Contactors

Motor Protection and Monitoring Relays

Manual Motor Protectors and Controllers

Soft Starters

Drives

For our complete product offering, see Volume 5—Motor Control and Protection, CA08100006E and Volume 6—Solid-State Motor Control, CA08100007E.

Product Overview

Contactors Selection Guide

Description	Definite Purpose Contactors	*XT* IEC Miniature Contactors	*XT* IEC Contactors
	Page V9-T2-3	**Page V9-T2-7**	**Page V9-T2-9**
Type			
	Definite purpose	IEC	IEC
Approvals			
	UL® Recognized, CSA®, CE, ARI, RoHS	UL, IEC EN 60947, CE, CSA, RoHS	UL, IEC EN 60947, CE, CSA, RoHS
Technical Data			
Pole configurations	1P, 2P, 3P, 4P	3P, 4P	3P, 4P
Inductive Amp ratings	To 360A	To 8.8A (AC-3)	To 1600A (AC-3)
Resistive Amp ratings	To 360A	To 20A (AC-1)	To 3185A (AC-1)
Typical electrical operations	To 300,000	To 750,000	To 1,400,000

For our complete product offering, see Volume 5—Motor Control and Protection, CA08100006E.

Compact Definite Purpose Contactors

Features

- Insulation voltage: 690V
- Current rated and hp/kW rated
- Magnet coil: Class F, 155°C
- Contact arc covers are standard on all contactors

Product Selection

Compact Definite Purpose Contactors—Open Type

Ampere Ratings ①

Inductive Full Load	Resistive	Locked Rotor 240–277V	Catalog Number ②
Single-Pole			
30	40	150	**C25ANB130_**
40	50	240	**C25ANB140_**
Single-Pole with Shunt			
30	40	150	**C25CNB130_**
40	50	240	**C25CNB140_**
Two-Pole			
25	35	150	**C25BNB225_**
30	40	150	**C25BNB230_**
40	50	240	**C25BNB240_**

Magnet Coil Selection

AC Coil Voltage 50/60 Hz	Coil Suffix
24	**T**
110–120	**A**
208–240	**B**

Notes

① Rating per pole.

② Replace underscore (_) in catalog number with coil suffix letter from table at left.

Catalog Number Selection

Definite Purpose Contactors

2

Definite Purpose Contactors

C 25 D N A 2 15 A A

Model
C = Contactor
A = Three-phase starter
B = Single-phase starter

Type
25 = Non-reversing contactors
27 = Non-reversing starters
29 = Non-reversing starters
65 = Reversing contactors

Contactor Frame Size
A = Compact, single-pole
B = Compact, two-pole
C = Compact, single-pole w/shunt
D = 15–50A, two- and three-pole
E = 25–40A, four-pole
F = 60–75A, two- and three-pole
G = 90A, two- and three-pole
H = 120A, two- and three-pole
K = 200 and 300A, three-pole
L = 360A, three-pole

For Starters Only
C = Common control wiring
S = Separate control wiring

Enclosure Type
N = Open with metal mounting plate
R = Open with DIN rail mounting adapter (two- and three-pole, 15–50A contactors only)
G = NEMA Type 1 Enclosed

Number of Poles
1 = Single-pole
2 = Two-pole
3 = Three-pole
4 = Four-pole

Power Terminals
A = Binding head screw
B = Binding head screw and quick connect terminals (side-by-side)
C = Screw/pressure plate ①
D = Screw/pressure plate and quick connect terminals (side-by-side) ①
E = Box lugs (posidrive setscrew)
F = Box lugs (posidrive setscrew) and quick connect terminals (side-by-side)
G = Binding head screw and quick connect terminals (vertical in-line)
H = Screw/pressure plate and quick connect ZZ terminals (vertical in-line) ①
J = Box lugs (posidrive setscrew) and quick connect terminals (vertical in-line)
K = Box lugs (hex socket allen head setscrew)
L = Box lugs (hex socket allen head setscrew) and quick connect terminals (side-by-side)
M = Box lugs (hex socket allen head setscrew) and quick connect terminals (vertical in-line)

Current Rating

15 = 15A	**50** = 50A	**120** = 120A
25 = 25A	**60** = 60A	**200** = 200A
30 = 30A	**75** = 75A	**300** = 300A
40 = 40A	**90** = 90A	**360** = 360A

Coil Selection

A = 110–120 Vac, 50/60 Hz	**R** = 12 Vac, 50/60 Hz
B = 208–240 Vac, 50/60 Hz	**T** = 24 Vac, 50/60 Hz
C = 440–480 Vac, 50/60 Hz	**1R** = 12 Vdc
D = 550–600 Vac, 50/50 Hz	**1T** = 24 Vdc
H = 277 Vac, 60 Hz	**1W** = 48 Vdc
J = 220–240 Vac, 50/60 Hz	**1A** = 120 Vdc
L = 380–415 Vac, 50 Hz	

Auxiliary Contacts (Side Mount)
A = 1NO pressure plate
B = 1NC pressure plate
C = 1NO-1NC pressure plate
L = 1NO-1NC snap switch QC only
M = 2NO-2NC snap switch QC only

Note
① Not available on 50A devices.

50 mm C25 Definite Purpose Contactors

Features

- Contactors are dual-rated with inductive and resistive ratings, as well as horsepower and kilowatt ratings
- Contactors rated 15–50A are available with DIN rail mount as a factory installed option
- Magnet coil: Class B (C25E, F, G, H and K), 130°C
- Ambient temperature: 150°F (65°C) maximum

Product Selection

50 mm C25 Definite Purpose Contactors

C25 Contactors—Open Type

Rating, Amperes Inductive Full Load	Resistive per Pole	Line Voltage	Locked Rotor	Maximum Motor Horsepower Single-Phase	Maximum Motor Horsepower Three-Phase	Open Type with Metal Mounting Plate Catalog Number ①②	Open Type with DIN Rail Adapter Catalog Number ①②
15	20	230	90	2	3	**C25DND315_**	**C25DRD315_**
		460	75	—	5		
		575	60	—	5		
25	35	230	150	3	7-1/2	**C25DND325_**	**C25DRD325_**
		460	125	—	10	**C25END425_**	
		575	100	—	10		
30	40	230	180	5	10	**C25DND330_**	**C25DRD330_**
		460	150	—	15	**C25END430_**	
		575	120	—	15		
40	50	230	240	7-1/2	10	**C25DNF340_**	**C25DRF3340_**
		460	200	—	20	**C25ENF440_**	
		575	160	—	20		
50	65	230	300	10	15	**C25DNJ350_**	**C25DRJ350_**
		460	250	—	30		
		575	200	—	30		
60	75	230	360	10	20	**C25FNF360_**	—
		460	300	—	40		
		575	240	—	40		
75	90	230	450	15	20	**C25FNF375_**	—
		460	375	—	50		
		575	300	—	50		

Magnet Coil Selection

Voltage 60 Hz	50 Hz	Coil Suffix
AC ③		
24 ④	24	**T**
110–120 ⑤	110–120 ⑤	**A**
208–240 ⑤	208–240	**B**
DC ⑥		
24		**1T**

Notes

① Replace underscore (_) in catalog number with magnet coil suffix from table at left.

② Carton quantities including 20 individually packaged units are available for two- and three-pole units through 60A inductive.

③ Class H AC coils available as option for 15–50A contactor. Add 2 before AC coil suffix letter.

④ Available through 120A.

⑤ 104–120V 50/60 Hz for 60A, 75A and all four-pole contactors (25–40A).

⑥ Contactors with DC coils (only available up to 75A) include an early break NC auxiliary contact, C320KGD1.

Reversing and Two-Speed Contactors—Open Type—Unwired, Mechanically Interlocked Only

Rating, Amperes Inductive Full Load	Resistive per Pole	Line Voltage	Locked Rotor	Maximum Motor Horsepower		Open Type with Metal Mounting Plate
				Single-Phase	Three-Phase	Catalog Number ①
15	20	230	90	2	3	**C65DND315_**
		460	75	—	5	
		575	60	—	5	
25	35	230	150	3	7-1/2	**C65DND325_**
		460	125	—	10	
		575	100	—	10	
30	40	230	180	5	10	**C65DND330_**
		460	150	—	15	
		575	120	—	15	
40	50	230	240	7-1/2	10	**C65DNF340_**
		460	200	—	20	
		575	160	—	20	
50	65	230	300	10	15	**C65DNJ350_**
		460	250	—	30	
		575	200	—	30	

Magnet Coil Selection

Voltage 60 Hz	50 Hz	Coil Suffix ②
24	24	**T**
110–120 ③	110–120 ③	**A**
208–240 ④	208–240	**B**

Notes

① Replace underscore (_) with magnet coil suffix from table at left.

② Class H AC coils available as option for 15–50A contactor. Add 2 before AC coil suffix letter.

③ 104–120V 50/60 Hz for 60A, 75A.

④ Available through 50A.

***XT* IEC Miniature Contactors**

Features

- 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
- Direct mount with XTOM miniature overload relays

Catalog Number Selection

XT IEC Miniature Contactors

Miniature Contactors

XT MC 6 A 10 A

Designation	Type	Current Rating, AC-3	Frame Size	Integral Auxiliary Contact	Coil Codes
XT = ***XT*** IEC power control	**MC** = Three-pole FVNR mini IEC contactor	**XTMC** **6** = 6.6A, **9** = 8.8A	**A** = 45 mm mini	**01** = 1NC, **10** = 1NO	**A** = 110V 50 Hz, 120V 60 Hz **B** = 220V 50 Hz, 240V 60 Hz **T** = 24V 50/60 Hz **TD** = 24 Vdc

Product Selection

Full Voltage Non-Reversing Miniature Contactors

Operational Current AC-3 Amp Rating 380/400V	Conventional Free Air Thermal Current AC-1 at 50°C	Maximum kW Ratings AC-3 Three-Phase Motors, 50–60 Hz				Maximum Three-Phase Motor Ratings Single-Phase hp Ratings			Three-Phase hp Ratings				Number of Power Poles	Auxiliary Contacts	Catalog Number—Screw Terminals ①
		220–240V	380–400V	550V	660/690V	115V	200V	230V	200V	230V	460V	575V			
6.6	20	1.5	3	3	3	1/4	3/4	1	1-1/2	2	3	3	3	1NO	**XTMC6A10_**
6.6	20	1.5	3	3	3	1/4	3/4	1	1-1/2	2	3	3	3	1NC	**XTMC6A01_**
8.8	20	2.2	4	4	4	1/2	1	1-1/2	2	3	5	5	3	1NO	**XTMC9A10_**
8.8	20	2.2	4	4	4	1/2	1	1-1/2	2	3	5	5	3	1NC	**XTMC9A01_**
8.8	20	2.2	4	4	4	1/2	1	1-1/2	2	3	5	5	4	—	**XTMF9A00_**

Magnet Coil Suffix

Coil Voltage	Suffix Code
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
24V 50/60 Hz	**T**
24 Vdc	**TD** ②
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**

IEC Utilization Categories

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.

Notes

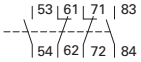
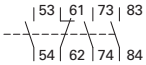
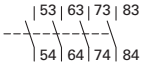
① Underscore (_) indicates magnet coil suffix required. See table at left.

② With DC operation: Integrated diode resistor combination, coil rating 2.6W.

Accessories

2

Front Mount Auxiliary Contacts ①

Conventional Free Air Thermal Current, $I_{th} = I_e$, AC-1 in Amps	Contact Configuration	Contact Sequence	Package Qty.	Catalog Number—Screw Terminals
10	1NO-1NC		5	**XTMCXFA11**
10	2NO-2NC		5	**XTMCXFA22**
10	3NO-1NC		5	**XTMCXFA31**
10	4NO		5	**XTMCXFA40**

XT IEC Miniature Contactors

Description	Package Qty.	Catalog Number
Mechanical interlock	5	**XTMCXML**
Reversing link kit—main current wiring for reversing contactors and starters	1	**XTMCXRL** ②
Connector—for mechanically arranging contactors and timing relays in combinations	50	**XTMCXCN** ③

Notes

① 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 x 106 operations. 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.

③ 0 mm distance between contactors.

XT **IEC Contactors**

Features

- Reversing or non-reversing contactors
- AC-3 contactor ratings to 1600A and AC-1 contactor ratings to 2000A
- Panel or DIN rail mounting to 65A
- IP20 finger and back-of-hand proof
- Built-in NO or NC auxiliary contacts to 32A
- Built-in surge suppression on DC coils XTCE Frame B-G and AC or DC coils on XTCE Frame L-R
- Can be used with ***XT*** or C396 overload relays
- Can be used with XTPR MMPs for manual motor controllers or UL508 Type F combination motor controllers

Catalog Number Selection

XT IEC Contactors

Contactors

XT CE 007 B 01 A

Designation
XT = ***XT*** line of IEC control

Type
CE = Three-pole FVNR IEC contactor
CS = Three-pole FVNR S Series IEC contactor

Current Ratings, AC-3		
007 = 7A	**080** = 80A	**570** = 570A
009 = 9A	**095** = 95A	**580** = 580A
012 = 12A	**115** = 115A	**650** = 650A
015 = 15A	**150** = 150A	**750** = 750A
018 = 18A	**170** = 170A	**820** = 820A
025 = 25A	**185** = 185A	**C10** = 1000A
032 = 32A	**225** = 225A	**C14** = 1400A, AC-1
040 = 40A	**250** = 250A	**C16** = 1600A, AC-3
050 = 50A	**300** = 300A	**C20** = 2000A, AC-1
065 = 65A	**400** = 400A	
072 = 72A	**500** = 500A	

Built-In Auxiliary Contact	
01 = 1NC	**00** = 0NO–0NC
10 = 1NO	**22** = 2NO–2NC

Frame Size Designation	
B = 45 mm	**L** = 140 mm
C = 45 mm	**M** = 160 mm
D = 55 mm	**N** = 250 mm
F = 90 mm	**P** = 260 mm
G = 90 mm	**R** = 515 mm
H = 140 mm	

Coil Codes
See **Page V9-T2-12**.

Product Selection

2

Full Voltage Non-Reversing Three-Pole Contactors, Frames B–G

UL/CSA Ratings								IEC Ratings						
UL General Purpose Amp Rating	Single-Phase hp Ratings			Three-Phase hp Ratings				AC-3 I_e (A)	AC-1 (40°C) $I_e = I_{th}$ (A)	Maximum kW Ratings AC-3 Three-Phase Motors 50–60 Hz				Auxiliary Contacts	Catalog Number— Screw Terminals ①②
	115V	200V	230V	200V	230V	460V	575V			220/230V	380/400V	415V	660/690V		
Frame B															
20	1/4	3/4	1	1-1/2	2	3	5	7	22	2.2	3	4	3.5	1NO	**XTCE007B10_**
20	1/4	3/4	1	1-1/2	2	3	5	7	22	2.2	3	4	3.5	1NC	**XTCE007B01_**
20	1/2	1	1-1/2	3	3	5	7-1/2	9	22	2.5	4	5.5	4.5	1NO	**XTCE009B10_**
20	1/2	1	1-1/2	3	3	5	7-1/2	9	22	2.5	4	5.5	4.5	1NC	**XTCE009B01_**
20	1	2	2	3	3	10 ③	10	12	22	3.5	5.5	7	6.5	1NO	**XTCE012B10_**
20	1	2	2	3	3	10 ③	10	12	22	3.5	5.5	7	6.5	1NC	**XTCE012B01_**
20	1	2	3	5	5	10 ③	10	15.5	22	4	7.5	8	7	1NO	**XTCE015B10_**
20	1	2	3	5	5	10 ③	10	15.5	22	4	7.5	8	7	1NC	**XTCE015B01_**
Frame C															
40	2	2	3	5	5	10 ③	15	18	40	5	7.5	10	11	1NO	**XTCE018C10_**
40	2	2	3	5	5	10 ③	15	18	40	5	7.5	10	11	1NC	**XTCE018C01_**
40	2	3	5	7-1/2	10	15	20	25	45	7.5	11	14.5	14	1NO	**XTCE025C10_**
40	2	3	5	7-1/2	10	15	20	25	45	7.5	11	14.5	14	1NC	**XTCE025C01_**
40	3	5	5	10	10	20	25	32	45	10	15	18	17	1NO	**XTCE032C10_**
40	3	5	5	10	10	20	25	32	45	10	15	18	17	1NC	**XTCE032C01_**
Frame D															
63	3	5	7-1/2	10	15	30	40	40	60	12.5	18.5	24	23	—	**XTCE040D00_**
80	3	7-1/2	10	15	20	40	50	50	80	15.5	22	30	30	—	**XTCE050D00_**
88	5	10	15	20	25	50	60	65	98	20	30	39	35	—	**XTCE065D00_**
88	5	10	15	20	25	50	60	72	98	22	37	41	35	—	**XTCE072D00_**
Frame F															
125	7-1/2	15	15	25	30	60	75	80	110	25	37	48	63	—	**XTCE080F00_**
125	7-1/2	15	15	25	40	75	75	95	130	30	45	57	75	—	**XTCE095F00_**
Frame G															
160	10	25	25	40	50	100	100	115	160	37	55	70	90	—	**XTCE115G00_**
180	10	25	30	40	60	125	125	150	190	48	75	91	96	—	**XTCE150G00_**
225 ④	10	25	30	40	60	125	125	170	225	52	90	100	96	—	**XTCE170G00_**

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.

Frames B–C contactors with 1NC built-in auxiliary are mirror contacts (XTCE…B01_–XTCE…C01_).

① Underscore (_) indicates magnet coil suffix required. See **Page V9-T2-12**.

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 Volume 5—Motor Control and Protection, CA08100006E, Tab 27.

④ For 180–225A, use 2 x 3/0 AWG wire.

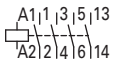
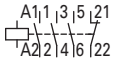
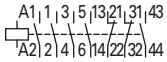
Full Voltage Non-Reversing Three-Pole Contactors, Frames H–R

UL/CSA Ratings					IEC Ratings								
UL General Purpose Amp Rating	Three-Phase hp Ratings 200V	230V	460V	575V	AC-3 I_e (A)	AC-1 (40°C) $I_e = I_{th}$ (A)	Maximum kW Ratings AC-3 Three-Phase Motors 50–60 Hz 220/230V	380/400V	415V	660/690V ①	1000V ①	Auxiliary Contacts	Catalog Number ②
Frame H—Electronic Coil													
250	50	60	125	150	185	337	55	90	—	140	108	2NO-2NC	**XTCE185H22_**
250	60	75	150	200	225	386	70	110	—	215	108	2NO-2NC	**XTCE225H22_**
Frame L—Standard Coil (110/120V, 230/240 Vac Coil Only)													
300	75	100	200	250	250	429	75	132	148	240	108	2NO-2NC	**XTCS250L22_**
350	100	125	250	300	300	490	90	160	—	195	132	2NO-2NC	**XTCS300L22_**
Frame L—Electronic Coil													
300	75	100	200	250	250	429	75	132	148	240	108	2NO-2NC	**XTCE250L22_**
350	100	125	250	300	300	490	90	160	—	195	132	2NO-2NC	**XTCE300L22_**
Frame M—Standard Coil (110/120V, 230/240 Vac Coil Only)													
450	125	150	300	400	400	612	125	200	240	344	132	2NO-2NC	**XTCS400M22_**
550	150	200	400	500	500	857	155	250	300	344	132	2NO-2NC	**XTCS500M22_**
Frame M—Electronic Coil													
450	125	150	300	400	400	612	125	200	240	344	132	2NO-2NC	**XTCE400M22_**
550	150	200	400	500	500	857	155	250	300	344	132	2NO-2NC	**XTCE500M22_**
Frame N—Electronic Coil													
630	200	200	400	600	580	980	185	315	348	560	600	2NO-2NC	**XTCE580N22_** ③
700	200	250	500	600	650	1041	205	355	390	630	600	2NO-2NC	**XTCE650N22_** ③
800	250	300	600	700	750	1102	240	400	455	720	800	2NO-2NC	**XTCE750N22_** ③
850	290	350	700	860	820	1225	260	450	500	750	800	2NO-2NC	**XTCE820N22_** ③
1100	350	420	850	980	1000	1225	315	560	610	1000	1000	2NO-2NC	**XTCEC10N22_** ③
Frame P—Electronic Coil													
1400	—	—	—	—	—	1714	—	—	—	—	—	2NO-2NC	**XTCEC14P22_** ③
Frame R—Electronic Coil													
1600	560	640	1200	1300	1600	2200	500	900	900	1600	1700	2NO-2NC	**XTCEC16R22_** ③
2000	—	—	—	—	—	2450	—	—	—	—	—	2NO-2NC	**XTCEC20R22_** ③

Contactor Application Data

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	

Notes

AC and DC operated contactors have a built-in suppressor circuit (Frames L–R, 185–2000A).

① For 185–500A contactors at 660/690V or 1000V: Do not reverse directly.

② Underscore (_) indicates magnet coil suffix required. See **Page V9-T2-12**.

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.

Magnet Coil Suffix

Coil Voltage	Suffix Code
Frames B–F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
24V 50/60 Hz	**T**
24 Vdc	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
Frame G	
100–120V 50/60 Hz	**A**
190–240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24–27 Vdc	**TD**
480–500V 50/60 Hz	**C**

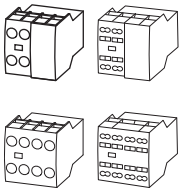
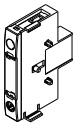
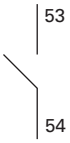
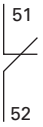
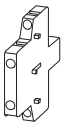
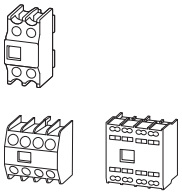
Coil Voltage	Suffix Code
Frame H	
100–120V 50/60 Hz	**A**
190–240V 50/60 Hz	**B**
480–500V 50/60 Hz	**C**
24–27 Vdc	**TD**
Frames L–M, S-Series	
110–120V 50/60 Hz	**A**
220–240V 50/60 Hz	**B**
Frame N	
110–250V 40–60 Hz/DC	**A**
250–500V 40–60 Hz	**C**
24–48 Vdc	**TD**
Frames P–R	
220–250V 50–60 Hz/DC	**B**

XTCR Reversing Contactor Components

Qty.	Frame	B	C	D	F	G
2	Contactor	**XTCE…B01_**	**XTCE…B01_**	**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**

Accessories

Auxiliary Contacts—Frames B–G

	Conventional Thermal Current, Open at 60°C $I_{th} = I_e$, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Catalog Number—Screw Terminals
Frames B–C	**Frames B–C—Front (Top) Mount** ①					
	16	2	2NO		5	**XTCEXFAC20**
	16	2	1NO-1NC		5	**XTCEXFAC11**
	16	4	4NO		5	**XTCEXFAC40**
	16	4	2NO-2NC		5	**XTCEXFAC22**
Frame B	**Frame B—Side Mount** ①②					
	16	1	1NO		1	**XTCEXSAB10**
	16	1	1NC		1	**XTCEXSAB01**
Frame C	**Frame C—Side Mount** ①					
	10	2	1NO-1NC		1	**XTCEXSCC11** ①
Frames D–G	**Frames D–G** ③					
	16	2	2NO		5	**XTCEXFBG20**
	16	2	1NO-1NC		5	**XTCEXFBG11**
	16	4	4NO-0NC		5	**XTCEXFBG40**
	16	4	2NO-2NC		5	**XTCEXFBG22**

Notes

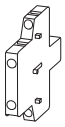
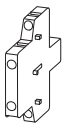
Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO [early make] and NC [late break] contacts) and for the built-in auxiliary contacts of the XTCE007_–XTCE032_ Auxiliary break contact can be used as mirror contact to IEC/EN 60947-4-1 Annex F (not NC [late break] contact). No auxiliary contacts can be fitted between two contactors.

① Frames B–C cannot use both a side AND a top mount auxiliary contact at the same time.

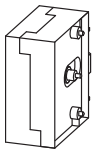
② Can be mounted to the left side of contactor only.
Cannot be used in combination with front (top) mount auxiliary contacts or mechanical interlocks.

③ For Frame D, six auxiliary contacts maximum (can be a combination of side and top mount units).

Side Mount Auxiliary Contacts—Frames D–R, 40–2000A

	Conventional Free Air Thermal Current, $I_{th} = I_e$, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Catalog Number—Screw Terminals
	Frame D–R ①②					
Frames D–R 	10	2	1NO-1NC		1	**XTCEXSBN11**
	Frames H–R (Screw Mount) ②					
Frames H–R 	10	2	1NO-1NC		1	**XTCEXSBR11**

Mechanical Interlock ③

	For Use with …	Package Qty.	Catalog Number
XTCEXMLB 	XTCE007B–XTCE015B, XTCF020B	5	**XTCEXMLB**
XTCEXMLC 	XTCE018C–XTCE032C	1	**XTCEXMLC**
	XTCF032C–XTCF045C		
	XTCE040D–XTCE072D		
	XTCF063D–XTCF080D	1	**XTCEXMLD**
	XTCE080F–XTCE170G	1	**XTCEXMLG** ④
	XTCF125G–XTCF200G		
XTCEXMLM 	XTCE185H–XTCE570M	1	**XTCEXMLM**
	XTCE580N–XTCEC10N	1	**XTCEXMLN** ④
	XTCE500M–XTCE570M with XTCE500N–XTCEC10N	1	**XTCEXMLNM** ④

Reversing Link Kits

Reversing Link Kits

For Use with …	Package Qty.	Catalog Number
XTCE007B–XTCE015B	1	**XTCEXRLB** ⑤
XTCE018C–XTCE032C	1	**XTCEXRLC**
XTCE040D–XTCE065D	1	**XTCEXRLD**
XTCE080F–XTCE150G	1	**XTCEXRLG**

Notes

① For Frame D, six auxiliary contacts maximum (can be a combination of side and top mount units).

② For Frames F–R, eight auxiliary contacts maximum (can be a combination of side and top mount units).

③ For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For B–G frames, mechanical lifespan is 2.5 x 106 operations and the distance between contactors is 0 mm. For L–N frames, mechanical lifespan is 5 x 106 operations and no auxiliary contact can be mounted between the mechanical interlock and the contactor—the distance between contactors is 15 mm.

④ XTCEXMLG, XTCEXMLN and XTCEXMLNM consist of an interlock element and mounting plate.

⑤ Also includes interlocking bridge (XTCEXLBB). The following control cables are integrated for electrical interlock: K1M: A1–K2M: 21; K1M: 21–K2M: A1; K1M: A2–K2M: A2.

Product Overview

Monitoring Relays Selection Guide

Description	D65 Series	D65C Series
	Page V9-T2-17	**Page V9-T2-19**
Approvals		
	cULus, CE	RoHS, cURus, cULus, CE
Features		
	Various combinations of protection available Compact cases for easy mounting LED indicators for quick troubleshooting	Monitors AC single-phase currents from 0.1–10 A External CT can be used to extend ranges LED indicates output relay status Choice of fixed or user-adjustable settings
Contact Data		
Configuration	SPDT or DPDT	—
Maximum allowable load	10A	Less than 5 VA
Material	—	—
Resistance	—	—
Dielectric strength	2000V	—
Coil Data		
AC	24–480 Vac	—
DC	24–120 Vdc	—
Power		
VA (Vac)	5 VA	—
Watts (Vdc)	—	—
General Data		
Ambient temperature		
Operational	–4° to 149°F (–20° to 65°C)	–20° to 131°F (–28° to 55°C)
Maximum pick-up	<= 500 milliseconds	Overcurrent: Adjustable throughout current range monitored Undercurrent: Fixed at 5% above adjustable drop-out setting
Maximum release	<= 500 milliseconds	Overcurrent: Fixed at 95% of pick-up setting for D65CE; adjustable from 50–95% of pick-up setting for D65CEK Undercurrent: Adjustable throughout current range monitored
Life		
Mechanical operations	10 million	10 million
Electrical operations	100,000	100,000

For our complete product offering, see Volume 5—Motor Control and Protection, CA08100006E.

Overload Relays Selection Guide

Description	 ***XT*** **IEC Miniature Overload Relays**	 **XTOB, XTOT Thermal Overload Relays**	 ***XT*** **Electronic Overload Relays**	 **Motor Insight Overload and Monitoring Relays**
	Page V9-T2-22	**Page V9-T2-23**	**Page V9-T2-26**	**Page V9-T2-32**
Relay type	Thermal bi-metal	Thermal bi-metal	Electronic	Electronic
FLA range	0.1–12A	0.1–630A	0.1–1500A	1–540A
FLA max.:min. ratio	Approx. 1.5:1	Approx. 1.5:1	5:1	18:1 and 9:1
Trip class	10	10	Selectable 10A/10/20/30	5–30, stepped by 1's
Reset type	Selectable manual/automatic	Selectable manual/automatic	Selectable manual/automatic/remote	Selectable manual/automatic/remote
Direct connect to ***XT*** contactor	Yes, XTMC	Yes, XTCE	Yes, XTCE	—
Direct connect to DP contactor	—	—	Yes	—
Standalone mounting	—	Panel or DIN	Panel or DIN	Panel
Thermal overload protection	Yes	Yes	Yes	Yes, programmable
Jam	—	—	—	Yes, programmable
Current unbalance protection	—	—	Yes, selectable	Yes, programmable
Single-phasing	—	—	Yes, fixed level	Yes, fixed on or off
Ground fault	—	—	Yes, fixed	Yes, programmable
Phase reversal	—	—	—	Yes, programmable
Undercurrent	—	—	—	Yes, programmable
Overcurrent	—	—	—	—
Low power/high power	—	—	—	Yes, programmable
Overvoltage/undervoltage	—	—	—	Yes, programmable
Voltage unbalance	—	—	—	Yes, programmable
Current per phase and average rms	—	—	—	Yes
Current unbalance percent	—	—	Yes	Yes
Ground fault current	—	—	Yes	Yes
Voltage per phase and average rms	—	—	—	Yes
Voltage unbalance percent	—	—	—	Yes
Power/power factor	—	—	—	Yes
Thermal capacity	—	—	Yes	Yes
Frequency	—	—	Yes	Yes
Motor run hours	—	—	—	Yes
Motor starts count	—	—	—	Yes
Time to restart after fault	—	—	—	Yes
Overload status	—	—	Yes	Yes
Programmable reset timers/attempts	—	—	—	Yes
Programmable trip delays	—	—	—	Yes
Programmable auxiliary contact	—	—	—	Yes (120 Vac control-power version)
Communications with I/O	—	—	Yes (Modbus® RTU, DeviceNet™, PROFIBUS®; Modbus TCP, EtherNet/IP)	Yes (Modbus RTU, DeviceNet, PROFIBUS, Modbus TCP, EtherNet/IP)
Remote display	—	—	—	Yes (NEMA 1, 12, and 3R)
Lockable user interface or tamperproof	—	—	Yes	Yes
Alarm no-trip mode	—	—	—	Yes, for GF and line faults
Diagnostics	—	—	—	Yes, 10 fault queue

For our complete product offering, see Volume 5—Motor Control and Protection, CA08100006E.

Catalog Number Selection

D65 Series Monitoring Relays

D65 Series

D65 VML S 120

Type	Function	Monitoring	Voltage
D65 = D65 Series	**VML** = Full-featured voltage/phase monitor **PLR** = Phase loss/reversal **VMC** = Phase reversal **PAR** = Phase loss/reverse/undervoltage	**S** = Surface mount **P or blank** = Plug-in octal	**120** = 120V **208** = 208V **240** = 240V **400** = 400V **480** = 240–480V **600** = 600V

D65 Series Full-Featured Voltage/Phase Monitor

Features

- Full-featured voltage/phase monitoring relays
- Undervoltage, overvoltage, phase imbalance, phase loss (single-phasing), phase reversal
- Universal voltage range of 208–480V provides the flexibility to cover a variety of applications; 120V and 600V units also available
- Automatic or manual reset after the fault condition is corrected
- User-adjustable settings include nominal voltage, percent phase imbalance, undervoltage drop-out, time delay on undervoltage and time delay on restart after fault

Product Selection

D65VML_

D65VML Series

Style	Operating Voltage, 50/60 Hz	Catalog Number
Surface-mount (DIN rail or panel)	120V	**D65VMLS120**
	208–480V	**D65VMLS480**
	600V	**D65VMLS600**
Plug-in (DIN rail)	120V	**D65VMLP120**
	208–480V	**D65VMLP480** ①
8-pin socket	—	**D3PA2** ②
8-pin IP20 rated socket	—	**D3PA6**

D65 Series Phase Reversal Monitoring Relays

Features

- Protects against phase reversal
- One version works on 208–480V three-phase systems
- 10A SPDT output contacts

Product Selection

D65VMC_

D65VMC Series

Style	Nominal Voltage, 50/60 Hz	Catalog Number
Plug-in	120V	**D65VMC120**
	208–480V	**D65VMC480** ①

Notes

① Requires a 600V rated socket when used on system voltages greater than 300V.
② The D3PA2 socket is rated 10A, 600V.

2

D65 Series Phase Loss and Reversal Monitoring Relays

Features

- Protects against phase loss and phase reversal
- LED indicates both normal and fault conditions
- 10A SPDT output contacts

Product Selection

D65PLR_

D65PLR Series

Style	Nominal Voltage, 50/60 Hz	Catalog Number
Plug-in	120V	**D65PLR120**
	208V	**D65PLR208**
	240V	**D65PLR240**
	400V	**D65PLR400** ①
	480V	**D65PLR480** ①

D65 Series Phase Loss, Reversal and Undervoltage

Features

- Protects against phase loss, phase reversal and undervoltage
- Undervoltage setting is adjustable from 75–95% of nominal
- LED indicates both normal and fault conditions
- 10A SPDT output contacts

Product Selection

D65PAR_

D65PAR Series

Style	Nominal Voltage, 60 Hz	Undervoltage Range	Catalog Number
Plug-in	120V	90–115V	**D65PAR120**
	208V	156–198V	**D65PAR208**
	240V	180–230V	**D65PAR240**
	400V	300–380V	**D65PAR400** ①
	480V	360–460V	**D65PAR480** ①

Note

① Requires a 600V rated socket when used on system voltages greater than 300V.

Catalog Number Selection

D65C Series Monitoring Relays

D65C Series

D65C E K 2 C10 T

Type	Function	Drop-Out Setting	Number of Poles	Current Range	Voltage
D65C = Current monitors	**E** = Standard **H** = Overcurrent **L** = Undercurrent	**K** = Adjustable **Blank** = Fixed	**1** = 1 PDT **2** = 2 PDT	**C01** = 0.1–1A **C5** = 0.5–5A **C10** = 1–10A	**T** = 24 Vac **A** = 120 Vac

D65CE Standard Current Monitoring Relays

Features

- Monitors AC single-phase currents
- Three separate current monitoring ranges covering 0.1–10 amperes
- External CT can be used to extend ranges
- Fixed 100 ms pick-up and drop-out time delay

Product Selection

D65CE_

D65CE Series

Pick-Up Setting	Drop-Out Setting	Input Voltage	Current Range Monitored	Catalog Number
SPDT—8-Pin Plug-In				
Adjustable	Fixed (at 95% of pick-up)	24 Vac	0.1–1A	**D65CE1C01T**
			0.5–5A	**D65CE1C5T**
			1–10A	**D65CE1C10T**
		120 Vac	0.1–1A	**D65CE1C01A**
			0.5–5A	**D65CE1C5A**
			1–10A	**D65CE1C10A**
	Adjustable (50–95% of pick-up)	24 Vac	0.1–1A	**D65CEK1C01T**
			0.5–5A	**D65CEK1C5T**
			1–10A	**D65CEK1C10T**
		120 Vac	0.1–1A	**D65CEK1C01A**
			0.5–5A	**D65CEK1C5A**
			1–10A	**D65CEK1C10A**
DPDT—11-Pin Plug-In				
Adjustable	Fixed (at 95% of pick-up)	24 Vac	0.1–1A	**D65CE2C01T**
			0.5–5A	**D65CE2C5T**
			1–10A	**D65CE2C10T**
		120 Vac	0.1–1A	**D65CE2C01A**
			0.5–5A	**D65CE2C5A**
			1–10A	**D65CE2C10A**
	Adjustable (50–95% of pick-up)	24 Vac	0.1–1A	**D65CEK2C01T**
			0.5–5A	**D65CEK2C5T**
			1–10A	**D65CEK2C10T**
		120 Vac	0.1–1A	**D65CEK2C01A**
			0.5–5A	**D65CEK2C5A**
			1–10A	**D65CEK2C10A**

D65CH Series, Overcurrent Monitors

Features

- Monitors AC single-phase currents for overcurrent conditions
- Three separate current monitoring ranges covering 0.1–10 amperes
- External CT can be used to extend ranges
- Adjustable pick-up setting with either fixed or adjustable drop-out setting
- Adjustable time delay of 0.1–10 seconds on pick-up
- Fixed 100 ms time delay on drop-out
- LED indicates output

Product Selection

D65CH_

D65CH Series

Pick-Up Setting	Drop-Out Setting	Input Voltage	Current Range Monitored	Catalog Number
SPDT—8-Pin Plug-In				
Adjustable	Fixed (at 95% of pick-up)	24 Vac	0.1–1A	**D65CH1C1T**
			0.5–5A	**D65CH1C5T**
			1–10A	**D65CH1C10T**
		120 Vac	0.1–1A	**D65CH1C1A**
			0.5–5A	**D65CH1C5A**
			1–10A	**D65CH1C10A**
	Adjustable (50–95% of pick-up)	24 Vac	0.1–1A	**D65CHK1C1T**
			0.5–5A	**D65CHK1C5T**
			1–10A	**D65CHK1C10T**
		120 Vac	0.1–1A	**D65CHK1C1A**
			0.5–5A	**D65CHK1C5A**
			1–10A	**D65CHK1C10A**
DPDT—11-Pin Plug-In				
Adjustable	Fixed (at 95% of pick-up)	24 Vac	0.1–1A	**D65CH2C1T**
			0.5–5A	**D65CH2C5T**
			1–10A	**D65CH2C10T**
		120 Vac	0.1–1A	**D65CH2C1A**
			0.5–5A	**D65CH2C5A**
			1–10A	**D65CH2C10A**
	Adjustable (50–95% of pick-up)	24 Vac	0.1–1A	**D65CHK2C1T**
			0.5–5A	**D65CHK2C5T**
			1–10A	**D65CHK2C10T**
		120 Vac	0.1–1A	**D65CHK2C1A**
			0.5–5A	**D65CHK2C5A**
			1–10A	**D65CHK2C10A**

D65CL Series, Undercurrent Monitoring Relays

Features

- Monitors AC single-phase currents for undercurrent conditions
- Three separate current monitoring ranges covering 0.1–10 amperes
- External CT can be used to extend ranges
- Adjustable drop-out setting with fixed pick-up setting
- Adjustable time delay of 0.1–10 seconds on drop-out
- Fixed 100 ms time delay on pick-up

Product Selection

D65CL_

D65CL Series

Pick-Up Setting	Drop-Out Setting	Input Voltage	Current Range Monitored	Catalog Number
SPDT—8-Pin Plug-In				
Adjustable	Fixed (at 5% of drop-out)	24 Vac	0.1–1A	**D65CL1C1T**
			0.5–5A	**D65CL1C5T**
			1–10A	**D65CL1C10T**
		120 Vac	0.1–1A	**D65CL1C1A**
			0.5–5A	**D65CL1C5A**
			1–10A	**D65CL1C10A**
SPDT—11-Pin Plug-In				
Adjustable	Fixed (at 5% of drop-out)	24 Vac	0.1–1A	**D65CL2C1T**
			0.5–5A	**D65CL2C5T**
			1–10A	**D65CL210T**
		120 Vac	0.1–1A	**D65CL2C1A**
			0.5–5A	**D65CL2C5A**
			1–10A	**D65CL2C10A**

2

XT **IEC Miniature Overload Relays**

Features

- Trip class 10A
- Ambient temperature compensated –5° to 50°C (23° to 122°F)
- Selectable manual/automatic reset
- 1NO-1NC auxiliary contact as standard
- Direct mount with XTMC contactors

Catalog Number Selection

XT IEC Miniature Overload Relays

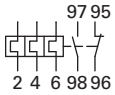
Miniature Overload Relays

XT OM P16 A C1

Designation	Type	Overload Release		Frame Size	Trip Class
XT = ***XT*** IEC power control	**OM** = Mini overload relay	**P16** = 0.1–0.16A **P24** = 0.16–0.24A **P40** = 0.24–0.4A **P60** = 0.4–0.6A **001** = 0.6–1A **1P6** = 1–1.6A	**2P4** = 1.6–2.4A **004** = 2.4–4A **006** = 4–6A **009** = 6–9A **012** = 9–12A	**A** = 45 mm mini	**C1** = Class 10A

Product Selection

Miniature Overload Relays ①②

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

Notes

① Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402002E for more information.

② When fitted directly to the contactor, a clearance of at least 5 mm is required between the overload relays.

XTOB, XTOT Thermal Overload Relays

Features

- Direct mount to ***XT*** contactors or separate mount
- Class 10A
- Up to 630A

Catalog Number Selection

XTOB, XTOT Thermal Overload Relays

Thermal Overload Relays

XT OB P16 B C1 S

Designation
XT = ***XT*** line of IEC control

Type
OB = Bimetallic overload relay
OT = Current transformer overload relay

Overload Release		
Frame B		
P16 = 0.1–0.16A	**001** = 0.6–1A	**006** = 4–6A
P24 = 0.16–0.24A	**1P6** = 1.0–1.6A	**010** = 6–10A
P40 = 0.24–0.4A	**2P4** = 1.6–2.4A	**012** = 9–12A
P60 = 0.4–0.6A	**004** = 2.4–4A	**016** = 12–16A
Frame C		
P16 = 0.1–0.16A	**1P6** = 1.0–1.6A	**010** = 6–10A
P24 = 0.16–0.24A	**2P4** = 1.6–2.4A	**016** = 10–16A
P40 = 0.24–0.4A	**004** = 2.4–4A	**024** = 16–24A
P60 = 0.4–0.6A	**006** = 4–6A	**032** = 24–32A
001 = 0.6–1A		
Frame D		
010 = 6–10A	**040** = 24–40A	**065** = 50–65A
016 = 10–16A	**057** = 40–57A	**075** = 65–75A
024 = 16–24A		
Frame F		
035 = 25–35A	**070** = 50–70A	**100** = 70–100A
050 = 35–50A		
Frame G		
035 = 25–35A	**100** = 70–100A	**150** = 120–150A
050 = 35–50A	**125** = 95–125A	**175** = 145–175A
070 = 50–70A		
Frame L and H		
070 = 50–70A	**125** = 95–125A	**220** = 160–220A
100 = 70–100A	**160** = 120–160A	**250** = 200–250A
CT Type		
063 = 42–63A	**160** = 110–160A	**400** = 270–400A
090 = 60–90A	**240** = 160–240A	**540** = 360–540A
125 = 85–125A	**290** = 190–290A	

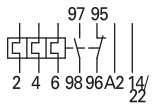
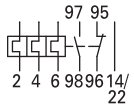
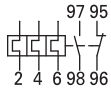
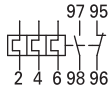
Trip Class
C1 = Class 10A
C3 = Class 30

Frame Size Designation	
B	= 45 mm
C	= 45 mm
D	= 55 mm
G	= 90 mm
H	= 140 mm
L	= 140 mm
Blank	= XTOT only

Mounting	
Blank	= Direct to contactor
S	= Separate mount

Product Selection

XTOB, XTOT Thermal Overload Relays

Overload Releases, I_r	Contact Sequence	Contact Configuration	For Use with Contactor Ampere Range	Short-Circuit Protection (A) Maximum Circuit Breaker	CEC/NEC Fuse	Catalog Number
Frame B—Direct Mount to XTCE...B Contactor						
0.1–0.165		1NO-1NC	7–15A	25	3	**XTOBP16BC1**
0.16–0.24			7–15A	25	3	**XTOBP24BC1**
0.24–0.4			7–15A	25	3	**XTOBP40BC1**
0.4–0.6			7–15A	25	3	**XTOBP60BC1**
0.6–1			7–15A	25	3	**XTOB001BC1**
1–1.6			7–15A	25	6	**XTOB1P6BC1**
1.6–2.4			7–15A	25	6	**XTOB2P4BC1**
2.4–4			7–15A	25	15	**XTOB004BC1**
4–6			7–15A	25	20	**XTOB006BC1**
6–10			7–15A	25	35	**XTOB010BC1**
9–12			9–15A	25	45	**XTOB012BC1**
12–16			12–15A	30	45	**XTOB016BC1**
Frame C—Direct Mount to XTCE...C Contactor						
0.6–1		1NO-1NC	18–32A	25	3	**XTOB001CC1**
1–1.6			18–32A	25	6	**XTOB1P6CC1**
1.6–2.4			18–32A	25	6	**XTOB2P4CC1**
2.4–4			18–32A	25	15	**XTOB004CC1**
4–6			18–32A	25	20	**XTOB006CC1**
6–10			18–32A	25	25	**XTOB010CC1**
10–16			18–32A	30	25	**XTOB016CC1**
16–24			18–32A	30	25	**XTOB024CC1**
24–32			25–32A	30	25	**XTOB032CC1**
Frame D—Direct Mount to XTCE...D Contactor						
6–10		1NO-1NC	40–72A	25	25	**XTOB010DC1**
10–16			40–72A	25	25	**XTOB016DC1**
16–24			40–72A	30	25	**XTOB024DC1**
24–40			40–72A	125	125	**XTOB040DC1**
40–57			50–72A	150	150	**XTOB057DC1**
50–65			65–72A	150	200	**XTOB065DC1**
65–75			72A	150	200	**XTOB075DC1**
Frames F–G—Direct Mount to XTCE...F or XTCE...G Contactor						
35–50		1NO-1NC	80–170A	150	200	**XTOB050GC1**
50–70			80–170A	150	200	**XTOB070GC1**
70–100			80–170A	400	400	**XTOB100GC1**
95–125			80–170A	500	400	**XTOB125GC1**
120–150			80–170A	600	600	**XTOB150GC1**
145–175			150–170A	600	600	**XTOB175GC1**

Notes

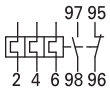
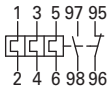
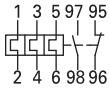
Short circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting.
See MN03402001E for more information on overload relays for Frames B–G.

Trip Class: 10A

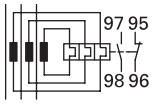
Suitable for protection of EEx e-motors. EC prototype test certificate available upon request.

Observe manuals MN03402001E and MN03407001E. See documentation—manuals for overload monitoring of EEx e-motors.

XTOB, XTOT Thermal Overload Relays, continued

Overload Releases, I_r	Contact Sequence	Contact Configuration	For Use with Contactor Ampere Range	Short-Circuit Protection (A) Maximum Circuit Breaker	CEC/NEC Fuse	Catalog Number
Frames F–G—Separate Mount						
35–50		1NO-1NC	80–170A	150	200	**XTOB050GC1S**
50–70			80–170A	150	200	**XTOB070GC1S**
70–100			80–170A	400	400	**XTOB100GC1S**
95–125			80–170A	500	400	**XTOB125GC1S**
120–150			80–170A	600	600	**XTOB150GC1S**
145–175			150–170A	600	600	**XTOB175GC1S**
Frame H—Separate Mount						
50–70		1NO-1NC	185–250A	150	200	**XTOB070HC1**
70–100			185–250A	400	400	**XTOB100HC1**
95–125			185–250A	500	400	**XTOB125HC1**
120–160			185–250A	600	600	**XTOB160HC1**
160–220			185–250A	600	800	**XTOB220HC1**
200–250			225–250A	600	700	**XTOB250HC1**
Frame L—Direct Mount to XTC (E or S)…L or Separate Mount						
50–70		1NO-1NC	185–250A	150	200	**XTOB070LC1**
70–100			185–250A	400	400	**XTOB100LC1**
95–125			185–250A	500	400	**XTOB125LC1**
120–160			185–250A	600	600	**XTOB160LC1**
160–220			185–250A	800	800	**XTOB220LC1**
200–250			225–250A	600	700	**XTOB250LC1**

Current Transformer Operated Overload Relay

Overload Releases, I_r	Contact Sequence	Contact Configuration	For Use with Contactor Ampere Range	Short-Circuit Protection (A) Maximum Circuit Breaker	CEC/NEC Fuse	Catalog Number
Frames M–N—Separate Mount						
160–240		1NO-1NC	300–500A	600	700	**XTOT240C3S**
190–290			300–500A	600	700	**XTOT290C3S**
270–400			300–500A	1000	1000	**XTOT400C3S**
360–540			500A	600	1000	**XTOT540C3S**
420–630			630A	600	1000	**XTOT630C3S**

Accessories

Adapter

DIN-Rail or Panel-Mount Adapter, Frames C–D ①

For Use With…	Package Qty.	Catalog Number
XTOB…CC1	5	**XTOBXDINC**
XTOB…DC1	2	**XTOBXDIND**

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.

Observe manuals MN03402001E and MN03407001E. See documentation—manuals for overload monitoring of EEx e-motors.

① Can be snap fitted on a top hat rail (DIN rail) or can be screw fitted.

2

XT **Electronic Overload Relays**

Features

- Direct mount to ***XT*** contactors or separate mount
- Standard version: selectable trip class (10A, 10, 20, 30) with selectable manual or auto reset
- Broad 5:1 FLA range
- Self-powered design, will accept AC voltages from 12–690V 50/60 Hz
- Electrically isolated 1NO-1NC contacts (push-to-test)
- FLA range of 0.1–1500A

Catalog Number Selection

XT Electronic Overload Relays

XT Electronic Overload Relay—IEC ①

XT **OE** **1P6** **C** **CS** **S**

Designation
XT = ***XT*** line of IEC control

Type
OE = Electronic overload relay

Mounting
Blank = Direct to contactor **S** = Separate mount (Frames C and G only)

Trip Type
CS = Selectable Class 10A, 10, 20, 30 **GS** = Ground fault with selectable Class 10, 20

Overload Range	Contactor Frame
1P6 = 0.33–1.65A **005** = 1–5A **020** = 4–20A	**B** = 45 mm
1P6 = 0.33–1.65A **005** = 1–5A **020** = 4–20A **045** = 9–45A	**C** = 45 mm
045 = 9–45A **100** = 20–100A	**D** = 55 mm
100 = 20–100A	**F, G** = 105 mm
175 = 35–175A	**G, H** = 110 mm

Note

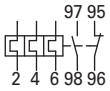
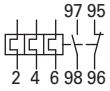
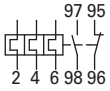
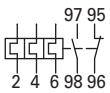
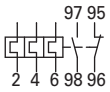
① See **Page V9-T2-27** for Product Selection.

Product Selection

XT Electronic Overload Relays

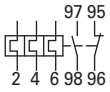
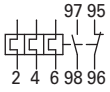
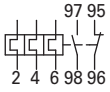
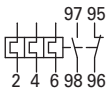
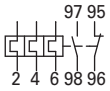
45 mm *XT* for Direct Mount

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…, XTCE009B…, XTCE012B…, XTCE015B…	0.33–1.65		45 mm	NO-NC	ZEB12-1,65	**XTOE1P6BCS**
		1–5				ZEB12-5	**XTOE005BCS**
		4–20				ZEB12-20	**XTOE020BCS**
C	XTCE018C…, XTCE025C…, XTCE032C	0.33–1.65		45 mm	NO-NC	ZEB32-1,65	**XTOE1P6CCS**
		1–5				ZEB32-5	**XTOE005CCS**
		4–20				ZEB32-20	**XTOE020CCS**
		9–45				ZEB32-45	**XTOE045CCS**
D	XTCE040D…, XTCE050D…, XTCE065D…, XTCE072D…	9–45		45 mm	NO-NC	ZEB65-45	**XTOE045DCS**
		20–100		55 mm		ZEB65-100	**XTOE100DCS**
F	XTCE080F…, XTCE095F…	20–100		55 mm	NO-NC	ZEB150-100	**XTOE100GCS**
G	XTCE115G…, XTCE150G…, XTCE170G…	20–100		55 mm	NO-NC	ZEB150-100	**XTOE100GCS**
		35–175		110 mm		ZEB150-175	**XTOE175GCS**
H	XTCE185H…	35–175		110 mm	NO-NC	ZEB225-175	**XTOE175HCS**

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…, XTCE009B…, XTCE012B…, XTCE015B…	0.33–1.65		45 mm	NO-NC	ZEB12-1,65-GF	**XTOE1P6BGS**
		1–5				ZEB12-5-GF	**XTOE005BGS**
		4–20				ZEB12-20-GF	**XTOE020BGS**
C	XTCE018C…, XTCE025C…, XTCE032C	0.33–1.65		45 mm	NO-NC	ZEB32-1,65-GF	**XTOE1P6CGS**
		1–5				ZEB32-5-GF	**XTOE005CGS**
		4–20				ZEB32-20-GF	**XTOE020CGS**
		9–45				ZEB32-45-GF	**XTOE045CGS**
D	XTCE040D…, XTCE050D…, XTCE065D…, XTCE072D…	9–45		45 mm	NO-NC	ZEB65-45-GF	**XTOE045DGS**
		20–100		55 mm		ZEB65-100-GF	**XTOE100DGS**
F	XTCE080F…, XTCE095F…	20–100		55 mm	NO-NC	ZEB150-100-GF	**XTOE100GGS**
G	XTCE115G…, XTCE150G…, XTCE170G…	20–100		55 mm	NO-NC	ZEB150-100-GF	**XTOE100GGS**
		35–175		110 mm		ZEB150-175-GF	**XTOE175GGS**
H	XTCE185H…	35–175		110 mm	NO-NC	ZEB225-175-GF	**XTOE175HGS**

2

1–5A OL with CTs

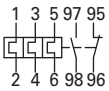
XT Electronic Overload Relays for use with Large Frame *XT* Contactors (L–R)

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	**ZEB-XCT300**	750 kcmil (2) 250 kcmil 3/0 Cu/Al	**XTOE005CCSS**	**XTOE005CGSS**
M, N	300–820A	120-600	600: 5 panel-mount CT kit with integrated, pass through holes	**ZEB-XCT600**	(2) 750 kcmil 3/0 Cu/Al	**XTOE005CCSS**	**XTOE005CGSS**
N	580–1000A	200-1000	1000: 5 panel-mount CT kit with integrated, pass through holes	**ZEB-XCT1000**	(3) 750 kcmil 3/0 Cu/Al	**XTOE005CCSS**	**XTOE005CGSS**
R	1600A	300-1500	1500: 5 panel-mount CT kit with integrated, pass through holes	**ZEB-XCT1500**	(4) 750 kcmil 1/0 Cu/Al	**XTOE005CCSS**	**XTOE005CGSS**

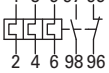
45 mm *XT* for Separate Mount

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
Overload Relay					
0.33–1.65	45 mm		ZEB32-1,65/KK	**XTOE1P6CCSS**	**XTOE1P6CGSS**
1–5			ZEB32-5/KK	**XTOE005CCSS**	**XTOE005CGSS**
4–20			ZEB32-20/KK	**XTOE020CCSS**	**XTOE020CGSS**
9–45			ZEB32-45/KK	**XTOE045CCSS**	**XTOE045CGSS**
20–100	55 mm		ZEB150-100/KK	**XTOE100GCSS**	**XTOE100GGSS**
35–175	110 mm		ZEB150-175/KK	**XTOE175GCSS**	**XTOE175GGSS**

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		ZEB150-175/PT	**XTOE175GCSP**	**XTOE175GGSP**

Accessories

CT Kits

Accessories

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

Safety Cover

Reset Bar

Remote Reset

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

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)

		Standard-Fault Short Circuit Data			High-Fault Short Circuit Data					
					Fuses (RK5, J, CC)			Thermal-Magnetic Circuit Breakers		
Overload FLA Range	Maximum Operating Voltage	600V (kA)	Maximum Fuse Size (A) (RK5)	Maximum Breaker Size (A)	480V (kA)	600V (kA)	Maximum Fuse Size	480V (kA)	600V (kA)	Maximum 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) 320 (415 Vac)	100	100	500 (gG)	100 (415 Vac)	—	350 (LGC3350) 320 (NZMH3)

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

		High-Fault Short Circuit Data			Thermal-Magnetic Circuit Breakers		
	Maximum	Fuses (RK5, J, CC)					
Contactor Frame Size	Operating Voltage	480V	600V	Maximum Fuse Size	480V	600V	Maximum 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) 350 (600 Vac)
H	35–175A	100	100	400	65	30	400

2

Motor Insight Overload and Monitoring Relays

Features

- Power, voltage and current monitoring, ground fault, flexible communications, motor and line protection in a single package
- Monitor energy consumption at individual loads to avoid peak demand charges
- Protect pumps from dead-head or starved conditions
- 0–660V, 1–540A with two relays
- Remote display allows for configuration without opening the panel, providing additional operator safety

Catalog Number Selection

Motor Insight Overload and Monitoring Relays

Motor Insight Overload Relays

C441 B A NOUI

Device Type
C441 = Motor Insight overload relay

Overload Relay Power Source Voltage	
B	= 240 Vac (170–264 Vac)
C	= 480 Vac (323–528 Vac)
D	= 600 Vac (487–660 Vac)
Blank	= 120 Vac control power (170–660 Vac)

Overload Relay Current Rating	
A	= 1–9A (1–540A refer to **Page V9-T2-33**)
B	= 5–90A (5–90A refer to **Page V9-T2-33**)
0109	= 120 Vac control power (0–660 Vac, 1–9A)
0590	= 120 Vac control power (0–660 Vac, 5–90A)

Internal User Interface	
Blank	= With user interface (line powered models)
NOUI	= Without user interface (120 Vac control models)

Motor Insight Overload Relays—Communications Modules and Accessory Types

C441 K

Device Type
C441 = Motor Insight overload relay

Communication Module	
K	= DeviceNet module 4IN/2OUT 120 Vac
L	= DeviceNet module 4IN/2OUT 24 Vdc
M	= Modbus RTU module
N	= Modbus RTU module 4IN/2OUT 120 Vac
P	= Modbus RTU module 4IN/2OUT 24 Vdc
Q	= PROFIBUS module 4IN/2OUT 120 Vac
R	= Modbus TCP / EtherNet/IP module 4IN/2OUT 120 Vac
S	= PROFIBUS module 4IN/2OUT 24 Vdc
T	= Modbus TCP / EtherNet/IP module 4IN/2OUT 24 Vdc

Accessory Type	
1	= Type 1 and 12 remote mounted display
3	= Type 3R kit for remote display
CMP1	= Conversion plate

Product Selection

Motor Insight

Motor Insight

Power Source	Monitoring Range	Current Range	Catalog Number
240 Vac (170–264)	170–264 Vac	1–9A	**C441BA**
		5–90A	**C441BB**
480 Vac (323–528)	323–528 Vac	1–9A	**C441CA**
		5–90A	**C441CB**
600 Vac (489–660)	489–660 Vac	1–9A	**C441DA**
		5–90A	**C441DB**
120 Vac (93.5–132)	170–660 Vac	1–9A	**C4410109NOUI**
		5–90A	**C4410590NOUI**

Motor Insight CT Multiplier and Wire Wrap Schedule

Catalog Number ①	Motor FLA	Number of Loops	Number of Conductors Through CT Primary	CT Multiplier Setting	External CT Kit Catalog Number ②
Current Range: 5–90A					
C441_B and C4410590NOUI	5–22.5A	3	4	4	—
	6.67–30A	2	3	3	—
	10–45A	1	2	2	—
	20–90A	0	1	1	—
Current Range: 1–9A					
C441_A and C4410109NOUI	1–5A	1	2	2	—
	2–9A	0	1	1	—
	60–135A	0	1	150–(150:5)	**C441CTKIT150**
	120–270A	0	1	300–(300:5)	**C441CTKIT300**
	240–540A	0	1	600–(600:5)	**C441CTKIT600**

Notes

① Underscore indicates Operating Voltage Code required.
Operating Voltage Codes:

Code	Voltage
B	240 Vac
C	480 Vac
D	600 Vac
<empty>	120 Vac Control Power

② Any manufacturer's CTs may be used.

Modbus Communication Module

Description	I/O	Catalog Number
Modbus communication module	None	**C441M**
Modbus communication module 4IN/2OUT	120 Vac	**C441N**
Modbus communication module 4IN/2OUT	240 Vdc	**C441P**

PROFIBUS Communication Module

Description	I/O	Catalog Number
PROFIBUS communication module 4IN/2OUT	120 Vac	**C441S**
PROFIBUS communication module 4IN/2OUT	24 Vdc	**C441Q**

DeviceNet Modules

Description	I/O	Catalog Number
DeviceNet communication module	120 Vac	**C441K**
DeviceNet communication module	24 Vdc	**C441L**

Ethernet Communication Module

Description	I/O	Catalog Number
Modbus TCP / EtherNet/IP communication module 4IN/2OUT	120 Vac	**C441R**
Modbus TCP / EtherNet/IP communication module 4IN/2OUT	24 Vdc	**C441T**

Accessories

Motor Insight

	Description	Catalog Number
Remote Display 	Remote display Type 1	**C4411**
Kit for Remote display 	Type 3R kit for remote display (remote display not included)	**C4413**
	Adaptive mounting plate	**C441CMP1**

Communication Cables

The Remote Display requires a communication cable to connect to the Motor Insight overload relay.

Communication Cable Lengths

Length in Inches (meters)	Catalog Number
9.8 (0.25)	**D77E-QPIP25**
39.4 (1.0)	**D77E-QPIP100**
78.7 (2.0)	**D77E-QPIP200**
118.1 (3.0)	**D77E-QPIP300**

Note

① Underscore indicates operating voltage code required.

Product Overview

Manual Motor Protectors and Controllers Selection Guide

Description	XTPB Pushbutton Manual Motor Protectors	XTPR Rotary Manual Motor Protectors	XTSC Manual Motor Controllers	XTFC Combination Motor Controllers
	Page V9-T2-37	**Page V9-T2-37**	**Page V9-T2-41**	**Page V9-T2-41**
Operator style	Pushbutton	Rotary	Rotary	Rotary
Components	Manual motor protector	Manual motor protector	Manual motor protector contactor connector kit	Manual motor protector contactor connector kit line side adapter
UL 508 Type E	—	Yes, with line side adapter	—	—
UL 508 Type F	—	—	—	Yes
Branch motor circuit functions	Disconnect	Disconnect	Disconnect	Disconnect
	Controller (manual)	Controller (manual)	Controller (manual and remote)	Controller (manual and remote)
	Short circuit protection	Short circuit protection	Short circuit protection	Short circuit protection
	Motor overload protection	Motor overload protection	Motor overload protection	Motor overload protection
FLA range	0.1–25A	0.1–65A	0.1–65A	0.1–65A

XT **IEC Manual Motor Protectors**

Features

- ON/OFF rotary handle with lockout provision
- Class 10 overload protection
- Motor applications from 0.1–63A
- Built-in heater and magnetic trip elements to protect the motor
- Adjustment dial for setting motor FLA
- XTPR Rotary MMP with a lineside adapter is rated for UL 508 Type E

Catalog Number Selection

XT IEC Manual Motor Protectors

Manual Motor Protectors

XT PR 012 B C1

Designation
XT = ***XT*** IEC power control

Type
PB = Manual motor protector—pushbutton
PR = Manual motor protector—rotary

Current Ratings	
Frame B	**Frame D**
P16 = 0.16A	**016** = 16A
P25 = 0.25A	**025** = 25A
P40 = 0.40A	**032** = 32A
P63 = 0.63A	**040** = 40A
001 = 1A	**050** = 50A
1P6 = 1.6A	**058** = 58A
2P5 = 2.5A	**063** = 63A
004 = 4A	
6P3 = 6.3A	
010 = 10A	
012 = 12A	
016 = 16A	
020 = 20A	
025 = 25A	
032 = 32A	

Frame Size
B = 45 mm
D = 55 mm

Trip Class
C1 = Class 10
Blank = Magnetic only (no thermal trip)

Product Selection

2

XTPB Pushbutton Manual Motor Protectors—Global and North American Ratings

Motor Protective Device with Thermal and Magnetic Trip

Note: Service Factor (SF)—Setting I_r of current scale in dependence of load factor:
SF = 1.15 -> I_r = 1 x I_n mot
SF = 1 -> I_r = 0.9 x I_n mot

Rated Uninterrupted Current— $I_u = I_e$ (Amps)	FLA Adjustment Range/Overload Release—I_r (A)	Short Circuit Release— I_{rm} (A)	Maximum Motor Ratings ① Maximum kW Rating AC-3—P (kW) Three-Phase					Maximum hp Rating—P (hp) UL 508/CSA C 22.2 No. 14 Three-Phase				Screw Terminals— Catalog Number
			220–240V	380–415V	440V	500V	660–690V	200V	240V	480V	600V	
Frame B												
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	1/2	1/2	**XTPB001BC1**
1.6	1–1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**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	1	1	2	3	**XTPB004BC1**
6.3	4–6.3	88	1.1	2.2	3	3	4	1-1/2	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	5	10	15	**XTPB020BC1**
25	20–25	350	5.5	12.5	12.5	15	22	5	7-1/2	15	20	**XTPB025BC1**

Notes

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).

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

Motor Protective Device with Thermal and Magnetic Trip

Note: Service Factor (SF)—Setting I_r of current scale in dependence of load factor:
SF = 1.15 -> I_r = 1 x I_n mot
SF = 1 -> I_r = 0.9 x I_n mot

Rated Uninterrupted Current— $I_u = I_e$ (Amps)	FLA Adjustment Range/Overload Release—I_r (A)	Short Circuit Release— I_{rm} (A)	Maximum Motor Ratings ① Maximum kW Rating AC-3—P (kW) Three-Phase					Maximum hp Rating—P (hp) UL 508/CSA C 22.2 No. 14 Three-Phase				Screw Terminals— Catalog Number ③
			220–240V	380–415V	440V	500V	660–690V	200V	240V	480V	600V	
Frame B												
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	1/2	1/2	**XTPR001BC1**
1.6	1–1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**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	1	1	2	3	**XTPR004BC1**
6.3	4–6.3	88	1.1	2.2	3	3	4	1-1/2	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	5	10	15	**XTPR020BC1**
25	20–25	350	5.5	12.5	12.5	15	22	5	7-1/2	15	20	**XTPR025BC1**
32	25–32	448	7.5	15	15	22	30	7-1/2	10	25	30	**XTPR032BC1**
Frame D												
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	20	25	**XTPR025DC1**
32	25–32	448	7.5	15	17.5	22	22	10	10	25	30	**XTPR032DC1**
40	32–40	560	11	20	22	24	30	10	15	30	40	**XTPR040DC1**
50	40–50	700	14	25	30	30	45	10	15	30	40	**XTPR050DC1**
58	50–58	812	17	30	37	37	55	—	—	40	—	**XTPR058DC1**
65	55–65	882	18.5	34	37	45	55	—	—	—	—	**XTPR063DC1**

Notes

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).

③ Catalog number shown comes with screw terminals. For Frame B devices up to 16A, spring cage terminals are available.
For spring cage terminals on line and load sides, insert a "C" into the catalog number in the 5th position—Example: XTPRC _BC1.
For spring cage terminals on the load side only, insert an "SC" into the catalog number in the 5th and 6th positions—Example: XTPRSC _BC1.

XTPR Manual Self-Protected Motor Starters—North American Ratings, UL 508 Type E ②

Motor Protective Device with Thermal and Magnetic Trip

2

Note: 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 (e.g., 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.

Rated Uninterrupted Current— $I_u = I_e$ (Amps)	FLA Adjustment Range/Overload Release—I_r (A)	Short Circuit Release— I_{rm} (A)	Maximum Motor Ratings ① Maximum hp Rating—P (hp) Three-Phase				Rated Short Circuit Breaking Capacity (kA)			Line Side Adapter— Catalog Number ②	Manual Motor Protector Screw Terminals— Catalog Number
			220V	240V	480–277V	600–247V	240V	480–277V	600–247V		
Frame B											
0.16	0.1–0.16	2.2	③	③	1/2	1/2	50	50	50	**XTPAXLSA**	**XTPRP16BC1**
0.25	0.16–0.25	3.4	③	③	1/2	1/2	50	50	50	**XTPAXLSA**	**XTPRP25BC1**
0.4	0.25–0.4	5.6	③	③	1/2	1/2	50	50	50	**XTPAXLSA**	**XTPRP40BC1**
0.63	0.4–0.63	8.8	③	③	1/2	1/2	50	50	50	**XTPAXLSA**	**XTPRP63BC1**
1	0.63–1	14	③	③	1/2	1/2	50	50	50	**XTPAXLSA**	**XTPR001BC1**
1.6	1–1.6	22	③	③	3/4	3/4	50	50	50	**XTPAXLSA**	**XTPR1P6BC1**
2.5	1.6–2.5	35	1/2	1/2	1	1-1/2	50	50	50	**XTPAXLSA**	**XTPR2P5BC1**
4	2.5–4	56	3/4	1	2	3	50	50	50	**XTPAXLSA**	**XTPR004BC1**
6.3	4–6.3	88	1	1-1/2	3	5	50	50	50	**XTPAXLSA**	**XTPR6P3BC1**
10	6.3–11	140	3	3	7-1/2	10	50	50	50	**XTPAXLSA**	**XTPR010BC1**
12	8–12	168	3	3	7-1/2	—	42	42	—	**XTPAXLSA**	—
16	10–16	224	3	5	10	—	42	42	—	**XTPAXLSA**	**XTPR016BC1**
20	16–20	280	5	5	—	—	42	42	—	**XTPAXLSA**	**XTPR020BC1**
25	20–25	350	5	7-1/2	15	—	18	18	—	**XTPAXLSA**	**XTPR025BC1**
32	25–32	448	7-1/2	10	25	—	18	18	—	**XTPAXLSA**	**XTPR032BC1**
Frame D											
16	10–16	224	3	5	10	10	50	50	50	**XTPAXLSAD**	**XTPR016DC1**
25	16–25	350	7-1/2	7-1/2	20	25	50	50	50	**XTPAXLSAD**	**XTPR025DC1**
32	25–32	448	10	10	25	30	50	50	50	**XTPAXLSAD**	**XTPR032DC1**
40	32–40	560	10	10	30	40	50	50	50	**XTPAXLSAD**	**XTPR040DC1**
50	40–50	700	10	15	30	—	65	65	—	**XTPAXLSAD**	**XTPR050DC1**
58	50–58	812	15	15	40	—	65	65	—	**XTPAXLSAD**	**XTPR058DC1**
65	55–65	882	15	15	40	—	65	65	—	**XTPAXLSAD**	**XTPR063DC1**

Notes

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

② UL 508 Type E starters are assembled from a standard XTPR and a special incoming terminal line side adapter (XTPAXLSA or XTPAXLSAD).

③ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

XT **IEC Manual and Combination Motor Controllers**

Features

- ON/OFF rotary handle with lockout provision
- Class 10 overload protection
- Adjustment dial for setting motor FLA
- Built-in surge suppression on DC coils as standard
- Assembled manual motor controllers consist of manual motor protector, contactor, connector kit and 1NO-1NC auxiliary contact for MMP
- Assembled combination motor controllers consist of manual motor protector, contactor, connector kit, 1NO-1NC auxiliary contact for MMP and line side adapter
- Combination motor controllers are UL 508 Type F rated, and provide the following functions in a single device
  - Disconnect, short circuit protection, motor overload protection, motor controller

Catalog Number Selection

XT IEC Manual and Combination Motor Controllers

Manual and Combination Motor Controllers

XT SC 012 B B A

Design
XT = ***XT*** IEC power control

Type
SC = Manual motor controller—FVNR
FC = Combination motor controller, UL 508 Type F—FVNR

Rated Current of MMP	
Frame B	**Frame D**
P16 = 0.16A	**016** = 16A
P25 = 0.25A	**025** = 25A
P40 = 0.40A	**032** = 32A
P63 = 0.63A	**040** = 40A
001 = 1A	**050** = 50A
1P6 = 1.6A	**058** = 58A
2P5 = 2.5A	**063** = 63A
004 = 4A	
6P3 = 6.3A	
010 = 10A	
012 = 12A	
016 = 16A	
020 = 20A	
025 = 25A	
032 = 32A	

Frame Size—MMP
B = 45 mm, 0.1 to 32A
D = 55 mm, 16 to 63A

Frame Size—Contactor
B = 45 mm, 7 to 15A
C = 45 mm, 18 to 32A
D = 55 mm, 40 to 65A

Coil Voltage
A = 110V 50 Hz, 120V 60 Hz
B = 220V 50 Hz, 240V 60 Hz
C = 415V 50 Hz, 480V 60 Hz
D = 550V 50 Hz, 600V 60 Hz
E = 208V 50 Hz
T = 24V 50/60 Hz
TD = 24 Vdc

Product Selection

2

XTSC Manual Motor Controllers (MMC)/Starter Combinations

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor

FLA Adjustment Range (A) ①	Short Circuit Release— I_{rm} (A)	Maximum Motor Ratings—P ② Maximum kW Rating AC-3—P (kW) Three-Phase 220–240V	380–415V	500V	660–690V	Maximum hp Rating—P (hp) Three-Phase 200V	240V	480V	600V	Assembled Manual Motor Controller ③ Non-Reversing— Catalog Number
Frame B MMP + Frame B Contactor										
0.1–0.16	3.2	—	—	—	0.06	④	④	1/2	1/2	**XTSCP16BB_**
0.16–0.25	3.5	—	0.06	0.06	0.12	④	④	1/2	1/2	**XTSCP25BB_**
0.25–0.4	5.6	0.06	0.09	0.12	0.18	④	④	1/2	1/2	**XTSCP40BB_**
0.4–0.63	8.82	0.09	0.18	0.25	0.25	④	④	1/2	1/2	**XTSCP63BB_**
0.63–1	14	0.12	0.25	0.37	0.55	④	④	1/2	1/2	**XTSC001BB_**
1–1.6	22.4	0.25	0.55	0.75	1.1	④	④	3/4	1	**XTSC1P6BB_**
1.6–2.5	35	0.37	0.75	1.1	1.5	1/2	1/2	1	1-1/2	**XTSC2P5BB_**
2.5–4	56	0.75	1.5	2.2	3	1	1	2	3	**XTSC004BB_**
4–6.3	88.2	1.1	2.2	3	4	1-1/2	1-1/2	3	5	**XTSC6P3BB_**
6.3–10	140	2.2	4	4	7.5	3	3	7-1/2	10	**XTSC010BB_**
8–12	168	3	5.5	5.5	11	3	3	7-1/2	10	**XTSC012BB_**
10–16	224	4	7.5	9	12.5	3	3	10	10	**XTSC016BB_**
Frame B MMP + Frame C Contactor										
10–16	224	4	7.5	9	12.5	3	3	10	10	**XTSC016BC_**
16–20	280	5.5	9	12.5	15	5	5	10	15	**XTSC020BC_**
20–25	350	5.5	11	15	22	5	7-1/2	15	20	**XTSC025BC_**
25–32	448	7.5	15	22	30	7-1/2	10	20	25	**XTSC032BC_**
Frame D MMP + Frame C Contactor										
10–16	224	4	7.5	9	12.5	3	5	10	15	**XTSC016DC_**
16–25	350	5.5	12.5	12.5	22	7-1/2	7-1/2	20	25	**XTSC025DC_**
25–32	448	7.5	15	17.5	22	10	10	25	30	**XTSC032DC_**
Frame D MMP + Frame D Contactor										
32–40	560	11	20	22	30	10	—	30	30	**XTSC040DD_**
40–50	700	14	25	30	45	15	15	30	40	**XTSC050DD_**
50–58	812	17	30	37	55	—	—	40	—	**XTSC058DD_**
55–65	882	18.5	34	37	55	—	—	40	—	**XTSC063DD_**

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 can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB). 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 -> I_r = 1 x I_n mot
SF = 1 -> I_r = 0.9 x I_n mot

① Overload release—I_r.
② Select manual motor protectors by full load amperes. Maximum motor ratings (kW, hp) are for reference only.
③ Underscore (_) indicates magnet coil suffix required. See **Page V9-T2-43**.
④ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).

XTFC Combination Motor Controllers (CMC), UL 508 Type F

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor + Required Line Side Adapter

FLA Adjustment Range (A) ①	Short Circuit Release— I_{rm} (A)	Maximum Motor Ratings—P ② Maximum kW Rating AC-3—P (kW) Three-Phase 220–240V	380–415V	500V	660–690V	Maximum hp Rating—P (hp) Three-Phase 200V	240V	480V	600V	Assembled Manual Motor Controller ③ Non-Reversing— Catalog Number
Frame B MMP + Frame B Contactor										
0.1–0.16	2.2	—	—	—	0.06	④	④	1/2	1/2	**XTFCP16BB_**
0.16–0.25	3.5	—	0.06	0.06	0.12	④	④	1/2	1/2	**XTFCP25BB_**
0.25–0.4	5.6	0.06	0.09	0.12	0.18	④	④	1/2	1/2	**XTFCP40BB_**
0.4–0.63	8.82	0.09	0.18	0.25	0.25	④	④	1/2	1/2	**XTFCP63BB_**
0.63–1	14	0.12	0.25	0.37	0.55	④	④	1/2	1/2	**XTFC001BB_**
1–1.6	22.4	0.25	0.55	0.75	1.1	④	④	3/4	1	**XTFC1P6BB_**
1.6–2.5	35	0.37	0.75	1.1	1.5	1/2	1/2	1	1-1/2	**XTFC2P5BB_**
2.5–4	56	0.75	1.5	2.2	3	1	1	2	3	**XTFC004BB_**
4–6.3	88.2	1.1	2.2	3	4	1-1/2	1-1/2	3	5	**XTFC6P3BB_**
6.3–10	140	2.2	4	4	7.5	3	3	7-1/2	10	**XTFC010BB_**
8–12	168	3	5.5	5.5	11	3	3	7-1/2	—	**XTFC012BB_**
10–16	224	4	7.5	9	12.5	3	5	10	—	**XTFC016BB_**
Frame B MMP + Frame C Contactor										
10–16	224	4	7.5	9	12.5	3	5	10	—	**XTFC016BC_**
16–20	280	5.5	9	12.5	15	5	5	—	—	**XTFC020BC_**
20–25	350	5.5	11	15	22	5	7-1/2	15	—	**XTFC025BC_**
25–32	448	7.5	15	22	30	7-1/2	10	20	—	**XTFC032BC_**
Frame D MMP + Frame C Contactor										
10–16	224	4	7.5	9	12.5	3	5	10	10	**XTFC016DC_**
16–25	350	5.5	12.5	12.5	22	7-1/2	7-1/2	20	25	**XTFC025DC_**
25–32	448	7.5	15	17.5	22	10	10	25	30	**XTFC032DC_**
Frame D MMP + Frame D Contactor										
32–40	560	11	20	22	30	10	10	30	40	**XTFC040DD_**
40–50	700	14	25	30	45	10	15	30	—	**XTFC050DD_**
50–58	812	17	30	37	55	15	15	40	—	**XTFC058DD_**
55–65	882	18.5	34	37	55	15	15	40	—	**XTFC063DD_**

Magnet Coil Suffix

Coil Voltage	Suffix Code
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
24V 50/60 Hz	**T**
24 Vdc	**TD** ⑤
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**

Notes

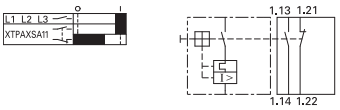
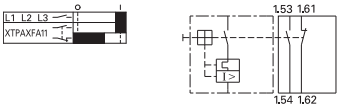
The assembled Combination Motor Controller (CMC) consists of an XTPR Manual Motor Protector (MMP) and an XTCE contactor and a required Line Side Adapter. For Frame B MMP + Frame B Contactor assemblies, the XTFC and XTFR can be mounted directly on DIN rail without an adapter. The contactors are supported 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.
SF = 1.15 -> I_r = 1 x I_n mot
SF = 1 -> I_r = 0.9 x I_n mot

① Overload release—I_r.
② Select combination motor controllers by full load amperes. Maximum motor ratings (kW, hp) are for reference only.
③ Underscore (_) indicates magnet coil suffix required. See table at left.
④ In this range, calculate motor rating according to rated current. Specified values to NEC 430.6(A)(1).
⑤ With DC operation: Integrated diode-resistor combination, coil rating 2.6W.

Accessories

Auxiliary Contacts

Contact Configuration	Contact Sequence	Screw Terminals Pkg. Qty.	Catalog Number
Side-Mount			
1NO-1NC		5	**XTPAXSA11**
Front-Mount			
1NO-1NC		5	**XTPAXFA11**

Rotary Handle Mechanism

IP65 Rotary Handle Mechanism ①②③

Description	Pkg. Qty.	Catalog Number
Complete Kits—Includes Handle, Shaft and Required Hardware		
Rotary handle mechanism IP65 black—for use on main switches to IEC/EN 60204.	1	**XTPAXRHMB**
Rotary handle mechanism IP65 red/yellow—for use on main switch with emergency-stop function to IEC/EN 60204.	1	**XTPAXRHMRY**
Rotary handle mechanism IP65 black—for use on main switches to IEC/EN 60204 where XTPR is mounted 90° from vertical.	1	**XTPAXRHM90B**
Rotary handle mechanism IP65 red/yellow—for use on main switch with emergency-stop function to IEC/EN 60204 where XTPR is mounted 90° from vertical.	1	**XTPAXRHM90RY**

Shunt Release

Shunt Release

Pkg. Qty.	Screw Terminals—Catalog Number
2	**XTPAXSR120V60H**
2	**XTPAXSR240V60H**
2	**XTPAXSR480V60H**
2	**XTPAXSR24VDC**

Undervoltage Release

Undervoltage Release

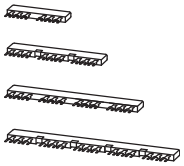
Pkg. Qty.	Screw Terminals—Catalog Number
2	**XTPAXUVR120V60H**
2	**XTPAXUVR240V60H**
2	**XTPAXUVR480V60H**

Notes

① With ON/OFF switch position and "+" (tripped), lockable with three padlocks, 4–8 mm hasp. Can be locked in the OFF position, if required.
② Rotary handle mechanisms ship with door interlock disabled. See instruction publication with product for how to enable door interlock.
③ Not for use with XTPAXFAEM20 early-make front-mount auxiliary contact.

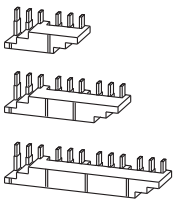
Three-Phase Commoning Links ①

MMP—Frame B



For Use With…	Qty MMP	Length of Link (mm)	Unit Width (mm)	Pkg. Qty.	Catalog Number
Frame B					
MMP with no side-mounted auxiliaries or voltage releases	2	90	45	10	**XTPAXCLKA2**
	3	135	45	10	**XTPAXCLKA3**
	4	180	45	10	**XTPAXCLKA4**
	5	225	45	10	**XTPAXCLKA5**
Frame D					
MMP with no side-mounted auxiliaries or voltage releases	2	110	55	1	**XTPAXCLKA2D**
	3	165	55	1	**XTPAXCLKA3D**
	4	220	55	1	**XTPAXCLKA4D**

MMP—Frame D



Incoming Terminal for Three-Phase Commoning Link ②

Incoming Terminal

For Use With…	Pkg. Qty.	Catalog Number
B Frame XTPR, XTPB	5	**XTPAXIT**

Line-Side Adapter ③

Line-Side Adapter

For Use With…	Pkg. Qty.	Catalog Number
B Frame XTPR to create a UL 508 type E/F manual combination starter	5	**XTPAXLSA**
D Frame XTPR to create a UL 508 type E/F manual combination starter	1	**XTPAXLSAD** ④

Notes

① Protected against accidental contact. B Frame short circuit proof Ue = 690V, Iu = 63A; D Frame short circuit proof Ue = 690V, Iu = 128A. Frame B links can be combined by rotating mounting. Frame D links cannot be combined.

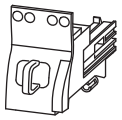
② For three-phase commoning link, protected against accidental contact, Ue = 690V, Iu = 63A; for conductor cross-sections: 2.5–25 mm^2 stranded; 2.5–16 mm^2 flexible with ferrules, AWG 14-6.

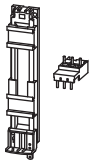
③ XTPAXLSA is for three-phase commoning link, finger- and back-of-hand proof, Ue = 690V, Iu = 60A; for conductor cross sections: 2.5–25 mm^2 stranded, 2.5–16 mm^2 flexible with ferrule, AWG 14-6.

④ XTPAXLSAD cannot be combined with three-phase commoning links.

2

Non-Reversing Starters

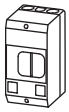




Combination Connection Kits for Connection of XTPR MMP with XTCE Contactor

For Use With…	Description	Std. Pack	Catalog Number
Non-Reversing Starters			
XTPR…B + XTCE…B	Comprised of:	1	**XTPAXTPCB**
	Mechanical connection element for XTPR…B and contactor		
	Main current wiring between XTPR…B and contactor in tool-less plug connection		
	Cable guidance		
	Use contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. six cables up to 2.5 mm^2 external diameter or four cables up to 3.5 mm^2 external diameter.		
XTPR…B + XTCE…C XTPR…D + XTCE…D	Comprised of:	1	**XTPAXTPCC**
	DIN rail adapter plate		
	Main current wiring between XTPR and contactor	1	**XTPAXTPCD**

Insulated Enclosures



Insulated Enclosures for Surface Mounting

Degree of Protection	For Use With…	Description	Catalog Number
XTPB Pushbutton Manual Motor Protectors—North American Usage ①②			
IP65 NEMA 3R, 4X, 12, 13	XTPB MMP only or with: XTPAXFA_, XTPBXFAEM20, XTPAXSA_, XTPAXUVR_, XTPAXSR_, XTPAXCL	With actuating diaphragm	**XTPBXENAS65**
IP65 NEMA 3R, 4X, 12, 13	XTPB MMP only or with: XTPAXFA_, XTPBXFAEM20, XTPAXUVR_, XTPAXSR_, XTPAXCL	With emergency-stop (E-stop) pushbutton actuator, red/yellow	**XTPBXENASES65**
B Frame (0.1–32A) XTPR Rotary Manual Motor Protectors—North American Usage ③			
IP55 NEMA 1, 12, 3R	B Frame XTPR Only or with: XTPAXSA_ and XTPAXFA_, XTPAXUVR_ and XTPAXFA_, XTPAXSR_ and XTPAXFA_, XTPAXCL	With red/yellow rotary handle for use as emergency-stop switch to VDE 0113	**XTPAXENAS55RY**
D Frame (10–65A) XTPR Rotary Manual Motor Protectors ④⑤			
IP65 NEMA 1, 12, 3R, 4X	D Frame XTPR only or with: XTPAXFA_, XTPAXFAEM20, XTPAXSA_, XTPAXSATR_, XTPAXUVR_, XTPAXSR_, XTPAXCL	With red/yellow rotary handle for use as emergency-stop switches to IEC/EN 60204	**XTPAXENCSD65RY**

Notes

① Built-in terminal for PE(N).
② North American enclosures come with conduit adapters for use with 1/2 NPT.
③ Built-in N and PE terminal, lower part without knockouts.
④ Integrated terminal for PE(N) connection.
⑤ % Metric knockouts:
Top ÷ bottom: M25/M32
In backplate: M25/M32
Control cable entry: M20

Product Overview

Soft Starters Selection Guide

					
Description	**DS7**	**DS6**	**S611**	**S801+**	**S811+**
	Page V9-T2-48	**Page V9-T2-50**	**Page V9-T2-51**	**Page V9-T2-55**	**Page V9-T2-58**
Power					
Current range (A)	4–32	41–200	26–414	11–1000	11–1000
Phases	Two-phase control	Two-phase control	Three-phase	Three-phase	Three-phase
Input voltage (line voltage)	0–460V	0–460V	0–600V	0–600V; 690V on V and T Frame	0–600V; 690V on V and T Frame
Horsepower range	460V: 2–20 hp	460V: 30–150 hp	460V: 40–350 hp	460V: 25–800 hp	460V: 25–800 hp
Internal run-bypass	Yes	Yes	Yes	Yes	Yes
Inside-the-delta control	—	—	—	Yes	Yes
Control					
User interface	Dials	Dials	LED and keypad	Dials and DIP switches	LCD and keypad
Control voltage	24 Vac/Vdc or 120–240 Vac	24 Vdc	120 Vac	24 Vdc	24 Vdc
Communications	—	—	Modbus RTU, EtherNet/IP, Modbus TCP, PROFIBUS, DeviceNet	—	Modbus RTU, EtherNet/IP, Modbus TCP
Program relays	—	—	Yes	Yes	Yes
Soft Start					
Voltage ramp initial current	5–85% LRT	5–85% LRT	5–85% LRT	5–85% LRT	5–85% LRT
Voltage ramp time	1–30 sec	1–30 sec	0.5–180 sec	0.5–180 sec	0.5–180 sec
Current limit	—	—	5–85% LRT	5–85% LRT	5–85% LRT
Current limit time	—	—	0.5–180 sec	0.5–180 sec	0.5–180 sec
Kick start current	—	—	5–85% LRT	5–85% LRT	5–85% LRT
Kick start time	—	—	0–2 sec	0–2 sec	0–2 sec
Jog	—	—	—	Yes	Yes
Soft Stop					
Stop ramp time	0–30 sec	0–30 sec	0–60 sec	0–60 sec	0–60 sec
Pump control	—	—	Optional	Optional	Optional
Environmental					
Operating temperature	0° to 40°C	0° to 40°C	–20° to 50°C	–30° to 50°C	–30° to 50°C
Humidity	0–95% noncondensing	0–95% noncondensing	0–95% noncondensing	0–95% noncondensing	0–95% noncondensing
Altitude	<2000M	<2000M	<2000M	<2000M	<2000M

2

DS7 Soft Start Controller

Features

- Small size
- Patented asymmetric delay angle control—makes torque behavior similar to a three-phase control device
- Integrated bypass
- It can take 24 Vac/Vdc or 110V/230 Vac control voltage
- Mechanical and electrical toolless assembly with MMPs
- Low cost solution compared to three-phase control devices
- Full UL approval

Product Selection

DS7 Soft Start Controller

Please refer to Application Note AP03901006E for additional information on proper size selection.

DS7 Soft Start Controller—Frame 1

DS7 Soft Start Controllers—Horsepower Ratings—10 Second Ramp, One Start per Hour, 300% Current Limit at 40°C ①

Rated Current (A)	Motor Power (hp) 200V	230V	480V	Maximum Allowable Breaker Size	Maximum Allowable Fuse Size	Recommended XTOB Overload (Direct Connect) ②	Recommended XTOE Overload ②	MMP ②	Connection Kit to MMP	Catalog Number
3.7	0.75	0.75	2	HFD3015	15A Class RK5	XTOB004BC1	XTOE005BCS	XTPR004BC1	XTPAXTPCB	**DS7-340SX004NO-N** ③
										DS7-342SX004NO-N ④
6.9	1.5	2	3	HFD3015	15A Class RK5	XTOB006BC1 ①	XTOE020BCS	XTPR6P3BC1	XTPAXTPCB	**DS7-340SX007NO-N** ③
										DS7-342SX007NO-N ④
7.8	2	2	5	HFD3020	20A Class RK5	XTOB010BC1	XTOE020BCS	XTPR010BC1	XTPAXTPCB	**DS7-340SX009NO-N** ③
										DS7-342SX009NO-N ④
11	3	3	7.5	HFD3030	20A Class RK5	XTOB012BC1	XTOE020BCS	XTPR012BC1	XTPAXTPCB	**DS7-340SX012NO-N** ③
										DS7-342SX012NO-N ④
15.2	3	5	10	HFD3035	25A Class RK5	XTOB016CC1	XTOE020CCS	XTPR016BC1	XTPAXTPCC	**DS7-340SX016NO-N** ③
										DS7-342SX016NO-N ④
22	5	7.5	15	HFD3060	40A Class RK5	XTOB024CC1	XTOE045CCS	XTPR025BC1	XTPAXTPCC	**DS7-340SX024NO-N** ③
										DS7-342SX024NO-N ④
32	7.5	10	20	HFD3070	50A Class RK5	XTOB032CC1	XTOE045CCS	XTPR032BC1	XTPAXTPCC	**DS7-340SX032NO-N** ③
										DS7-342SX032NO-N ④

Notes

① Actual motor FLAs vary. Verify these devices cover the motor specific FLA.
② Selections are based on motor FLA value at 480V.
③ 24 Vac/Vdc device.
④ 120/230 Vac device.

Please refer to Application Note AP03901006E for additional information on proper size selection.

DS7 Soft Start Controller—Frame 1

DS7 Soft Start Controllers—Horsepower Ratings—10 Second Ramp, One Start per Hour, 400% Current Limit at 40°C ①

Rated Current (A)	Motor Power (hp) 200V	230V	480V	Maximum Allowable Breaker Size	Maximum Allowable Fuse Size	Recommended XTOB Overload (Direct Connect) ②	Recommended XTOE Overload ②	MMP ②	Connection Kit to MMP	Catalog Number
3	0.5	0.5	1.5	HFD3015	15A Class RK5	XTOB004BC1	XTOE005BCS	XTPR004BC1	XTPAXTPCB	**DS7-340SX004NO-N** ③
										DS7-342SX004NO-N ④
4.8	1	1	3	HFD3015	15A Class RK5	XTOB006BC1 ①	XTOE020BCS	XTPR6P3BC1	XTPAXTPCB	**DS7-340SX007NO-N** ③
										DS7-342SX007NO-N ④
6.9	1.5	2	3	HFD3020	20A Class RK5	XTOB006BC1	XTOE020BCS	XTPR6P3BC1	XTPAXTPCB	**DS7-340SX009NO-N** ③
										DS7-342SX009NO-N ④
9	2	2	5	HFD3030	20A Class RK5	XTOB010BC1	XTOE020BCS	XTPR010BC1	XTPAXTPCB	**DS7-340SX012NO-N** ③
										DS7-342SX012NO-N ④
11	3	3	7.5	HFD3035	25A Class RK5	XTOB016CC1	XTOE020CCS	XTPR016BC1	XTPAXTPCC	**DS7-340SX016NO-N** ③
										DS7-342SX016NO-N ④
17.5	5	5	10	HFD3060	40A Class RK5	XTOB016CC1	XTOE045CCS	XTPR016BC1	XTPAXTPCC	**DS7-340SX024NO-N** ③
										DS7-342SX024NO-N ④
22	5	7.5	15	HFD3070	50A Class RK5	XTOB024CC1	XTOE045CCS	XTPR025BC1	XTPAXTPCC	**DS7-340SX032NO-N** ③
										DS7-342SX032NO-N ④

Notes

① Actual motor FLAs vary. Verify these devices cover the motor specific FLA.
② Selections are based on motor FLA value at 480V.
③ 24 Vac/Vdc device.
④ 120/230 Vac device.

DS6 Soft Start Controller

Features

- Run bypass mode greatly reduces internal heating created by the power dissipation across the SCRs. The bypass contactor directly connects the motor to the line and improves system efficiency by reducing internal power losses
- Less heat minimizes enclosure size and cooling requirements, and maximizes the life of all devices in the enclosure
- LED displays device status and provides fault indication
- Variable ramp times and voltage control (torque control) settings provide unlimited starting configurations, allowing for maximum application flexibility
- Minimizes the peak inrush current's stress on the power system
- Minimizes peak starting torque to diminish mechanical system wear and damage

Product Selection

DS6 Soft Start Controller

For 400% ramp, see Volume 6—Solid-State Motor Control, CA08100007E, Tab 1.

DS6 Soft Start Controller—Horsepower Rating, 10-Second Ramp, One Start per Hour, 300% Current Limit at 40°C

Rated Current (A)	Motor Power (hp) 200V	230V	460V	Maximum Allowable Breaker Size a	Maximum Allowable Fuse Size ①	Recommended XTOB Overload	Recommended C396 Overload	Catalog Number
40	10	10	30	HFD3150L	150A Class RK5	XTOB040DC1 ②	C396A2A045SELAX	**DS6-34DSX041N0-N**
52	15	20	40	HFD3200L	200A Class RK5	XTOB057DC1 ②	C396B2A075SELAX	**DS6-34DSX055N0-N**
65	20	25	50	HJD3250	200A Class RK5	XTOB065DC1 ②	C396B2A075SELAX	**DS6-34DSX068N0-N**
77	25	30	60	HKD3300	300A Class RK5	XTOB100GC1S	C396B2A110SELAX	**DS6-34DSX081N0-N**
96	30	30	75	HKD3350	350A Class RK5	XTOB100GC1S	C396B2A110SELAX	**DS6-34DSX099N0-N**
124	40	50	100	HKD3400	500A Class RK5	XTOB125GC1S	C396C2A150SELAX	**DS6-34DSX134N0-N**
156	50	60	125	HLD3450	500A Class RK5	XTOB160LC1 ③	C396A2A005SELAX ④	**DS6-34DSX161N0-N**
180	60	75	150	HLD3500	500A Class RK5	XTOB220LC1 ③	C396A2A005SELAX ④	**DS6-34DSX196N0-N**

Power Supply Selection

Description	Catalog Number
85–264V input and 24V output	**ELC-PS01**
380–480V input and 24V output	**PSS25F**
100–240 Vac input and 24 Vdc output	**PSG60E**
380–480 Vac input and 24 Vdc output	**PSG60F**

Notes

① Maximum values may be higher than allowed per NEC 430.52 and UL 508A 31.1.
② XTOBXDIND panel mounting adaptor must be used with this overload.
③ XTOBXTLL line and load lugs must be used with this overload.
④ C396CTK300 current transformer must be used with this overload.

S611 Soft Starter

Features

- Integrated bypass
- Integrated electronic overload protection
- 120V control
- Power monitoring
- Intuitive user interface
- Field serviceability (control board, contactors)
- Pump control option
- Modbus RTU native
- Plug-and-play EtherNet IP / Modbus TCP / PROFIBUS / DeviceNet adapters
- Control board mounted underneath the cover
- High fault combination rating up to 100 kA
- Available in NEMA 1/12/3R/4/4X enclosures

Catalog Number Selection

S611 Soft Starter

Solid-State Soft Starter

S 611 B 125 N 3 S

S = Soft starter

611 = Non-combination soft starter

Frame Size
- **A** = 52–77A
- **B** = 99–125A
- **C** = 156–180A
- **D** = 242A
- **E** = 302–361A
- **F** = 414A

Ampere Rating

052 = 52A	**180** = 180A
065 = 65A	**242** = 242A
077 = 77A	**302** = 302A
099 = 99A	**361** = 361A
125 = 125A	**414** = 414A
156 = 156A	

Options
- **N** = No options
- **P** = Pump control

Number of Poles
- **3** = Three-pole device

S = Standard soft starter

Product Selection

Horsepower Ratings

Note: Always refer to motor plate FLA and ensure that the motor plate FLA is equal to or lower than the maximum current value in the tables.

S611

Standard Duty—300% Current for 15 Seconds, 115% Continuous

Maximum Current (Amps)	Horsepower Rating 208V	240V	480V	600V	Catalog Number
52	15	15	40	50	**S611A052N3S**
65	20	20	50	60	**S611A065N3S**
77	25	25	60	75	**S611A077N3S**
99	30	30	75	100	**S611B099N3S**
125	40	40	100	125	**S611B125N3S**
156	50	60	125	150	**S611C156N3S**
180	60	60	150	150	**S611C180N3S**
242	75	75	200	250	**S611D242N3S**
302	100	100	250	300	**S611E302N3S**
361	125	150	300	350	**S611E361N3S**
414	150	150	350	450	**S611F414N3S**

Standard Duty Plus—350% FLA for 30 Seconds, 115% Continuous

Maximum Current (Amps)	Horsepower Rating 208V	240V	480V	600V	Catalog Number
52	15	15	40	50	**S611A052N3S**
65	20	20	50	60	**S611A065N3S**
71	20	25	60	75	**S611A077N3S**
99	30	30	75	100	**S611B099N3S**
119	40	40	100	125	**S611B125N3S**
156	50	60	125	150	**S611C156N3S**
180	60	60	150	150	**S611C180N3S**
242	75	75	200	250	**S611D242N3S**
302	100	100	250	300	**S611E302N3S**
361	125	150	300	350	**S611E361N3S**
407	150	150	350	400	**S611F414N3S**

Note: Always refer to motor plate FLA and ensure that the motor plate FLA is equal to or lower than the maximum current value in the tables.

S611

Heavy Duty—500% FLA for 30 Seconds, 125% Continuous

Maximum Current (Amps)	Horsepower Rating 208V	240V	480V	600V	Catalog Number
49	15	15	40	50	**S611A052N3S**
83	25	30	60	75	**S611B099N3S**
142	40	60	125	150	**S611C156N3S**
225	75	75	200	200	**S611D242N3S**
256	75	100	200	250	**S611E361N3S**
285	100	125	250	300	**S611F414N3S**

Severe Duty—600% FLA for 30 Seconds, 125% Continuous

Maximum Current (Amps)	Horsepower Rating 208V	240V	480V	600V	Catalog Number
41	10	15	30	40	**S611A052N3S**
69	20	30	60	60	**S611B099N3S**
117	30	50	100	125	**S611C180N3S**
187	60	75	150	200	**S611D242N3S**
213	75	75	150	200	**S611E361N3S**
238	75	100	200	250	**S611F414N3S**

Accessories

Optional Accessory Kits

Description	S611 Current Rating	Accessory Kit Part Number
User interface remote mounting kit —3.28 ft (1m)	52–414A	**S611-RMK-100**
User interface remote mounting kit—6.56 ft (2m)	52–414A	**S611-RMK-200**
User interface remote mounting kit—9.84 ft (3m)	52–414A	**S611-RMK-300**
User interface communication cable—3.28 ft (1m)	52–414A	**D77E-QPIP100**
User interface communication cable—6.56 ft (2m)	52–414A	**D77E-QPIP200**
User interface communication cable—9.84 ft (3m)	52–414A	**D77E-QPIP300**
Lug kit—mechanical	52–77A	**S611-LUG-M01**
	99–125A	**S611-LUG-M02**
	156–242A	**S611-LUG-M03**
	302–414A	**S611-LUG-M04**

Options

2

Pump Control

For pump control option, change the **8th** digit in the Catalog Number to **P**, as in S611XXX**P**3S.

Replacement Parts

S611 Replacement Components

Description	Part Number
User interface	**S611-KEYPAD**
User interface communication cable—0.25m (0.82 ft)	**D77E-QPIP25**
Control board assembly—52A standard	**S611-PCB-052S**
Control board assembly—65A standard	**S611-PCB-065S**
Control board assembly—77A standard	**S611-PCB-077S**
Control board assembly—99A standard	**S611-PCB-099S**
Control board assembly—125A standard	**S611-PCB-125S**
Control board assembly—156A standard	**S611-PCB-156S**
Control board assembly—180A standard	**S611-PCB-180S**
Control board assembly—242A standard	**S611-PCB-242S**
Control board assembly—302A standard	**S611-PCB-302S**
Control board assembly—361A standard	**S611-PCB-361S**
Control board assembly—414A standard	**S611-PCB-414S**
Control board assembly—52A pump	**S611-PCB-052P**
Control board assembly—65A pump	**S611-PCB-065P**
Control board assembly—77A pump	**S611-PCB-077P**
Control board assembly—99A pump	**S611-PCB-099P**
Control board assembly—125A pump	**S611-PCB-125P**
Control board assembly—156A pump	**S611-PCB-156P**
Control board assembly—180A pump	**S611-PCB-180P**
Control board assembly—242A pump	**S611-PCB-242P**
Control board assembly—302A pump	**S611-PCB-302P**
Control board assembly—361A pump	**S611-PCB-361P**
Control board assembly—414A pump	**S611-PCB-414P**
Frame A/B CT	**S611-CT-AB**
Frame C/D CT	**S611-CT-CD**
Frame E/F CT	**S611-CT-EF**
Contactor assembly—52–180A	**C25DNY172**
Contactor assembly—242–414A	**C25DNY173**

S801+ Soft Starters

Features

- Smaller size
- Physically fits in place of most NEMA and IEC starters
- Built-in run bypass contactor
- Built-in overload protection
- Adjustable ramp times
- Adjustable kick start control
- Dial and DIP switch user interface (CIM)
- Alarm and warning capability
- Analog input

Catalog Number Selection

S801+ Soft Starter

S801+ Open Soft Starters ①②

S 801+ N66 N 3 S

S = Soft starter

801+ = Non-combination soft starter

Ampere Rating

N37 = 37A	**U50** = 500A ③
N66 = 66A	**V36** = 360A
R10 = 105A	**V42** = 420A
R13 = 135A	**V50** = 500A
T18 = 180A	**V65** = 650A
T24 = 240A	**V72** = 720A
T30 = 304A	**V85** = 850A
U36 = 360A	**V10** = 1000A
U42 = 420A	

Options

N = Standard

Number of Poles

3 = Three-pole device

S = Standard soft starter

Notes

① S801+T_, S801+U_ and S801+V_ units require lug kits found on **Pages V9-T2-63**.

② All units require a 24 Vdc power supply found on catalog **Pages V9-T2-63**, or equivalent.

③ S801+U50N3S unit does not have IEC certification.

Product Selection

2

Standard Duty

S801+

Standard Duty—15 Second Ramp, 300% Current Limit at 40°C, Inline Connection

Max. Current	Three-Phase Motors kW Rating (50 Hz) 230V	380–400V	440V	hp Rating (60 Hz) 200V 1.0SF	200V 1.15SF	230V 1.0SF	230V 1.15SF	460V 1.0SF	460V 1.15SF	575–600V 1.0SF	575–600V 1.15SF	Catalog Number
Frame Size N												
37	10	18.5	18.5	10	10	10	10	25	20	30	30	**S801+N37N3S**
66	18.5	30	37	20	15	20	20	50	40	60	50	**S801+N66N3S**
Frame Size R												
105	30	55	59	30	25	40	30	75	60	100	75	**S801+R10N3S**
135	40	63	80	40	30	50	40	100	75	125	100	**S801+R13N3S**
Frame Size T												
180	51	90	110	60	50	60	60	150	125	150	150	**S801+T18N3S**
240	75	110	147	75	60	75	75	200	150	200	200	**S801+T24N3S**
304	90	160	185	100	75	100	100	250	200	300	250	**S801+T30N3S**
Frame Size U												
360	110	185	220	125	100	150	125	300	250	350	300	**S801+U36N3S**
420	129	220	257	150	125	175	150	350	300	450	350	**S801+U42N3S**
500	150	257	300	150	150	200	150	400	350	500	450	**S801+U50N3S** ①
Frame Size V												
360	110	185	220	125	100	150	125	300	250	350	300	**S801+V36N3S**
420	129	220	257	150	125	175	150	350	300	450	350	**S801+V42N3S**
500	150	257	300	150	150	200	150	400	350	500	450	**S801+V50N3S**
650	200	355	425	250	200	250	200	500	450	600	500	**S801+V65N3S**
720	220	400	450	—	—	300	250	600	500	700	600	**S801+V72N3S**
850	257	475	500	—	—	350	300	700	600	900	700	**S801+V85N3S**
1000	277	525	550	—	—	400	350	800	700	900	800	**S801+V10N3S**

Note

① S801+U50N3S does not have IEC certification.

Severe Duty

S801+

Severe Duty—>30 Second Ramp, >300% Current Limit

Max. Current	Three-Phase Motor kW Rating (50 Hz) 230V	380–400V	440V	hp Rating (60 Hz) 200V 1.0SF	200V 1.15SF	230V 1.0SF	230V 1.15SF	460V 1.0SF	460V 1.15SF	575V 1.0SF	575V 1.15SF	Catalog Number
Frame Size N												
22	5.5	10	11	5	5	7-1/2	5	15	10	20	15	**S801+N37N3S**
42	11	18.5	22	10	10	15	10	30	25	40	30	**S801+N66N3S**
Frame Size R												
65	15	30	33	15	15	20	15	50	40	50	50	**S801+R10N3S**
80	22	40	45	25	20	30	25	60	50	75	60	**S801+R13N3S**
Frame Size T												
115	33	59	63	30	30	40	30	75	75	100	100	**S801+T18N3S**
150	45	80	90	50	40	50	50	100	100	150	125	**S801+T24N3S**
192	55	100	110	60	50	75	60	150	125	200	150	**S801+T30N3S**
Frame Size U												
240	75	110	147	75	60	75	75	200	150	200	200	**S801+U36N3S**
305	90	160	185	100	75	100	100	250	200	300	250	**S801+U42N3S**
365	110	185	220	125	100	150	125	300	250	350	300	**S801+U50N3S** ①
Frame Size V												
240	75	110	147	75	60	75	75	200	150	200	200	**S801+V36N3S**
305	90	160	185	100	75	100	100	250	200	300	250	**S801+V42N3S**
365	110	185	220	125	100	150	125	300	250	350	300	**S801+V50N3S**
420	129	220	257	150	125	150	150	350	300	450	350	**S801+V65N3S**
480	147	257	295	150	150	200	150	400	350	500	450	**S801+V72N3S**
525	160	280	335	150	150	200	150	450	350	500	450	**S801+V85N3S**
600	185	315	375	200	150	250	200	500	450	600	500	**S801+V10N3S**

Note

① S801+U50N3S unit does not have IEC certification.

2

Type S811+ Soft Starters

Features

- Smaller size
- Physically fits in place of most NEMA and IEC starters
- Built-in run bypass contactor
- Built-in overload protection
- Adjustable ramp times
- Adjustable kick start control
- Native Modbus RTU and QCP communication
- kW and power factor measurement
- Cloning feature
- Alarm and warning capability
- Analog input
- Digital interface
- Pump control option
- Inside-the-delta capability

Catalog Number Selection

S811+ Soft Starter

S811+ Open Soft Starters ①

S 811+ T 30 N 3 S

S = Soft starter

811+ = Non-combination soft starter

Frame Size ②
- **N** = 65 mm
- **R** = 110 mm
- **T** = 200 mm
- **U** = 200 mm
- **V** = 290 mm

Ampere Rating

37 = 37A	**24** = 240A	**65** = 650A
66 = 66A	**30** = 304A	**72** = 720A
10 = 105A	**36** = 360A	**85** = 850A
13 = 135A	**42** = 420A	**10** = 1000A
18 = 180A	**50** = 500A ③	

Options
- **N** = No options ④
- **P** = Premium, 600V rated ⑤
- **V** = Premium, 690V rated (S811+T18V35 through S811+V85V35) ⑥⑦

Number of Poles
- **3** = Three-pole device

S = Soft starter

Notes

① All units require a 24 Vdc power supply found on catalog **Page V9-T2-63**, or equivalent.
② S811+T_, S811+U_ and S811+V_ units require lug kits found on **Page V9-T2-63**.
③ S811+U50_ unit does not have IEC certification.
④ Level/Edge Sense, Inline or Inside-the-Delta wiring configuration.
⑤ Level/Edge Sense, Inline or Inside-the-Delta wiring configuration, pump control and extended ramp.
⑥ Not available in S811+U_.
⑦ Level/Edge Sense, Inline wiring configuration, pump control, extended ramp.

Product Selection

Standard Duty

S811+

Standard Duty—15 Second Ramp, 300% Current Limit at 40°C, Inline Connection

Max. Current	Three-Phase Motors kW Rating (50 Hz) 230V	380–400V	440V	hp Rating (60 Hz) 200V 1.0SF	200V 1.15SF	230V 1.0SF	230V 1.15SF	460V 1.0SF	460V 1.15SF	575–690V ① 1.0SF	575–690V ① 1.15SF	Catalog Number
Frame Size N												
37	10	18.5	18.5	10	10	10	10	25	20	30	30	**S811+N37N3S**
66	18.5	30	37	20	15	20	20	50	40	60	50	**S811+N66N3S**
Frame Size R												
105	30	55	59	30	25	40	30	75	60	100	75	**S811+R10N3S**
135	40	63	80	40	30	50	40	100	75	125	100	**S811+R13N3S**
Frame Size T												
180	51	90	110	60	50	60	60	150	125	150	150	**S811+T18N3S**
240	75	110	147	75	60	75	75	200	150	200	200	**S811+T24N3S**
304	90	160	185	100	75	100	100	250	200	300	250	**S811+T30N3S**
Frame Size U												
360	110	185	220	125	100	150	125	300	250	350	300	**S811+U36N3S**
420	129	220	257	150	125	175	150	350	300	450	350	**S811+U42N3S**
500	150	257	300	150	150	200	150	400	350	500	450	**S811+U50N3S** ②
Frame Size V												
360	110	185	220	125	100	150	125	300	250	350	300	**S811+V36N3S**
420	129	220	257	150	125	175	150	350	300	450	350	**S811+V42N3S**
500	150	257	300	150	150	200	150	400	350	500	450	**S811+V50N3S**
650	200	355	425	250	200	250	200	500	450	600	500	**S811+V65N3S**
720	220	400	450	—	—	300	250	600	500	700	600	**S811+V72N3S**
850	257	475	500	—	—	350	300	700	600	900	700	**S811+V85N3S**
1000	277	525	550	—	—	400	350	800	700	900	800	**S811+V10N3S**

Notes

① 690V is available only from S811+T18V3S through S811+V85V3S. Not available on S811+U…V3S.

② S811+U50_ rating does not have IEC certification.

Severe Duty

2

S811+

Severe Duty—30 Second Ramp and/or 450% Current Limit at 50°C, Inline Connection

Max. Current	Three-Phase Motors kW Rating (50 Hz) 230V	380–400V	440V	hp Rating (60 Hz) 200V 1.0SF	200V 1.15SF	230V 1.0SF	230V 1.15SF	460V 1.0SF	460V 1.15SF	575–690V ① 1.0SF	575–690V ① 1.15SF	Catalog Number
Frame Size N												
22	5.5	10	11	5	5	7-1/2	5	15	10	20	15	**S811+N37N3S**
42	11	18.5	22	10	10	15	10	30	25	40	30	**S811+N66N3S**
Frame Size R												
65	15	30	33	15	15	20	15	50	40	50	50	**S811+R10N3S**
80	22	40	45	25	20	30	25	60	50	75	60	**S811+R13N3S**
Frame Size T												
115	33	59	63	30	30	40	30	75	75	100	100	**S811+T18N3S**
150	45	80	90	50	40	50	50	100	100	150	125	**S811+T24N3S**
192	55	100	110	60	50	75	60	150	125	200	150	**S811+T30N3S**
Frame Size U												
240	75	110	147	75	60	75	75	200	150	200	200	**S811+U36N3S**
305	90	160	185	100	75	100	100	250	200	300	250	**S811+U42N3S**
Frame Size V												
240	75	110	147	75	60	75	75	200	150	200	200	**S811+V36N3S**
305	90	160	185	100	75	100	100	250	200	300	250	**S811+V42N3S**
365	110	185	220	125	100	150	125	300	250	350	300	**S811+V50N3S**
420	129	220	257	150	125	150	150	350	300	450	350	**S811+V65N3S**
480	147	257	295	150	150	200	150	400	350	500	450	**S811+V72N3S**
525	160	280	335	150	150	200	150	450	350	500	450	**S811+V85N3S**
575	172	303	370	200	150	250	200	500	450	600	500	**S811+V10N3S**

Note

① 690V is available only from S811+T18V3S through S811+V85V3S. Not available on S811+U…V3S.

Inside-the-Delta, Standard Duty

S811+

Standard Duty—15 Second Ramp, 300% Current Limit at 40°C, Inside-the-Delta Connection

Max. Continuous Motor Line Current	Three-Phase Motor kW Rating (50 Hz)			hp Rating (60 Hz)								Catalog Number
				200V		230V		460V		575V		
	230V	380–400V	440V	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
65	10	18.5	18.5	15	15	15	15	40	30	50	50	**S811+N37N3S**
114	18.5	30	37	30	25	30	30	75	60	100	75	**S811+N66N3S**
Frame Size R												
182	30	55	59	50	40	60	50	125	100	150	125	**S811+R10N3S**
234	40	63	80	60	50	75	60	150	125	200	150	**S811+R13N3S**
Frame Size T												
311	51	90	110	100	75	100	100	250	200	250	250	**S811+T18N3S**
415	75	110	147	125	100	125	125	300	250	300	300	**S811+T24N3S**
526	90	160	185	150	125	150	150	400	300	400	400	**S811+T30N3S**
Frame Size U												
623	110	185	220	200	150	250	200	450	400	550	450	**S811+U36N3S**
727	129	220	257	250	200	300	250	550	450	700	550	**S811+U42N3S**
865	150	257	300	250	250	300	250	600	550	750	700	**S811+U50N3S** ①②
Frame Size V												
623	110	185	220	200	150	250	200	450	400	550	450	**S811+V36N3S**
727	129	220	257	250	200	300	250	550	450	700	550	**S811+V42N3S**
865	150	257	300	250	250	300	250	600	550	750	700	**S811+V50N3S**
1125	200	355	425	400	300	400	300	750	700	900	750	**S811+V65N3S**
1246	—	—	—	—	—	—	—	—	—	—	—	**S811+V72N3S**
1471	—	—	—	—	—	—	—	—	—	—	—	**S811+V85N3S**
—	—	—	—	—	—	—	—	—	—	—	—	**S811+V10N3S**

Notes

① 15 sec start, 300% inrush, 40°C, 1 start every 15 minutes. If these start parameters are exceeded, please refer to S811+V50_.

② S811+U50_ unit does not have IEC certification.

Inside-the-Delta, Severe Duty

2

S811+

Severe Duty—30 Second Ramp and/or 450% Current Limit at 50°C, Inside-the-Delta Connection

Max. Continuous Motor Line Current	Three-Phase Motor kW Rating (50 Hz)			hp Rating (60 Hz) 200V		230V		460V		575V		Catalog Number
	230V	380–400V	440V	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	1.0SF	1.15SF	
Frame Size N												
39	5.5	10	11	7-1/2	7-1/2	10	7-1/2	25	15	30	25	**S811+N37N3S**
73	11	18.5	22	15	15	25	15	50	40	60	50	**S811+N66N3S**
Frame Size R												
111	15	30	33	25	25	30	25	75	60	75	75	**S811+R10N3S**
138	22	40	45	40	30	50	40	100	75	120	100	**S811+R13N3S**
Frame Size T												
199	33	59	63	50	50	60	50	125	125	150	150	**S811+T18N3S**
257	45	80	90	75	60	75	75	150	150	250	200	**S811+T24N3S**
324	55	100	110	100	75	100	100	250	200	300	250	**S811+T30N3S**
Frame Size U												
415	75	110	147	125	100	125	125	300	250	300	300	**S811+U36N3S**
526	90	160	185	150	120	150	150	400	300	450	400	**S811+U42N3S**
623	110	185	220	200	150	250	200	450	400	550	450	**S811+U50N3S** ①
Frame Size V												
415	75	110	147	125	100	125	125	300	250	300	300	**S811+V36N3S**
526	90	160	185	150	120	150	150	400	300	450	400	**S811+V42N3S**
623	110	185	220	200	150	250	200	450	400	550	450	**S811+V50N3S**
727	129	220	257	250	200	250	250	550	450	700	550	**S811+V65N3S**
816	147	257	295	250	250	300	250	600	550	750	700	**S811+V72N3S**
908	160	280	335	250	250	300	250	700	550	750	700	**S811+V85N3S**
—	—	—	—	—	—	—	—	—	—	—	—	**S811+V10N3S**

Note

① S811+U50_ unit does not have IEC certification.

Accessories

Lug Kits

S811+T_, S811U_ and S811+V_ soft starters each have different lug options based on your wiring needs. Each lug kit contains three lugs that can be mounted on either the load or line side.

Lug Kit

Lug Kits

S811+ Catalog Number	Description	Kits Required	Catalog Number
S811+T_, S811+U_	2 cable connections, 4 AWG to 1/0 cable	2	**EML22**
	1 cable connection, 4/0 to 500 kcmil cable		**EML23**
	2 cable connections, 4/0 to 500 kcmil cable		**EML24**
	1 cable connection, 2/0 to 300 kcmil cable		**EML25**
	2 cable connections, 2/0 to 300 kcmil cable		**EML26**
S811+V_	2 cable connections, 4/0 to 500 kcmil cable	2	**EML28**
	4 cable connections, 4/0 to 500 kcmil cable		**EML30**
	6 cable connections, 4/0 to 500 kcmil cable		**EML32**
	4 cable connections, 2/0 to 300 kcmil cable		**EML33** ①

Power Supplies

24 Vdc power supply that can be used with the S811+ SSRV or as a stand-alone device.

Power Supplies

Description	Catalog Number
85–264 Vac input 24 Vdc output	**PSG240E**
360–575 Vac input 24 Vdc output	**PSG240F**

Lug Cover Kits

Replacement covers for the S811+T_, S811+U_ and S811+V_ soft starters are available in case of damage to the existing covers.

Lug Cover Kits

Description	Catalog Number
Lug cover S811+T_, S811+U_	**EML27**
Lug cover S811+V_	**EML34**

IP20 Kits

IP20 Kits

Description	Catalog Number
S811+N_	**SS-IP20-N**
S811+R_	**SS-IP20-R**
S811+T_ and S811+U_	**SS-IP20-TU**
S811+V_	**SS-IP20-V**

Surge Suppressors

The surge suppressor can mount on either the line or load side of the soft starter. It is designed to clip the line voltage (or load side induced voltage).

Surge Suppressor

Surge Suppressors

Description	Catalog Number
600V MOV for S811+_ units	**EMS39**
690V MOV for S811+_ units ②	**EMS41**

Notes

① The EML33 does not have a CSA listing.

② S811+T_ only.

2

Mounting Plates

The mounting plates are designed to help make it easy to install or retrofit the soft starter into enclosures and MCCs. The soft starter can be mounted onto the plate prior to installation. The mounting plate is designed with tear drop mounting holes for easier installation.

Mounting Plates

Description	Catalog Number
S811+N_	**EMM13N**
S811+R_	**EMM13R**
S811+T_ and S811+U_	**EMM13T**
S811+V_	**EMM13V**

Vibration Plates

The vibration plates allow the soft starter to be applied in high shock and vibration applications. The vibration plate allows vibration up to 5g and shock in up to 40g. The soft starter is mounted onto the vibration plate prior to installation in the panel.

Vibration Plates

Description	Catalog Number
S811+N_	**EMM14N**
S811+R_	**EMM14R**
S811+T_ and S811+U_	**EMM14T**
S811+V_	**EMM14V**

Adapter Plates

The adapter plate allows customers to retrofit a S811+V_ soft starter with the S811+U_ soft starter.

Adapter Plates

Description	Catalog Number
Adapter plates	**EMM13U**

Control Wire Connector

Control Wire Connector

Description	Catalog Number
12-pin, 5 mm pitch connector for control wiring	**EMA75**

Digital Interface Module

The Digital Interface Module (DIM) is available as a replacement part.

DIM

Description	Catalog Number
Blank cover (filler)	**EMA68**
DIM for standard unit	**EMA91**
Panel mounting kit	
3 ft cable	**EMA69A**
5 ft cable	**EMA69B**
8 ft cable	**EMA69C**
10 ft cable	**EMA69D**

Options

S811+ Premium

In addition to what is already there in the S811+ standard, these devices offer pump control and extended ramp functions.

S811+ Premium

Current Range	Catalog Number
11–37	**S811+N37P3S**
20–66	**S811+N66P3S**
32–105	**S811+R10P3S**
42–135	**S811+R13P3S**
56–180	**S811+T18P3S**
75–240	**S811+T24P3S**
95–304	**S811+T30P3S**
112–360	**S811+U36P3S**
131–420	**S811+U42P3S**
156–500	**S811+U50P3S** ①
112–360	**S811+V36P3S**
131–420	**S811+V42P3S**
156–500	**S811+V50P3S**
203–650	**S811+V65P3S**
225–720	**S811+V72P3S**
265–850	**S811+V85P3S**
312–1000	**S811+V10P3S**

S811+ Premium 690V Option

In addition to what is already there in S811+ standard, this product offers 690V, pump control and extended ramp functions.

S811+ Premium 690V Option

Current Range	Catalog Number
56–180	**S811+T18V3S**
75–240	**S811+T24V3S**
95–304	**S811+T30V3S**
112–360	**S811+V36V3S**
131–420	**S811+V42V3S**
156–500	**S811+V50V3S**
203–650	**S811+V65V3S**
225–720	**S811+V72V3S**
265–850	**S811+V85V3S**

Cooling Fan Kit

The EMM18 cooling fan kit mounts on either side of any frame size S811+ soft starter to provide additional printed circuit board cooling in high ambient operating temperatures.

Cooling Fan Kit

Description	Catalog Number
Fan kit	**EMM18**

Note

① S811+U50_ unit does not have IEC certification.

Product Overview

Drives Selection Guide

Description	M-Max Machinery Drives			SVX9000 Drives					
	Page V9-T2-66			Page V9-T2-68					
Frame									
	FS1	**FS2**	**FS3**	**FR4**	**FR5**	**FR6**	**FR7**	**FR8**	**FR9**
Dimensions (in Inches)									
Height	6.16	7.68	10.33	12.9	16.5	2.2	24.8	30.1	45.3
Width	2.58	3.54	3.94	5	5.6	7.6	9.3	11.5	18.9
Depth	4.02	4.13	4.41	7.5	8.4	9.3	10.1	13.5	13.4
I/O									
	Six digital inputs Two analog inputs (V and mA) One analog output One digital output Two relay outputs RS-485 interface (Modbus RTU)			Six digital inputs Two analog inputs (V and mA) Two digital outputs, form C relays One digital output, open collector One analog output Varied communication options					

M-Max Machinery Drive

2

Features

- Ease of use—plug and play, start-up wizard, advanced diagnostic capability, copy/paste parameters without powering drive
- Compact, space-saving design
- Availability—short lead-times, stocked at multiple locations
- Aftermarket support organization with industry-leading drive specialists for pre- and post-sale support
- Rugged and reliable—50°C rating, 150% overload for one min., 200% starting current for two secs. in every 20 sec. period, conformal coated boards, two year warranty
- RoHS compliance

Catalog Number Selection

M-Max™ Machinery Drive

Machinery Drive

MMX 1 1 AA 1D1 F 1 – 0

Base Catalog Number

Phase
1 = Single-phase
3 = Three-phase

Voltage
1 = 115V
2 = 230V
4 = 480V

Software Designation Series
AA

Output Current
1D6 = 1.6A
010 = 10A

EMC Filter
F = Filter
N = No filter

Enclosure Class
0 = NEMA 0 or IP00
1 = IP21 or NEMA 1

Option
0 = Full version

Product Selection

M-Max Machinery Drive

P (kW)	P (hp)	I_N (A)	Catalog Number
Input 115V Single-Phase		**Out 230V Three-Phase**	
0.25	0.33	1.7	**MMX11AA1D7N0-0**
0.37	0.5	2.4	**MMX11AA2D4N0-0**
0.55	0.75	2.8	**MMX11AA2D8N0-0**
0.75	1	3.7	**MMX11AA3D7N0-0**
1.1	1.5	4.8	**MMX11AA4D8F0-0**
Input 230V Single-Phase		**Out 230V Three-Phase**	
0.25	0.33	1.7	**MMX12AA1D7F0-0**
0.37	0.5	2.4	**MMX12AA2D4F0-0**
0.55	0.75	2.8	**MMX12AA2D8F0-0**
0.75	1	3.7	**MMX12AA3D7F0-0**
1.1	1.5	4.8	**MMX12AA4D8F0-0**
1.5	2	7	**MMX12AA7D0F0-0**
2.2	3	9.6	**MMX12AA9D6F0-0**
Input 230V Three-Phase		**Out 230V Three-Phase**	
0.25	0.33	1.7	**MMX32AA1D7N0-0**
0.37	0.5	2.4	**MMX32AA2D4N0-0**
0.55	0.75	2.8	**MMX32AA2D8N0-0**
0.75	1	3.7	**MMX32AA3D7N0-0**
1.1	1.5	4.8	**MMX32AA4D8F0-0**
1.5	2	7	**MMX32AA7D0F0-0**
2.2	3	11	**MMX32AA011F0-0**

P (kW)	P (hp)	I_N (A)	Catalog Number
Input 480V Three-Phase		**Out 480V Three-Phase**	
0.37	0.5	1.3	**MMX34AA1D3F0-0**
0.55	0.75	1.9	**MMX34AA1D9F0-0**
0.75	1	2.4	**MMX34AA2D4F0-0**
1.1	1.5	3.3	**MMX34AA3D3F0-0**
1.5	2	4.3	**MMX34AA4D3F0-0**
2.2	3	5.6	**MMX34AA5D6F0-0**
3	4	7.6	**MMX34AA7D6F0-0**
4	5.5	9	**MMX34AA9D0F0-0**
5.5	7.5	12	**MMX34AA012F0-0**
7.5	10	14	**MMX34AA014F0-0**
Input 575V Three-Phase		**Out 575V Three-Phase**	
1	1.7	2	**MMX35AA1D7N0-0**
2	2.7	3.6	**MMX35AA2D7N0-0**
3	3.9	5	**MMX35AA3D9N0-0**
5	6.1	7.6	**MMX35AA6D1N0-0**
7.5	9	10.4	**MMX35AA9D0N0-0**

Accessories

Kits

Description	Catalog Number
Drive to PC communication module	**MMX-COM-PC**
Type 1 and IP21 kit for Frame 1	**MMX-IP21-FS1**
Type 1 and IP21 kit for Frame 2	**MMX-IP21-FS2**
Type 1 and IP21 kit for Frame 3	**MMX-IP21-FS3**

Optional Communication Modules

Description	Catalog Number
Communication adapter kit	**MMX-NET-XA**
CANopen network card	**XMX-NET-CO-A**
PROFIBUS DP network card with serial connection	**XMX-NET-PS-A**
PROFIBUS DP network card with sub-D connection	**XMX-NET-PD-A**
DeviceNet network card	**XMX-NET-DN-A**

SVX9000 Drives

Features

- Integrated 3% line reactors standard on drives from FR4 through FR9
- EMI/RFI filters standard up to 200 hp I_H 480V, 100 hp I_H 230V
- Quick start wizard built into the programming of the drive ensures a smooth start-up
- LOCAL/REMOTE operation from keypad
- Copy/paste function allows transfer of parameter settings from one drive to the next
- Standard Type 12 keypad on all drives
- Hand-held auxiliary 240V power supply allows programming/monitoring of control module without applying full power to the drive

Catalog Number Selection

SVX9000 Drives

SVX9000

SVX 010 A 1 – 4 A 1 B 1 _ _ _ _ _ _

Product Family
SVX = Open drives
SVX = Open drives FR10 and greater

Horsepower Rating

F07 = 3/4 hp	**800** = 800 hp
F15 = 1-1/2 hp	**900** = 900 hp
007 = 7-1/2 hp	**H10** = 1000 hp
010 = 10 hp	**H12** = 1200 hp
050 = 50 hp	**H13** = 1350 hp
125 = 125 hp	**H15** = 1500 hp
350 = 350 hp	**H16** = 1600 hp
700 = 700 hp	**H20** = 2000 hp

AFD Software Series
A = Standard software

Enclosure ①②
0 = Chassis
1 = NEMA Type 1
2 = NEMA Type 12

Voltage Rating
2 = 230 (208–240) V
4 = 480 (380–500) V
5 = 575 (525–690) V

Keypad
A = Alphanumeric

Input Options ③
1 = Three-phase, EMC H
2 = Three-phase, EMC N
4 = Three-phase, EMC L

Brake Chopper Options ④
N = No brake chopper circuit
B = Internal brake chopper circuit

Board Modifications
1 = Standard boards
2 = Conformal (varnished) coating

Options
Options appear in alphabetical order.

Extended I/O Card Options
B1 = 6 DI, 1 ext +24 Vdc/EXT +24 Vdc
B2 = 1 RO (NC-NO), 1 RO (NO), 1 therm
B4 = 1 AI (mA isolated), 2 AO (mA isolated), 1 ext +24 Vdc/EXT + 24 Vdc
B5 = 3 RO (NO)
B8 = 1 ext +24 Vdc/EXT +24 Vdc, 3 Pt100
B9 = 1 RO (NO), 5 DI 42–240 Vac input

Communication Cards
CA = Johnson Controls® N2
CI = Modbus TCP
CJ = BACnet®
CK = Ethernet IP
C2 = Modbus
C3 = PROFIBUS DP
C4 = LonWorks®
C5 = PROFIBUS DP (D9 connector)
C6 = CANopen (slave)
C7 = DeviceNet
C8 = Modbus (D9 Type connector)
D3 = RS-232 with D9 connection

Notes

① 480V drives 250 hp (IH) and larger are available with enclosure style **0** (chassis); 690V drives 200 hp (IH) and larger are available with enclosure style **0** (chassis).

② 480V and 690V FR10 freestanding drives are available with enclosure style **1** (NEMA Type 1) and enclosure style **2** (NEMA Type 12). FR11 freestanding drives only available with enclosure style **1** (NEMA Type 1).

③ All 230V drives and 480V drives up to 200 hp (IH) are only available with input option **1** (EMC level H). 480V drives 250 hp (IH) or larger are available with input option **2** (EMC level N). 480V drives are available with input option **4** (EMC level L). 575V drives 200 hp (IH) or larger are only available with input option **2**. 575V drives up to 150 hp (IH) are only available with input option **4** (EMC level L).

④ 480V drives up to 30 hp (IH) are only available with brake chopper option **B**. 480V drives 40 hp (IH) or larger come standard with brake chopper option **N**. 230V drives up to 15 hp (IH) are only available with brake chopper option **B**. 230V drives 20 hp or larger come standard with brake chopper option **N**. All 575V drives come standard without brake chopper option (**N**). **N** = No brake chopper.

Product Selection

208–240V, Type 1 Drive

Frame Size	Delivery Code	hp (I_H)	Current (I_H)	hp (I_L)	Current (I_L)	Catalog Number
FR4	W	3/4	3.7	1	4.8	**SVXF07A1-2A1B1**
		1	4.8	1-1/2	6.6	**SVX001A1-2A1B1**
		1-1/2	6.6	2	7.8	**SVXF15A1-2A1B1**
		2	7.8	3	11	**SVX002A1-2A1B1**
		3	11	—	12.5	**SVX003A1-2A1B1**
FR5	W	—	12.5	5	17.5	**SVX004A1-2A1B1**
		5	17.5	7-1/2	25	**SVX005A1-2A1B1**
		7-1/2	25	10	31	**SVX007A1-2A1B1**
FR6	W	10	31	15	48	**SVX010A1-2A1B1**
		15	48	20	61	**SVX015A1-2A1B1**
FR7	W	20	61	25	75	**SVX020A1-2A1N1**
		25	75	30	88	**SVX025A1-2A1N1**
		30	88	40	114	**SVX030A1-2A1N1**
FR8	W	40	114	50	140	**SVX040A1-2A1N1**
		50	140	60	170	**SVX050A1-2A1N1**
		60	170	75	205	**SVX060A1-2A1N1**
FR9	W	75	205	100	261	**SVX075A1-2A1N1**
		100	261	—	—	**SVX100A1-2A1N1**

380–500V, Type 1 Drive

Frame Size	Delivery Code	hp (I_H)	Current (I_H)	hp (I_L)	Current (I_L)	Catalog Number
FR4	W	1	2.2	1-1/2	3.3	**SVX001A1-4A1B1**
		1-1/2	3.3	2	4.3	**SVXF15A1-4A1B1**
		2	4.3	3	5.6	**SVX002A1-4A1B1**
		3	5.6	5	7.6	**SVX003A1-4A1B1**
		5	7.6	—	9	**SVX005A1-4A1B1**
		—	9	7-1/2	12	**SVX006A1-4A1B1**
FR5	W	7-1/2	12	10	16	**SVX007A1-4A1B1**
		10	16	15	23	**SVX010A1-4A1B1**
		15	23	20	31	**SVX015A1-4A1B1**
FR6	W	20	31	25	38	**SVX020A1-4A1B1**
		25	38	30	46	**SVX025A1-4A1B1**
		30	46	40	61	**SVX030A1-4A1B1**
FR7	W	40	61	50	72	**SVX040A1-4A1N1**
		50	72	60	87	**SVX050A1-4A1N1**
		60	87	75	105	**SVX060A1-4A1N1**
FR8	W	75	105	100	140	**SVX075A1-4A1N1**
		100	140	125	170	**SVX100A1-4A1N1**
		125	170	150	205	**SVX125A1-4A1N1**
FR9	W	150	205	200	261	**SVX150A1-4A1N1**
		200	245	250	300	**SVX200A1-4A1N1**

525–690V, Type 1 Drive

Frame Size	Delivery Code	hp (I_H)	Current (I_H)	hp (I_L)	Current (I_L)	Catalog Number
FR6	W	2	3.33	3	4.5	**SVX002A1-5A4N1**
		3	4.5	—	5.5	**SVX003A1-5A4N1**
		—	5.5	5	7.5	**SVX004A1-5A4N1**
		5	7.5	7-1/2	10	**SVX005A1-5A4N1**
		7-1/2	10	10	13.5	**SVX007A1-5A4N1**
		10	13.5	15	18	**SVX010A1-5A4N1**
		15	18	20	22	**SVX015A1-5A4N1**
		20	22	25	27	**SVX020A1-5A4N1**
		25	27	30	34	**SVX025A1-5A4N1**
FR7	W	30	34	40	41	**SVX030A1-5A4N1**
		40	41	50	52	**SVX040A1-5A4N1**
FR8	W	50	52	60	62	**SVX050A1-5A4N1**
		60	62	75	80	**SVX060A1-5A4N1**
		75	80	100	100	**SVX075A1-5A4N1**
FR9	W	100	100	125	125	**SVX100A1-5A4N1**
		125	125	150	144	**SVX125A1-5A4N1**
		150	144	—	170	**SVX150A1-5A4N1**
		—	170	200	208	**SVX175A1-5A4N1**

Accessories

Option Board Kits

Option Kit Description ①	Allowed Slot Locations ②	Field Installed Catalog Number	Factory Installed Option Designator	SVX Ready Programs Basic
Standard I/O Cards				
2 RO (NC/NO)	B	**OPTA2**	—	X
6 DI, 1 DO, 2 AI, 1AO, 1 +10 Vdc Ref, 2 Ext +24 Vdc/Ext +24 Vdc	A	**OPTA9**	—	X
Extended I/O Card Options				
2 RO, therm—SPX only	B	**OPTA3**	A3	—
Encoder low volt +5V/15V/24V—SPX only	C	**OPTA4**	A4	—
Encoder high volt +15V/24V—SPX only	C	**OPTA5**	A5	—
Double encoder—SPX only	C	**OPTA7**	A7	X
6 DI, 1 DO, 2 AI, 1 AO—SPX only	A	**OPTA8**	A8	—
3 DI (encoder 10–24V), out +15V/+24V, 2 DO (pulse+direction)—SPX only	C	**OPTAE**	AE	X
6 DI, 1 ext +24 Vdc/Ext +24 Vdc	B, C, **D**, E	**OPTB1**	B1	—
1 RO (NC/NO), 1 RO (NO), 1 therm	B, C, **D**, E	**OPTB2**	B2	—
1 AI (mA isolated), 2 AO (mA isolated), 1 Ext +24 Vdc/Ext +24 Vdc	B, C, **D**, E	**OPTB4**	B4	X
3 RO (NO)	B, C, **D**, E	**OPTB5**	B5	—
1 Ext +24 Vdc/Ext +24 Vdc, 3 Pt100	B, C, **D**, E	**OPTB8**	B8	—
1 RO (NO), 5 DI 42–240 Vac input	B, C, **D**, E	**OPTB9**	B9	—
Communication Cards				
Modbus	D, **E**	**OPTC2**	C2	X
Johnson Controls N2 ③	D, **E**	**OPTC2**	CA	—
Modbus TCP	D, **E**	**OPTCI**	CI	X
BACnet	D, **E**	**OPTCJ**	CJ	X
Ethernet IP	D, **E**	**OPTCK**	CK	X
PROFIBUS DP	D, **E**	**OPTC3**	C3	X
LonWorks	D, **E**	**OPTC4**	C4	X
PROFIBUS DP (D9 connector)	D, **E**	**OPTC5**	C5	X
DeviceNet	D, **E**	**OPTC7**	C7	X
Modbus (D9 type connector)	D, **E**	**OPTC8**	C8	X
Adapter—SPX only	D, **E**	**OPTD1**	D1	X
Adapter—SPX only	D, **E**	**OPTD2**	D2	X
RS-232 with D9 connection	D, **E**	**OPTD3**	D3	X
Keypad				
9000X series local/remote keypad (replacement keypad)	—	**KEYPAD-LOC/REM**	—	—
9000X series remote mount keypad unit (keypad not included, includes 10 ft cable, keypad holder, mounting hardware)	—	**OPTRMT-KIT-9000X**	—	—
9000X Series RS-232 cable, 13 ft	—	**PP00104**	—	—

Notes

① AI = Analog Input; AO = Analog Output, DI = Digital Input, DO = Digital Output, RO = Relay Output.

② Option card must be installed in one of the slots listed for that card. Slot indicated in bold is the preferred location.

③ OPTC2 is a multi-protocol option card.

Miscellaneous Options

Description	Catalog Number
9000XDrive A PC-based tool for controlling and monitoring of the SVX9000. Features include: loading parameters that can be saved to a file or printed, setting references, starting and stopping the motor, monitoring signals in graphical or text form, and real-time display. To avoid damage to the drive or computer, SVDrivecable must be used.	**9000XDRIVE**
SVDrivecable 6 ft (1.8m) RS-232 cable (22 gauge) with a 7-pin connector on each end. Should be used in conjunction with the 9000XDrive option to avoid damage to the SVX9000 or computer. The same cable can be used for downloading specialized applications to the drive.	**SVDRIVECABLE**

NEMA Type 12 Conversion Kit

Note: The NEMA Type 12 kit option is used to convert a NEMA Type 1 to a NEMA Type 12 drive. The NEMA Type 12 kit consists of a metal drive shroud, fan kit for some frames, adapter plate and plugs.

Frame Size	Delivery Code	Approximate Dimensions in Inches (mm) Length	Width	Height	Approximate Weight in lb (kg)	Catalog Number
FR4	W	13 (330)	7 (178)	4 (102)	4 (1.8)	**OPTN12FR4**
FR5	W	16 (406)	8 (203)	7 (178)	5 (2.3)	**OPTN12FR5**
FR6	W	21 (533)	10 (254)	5 (127)	7 (3.2)	**OPTN12FR6**