                       | XTAE080F00_050                        |
| 55.0      | 58.0                  | 100                    | 100                  | XTCE080F00_                   | XTOB070GC1                       | XTAE080F00_070                        |
| 75.0      | 78.0                  | 100                    | 160                  | XTCE095F00_                   | XTOB100GC1                       | XTAE095F00_100                        |
| 90.0      | 93.0                  | 100                    | 160                  | XTCE115G00_                   | XTOB100GC1                       | XTAE115G00_100                        |
| 110.0     | 114.0                 | 100                    | 200                  | XTCE185L22_                   | XTOB125LC1                       | XTAE185L22_125                        |
| 132.0     | 134.0                 | 100                    | 250                  | XTCE185L22_                   | XTOB160LC1                       | XTAE185L22_160                        |
| 160.0     | 162.0                 | 100                    | 250                  | XTCE185L22_                   | XTOB220LC1                       | XTAE185L22_220                        |

**Notes**

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

① Underscore ( ) indicates magnet coil code required. See **Page V5-T1-245**.

## 400, 415V Type 2 Coordination—Contactor and Overload Relay (Motor Starter) with Fused Disconnect

| P<br>(kW) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | Fuses <sup>①</sup><br>Class BS88 | Contactor<br>Catalog Number <sup>②</sup> | Overload Relay<br>Catalog Number | Assembled Starter<br>Catalog Number <sup>②</sup> |
|-----------|-----------------------|------------------------|----------------------------------|------------------------------------------|----------------------------------|--------------------------------------------------|
| 0.12      | 0.41                  | 80                     | 4                                | XTCE007B10_                              | XTOBP60BC1                       | XTAE007B10_P60                                   |
| 0.18      | 0.60                  | 80                     | 4                                | XTCE007B10_                              | XTOBP60BC1                       | XTAE007B10_P60                                   |
| 0.25      | 0.80                  | 80                     | 4                                | XTCE007B10_                              | XTOB001BC1                       | XTAE007B10_001                                   |
| 0.37      | 1.10                  | 80                     | 6                                | XTCE007B10_                              | XTOB1P6BC1                       | XTAE007B10_1P6                                   |
| 0.55      | 1.50                  | 80                     | 10                               | XTCE007B10_                              | XTOB1P6BC1                       | XTAE007B10_1P6                                   |
| 0.75      | 1.90                  | 80                     | 16                               | XTCE007B10_                              | XTOB2P4BC1                       | XTAE007B10_2P4                                   |
| 1.10      | 2.60                  | 80                     | 16                               | XTCE007B10_                              | XTOB004BC1                       | XTAE007B10_004                                   |
| 1.50      | 3.60                  | 80                     | 20                               | XTCE007B10_                              | XTOB004BC1                       | XTAE007B10_004                                   |
| 2.20      | 5.00                  | 80                     | 20                               | XTCE007B10_                              | XTOB006BC1                       | XTAE007B10_006                                   |
| 3.00      | 6.60                  | 80                     | 20                               | XTCE007B10_                              | XTOB010BC1                       | XTAE007B10_010                                   |
| 4.00      | 8.50                  | 80                     | 25                               | XTCE009B10_                              | XTOB010BC1                       | XTAE009B10_010                                   |
| 5.50      | 11.3                  | 80                     | 25                               | XTCE018C10_                              | XTOB016CC1                       | XTAE018C10_016                                   |
| 7.50      | 16.0                  | 80                     | 25                               | XTCE018C10_                              | XTOB016CC1                       | XTAE018C10_016                                   |
| 11.0      | 21.7                  | 80                     | 35 and 32M35                     | XTCE025C10_                              | XTOB024CC1                       | XTAE032C10_024                                   |
| 15.0      | 29.3                  | 80                     | 50                               | XTCE032C10_                              | XTOB032CC1                       | XTAE032C10_032                                   |
| 18.5      | 36.0                  | 80                     | 63                               | XTCE040D00_                              | XTOB040DC1                       | XTAE040D00_040                                   |
| 22.0      | 41.0                  | 80                     | 80                               | XTCE050D00_                              | XTOB057DC1                       | XTAE065D00_057                                   |
| 30.0      | 55.0                  | 80                     | 100                              | XTCE065D00_                              | XTOB065DC1                       | XTAE065D00_065                                   |

**Notes**

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

① GEC/Alstom "Red Spot."

② Underscore ( \_ ) indicates magnet coil code required. See **Page V5-T1-245**.

## 400, 415V Type 2 Coordination—Contactor and Overload Relay (Motor Starter) with Circuit Breaker

| P<br>(kW) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | Circuit<br>Breaker | Contactor<br>Catalog Number <sup>①</sup> | Overload Relay<br>Catalog Number | Assembled Starter<br>Catalog Number <sup>①</sup> |
|-----------|-----------------------|------------------------|--------------------|------------------------------------------|----------------------------------|--------------------------------------------------|
| 0.12      | 0.41                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 0.18      | 0.60                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 0.25      | 0.80                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 0.37      | 1.10                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 0.55      | 1.50                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 0.75      | 1.90                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 1.10      | 2.60                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 1.50      | 3.60                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 2.20      | 5.00                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 3.00      | 6.60                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 4.00      | 8.50                  | 15                     | HMCPE015E0C        | XTCE018C10_                              | XTOB010CC1                       | XTAE018C10_010                                   |
| 5.50      | 11.3                  | 15                     | HMCPE015E0C        | XTCE018C10_                              | XTOB016CC1                       | XTAE018C10_016                                   |
| 7.50      | 16.0                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 11.0      | 21.7                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 15.0      | 29.3                  | 15                     | ②                  | ②                                        | ②                                | ②                                                |
| 18.5      | 36.0                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 22.0      | 41.0                  | 50                     | HMCPE100R3C        | XTCE050D00_                              | XTOB057DC1                       | XTAE050D00_057                                   |
| 30.0      | 55.0                  | 50                     | HMCPE100R3C        | XTCE065D00_                              | XTOB065DC1                       | XTAE065D00_065                                   |
| 37.0      | 68.0                  | 80                     | HMCPEJ250D5L       | XTCE080F00_                              | XTOB070GC1                       | XTAE080F00_070                                   |
| 45.0      | 81.0                  | 80                     | HMCPEJ250F5L       | XTCE095F00_                              | XTOB100GC1                       | XTAE095F00_100                                   |
| 55.0      | 99.0                  | 80                     | HMCPEJ250G5L       | XTCE115G00_                              | XTOB125GC1                       | XTAE115G00_125                                   |
| 75.0      | 134.0                 | 80                     | HMCPEJ250J5L       | XTCE150G00_                              | XTOB150GC1                       | XTAE150G00_150                                   |
| 90.0      | 161.0                 | 80                     | HMCPEJ250W5L       | XTCE185L22_                              | XTOB220LC1                       | XTAE185L22_220                                   |
| 110.0     | 196.0                 | 70                     | HMCPEJ250W5L       | XTCE225L22_                              | XTOB220LC1                       | XTAE225L22_220                                   |
| 132.0     | 231.0                 | 70                     | HMCPL600R6G        | XTCE300M22_                              | XTOT240C3S                       | XTAE300M22_240                                   |
| 160.0     | 279.0                 | 70                     | HMCPL600X6G        | XTCE300M22_                              | XTOT400C3S                       | XTAE300M22_400                                   |
| 200.0     | 349.0                 | 70                     | HMCPL600P6G        | XTCE400M22_                              | XTOT400C3S                       | XTAE400M22_400                                   |
| 250.0     | 430.0                 | 70                     | HMCPL600M          | XCE500M22_                               | XTOT540C3S                       | XTAE500M22_540                                   |

**Notes**

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

① Underscore (\_) indicates magnet coil code required. See **Page V5-T1-245**.

② Use MMP contactor combination. See **Page V5-T1-237**.

## 525V Type 2 Coordination—Contactor and Overload Relay (Motor Starter) with Circuit Breaker

| P<br>(kW) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | Circuit<br>Breaker | Contactor<br>Catalog Number <sup>①</sup> | Overload Relay<br>Catalog Number | Assembled Starter<br>Catalog Number <sup>①</sup> |
|-----------|-----------------------|------------------------|--------------------|------------------------------------------|----------------------------------|--------------------------------------------------|
| 0.37      | 1.02                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 0.55      | 1.22                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 0.75      | 1.66                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 1.10      | 2.22                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 1.50      | 3.16                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 2.20      | 4.25                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 3.00      | 5.60                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 4.00      | 7.50                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 5.50      | 9.90                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 7.50      | 14.1                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 11.0      | 19.3                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 15.0      | 23.5                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 18.5      | 27.2                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 22.0      | 37.0                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 30.0      | 45.0                  | 50                     | ②                  | ②                                        | ②                                | ②                                                |
| 37.0      | 54.0                  | 50                     | HMCP100R3C         | XTCE080F00_                              | XTOB070GC1                       | XTAE080F00_070                                   |
| 45.0      | 66.0                  | 50                     | HMCPJ250D5L        | XTCE080F00_                              | XTOB070GC1                       | XTAE080F00_070                                   |
| 55.0      | 79.0                  | 50                     | HMCPJ250F5L        | XTCE115G00_                              | XTOB100GC1                       | XTAE115G00_100                                   |
| 75.0      | 111.0                 | 50                     | HMCPJ250J5L        | XTCE115G00_                              | XTOB125GC1                       | XTAE115G00_125                                   |
| 90.0      | 130.0                 | 50                     | HMCPJ250K5L        | XTCE185L00_                              | XTOB160LC1                       | XTAE185L00_160                                   |
| 110.0     | 159.0                 | 50                     | HMCPJ250W5L        | XTCE185L00_                              | XTOB160LC1                       | XTAE185L00_160                                   |
| 132.0     | 185.0                 | 50                     | HMCPJ600N6G        | XTCE185L22_                              | XTOB220LC1                       | XTAE185L22_220                                   |
| 160.0     | 225.0                 | 50                     | HMCPJ600R6G        | XTCE225L22_                              | XTOB250LC1                       | XTAE225L22_250                                   |
| 200.0     | 270.0                 | 50                     | HMCPJ600X6G        | XTCE300M22_                              | XTOT290C3S                       | XTAE300M22_290                                   |

## 480V Type 2 Coordination—Contactor and Overload Relay (Motor Starter) with Circuit Breaker

| P<br>(hp) | I <sub>e</sub><br>(A) | I <sub>q</sub><br>(kA) | Circuit<br>Breaker | Contactor<br>Catalog Number <sup>①</sup> | Overload Relay<br>Catalog Number | Assembled Starter<br>Catalog Number <sup>①</sup> |
|-----------|-----------------------|------------------------|--------------------|------------------------------------------|----------------------------------|--------------------------------------------------|
| 50.0      | 65.0                  | 65                     | HMCPJ250D5L        | XTCE080F00_                              | XTOB070GC1                       | XTAE080F00_070                                   |
| 60.0      | 77.0                  | 65                     | HMCPJ250G5L        | XTCE080F00_                              | XTOB100GC1                       | XTAE080F00_100                                   |
| 75.0      | 96.0                  | 25                     | HMCPJ250J5L        | XTCE115G00_                              | XTOB125GC1                       | XTAE115G00_125                                   |
| 100.0     | 124.0                 | 50                     | HMCPJ250K5L        | XTCE185L22_                              | XTOB160LC1                       | XTAE185L22_160                                   |
| 125.0     | 156.0                 | 50                     | HMCPJ250W5L        | XTCE185L22_                              | XTOB160LC1                       | XTAE185L22_160                                   |
| 150.0     | 180.0                 | 25                     | HMCPJ600N6G        | XTCE225L22_                              | XTOB220LC1                       | XTAE225L22_220                                   |
| 200.0     | 240.0                 | 50                     | HMCPJ600N          | XTCE300M22_                              | XTOB240C3S                       | XTAE300M22_240                                   |
| 250.0     | 290.0                 | 50                     | HMCPJ600R          | XTCE300M22_                              | XTOB290C3S                       | XTAE300M22_290                                   |
| 300.0     | 361.0                 | 50                     | HMCPJ600Y          | XTCE400M22_                              | XTOB400C3S                       | XTAE400M22_400                                   |
| 350.0     | 414.0                 | 50                     | HMCPJ600M          | XTCE500M22_                              | XTOB540C3S                       | XTAE500M22_540                                   |

**Notes**

See **Page V5-T1-245** for more information on wye-delta (star delta) applications.

① Underscore ( \_ ) indicates magnet coil code required. See **Page V5-T1-245**.

② Use MMP contactor combination.

**400, 415V Type 2 Coordination—Contactor with Circuit Breaker <sup>①</sup>**

| P (kW) | I <sub>e</sub> (A) | I <sub>g</sub> (kA) | Circuit Breaker—MCP | Contactor Catalog Number <sup>②</sup> |
|--------|--------------------|---------------------|---------------------|---------------------------------------|
| 1.50   | 3.60               | 50                  | HMCPE015E0C         | XTCE018C10_                           |
| 2.20   | 5.00               | 50                  | HMCPE015E0C         | XTCE018C10_                           |
| 3.00   | 6.60               | 50                  | HMCPE015E0C         | XTCE018C10_                           |
| 4.00   | 8.50               | 50                  | HMCPE015E0C         | XTCE018C10_                           |
| 5.50   | 11.3               | 50                  | HMCPE015E0C         | XTCE018C10_                           |
| 7.50   | 16.0               | 50                  | HMCPE015E0C         | XTCE018C10_                           |
| 11.0   | 21.7               | 50                  | HMCPE100R3C         | XTCE040D00_                           |
| 15.0   | 29.3               | 50                  | HMCPE100R3C         | XTCE040D00_                           |
| 18.5   | 36.0               | 50                  | HMCPE100R3C         | XTCE040D00_                           |
| 22.0   | 41.0               | 50                  | HMCPE100R3C         | XTCE050D00_                           |
| 30.0   | 55.0               | 50                  | HMCPE100R3C         | XTCE065D00_                           |
| 37.0   | 68.0               | 80                  | HMCPE100R3C         | XTCE080F00_                           |
| 45.0   | 81.0               | 80                  | HMCPE100R3C         | XTCE095F00_                           |
| 55.0   | 99.0               | 80                  | HMCPE100R3C         | XTCE115G00_                           |
| 75.0   | 134.0              | 80                  | HMCPE100R3C         | XTCE150G00_                           |
| 90.0   | 161.0              | 80                  | HMCPE100R3C         | XTCE185L22_                           |
| 110.0  | 196.0              | 80                  | HMCPE100R3C         | XTCE225L22_                           |
| 132.0  | 231.0              | 70                  | HMCPL600R           | XTCE300M22_                           |
| 160.0  | 279.0              | 70                  | HMCPL600X           | XTCE300M22_                           |
| 200.0  | 350.0              | 70                  | HMCPL600P           | XTCE400M22_                           |
| 250.0  | 430.0              | 70                  | HMCPL600M           | XTCE500M22_                           |

**480V Type 2 Coordination—Contactor with Circuit Breaker <sup>①</sup>**

| P (hp) | I <sub>e</sub> (A) | I <sub>g</sub> (kA) | Circuit Breaker—MCP | Contactor Catalog Number <sup>②</sup> |
|--------|--------------------|---------------------|---------------------|---------------------------------------|
| 50.0   | 65.0               | 65                  | HMCPE100R3C         | XTCE080F00_                           |
| 60.0   | 77.0               | 65                  | HMCPE100R3C         | XTCE080F00_                           |
| 150.0  | 180.0              | 50                  | HMCPL600N           | XTCE300M00_                           |
| 200.0  | 240.0              | 50                  | HMCPL600N           | XTCE300M22_                           |
| 250.0  | 300.0              | 50                  | HMCPL600R           | XTCE300M22_                           |
| 300.0  | 361.0              | 50                  | HMCPL600Y           | XTCE400M00_                           |
| 350.0  | 414.0              | 50                  | HMCPL600M           | XTCE500M00_                           |

**Magnet Coil Suffix****Frames A–B**

| Coil Voltage           | Suffix Code            |
|------------------------|------------------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>               |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>               |
| 230V 50 Hz             | <b>F</b>               |
| 24V 50/60 Hz           | <b>T</b>               |
| 24 Vdc                 | <b>TD</b> <sup>③</sup> |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>               |
| 600V 60 Hz             | <b>D</b>               |
| 208V 60 Hz             | <b>E</b>               |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>               |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>               |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>               |
| 400V 50 Hz             | <b>N</b>               |
| 380V 60 Hz             | <b>P</b>               |
| 12V 50/60 Hz           | <b>R</b>               |
| 24V 50 Hz              | <b>U</b>               |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>               |
| 48V 50 Hz              | <b>Y</b>               |
| 120 Vdc                | <b>AD</b> <sup>③</sup> |
| 220 Vdc                | <b>BD</b> <sup>③</sup> |
| 12 Vdc                 | <b>RD</b> <sup>③</sup> |
| 48 Vdc                 | <b>WD</b> <sup>③</sup> |

**Frames C–F**

| Coil Voltage           | Suffix Code            |
|------------------------|------------------------|
| 110V 50 Hz, 120V 60 Hz | <b>A</b>               |
| 220V 50 Hz, 240V 60 Hz | <b>B</b>               |
| 230V 50 Hz             | <b>F</b>               |
| 24V 50/60 Hz           | <b>T</b>               |
| 24–27 Vdc              | <b>TD</b> <sup>③</sup> |
| 415V 50 Hz, 480V 60 Hz | <b>C</b>               |
| 600V 60 Hz             | <b>D</b>               |
| 208V 60 Hz             | <b>E</b>               |
| 190V 50 Hz, 220V 60 Hz | <b>G</b>               |
| 240V 50 Hz, 277V 60 Hz | <b>H</b>               |
| 380V 50 Hz, 440V 60 Hz | <b>L</b>               |
| 400V 50 Hz             | <b>N</b>               |
| 380V 60 Hz             | <b>P</b>               |
| 12V 50/60 Hz           | <b>R</b>               |
| 24V 50 Hz              | <b>U</b>               |
| 42V 50 Hz, 48V 60 Hz   | <b>W</b>               |
| 48V 50 Hz              | <b>Y</b>               |
| 110–130 Vdc            | <b>AD</b> <sup>③</sup> |
| 200–240 Vdc            | <b>BD</b> <sup>③</sup> |
| 12–14 Vdc              | <b>RD</b> <sup>③</sup> |
| 48–60 Vdc              | <b>WD</b> <sup>③</sup> |

**Frame G**

| Coil Voltage      | Suffix Code            |
|-------------------|------------------------|
| 100–120V 50/60 Hz | <b>A</b>               |
| 190–240V 50/60 Hz | <b>B</b>               |
| 24V 50/60 Hz      | <b>T</b>               |
| 24–27 Vdc         | <b>TD</b> <sup>③</sup> |
| 480–500V 50/60 Hz | <b>C</b>               |
| 380–440V 50/60 Hz | <b>L</b>               |
| 42–48V 50/60 Hz   | <b>W</b>               |
| 110–130 Vdc       | <b>AD</b> <sup>③</sup> |
| 200–240 Vdc       | <b>BD</b> <sup>③</sup> |
| 48–60 Vdc         | <b>WD</b> <sup>③</sup> |

**Frames L–M**

| Coil Voltage         | Suffix Code            |
|----------------------|------------------------|
| 110–250V 40–60 Hz/DC | <b>A</b>               |
| 250–500V 40–60 Hz/DC | <b>C</b>               |
| 48–110V 40–60 Hz/DC  | <b>Y</b> <sup>③</sup>  |
| 24–48 Vdc            | <b>TD</b> <sup>③</sup> |

**Wye-Delta (Star-Delta) Applications**

If Type 2 Coordination is required when using wye-delta starters, the full voltage (direct on-line) test data that is included in this document is valid. To ensure proper

protection, the K1M (main), K3M (star) and K5M (delta) contactors must all be the same size (amperage). For wye-delta starter kits, please see **Page V5-T1-55**.

**Notes**

- <sup>①</sup> For use with magnetic sensing means to monitor motor current.
- <sup>②</sup> Underscore ( \_ ) indicates magnet coil code required. See magnet coil suffix tables on this page.
- <sup>③</sup> With DC operation: integrated diode-resistor combination, coil rating 2.6W.

## Approvals for World Markets

### Overview

The **XT** line of products is approved for use throughout the world, including the USA and Canada. As such, they can be used without restriction as devices for world markets.

The majority of countries permit the import of devices on the manufacturer's undertaking that they have been constructed in accordance with the pertinent specifications. In the USA and Canada, however, there is a legal obligation to obtain official approval. In these countries, devices and enclosures—sometimes even complete control systems—are tested and approved by independent bodies.

In Europe, there also used to be a legal obligation to obtain official approval for low-voltage switchgear and controlgear. For industrial control gear, this legal obligation has now been abolished, provided the devices have been manufactured and tested in accordance with harmonized European standards (such as IEC/EN 60947). There is then no longer a requirement for them to carry their country's own approval mark.

Since January 1997, all devices must conform to the European Low-Voltage Directive and, where intended for sale within the European Union, must carry the CE mark.

**Europe**  
Conformité  
Européenne  
(CE)



This mark denotes that the device carrying it conforms to all relevant requirements and specifications. The mandatory application of this mark therefore enables the unrestricted use of marked devices within the European economic area.

Since January 1996, all devices sold within the European union must comply with the Electromagnetic Compatibility (EMC) Directive. **XT** has passed the required tests to these Directives and the devices carry the CE mark, demonstrating compliance with the EMC Directive. *Because devices bearing the CE mark comply with the harmonized standards, approval and the associated marking is no longer required in the following countries:*

### Belgium

Comité Electro-technique Belge  
Belgisch Elektro-technisch Comité  
(CEBEC)



### Denmark

Danmarks  
Elektriske  
Materielkontrol  
(DEMKO)



### Finland

(FIMKO)



### France

Union Technique  
de l'Electricité  
(UTE)



### Netherlands

Naamloze  
Vennootschap  
tot Keuring van  
Electrotechnische  
Materialien  
(KEMA)



### Norway

Norges Elektriske  
Materiellkontrol  
(NEMKO)



### Sweden

Svenska  
Elektriska Materiel-  
Kontrollanstalten  
(SEMKO)



### Switzerland

Schweizerischer  
Elektrotechnischer  
Verein  
(SEV)



Devices in the USA and Canada have UL and CSA approval.

### USA

Underwriters  
Laboratories  
(UL)

Listing

Recognition



### Canada

Canadian  
Standards  
Association  
(CSA)



Recently introduced is the mandatory approval of electrical products for:

- Slovakia
- Poland
- South Africa
- China
- Russia
- Turkey
- Argentina

Marking is partly mandatory for these countries. The IEC rating data is accepted as in other European countries.

Approval is not mandatory in the Czech Republic and Hungary. The manufacturer's declaration of conformity is sufficient here.

Romania requires that components that are to be used in public buildings must be approved by the Romanian test authority ICECON.

### Russia

Devices for Russia must bear the appropriate marking.



### Russia

Goststandart  
(GOST-R)

### South Africa

ZA  
SABS



### Argentina



### Selection of Devices

"Selection appropriate for export" does not mean merely meeting the requisite approvals and conformity to relevant specifications. The meaning of the term goes a great deal further by even including that equipment and installations must be designed to a concept with export in mind.

The following are important criteria for selecting switchgear suitable for export:

#### For motor-protective circuit breakers

Use inherently short-circuit proof switches capable of controlling the highest prospective fault levels at the point of installation without the need for back-up protection.

#### Advantage:

- No restrictions whatsoever for installation
- Complete independence from the on-site protective system
- No problems getting spare parts

#### For circuit breakers

Use types with visible contacts, quick-make and quick-break operation as standard. Use current-limiting circuit breakers for high short-circuit levels. Selective switches are recommended for the selective graduation of networks.

#### Advantage:

- Independence from local accident prevention regulations requiring visible contacts and safety faults caused by inexperienced operating personnel.
- The effects of short-circuits are kept to a minimum.
- Fuseless installations offer greater safety and reliability in plant operation. In the event of a fault, only the faulty section of the system is isolated.

#### For contactors

Use contactors whose entire range provides consistently reliable operation in the event of voltage drops (consistently down to 80%  $U_n$  should be aimed for) and whose contact system will not assume an indeterminate position either on closing or on opening in such conditions.

#### Advantage:

- During electrification work in areas such as Africa and the Middle East, an insufficient voltage stability is—at least for a certain time—likely in many applications (for example due to long spur lines or small local generators). The use of devices that fulfill the above requirements will eliminate one of the main failure causes related to contactors.

#### For enclosures

Use insulated enclosures with transparent covers (that is, “totally insulated” enclosures).

#### Advantage:

- Total insulation is the best possible protective measure from the user's point of view, avoiding reliance on the possibly doubtful skills of unknown installation personnel. Furthermore, protective measures based on earthing are often extremely difficult, if not impossible (in the Middle East, for example, due to the dryness of the ground).
- Insulated enclosures completely eliminate the need for any additional protection against corrosion. The transparent covers contribute significantly to the correct operation of a system, because switchgear operation can be monitored even with the doors or covers closed, thus virtually eliminating the possibility of these being left open through carelessness. The transparent cover is an important contribution to safety, especially where exports to areas of uncertain skills are concerned.

#### For overcurrent protective devices

Always use circuit breakers and motor-protective circuit breakers. Avoid fuses as much as possible.

#### Advantage:

- The operational reliability of a system is especially important for export contracts. Circuit breakers and motor-protective circuit breakers provide this reliability in full measure since they can be immediately reclosed once a fault has been cleared, they disconnect all poles, they have ideal protection through high tripping accuracy and they can be used for selective operation. Because they have no fuses or other consumables, they also greatly reduce the problem of obtaining replacement parts. The advantages of fuseless design for export are especially evident in this case. No complicated investigation is needed to find out which fusing system is used in the respective location and which specifications have to be followed to select the correct fuses. Often several different fuse systems with widely varying characteristics are used side-by-side in the same country. For the uninitiated, it may be almost impossible to find the right fuse in these circumstances. These problems do not arise where a circuit breaker is used.



**For main switches and safety switches**

Use devices with positive contact separation and clear switch position indication.

**Advantage:**

- The mechanical coupling of the actuating element with the contacts ensures that the OFF position is indicated only when all main contacts are separated by the prescribed distance and only in this position can the switch be padlocked. This ensures safety when carrying out maintenance and repair work on the installation or machinery.

**Test Authorities**

**USA**  
USA  
UL



**Canada**  
CDN  
CSA



ML PAT

**Romania**  
RO  
ICECON

**Russia**  
RUS  
GOST-R



**South Africa**  
ZA  
SABS



**Slovakia**  
SK  
SKTC



**Poland**  
PL  
BBJ-SEP



**Turkey**  
TR  
TSE



**China**  
PRC  
CCC



**Ukraine**  
UA  
Ukrain-GOST

**Shipping Classifications**

**Germany**  
Germanischer Lloyd (GL)



**Great Britain**  
Lloyd's Register of Shipping (LR)



**France**  
Bureau Veritas (BV)



**Russia**  
Russian Maritime Register of Shipping (RS)



**Italy**  
Registro Italiano Navale (RINA)



**Norway**  
Det Norske Veritas (DNV)



**Poland**  
Polski Rejestr Statkow (PRS)

**Approvals for North America**

In the U.S., the legally established OSHA (Occupational Safety and Health Act) and the NEC (National Electrical Code) require the use of approved devices and systems.

In Canada, all electrical apparatus must comply with the CEC (Canadian Electrical Code), which requires that all equipment and installations have CSA approval.

In addition to the normal UL and CSA approvals, the trade regulations originating from the NAFTA agreements allow the application for a joint UL and CSA approval. The devices then carry a logo that is recognized in both countries.

Some local inspectors and end users still refuse to accept the joint listing.

**Approvals for North America****Type of Approval****Approval Mark**

The device is UL- and CSA-approved as discrete device.



The device is CSA-approved as discrete device.



The device is UL-approved as discrete device.



The device contains UL-approved components; its approval conditions must be maintained in use (UL Recognized). The device is CSA-approved as discrete device.



**IEC Utilization Categories**

(See also IEC/EN 60947-1; 2.1.18/IEV 441-17-19)

A combination of specified requirements relating to the condition in which the switching device or fuse fulfills its purpose and selected to represent a characteristic group of real-life applications. The specified requirements may,

for example, relate to the values of making and breaking capacity and other characteristic values, data concerning associated circuits and the applicable conditions of use and operational behavior.

**Used in Technical Data and Formula**

| Code      | Description                                                |
|-----------|------------------------------------------------------------|
| DF        | Duty factory                                               |
| $I_{Dn}$  | Response value of earth-fault release                      |
| $I_{cm}$  | Rated short-circuit making capacity                        |
| $I_{cn}$  | Rated short-circuit breaking capacity                      |
| $I_{cs}$  | Rated service short-circuit breaking capacity              |
| $I_{cu}$  | Rated ultimate short-circuit breaking capacity             |
| $I_{cw}$  | Rated short-time withstand current                         |
| $I_e$     | Rated operational current                                  |
| $I_k$     | Transformer initial short-circuit AC current               |
| $I_L$     | Load monitoring response value                             |
| $I_n$     | Rated current                                              |
| $I_{NT}$  | Transformer rated current                                  |
| $I_{PK}$  | Rated peak withstand current                               |
| $I_q$     | Rated conditional short-circuit current                    |
| $I_r$     | Overcurrent release set value                              |
| $I_{rm}$  | Response value of non-delayed short-circuit release        |
| $I_i$     | Response value of non-delayed short-circuit release        |
| $I_{rmf}$ | Response value of fixed, non-delayed short-circuit release |

| Code      | Description                                                |
|-----------|------------------------------------------------------------|
| $I_{rmv}$ | Response value of short-time delayed short-circuit release |
| $I_{sd}$  | Response value of short-time delayed short-circuit release |
| $I_T$     | Response value of earth-fault release                      |
| $I_g$     | Response value of earth-fault release                      |
| $I_{th}$  | Conventional free air thermal current                      |
| $I_{the}$ | Conventional thermal current of enclosed devices           |
| $I_u$     | Rated uninterrupted current                                |
| $S_{NT}$  | Transformer rating                                         |
| $t_r$     | Time delay of overload release response                    |
| $t_T$     | Time delay of earth-fault release response                 |
| $t_g$     | Time delay of earth-fault release response                 |
| $t_v$     | Time delay of short-circuit release response               |
| $U_c$     | Rated actuating voltage                                    |
| $U_e$     | Rated operational voltage                                  |
| $U_i$     | Rated insulation voltage                                   |
| $U_{imp}$ | Rated impulse withstand voltage                            |
| $U_k$     | Transformer short-circuit voltage                          |
| $U_s$     | Rated control voltage                                      |

**Annex A (informative)****Examples of Utilization Categories for Low Voltage Switchgear and Controlgear ①**

| Category                    | Typical Application                                                                                        | Relevant IEC Product Standard |
|-----------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Nature of Current—AC</b> |                                                                                                            |                               |
| AC-1                        | Non-inductive or slightly inductive loads, resistance furnaces                                             | 60947-4-1                     |
| AC-2                        | Slip-ring motors: starting, switching off                                                                  | 60947-4-1                     |
| AC-3                        | Squirrel cage motors: starting, switching off motors during running                                        | 60947-4-1                     |
| AC-4                        | Squirrel cage motors: starting, plugging ②, inching ③                                                      | 60947-4-1                     |
| AC-5a                       | Switching of electric discharge lamp controls                                                              | 60947-4-1                     |
| AC-5b                       | Switching of incandescent lamps                                                                            | 60947-4-1                     |
| AC-6a                       | Switching of transformers                                                                                  | 60947-4-1                     |
| AC-6b                       | Switching of capacitor banks                                                                               | 60947-4-1                     |
| AC-7a                       | Slightly inductive loads for household appliances and similar applications                                 | 61095                         |
| AC-7b                       | Motor-loads for household applications                                                                     | 61095                         |
| AC-8a                       | Hermetic refrigerant compressor motor control with manual resetting of overload releases                   | 60947-4-1                     |
| AC-8b                       | Hermetic refrigerant compressor motor control with automatic resetting of overload releases                | 60947-4-1                     |
| AC-12                       | Control of resistive loads and solid-state loads with isolation by optocouplers                            | 60947-5-1                     |
| AC-12                       | Control of resistive loads and solid-state loads with optical isolation                                    | 60947-5-2                     |
| AC-13                       | Control of solid-state loads with transformer isolation                                                    | 60947-5-1                     |
| AC-14                       | Control of small electromagnetic loads                                                                     | 60947-5-1                     |
| AC-15                       | Control of AC electromagnetic loads                                                                        | 60947-5-1                     |
| AC-20                       | Connecting and disconnecting under no-load conditions                                                      | 60947-3                       |
| AC-21                       | Switching of resistive loads, including moderate overloads                                                 | 60947-3                       |
| AC-22                       | Switching of mixed resistive and inductive loads, including moderate overloads                             | 60947-3                       |
| AC-23                       | Switching of motor loads or other highly inductive loads                                                   | 60947-3                       |
| AC-31                       | Non-inductive or slightly inductive loads                                                                  | 60947-6-1                     |
| AC-33                       | Motor loads or mixed loads including motors, resistive loads and up to 30% incandescent lamp loads         | 60947-6-1                     |
| AC-35                       | Electric discharge lamp loads                                                                              | 60947-6-1                     |
| AC-36                       | Incandescent lamp loads                                                                                    | 60947-6-1                     |
| AC-40                       | Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance | 60947-6-2                     |
| AC-41                       | Non-inductive or slightly inductive loads, resistance furnaces                                             | 60947-6-2                     |
| AC-42                       | Slip-ring motors: starting, switching off                                                                  | 60947-6-2                     |
| AC-43                       | Squirrel cage motors: starting, switching off motors during running                                        | 60947-6-2                     |
| AC-44                       | Squirrel cage motors: starting, plugging ②, inching ③                                                      | 60947-6-2                     |
| AC-45a                      | Switching of electric discharge lamp controls                                                              | 60947-6-2                     |
| AC-45b                      | Switching of incandescent lamps                                                                            | 60947-6-2                     |
| AC-51                       | Non-inductive or slightly inductive loads, resistance furnaces                                             | 60947-4-3                     |
| AC-52a                      | Control of slip ring motor stators: 8 h duty with on-load currents for start, acceleration, run            | 60947-4-2                     |
| AC-52b                      | Control of slip ring motor stators: intermittent duty                                                      | 60947-4-2                     |
| AC-53a                      | Control of squirrel cage motors: 8 h duty with on-load currents for start, acceleration, run               | 60947-4-2                     |
| AC-53b                      | Control of squirrel cage motors: intermittent duty                                                         | 60947-4-2                     |
| AC-55a                      | Switching of electric discharge lamp controls                                                              | 60947-4-3                     |
| AC-55b                      | Switching of incandescent lamps                                                                            | 60947-4-3                     |
| AC-56a                      | Switching of transformers                                                                                  | 60947-4-3                     |
| AC-56b                      | Switching of capacitor banks                                                                               | 60947-4-3                     |

**Notes**

① 60947-1 © IEC: 2004.

② Plugging is stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.

③ Inching (jogging) is energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Examples of Utilization Categories for Low-Voltage Switchgear and Controlgear, continued <sup>①</sup>

| Category                               | Typical Application                                                                                                                                        | Relevant IEC Product Standard |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Nature of Current—AC, continued</b> |                                                                                                                                                            |                               |
| AC-58a                                 | Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: h duty with on-load currents for start, acceleration, run | 60947-4-2                     |
| AC-58b                                 | Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: intermittent duty                                         | 60947-4-2                     |
| AC-140                                 | Control of small electromagnetic loads with holding (closed) current ≤0,2 A, for example, contactor relays                                                 | 60947-5-2                     |
| <b>Nature of Current—AC and DC</b>     |                                                                                                                                                            |                               |
| A                                      | Protection of circuits, with no rated short-time withstand current                                                                                         | 60947-2                       |
| B                                      | Protection of circuits, with a rated short-time withstand current                                                                                          | 60947-2                       |
| <b>Nature of Current—DC</b>            |                                                                                                                                                            |                               |
| DC-1                                   | Non-inductive or slightly inductive loads, resistance furnaces                                                                                             | 60947-4-1                     |
| DC-3                                   | Shunt-motors: starting, plugging <sup>②</sup> , inching <sup>③</sup> , dynamic breaking of motors                                                          | 60947-4-1                     |
| DC-5                                   | Series-motors: starting, plugging <sup>②</sup> , inching <sup>③</sup> , dynamic breaking of motors                                                         | 60947-4-1                     |
| DC-6                                   | Switching of incandescent lamps                                                                                                                            | 60947-4-1                     |
| DC-12                                  | Control of resistive loads and solid-state loads with isolation by optocouplers                                                                            | 60947-5-1                     |
| DC-12                                  | Control of resistive loads and solid-state loads with optical isolation                                                                                    | 60947-5-2                     |
| DC-13                                  | Control of electromagnets                                                                                                                                  | 60947-5-1                     |
| DC-13                                  | Control of electromagnets                                                                                                                                  | 60947-5-2                     |
| DC-14                                  | Control of electromagnetic loads having economy resistors in circuit                                                                                       | 60947-5-1                     |
| DC-20                                  | Connecting and disconnecting under no-load conditions                                                                                                      | 60947-3                       |
| DC-21                                  | Switching of resistive loads, including moderate overloads                                                                                                 | 60947-3                       |
| DC-22                                  | Switching of mixed resistive and inductive loads, including moderate overloads (for example, shunt motors)                                                 | 60947-3                       |
| DC-23                                  | Switching of motor loads or other highly inductive loads (for example, series motors)                                                                      | 60947-3                       |
| DC-31                                  | Resistive loads                                                                                                                                            | 60947-6-1                     |
| DC-33                                  | Motor loads or mixed loads including motors                                                                                                                | 60947-6-1                     |
| DC-36                                  | Incandescent lamp loads                                                                                                                                    | 60947-6-1                     |
| DC-40                                  | Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance                                                 | 60947-6-2                     |
| DC-41                                  | Non-inductive or slightly inductive loads, resistance furnaces                                                                                             | 60947-6-2                     |
| DC-43                                  | Shunt-motors: starting, plugging <sup>②</sup> , inching <sup>③</sup> , dynamic breaking of DC                                                              | 60947-6-2                     |
| DC-45                                  | Series-motors: starting, plugging <sup>②</sup> , inching <sup>③</sup> , dynamic breaking of DC                                                             | 60947-6-2                     |
| DC-46                                  | Switching of incandescent lamps                                                                                                                            | 60947-6-2                     |

**Notes**<sup>①</sup> 60947-1 © IEC: 2004.<sup>②</sup> Plugging is stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.<sup>③</sup> Inching (jogging) is energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

## Motor Ratings Data

### Ampere Rating of AC and DC Motors

Ampere ratings of motors vary somewhat, depending upon the type of motor. The values given below are for drip-proof, Class B insulated (T Frame) where available, 1.15 service factor, NEMA Design B motors. These values represent an average full load motor current that was calculated from the motor performance data published by several motor manufacturers. In the case of high torque squirrel cage motors, the ampere ratings will be at least 10% greater than the values given below.

**Caution—** These average ratings could be high or low for a specific motor and therefore heater coil selection on this basis always involves risk. For fully reliable motor protection, select heater coils on the basis of full load current rating as shown on the motor nameplate.

### Ampere Ratings of Three-Phase, 60 Hz, AC Induction Motor

| hp    | Syn.<br>Speed<br>RPM | Current in Amperes |      |        |      |      |
|-------|----------------------|--------------------|------|--------|------|------|
|       |                      | 200V               | 230V | 380V ① | 460V | 575V |
| 1/4   | 1800                 | 1.09               | 0.95 | 0.55   | 0.48 | 0.38 |
|       | 1200                 | 1.61               | 1.40 | 0.81   | 0.70 | 0.56 |
|       | 900                  | 1.84               | 1.60 | 0.93   | 0.80 | 0.64 |
| 1/3   | 1800                 | 1.37               | 1.19 | 0.69   | 0.60 | 0.48 |
|       | 1200                 | 1.83               | 1.59 | 0.92   | 0.80 | 0.64 |
|       | 900                  | 2.07               | 1.80 | 1.04   | 0.90 | 0.72 |
| 1/2   | 1800                 | 1.98               | 1.72 | 0.99   | 0.86 | 0.69 |
|       | 1200                 | 2.47               | 2.15 | 1.24   | 1.08 | 0.86 |
|       | 900                  | 2.74               | 2.38 | 1.38   | 1.19 | 0.95 |
| 3/4   | 1800                 | 2.83               | 2.46 | 1.42   | 1.23 | 0.98 |
|       | 1200                 | 3.36               | 2.92 | 1.69   | 1.46 | 1.17 |
|       | 900                  | 3.75               | 3.26 | 1.88   | 1.63 | 1.30 |
| 1     | 3600                 | 3.22               | 2.80 | 1.70   | 1.40 | 1.12 |
|       | 1800                 | 4.09               | 3.56 | 2.06   | 1.78 | 1.42 |
|       | 1200                 | 4.32               | 3.76 | 2.28   | 1.88 | 1.50 |
|       | 900                  | 4.95               | 4.30 | 2.60   | 2.15 | 1.72 |
| 1-1/2 | 3600                 | 5.01               | 4.36 | 2.64   | 2.18 | 1.74 |
|       | 1800                 | 5.59               | 4.86 | 2.94   | 2.43 | 1.94 |
|       | 1200                 | 6.07               | 5.28 | 3.20   | 2.64 | 2.11 |
|       | 900                  | 6.44               | 5.60 | 3.39   | 2.80 | 2.24 |
| 2     | 3600                 | 6.44               | 5.60 | 3.39   | 2.80 | 2.24 |
|       | 1800                 | 7.36               | 6.40 | 3.87   | 3.20 | 2.56 |
|       | 1200                 | 7.87               | 6.84 | 4.14   | 3.42 | 2.74 |
|       | 900                  | 9.09               | 7.90 | 4.77   | 3.95 | 3.16 |
| 3     | 3600                 | 9.59               | 8.34 | 5.02   | 4.17 | 3.34 |
|       | 1800                 | 10.8               | 9.40 | 5.70   | 4.70 | 3.76 |
|       | 1200                 | 11.7               | 10.2 | 6.20   | 5.12 | 4.10 |
|       | 900                  | 13.1               | 11.4 | 6.90   | 5.70 | 4.55 |
| 5     | 3600                 | 15.5               | 13.5 | 8.20   | 6.76 | 5.41 |
|       | 1800                 | 16.6               | 14.4 | 8.74   | 7.21 | 5.78 |
|       | 1200                 | 18.2               | 15.8 | 9.59   | 7.91 | 6.32 |
|       | 900                  | 18.3               | 15.9 | 9.60   | 7.92 | 6.33 |
| 7-1/2 | 3600                 | 22.4               | 19.5 | 11.8   | 9.79 | 7.81 |
|       | 1800                 | 24.7               | 21.5 | 13.0   | 10.7 | 8.55 |
|       | 1200                 | 25.1               | 21.8 | 13.2   | 10.9 | 8.70 |
|       | 900                  | 26.5               | 23.0 | 13.9   | 11.5 | 9.19 |
| 10    | 3600                 | 29.2               | 25.4 | 15.4   | 12.7 | 10.1 |
|       | 1800                 | 30.8               | 26.8 | 16.3   | 13.4 | 10.7 |
|       | 1200                 | 32.2               | 28.0 | 16.9   | 14.0 | 11.2 |
|       | 900                  | 35.1               | 30.5 | 18.5   | 15.2 | 12.2 |

#### Note

① 380V 50 Hz.

**Ampere Ratings of Three-Phase, 60 Hz,  
AC Induction Motor, continued**

| hp | Syn.<br>Speed<br>RPM | Current in Amperes |      |        |      |      |
|----|----------------------|--------------------|------|--------|------|------|
|    |                      | 200V               | 230V | 380V ① | 460V | 575V |
| 15 | 3600                 | 41.9               | 36.4 | 22.0   | 18.2 | 14.5 |
|    | 1800                 | 45.1               | 39.2 | 23.7   | 19.6 | 15.7 |
|    | 1200                 | 47.6               | 41.4 | 25.0   | 20.7 | 16.5 |
|    | 900                  | 51.2               | 44.5 | 26.9   | 22.2 | 17.8 |
| 20 | 3600                 | 58.0               | 50.4 | 30.5   | 25.2 | 20.1 |
|    | 1800                 | 58.9               | 51.2 | 31.0   | 25.6 | 20.5 |
|    | 1200                 | 60.7               | 52.8 | 31.9   | 26.4 | 21.1 |
|    | 900                  | 63.1               | 54.9 | 33.2   | 27.4 | 21.9 |
| 25 | 3600                 | 69.9               | 60.8 | 36.8   | 30.4 | 24.3 |
|    | 1800                 | 74.5               | 64.8 | 39.2   | 32.4 | 25.9 |
|    | 1200                 | 75.4               | 65.6 | 39.6   | 32.8 | 26.2 |
|    | 900                  | 77.4               | 67.3 | 40.7   | 33.7 | 27.0 |
| 30 | 3600                 | 84.8               | 73.7 | 44.4   | 36.8 | 29.4 |
|    | 1800                 | 86.9               | 75.6 | 45.7   | 37.8 | 30.2 |
|    | 1200                 | 90.6               | 78.8 | 47.6   | 39.4 | 31.5 |
|    | 900                  | 94.1               | 81.8 | 49.5   | 40.9 | 32.7 |
| 40 | 3600                 | 111                | 96.4 | 58.2   | 48.2 | 38.5 |
|    | 1800                 | 116                | 101  | 61.0   | 50.4 | 40.3 |
|    | 1200                 | 117                | 102  | 61.2   | 50.6 | 40.4 |
|    | 900                  | 121                | 105  | 63.2   | 52.2 | 41.7 |
| 50 | 3600                 | 138                | 120  | 72.9   | 60.1 | 48.2 |
|    | 1800                 | 143                | 124  | 75.2   | 62.2 | 49.7 |
|    | 1200                 | 145                | 126  | 76.2   | 63.0 | 50.4 |
|    | 900                  | 150                | 130  | 78.5   | 65.0 | 52.0 |
| 60 | 3600                 | 164                | 143  | 86.8   | 71.7 | 57.3 |
|    | 1800                 | 171                | 140  | 90.0   | 74.5 | 59.4 |
|    | 1200                 | 173                | 150  | 91.0   | 75.0 | 60.0 |
|    | 900                  | 177                | 154  | 93.1   | 77.0 | 61.5 |

| hp  | Syn.<br>Speed<br>RPM | Current in Amperes |      |        |      |      |
|-----|----------------------|--------------------|------|--------|------|------|
|     |                      | 200V               | 230V | 380V ① | 460V | 575V |
| 75  | 3600                 | 206                | 179  | 108    | 89.6 | 71.7 |
|     | 1800                 | 210                | 183  | 111    | 91.6 | 73.2 |
|     | 1200                 | 212                | 184  | 112    | 92.0 | 73.5 |
|     | 900                  | 222                | 193  | 117    | 96.5 | 77.5 |
| 100 | 3600                 | 266                | 231  | 140    | 115  | 92.2 |
|     | 1800                 | 271                | 236  | 144    | 118  | 94.8 |
|     | 1200                 | 275                | 239  | 145    | 120  | 95.6 |
|     | 900                  | 290                | 252  | 153    | 126  | 101  |
| 125 | 3600                 | —                  | 292  | 176    | 146  | 116  |
|     | 1800                 | —                  | 293  | 177    | 147  | 117  |
|     | 1200                 | —                  | 298  | 180    | 149  | 119  |
|     | 900                  | —                  | 305  | 186    | 153  | 122  |
| 150 | 3600                 | —                  | 343  | 208    | 171  | 137  |
|     | 1800                 | —                  | 348  | 210    | 174  | 139  |
|     | 1200                 | —                  | 350  | 210    | 174  | 139  |
|     | 900                  | —                  | 365  | 211    | 183  | 146  |
| 200 | 3600                 | —                  | 452  | 257    | 226  | 181  |
|     | 1800                 | —                  | 458  | 265    | 229  | 184  |
|     | 1200                 | —                  | 460  | 266    | 230  | 184  |
|     | 900                  | —                  | 482  | 279    | 241  | 193  |
| 250 | 3600                 | —                  | 559  | 338    | 279  | 223  |
|     | 1800                 | —                  | 568  | 343    | 284  | 227  |
|     | 1200                 | —                  | 573  | 345    | 287  | 229  |
|     | 900                  | —                  | 600  | 347    | 300  | 240  |
| 300 | 1800                 | —                  | 678  | 392    | 339  | 271  |
|     | 1200                 | —                  | 684  | 395    | 342  | 274  |
| 400 | 1800                 | —                  | 896  | 518    | 448  | 358  |
| 500 | 1800                 | —                  | 1110 | 642    | 555  | 444  |

**Single-Phase AC Motors**

The following values of full-load currents are for motors running at usual speeds and motors with normal torque characteristics. Motors built for especially low speeds or high torques may have higher full-load currents and multispeed motors will have full-load current varying with speed, in which case the nameplate current ratings shall be used.

The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120 and 220 to 240V.

**Full-Load Currents in Amperes, Single-Phase  
Alternating-Current Motor**

| hp    | 115V | 200V | 208V | 230V |
|-------|------|------|------|------|
| 1/6   | 4.4  | 2.5  | 2.4  | 2.2  |
| 1/4   | 5.8  | 3.3  | 3.2  | 2.9  |
| 1/3   | 7.2  | 4.1  | 4.0  | 3.6  |
| 1/2   | 9.8  | 5.6  | 5.4  | 4.9  |
| 3/4   | 13.8 | 7.9  | 7.6  | 6.9  |
| 1     | 16   | 9.2  | 8.8  | 8    |
| 1-1/2 | 20   | 11.5 | 11   | 10   |
| 2     | 24   | 13.8 | 13.2 | 12   |
| 3     | 34   | 19.6 | 18.7 | 17   |
| 5     | 56   | 32.2 | 30.8 | 28   |
| 7-1/2 | 80   | 46   | 44   | 40   |
| 10    | 100  | 57.5 | 55   | 50   |

**Note**

① 380V 50 Hz.

**Three-Phase AC Motors**

The following values of full-load currents are typical for motors running at speeds usual for belted motors and motors with normal torque characteristics.

Motors built for low speeds (1,200 RPM or less) or high torques may require more running current and multi-speed motors will have full-load current varying with speed. In these cases the nameplate current rating shall be used.

The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120, 220 to 240, 440 to 480 and 550 to 600V.

**Full-Load Current Three-Phase Alternating-Current Motors**

| hp    | Induction Type Squirrel Cage and Wound-Rotor Amperes |      |      |      |      |      | Synchronous Type Unity Power Factor <sup>①</sup> Amperes |      |      |
|-------|------------------------------------------------------|------|------|------|------|------|----------------------------------------------------------|------|------|
|       | 115V                                                 | 200V | 208V | 230V | 460V | 575V | 230V                                                     | 460V | 575V |
| 1/2   | 4.4                                                  | 2.5  | 2.4  | 2.2  | 1.1  | .9   | —                                                        | —    | —    |
| 3/4   | 6.4                                                  | 3.7  | 3.5  | 3.2  | 1.6  | 1.3  | —                                                        | —    | —    |
| 1     | 8.4                                                  | 4.8  | 4.6  | 4.2  | 2.1  | 1.7  | —                                                        | —    | —    |
| 1-1/2 | 12.0                                                 | 6.9  | 6.6  | 6.0  | 3.0  | 2.4  | —                                                        | —    | —    |
| 2     | 13.6                                                 | 7.8  | 7.5  | 6.8  | 3.4  | 2.7  | —                                                        | —    | —    |
| 3     | —                                                    | 11.0 | 10.6 | 9.6  | 4.8  | 3.9  | —                                                        | —    | —    |
| 5     | —                                                    | 17.5 | 16.7 | 15.2 | 7.6  | 6.1  | —                                                        | —    | —    |
| 7-1/2 | —                                                    | 25.3 | 24.2 | 22   | 11   | 9    | —                                                        | —    | —    |
| 10    | —                                                    | 32.2 | 30.8 | 28   | 14   | 11   | —                                                        | —    | —    |
| 15    | —                                                    | 48.3 | 46.2 | 42   | 21   | 17   | —                                                        | —    | —    |
| 20    | —                                                    | 62.1 | 59.4 | 54   | 27   | 22   | —                                                        | —    | —    |
| 25    | —                                                    | 78.2 | 74.8 | 68   | 34   | 27   | 53                                                       | 26   | 21   |
| 30    | —                                                    | 92   | 88   | 80   | 40   | 32   | 63                                                       | 32   | 26   |
| 40    | —                                                    | 120  | 114  | 104  | 52   | 41   | 83                                                       | 41   | 33   |
| 50    | —                                                    | 150  | 143  | 130  | 65   | 52   | 104                                                      | 52   | 42   |
| 60    | —                                                    | 177  | 169  | 154  | 77   | 62   | 123                                                      | 61   | 49   |
| 75    | —                                                    | 221  | 211  | 192  | 96   | 77   | 155                                                      | 78   | 62   |
| 100   | —                                                    | 285  | 273  | 248  | 124  | 99   | 202                                                      | 101  | 81   |
| 125   | —                                                    | 359  | 343  | 312  | 156  | 125  | 253                                                      | 126  | 101  |
| 150   | —                                                    | 414  | 396  | 360  | 180  | 144  | 302                                                      | 151  | 121  |
| 200   | —                                                    | 552  | 528  | 480  | 240  | 192  | 400                                                      | 201  | 161  |
| 250   | —                                                    | —    | —    | —    | 302  | 242  | —                                                        | —    | —    |
| 300   | —                                                    | —    | —    | —    | 361  | 289  | —                                                        | —    | —    |
| 350   | —                                                    | —    | —    | —    | 414  | 336  | —                                                        | —    | —    |
| 400   | —                                                    | —    | —    | —    | 477  | 382  | —                                                        | —    | —    |
| 450   | —                                                    | —    | —    | —    | 515  | 412  | —                                                        | —    | —    |
| 500   | —                                                    | —    | —    | —    | 590  | 472  | —                                                        | —    | —    |

**Note**

<sup>①</sup> For 90 and 80 percent power factor, the above figures shall be multiplied by 1.1 and 1.25 respectively.

**DC Motors**

The following values of full-load currents are for motors running at base speed.

**Full-Load Current in Amperes, Direct-Current Motors**

| hp    | Armature Voltage Rating <sup>①</sup> |      | Ampere Capacity of Fuses for Motors<br>Recommended Values |      |
|-------|--------------------------------------|------|-----------------------------------------------------------|------|
|       | 120V                                 | 240V | 120V                                                      | 240V |
| 1/4   | 3.1                                  | 1.6  | 5                                                         | 3    |
| 1/3   | 4.1                                  | 2.0  | 5                                                         | 3    |
| 1/2   | 5.4                                  | 2.7  | 7                                                         | 3    |
| 3/4   | 7.6                                  | 3.8  | 10                                                        | 5    |
| 1     | 9.5                                  | 4.7  | 15                                                        | 7    |
| 1-1/2 | 13.2                                 | 6.6  | 20                                                        | 10   |
| 2     | 17                                   | 8.5  | 25                                                        | 12   |
| 3     | 25                                   | 12.2 | 30                                                        | 15   |
| 5     | 40                                   | 20   | 50                                                        | 25   |
| 7-1/2 | 58                                   | 29   | 80                                                        | 40   |
| 10    | 76                                   | 38   | 100                                                       | 50   |
| 15    | —                                    | 55   | —                                                         | 75   |
| 20    | —                                    | 72   | —                                                         | 100  |
| 25    | —                                    | 89   | —                                                         | 125  |
| 30    | —                                    | 106  | —                                                         | 150  |
| 40    | —                                    | 140  | —                                                         | 200  |
| 50    | —                                    | 173  | —                                                         | 250  |
| 60    | —                                    | 206  | —                                                         | 275  |
| 75    | —                                    | 255  | —                                                         | 350  |
| 100   | —                                    | 341  | —                                                         | 500  |
| 125   | —                                    | 425  | —                                                         | 600  |
| 150   | —                                    | 506  | —                                                         | —    |
| 200   | —                                    | 675  | —                                                         | —    |

**Note**

<sup>①</sup> These are average direct-current quantities.



## 1 Ampacities of Insulated Conductors (Based on 2005 NEC)

**Table 310.16.** Allowable Ampacities of Insulated Conductors Rated 0–2000V, 60°–90°C [140°–194°F], Not More Than Three Current-Carrying Conductors in Raceway or Cable or Earth (Directly Buried), Based on Ambient Temperature of 30°C [86°F] ①

| Temperature Rating of Conductor. See NEC Table 310-13. |                    |                                                                                   |                                                                                                                                      | Aluminum or Copper-Clad Aluminum |                                                                     |                                                                                                             |              |
|--------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------|
| Copper                                                 |                    |                                                                                   |                                                                                                                                      |                                  |                                                                     |                                                                                                             |              |
| Size                                                   | 60°C [140°F]       | 75°C [167°F]                                                                      | 90°C [194°F]                                                                                                                         | 60°C [140°F]                     | 75°C [167°F]                                                        | 90°C [194°F]                                                                                                | Size         |
| AWG<br>kcmil                                           | Types<br>TWT, UF ② | Types<br>FEPW ②, RH ②, RHW ②,<br>THHW ②, THW ②,<br>THWN ②, XHHW ②,<br>USE ②, ZW ② | Types<br>TBS, SA, SIS, FEP ②, FEPB ②, MI,<br>RHH ②, RHW-2, THHN ②, THHW ②,<br>THW-2 ②, THWN-2 ②, USE-2,<br>XHH, XHHW ②, XHHW-2, ZW-2 | Types<br>TW ②, UF ②              | Types<br>RH ②, RHW ②,<br>THHW ②, THW ②,<br>THWN ②, XHHW ②,<br>USE ② | Types<br>TBS, SA, SIS, THHN ②,<br>THHW ②, THW-2, THWN-2,<br>RHH ②, RHW-2, USE-2, XHH,<br>XHHW, XHHW-2, ZW-2 | AWG<br>kcmil |
| 18                                                     | —                  | —                                                                                 | 14                                                                                                                                   | —                                | —                                                                   | —                                                                                                           | —            |
| 16                                                     | —                  | —                                                                                 | 18                                                                                                                                   | —                                | —                                                                   | —                                                                                                           | —            |
| 14                                                     | 20†                | 20†                                                                               | 25†                                                                                                                                  | —                                | —                                                                   | —                                                                                                           | —            |
| 12                                                     | 25†                | 25†                                                                               | 30†                                                                                                                                  | 20†                              | 20†                                                                 | 25†                                                                                                         | 12           |
| 10                                                     | 30                 | 35†                                                                               | 40†                                                                                                                                  | 25                               | 30†                                                                 | 35†                                                                                                         | 10           |
| 8                                                      | 40                 | 50                                                                                | 55                                                                                                                                   | 30                               | 40                                                                  | 45                                                                                                          | 8            |
| 6                                                      | 55                 | 65                                                                                | 75                                                                                                                                   | 40                               | 50                                                                  | 60                                                                                                          | 6            |
| 70                                                     | 85                 | 95                                                                                | 55                                                                                                                                   | 65                               | 75                                                                  | 4                                                                                                           | 70           |
| 85                                                     | 100                | 110                                                                               | 65                                                                                                                                   | 75                               | 85                                                                  | 3                                                                                                           | 85           |
| 95                                                     | 115                | 130                                                                               | 75                                                                                                                                   | 90                               | 100                                                                 | 2                                                                                                           | 95           |
| 110                                                    | 130                | 150                                                                               | 85                                                                                                                                   | 100                              | 115                                                                 | 1                                                                                                           | 110          |
| 1/0                                                    | 125                | 150                                                                               | 170                                                                                                                                  | 100                              | 120                                                                 | 135                                                                                                         | 1/0          |
| 2/0                                                    | 145                | 175                                                                               | 195                                                                                                                                  | 115                              | 135                                                                 | 150                                                                                                         | 2/0          |
| 3/0                                                    | 165                | 200                                                                               | 225                                                                                                                                  | 130                              | 155                                                                 | 175                                                                                                         | 3/0          |
| 4/0                                                    | 195                | 230                                                                               | 260                                                                                                                                  | 150                              | 180                                                                 | 205                                                                                                         | 4/0          |
| 250                                                    | 215                | 255                                                                               | 290                                                                                                                                  | 170                              | 205                                                                 | 230                                                                                                         | 250          |
| 300                                                    | 240                | 285                                                                               | 320                                                                                                                                  | 190                              | 230                                                                 | 255                                                                                                         | 300          |
| 350                                                    | 260                | 310                                                                               | 350                                                                                                                                  | 210                              | 250                                                                 | 280                                                                                                         | 350          |
| 400                                                    | 280                | 335                                                                               | 380                                                                                                                                  | 225                              | 270                                                                 | 305                                                                                                         | 400          |
| 500                                                    | 320                | 380                                                                               | 430                                                                                                                                  | 260                              | 310                                                                 | 350                                                                                                         | 500          |
| 600                                                    | 355                | 420                                                                               | 475                                                                                                                                  | 285                              | 340                                                                 | 385                                                                                                         | 600          |
| 700                                                    | 385                | 460                                                                               | 520                                                                                                                                  | 310                              | 375                                                                 | 420                                                                                                         | 700          |
| 750                                                    | 400                | 475                                                                               | 535                                                                                                                                  | 320                              | 385                                                                 | 435                                                                                                         | 750          |
| 800                                                    | 410                | 490                                                                               | 555                                                                                                                                  | 330                              | 395                                                                 | 450                                                                                                         | 800          |
| 600                                                    | 355                | 420                                                                               | 475                                                                                                                                  | 285                              | 340                                                                 | 385                                                                                                         | 600          |
| 700                                                    | 385                | 460                                                                               | 520                                                                                                                                  | 310                              | 375                                                                 | 420                                                                                                         | 700          |
| 750                                                    | 400                | 475                                                                               | 535                                                                                                                                  | 320                              | 385                                                                 | 435                                                                                                         | 750          |
| 800                                                    | 410                | 490                                                                               | 555                                                                                                                                  | 330                              | 395                                                                 | 450                                                                                                         | 800          |
| 900                                                    | 435                | 520                                                                               | 585                                                                                                                                  | 355                              | 425                                                                 | 480                                                                                                         | 900          |
| 1000                                                   | 455                | 545                                                                               | 615                                                                                                                                  | 375                              | 445                                                                 | 500                                                                                                         | 1000         |
| 1250                                                   | 495                | 590                                                                               | 665                                                                                                                                  | 405                              | 485                                                                 | 545                                                                                                         | 1250         |
| 1500                                                   | 520                | 625                                                                               | 705                                                                                                                                  | 435                              | 520                                                                 | 585                                                                                                         | 1500         |
| 1750                                                   | 545                | 650                                                                               | 735                                                                                                                                  | 455                              | 545                                                                 | 615                                                                                                         | 1750         |
| 2000                                                   | 560                | 665                                                                               | 750                                                                                                                                  | 470                              | 560                                                                 | 630                                                                                                         | 2000         |

**Notes**

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② Unless otherwise specifically permitted elsewhere in this *Code*, the overcurrent protection for conductor types marked with an obelisk (†) shall not exceed 15A for No. 14, 20A for No. 12 and 30A for No. 10 copper; or 15A for No. 12 and 25A for No. 10 aluminum and copper-clad aluminum after any correction factors for ambient temperature and number of conductors have been applied.

**Table 310.16. Allowable Ampacities of Insulated Conductors Rated 0–2000V, 60°–90°C [140°–194°F], Not More Than Three Current-Carrying Conductors in Raceway or Cable or Earth (Directly Buried), Based on Ambient Temperature of 30°C [86°F]—Correction Factors** <sup>①</sup>

| Temperature Rating of Conductor. See NEC Table 310-13. |                                                                                                                                                                                              |                                                                                                                                                                                                                                      |              | Aluminum or Copper-Clad Aluminum                                                                                                                              |                                                                                                                                                 |              |                     |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------|
| Copper                                                 |                                                                                                                                                                                              |                                                                                                                                                                                                                                      |              |                                                                                                                                                               |                                                                                                                                                 |              |                     |
| Size                                                   | 60°C [140°F]                                                                                                                                                                                 | 75°C [167°F]                                                                                                                                                                                                                         | 90°C [194°F] | 60°C [140°F]                                                                                                                                                  | 75°C [167°F]                                                                                                                                    | 90°C [194°F] | Size                |
|                                                        | Types<br>FEPW <sup>②</sup> , RH <sup>②</sup> , RHW <sup>②</sup> ,<br>THHW <sup>②</sup> , THW <sup>②</sup> ,<br>THWN <sup>②</sup> , XHHW <sup>②</sup> ,<br>USE <sup>②</sup> , ZW <sup>②</sup> | Types<br>TBS, SA, SIS, FEP <sup>②</sup> , FEPB <sup>②</sup> , MI,<br>RHH <sup>②</sup> , RHW-2, THHN <sup>②</sup> , THHW <sup>②</sup> ,<br>THW-2 <sup>②</sup> , THWN-2 <sup>②</sup> , USE-2,<br>XHH, XHHW <sup>②</sup> , XHHW-2, ZW-2 |              | Types<br>RH <sup>②</sup> , RHW <sup>②</sup> ,<br>THHW <sup>②</sup> , THW <sup>②</sup> ,<br>THWN <sup>②</sup> , XHHW <sup>②</sup> ,<br>USE <sup>②</sup>        | Types<br>TBS, SA, SIS, THHN <sup>②</sup> ,<br>THHW <sup>②</sup> , THW-2, THWN-2,<br>RHH <sup>②</sup> , RHW-2, USE-2, XHH,<br>XHHW, XHHW-2, ZW-2 |              |                     |
| AWG<br>kcmil                                           | Types<br>TW <sup>②</sup> , UF <sup>②</sup>                                                                                                                                                   |                                                                                                                                                                                                                                      |              | Types<br>TW <sup>②</sup> , UF <sup>②</sup>                                                                                                                    |                                                                                                                                                 |              | AWG<br>kcmil        |
| Ambient<br>Temp. °C                                    | For Ambient Temperatures Other Than 30°C [86°F], Multiply the Allowable Ampacities Shown in the Table on Page V5-T1-256 by the Appropriate Factor Shown Below                                |                                                                                                                                                                                                                                      |              | For Ambient Temperatures Other Than 30°C [86°F], Multiply the Allowable Ampacities Shown in the Table on Page V5-T1-256 by the Appropriate Factor Shown Below |                                                                                                                                                 |              | Ambient<br>Temp. °F |
| 21–25                                                  | 1.08                                                                                                                                                                                         | 1.05                                                                                                                                                                                                                                 | 1.04         | 1.08                                                                                                                                                          | 1.05                                                                                                                                            | 1.04         | 70–77               |
| 26–30                                                  | 1.00                                                                                                                                                                                         | 1.00                                                                                                                                                                                                                                 | 1.00         | 1.00                                                                                                                                                          | 1.00                                                                                                                                            | 1.00         | 78–86               |
| 31–35                                                  | 0.91                                                                                                                                                                                         | 0.94                                                                                                                                                                                                                                 | 0.96         | 0.91                                                                                                                                                          | 0.94                                                                                                                                            | 0.96         | 87–95               |
| 36–40                                                  | 0.82                                                                                                                                                                                         | 0.88                                                                                                                                                                                                                                 | 0.91         | 0.82                                                                                                                                                          | 0.88                                                                                                                                            | 0.91         | 96–104              |
| 41–45                                                  | 0.71                                                                                                                                                                                         | 0.82                                                                                                                                                                                                                                 | 0.87         | 0.71                                                                                                                                                          | 0.82                                                                                                                                            | 0.87         | 105–113             |
| 46–50                                                  | 0.58                                                                                                                                                                                         | 0.75                                                                                                                                                                                                                                 | 0.82         | 0.58                                                                                                                                                          | 0.75                                                                                                                                            | 0.82         | 114–122             |
| 51–55                                                  | 0.41                                                                                                                                                                                         | 0.67                                                                                                                                                                                                                                 | 0.76         | 0.41                                                                                                                                                          | 0.67                                                                                                                                            | 0.76         | 123–131             |
| 56–60                                                  | —                                                                                                                                                                                            | 0.58                                                                                                                                                                                                                                 | 0.71         | —                                                                                                                                                             | 0.58                                                                                                                                            | 0.71         | 132–140             |
| 61–70                                                  | —                                                                                                                                                                                            | 0.33                                                                                                                                                                                                                                 | 0.58         | —                                                                                                                                                             | 0.33                                                                                                                                            | 0.58         | 141–158             |
| 71–80                                                  | —                                                                                                                                                                                            | —                                                                                                                                                                                                                                    | 0.41         | —                                                                                                                                                             | —                                                                                                                                               | 0.41         | 159–176             |

Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacities shall be reduced as shown in the following table:

**Table 310.15 (B)(2)(a). Adjustment Factor for More Than Three Current-Carrying Conductors in Raceway or Cable**

| Number of Current-Carrying Conductors | Percent of Values in Tables as Adjusted for Ambient Temperature if Necessary |
|---------------------------------------|------------------------------------------------------------------------------|
| 4–6                                   | 80                                                                           |
| 7–9                                   | 70                                                                           |
| 10–20                                 | 50                                                                           |
| 21–30                                 | 45                                                                           |
| 31–40                                 | 40                                                                           |
| 41 and above                          | 35                                                                           |

Where single conductors or multiconductor cables are stacked or bundled longer than 24 in (610 mm) without maintaining spacing and are not installed in raceways, the allowable ampacity of each conductor shall be reduced as shown in the above table.

#### Notes

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- <sup>②</sup> Unless otherwise specifically permitted elsewhere in this Code, the overcurrent protection for conductor types marked with an obelisk (†) shall not exceed 15A for No. 14, 20A for No. 12 and 30A for No. 10 copper; or 15A for No. 12 and 25A for No. 10 aluminum and copper-clad aluminum after any correction factors for ambient temperature and number of conductors have been applied.

**Table 310.18. Allowable Ampacities of Three Single Insulated Conductors Rated 0–2000V, 150°–250°C [302°–482°F], in Raceway or Cable Based on Ambient Air Temperature of 40°C [104°F]** ①

| Temperature Rating of Conductor. See NEC Table 310-13. |                  |                      |                                                   |                                            |              |
|--------------------------------------------------------|------------------|----------------------|---------------------------------------------------|--------------------------------------------|--------------|
| Size                                                   | 150°C [302°F]    | 200°C [392°F]        | 250°C [482°F]                                     | 150°C [302°F]                              | Size         |
| AWG<br>kcmil                                           | Type Z<br>Copper | Types FEP, FEPB, PFA | Types PFAH, TFE<br>Nickel or Nickel-Coated Copper | Type Z<br>Aluminum or Copper-Clad Aluminum | AWG<br>kcmil |
| 14                                                     | 34               | 36                   | 39                                                | —                                          | 14           |
| 12                                                     | 43               | 45                   | 54                                                | 30                                         | 12           |
| 10                                                     | 55               | 60                   | 73                                                | 44                                         | 10           |
| 8                                                      | 76               | 83                   | 93                                                | 57                                         | 8            |
| 6                                                      | 96               | 110                  | 117                                               | 75                                         | 6            |
| 4                                                      | 120              | 125                  | 148                                               | 94                                         | 4            |
| 3                                                      | 143              | 152                  | 166                                               | 109                                        | 3            |
| 2                                                      | 160              | 171                  | 191                                               | 124                                        | 2            |
| 1                                                      | 186              | 197                  | 215                                               | 145                                        | 1            |
| 1/0                                                    | 215              | 229                  | 244                                               | 169                                        | 1/0          |
| 2/0                                                    | 251              | 260                  | 273                                               | 198                                        | 2/0          |
| 3/0                                                    | 288              | 297                  | 308                                               | 227                                        | 3/0          |
| 4/0                                                    | 332              | 346                  | 361                                               | 260                                        | 4/0          |
| 250                                                    | —                | —                    | —                                                 | —                                          | 250          |
| 300                                                    | —                | —                    | —                                                 | —                                          | 300          |
| 350                                                    | —                | —                    | —                                                 | —                                          | 350          |
| 400                                                    | —                | —                    | —                                                 | —                                          | 400          |
| 500                                                    | —                | —                    | —                                                 | —                                          | 500          |
| 600                                                    | —                | —                    | —                                                 | —                                          | 600          |
| 700                                                    | —                | —                    | —                                                 | —                                          | 700          |
| 750                                                    | —                | —                    | —                                                 | —                                          | 750          |
| 800                                                    | —                | —                    | —                                                 | —                                          | 800          |
| 1000                                                   | —                | —                    | —                                                 | —                                          | 1000         |
| 1500                                                   | —                | —                    | —                                                 | —                                          | 1500         |
| 2000                                                   | —                | —                    | —                                                 | —                                          | 2000         |

#### Correction Factors

| Ambient<br>Temp. °C | For Ambient Temperatures Other Than 40°C [104°F], Multiply the Allowable Ampacities Shown Above By the Appropriate Factor Shown Below |      |      |      | Ambient<br>Temp. °F |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------|------|------|------|---------------------|
| 41–50               | 0.95                                                                                                                                  | 0.97 | 0.98 | 0.95 | 105–122             |
| 51–60               | 0.90                                                                                                                                  | 0.94 | 0.95 | 0.90 | 123–140             |
| 61–70               | 0.85                                                                                                                                  | 0.90 | 0.93 | 0.85 | 141–158             |
| 71–80               | 0.80                                                                                                                                  | 0.87 | 0.90 | 0.80 | 159–176             |
| 81–90               | 0.74                                                                                                                                  | 0.83 | 0.87 | 0.74 | 177–194             |
| 91–100              | 0.67                                                                                                                                  | 0.79 | 0.85 | 0.67 | 195–212             |
| 101–120             | 0.52                                                                                                                                  | 0.71 | 0.79 | 0.52 | 213–248             |
| 121–140             | 0.30                                                                                                                                  | 0.61 | 0.72 | 0.30 | 249–284             |
| 141–160             | —                                                                                                                                     | 0.50 | 0.65 | —    | 285–320             |
| 161–180             | —                                                                                                                                     | 0.35 | 0.58 | —    | 321–356             |
| 181–200             | —                                                                                                                                     | —    | 0.49 | —    | 357–392             |
| 201–225             | —                                                                                                                                     | —    | 0.35 | —    | 393–437             |

#### Note

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