

ZE, Z00 Overload Relays

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Z1, Z4 Overload Relays  
ZW7 Current Transformer-Operated Overload Relays  
Z5 Overload Relays

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ZWA Electronic Overload Relays  
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Accessories  
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# Overload Relays With single phasing sensitivity

UL / CSA / IEC / CE




Thermal Overload Relays  
Thermistor Overload Relays

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| 1 | 2  | 3  | 4                         | 5              | 6   |
|---|--|--|---------------------------|----------------|---|
|   | For direct mounting on contactors (see section 3 for contactors) | Adjustable setting range (Motor full load current) | <b>Type</b>               | <b>Price</b>   | Short-circuit protection by fuses<br>by circuit breaker |
|   | Contactor size   | Amps   |                           | \$             | Maximum 600V AC<br>Maximum 600V AC <sup>2)</sup>        |
|   | <b>E(E)M<sup>1)</sup></b>  | 0.1 – 0.16   | <b>ZE-0.16</b>            | See Price List | 1 15  |
|   |  | 0.16 – 0.24  | <b>ZE-0.24</b>            | See Price List | 1 15  |
|   |  | 0.24 – 0.4   | <b>ZE-0.4</b>             | See Price List | 1 15  |
|   |  | 0.4 – 0.6  | <b>ZE-0.6</b>             | See Price List | 1 15  |
|   |  | 0.6 – 1.0  | <b>ZE-1.0</b>             | See Price List | 3 15  |
|   |  | 1.0 – 1.6  | <b>ZE-1.6</b>             | See Price List | 6 15  |
|   |  | 1.6 – 2.4  | <b>ZE-2.4</b>             | See Price List | 6 15  |
|   |  | 2.4 – 4  | <b>ZE-4</b>               | See Price List | 15 15   |
|   |  | 4 – 6  | <b>ZE-6</b>               | See Price List | 20 15   |
|   |  | 6 – 9  | <b>ZE-9</b>               | See Price List | 35 15   |
|   |  | 9 – 12   | <b>ZE-12<sup>3)</sup></b> | See Price List | 45 –  |
|   | <b>00M</b>   | 0.1 – 0.16   | <b>Z00-0.16</b>           | See Price List | 1 25  |
|   | <b>00AM</b>  | 0.16 – 0.24  | <b>Z00-0.24</b>           | See Price List | 1 25  |
|   | <b>0M</b>  | 0.24 – 0.4   | <b>Z00-0.4</b>            | See Price List | 1 25  |
|   | <b>0AM</b>   | 0.4 – 0.6  | <b>Z00-0.6</b>            | See Price List | 1 25  |
|   |  | 0.6 – 1.0  | <b>Z00-1.0</b>            | See Price List | 3 25  |
|   |  | 1.0 – 1.6  | <b>Z00-1.6</b>            | See Price List | 6 25  |
|   |  | 1.6 – 2.4  | <b>Z00-2.4</b>            | See Price List | 6 25  |
|   |  | 2.4 – 4  | <b>Z00-4</b>              | See Price List | 15 25   |
|   |  | 4 – 6  | <b>Z00-6</b>              | See Price List | 20 25   |
|   |  | 6 – 10   | <b>Z00-10</b>             | See Price List | 40 25   |
|   |  | 10 – 16  | <b>Z00-16</b>             | See Price List | 60 30   |
|   |  | 16 – 24  | <b>Z00-24</b>             | See Price List | 90 30   |

1) A distance of at least 5 mm should be maintained between overload relays when mounted side by side.  
 2) Max. 480V AC for type ZE.  
 3) UL / CSA only

UL Listed File No. E 29184  
 CSA Certified File No. 45958 + 43359






| 1   | 2  | 3   | 4  | 5  | 6  |
|---|--|---|--|--|--|
|   | For direct mounting on contactors                      | Setting range   | Type   | Price  | Short-circuit protection by fuses<br>by circuit breaker                    |
|   |  |   |  |  | Maximum 600V AC<br>Maximum 600V AC   |
|   | DIL  | Amps  |  | \$   | Amps<br>Amps   |
|                         | 1M<br>1AM<br>2M<br>2M<br>2AM                           | 6-10<br>10-16<br>16-24<br>24-40<br>40-57<br>50-63                               | Z1-10<br>Z1-16<br>Z1-24<br>Z1-40<br>Z1-57<br>Z1-63                                 | See Price List<br>See Price List<br>See Price List<br>See Price List<br>See Price List<br>See Price List                                     | 40<br>60<br>90<br>125<br>200<br>200  |
|                         | For separate mounting<br><br>As supplied:<br>Z1-75+EZ1 | 63-75   | Z1-75  | See Price List<br>See Price List   | 250<br>200   |
| <b>For assembly with DIL universal contactors</b><br>(without K terminal block)                         |  |   |  |  |  |
|   | 3-22   | 50-70<br>70-100<br>100-140  | Z4-70-CNA/K3<br>Z4-100-CNA/K3<br>Z4-140-CNA/K3                                     | See Price List<br>See Price List<br>See Price List   | 250<br>400<br>500  |
|   | 4-22, 6-22   | 70-100<br>100-140<br>140-180<br>180-240   | Z4-100-CNA<br>Z4-140-CNA<br>Z4-180-CNA<br>Z4-240-CNA                               | See Price List<br>See Price List<br>See Price List<br>See Price List   | 400<br>500<br>500<br>700   |
|   | 8(A)-22  | 180-240   | Z4-240-CNA/K8  | See Price List   | 700  |
| <b>For separate mounting</b>  |  |   |  |  |  |
|   |  | 50-70<br>70-100<br>100-140<br>140-180<br>180-240                                | Z4-70/K-NA<br>Z4-100/K-NA<br>Z4-140/K-NA<br>Z4-180/K-NA<br>Z4-240/K-NA             | See Price List<br>See Price List<br>See Price List<br>See Price List<br>See Price List   | 250<br>400<br>500<br>500<br>700  |
| <b>Saturating Core Current Transformer Operated Relays</b><br>for motors having long accelerating times |  |   |  |  |  |
|                       | -<br>-<br>-<br>-<br>-<br>-<br>-<br>-                   | 42-63<br>60-90<br>85-125<br>110-160<br>160-240<br>190-290<br>270-400<br>360-540 | ZW7-63<br>ZW7-90<br>ZW7-125<br>ZW7-160<br>ZW7-240<br>ZW7-290<br>ZW7-400<br>ZW7-540 | See Price List<br>See Price List<br>See Price List<br>See Price List<br>See Price List<br>See Price List<br>See Price List<br>See Price List | As required by associated contactor.<br>Overload relay is self-protecting. |

Thermal Overload Relays  
Thermistor Overload Relays

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# Overload Relays With single phasing sensitivity

UL / CSA / IEC / CE

| 1  | 2                                   | 3             | 4            | 5              | 6   |
|--|-------------------------------------|---------------|--------------|----------------|---|
|  | For direct mounting on contactors   | Setting range | Type         | Price          | Short-circuit protection by fuses<br>by circuit breaker |
|  | DIL                                 | Amps          |              | \$             | Amps<br>Amps  |
| <b>Z 5 Overload Relays, Direct mounting</b>  |                                     |               |              |                |   |
|    | DIL 3M 80                           | 25-35         | Z5-35/SK3    | See Price List | 125   |
|  |                                     | 35-50         | Z5-50/SK3    | See Price List | 225   |
|  |                                     | 50-70         | Z5-70/SK3    | See Price List | 250   |
|  |                                     | 70-100        | Z5-100/SK3   | See Price List | 400 Class J   |
|    | DIL 4M 115                          | 35-50         | Z5-50/SK4    | See Price List | 225   |
|  |                                     | 50-70         | Z5-70/SK4    | See Price List | 250   |
|  |                                     | 70-100        | Z5-100/SK4   | See Price List | 400 Class J   |
|  |                                     | 95-125        | Z5-125/SK4   | See Price List | 500 Class J   |
|  |                                     | 120-142       | Z5-150/SK4   | See Price List | 600 Class J   |
| <b>Z 5 Overload Relays, Separate mounting</b>                                      |                                     |               |              |                |   |
|  | —                                   | 25-35         | Z5-35/KK3    | See Price List | 125   |
|  |                                     | 35-50         | Z5-50/KK3    | See Price List | 225   |
|  |                                     | 50-70         | Z5-70/KK3    | See Price List | 250   |
|  |                                     | 70-100        | Z5-100/KK3   | See Price List | 400 Class J   |
|  | —                                   | 35-50         | Z5-50/KK4    | See Price List | 225   |
|  |                                     | 50-70         | Z5-70/KK4    | See Price List | 250   |
|  |                                     | 70-100        | Z5-100/KK4   | See Price List | 400 Class J   |
|  |                                     | 95-125        | Z5-125/KK4   | See Price List | 500 Class J   |
|  |                                     | 120-150       | Z5-150/KK4   | See Price List | 600 Class J   |
|  | DIL M 185<br>DIL M 225<br>DIL M 250 | 50-70         | Z5-70/FF250  | See Price List | 250   |
|  |                                     | 70-100        | Z5-100/FF250 | See Price List | 400 Class J   |
|  |                                     | 95-125        | Z5-125/FF250 | See Price List | 500 Class J   |
|  |                                     | 120-160       | Z5-160/FF250 | See Price List | 600 Class J   |
|  |                                     | 160-220       | Z5-220/FF250 | See Price List | 800 Class J   |
|  |                                     | 200-250       | Z5-250/FF250 | See Price List | 800 Class J   |

Thermal Overload Relays  
Thermistor Overload Relays

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UL Listed File No. E 29184  
CSA Certified File No. 12528

| 1   | 2                                   | 3   | 4  |
|---|-------------------------------------|---|--|
| Setting range<br>Overload release<br>Amps                             |                                     | Type  | Price<br>\$  |
| <b>Tripping device with built-in current transformers</b><br>1.25-6.3 |                                     | ZWA-6.3(110–120V 50/60Hz)<br>ZWA-6.3(220–240V 50/60Hz)<br>ZWA-6.3(24V DC) | See Price List<br>See Price List<br>See Price List |
| 6.3-25  |                                     | ZWA-25(110–120V 50/60Hz)<br>ZWA-25(220–240V 50/60Hz)<br>ZWA-25(24V DC)    | See Price List<br>See Price List<br>See Price List |
| 25-100  |                                     | ZWA-100(110–120V 50/60Hz)<br>ZWA-100(220–240V 50/60Hz)<br>ZWA-100(24V DC) | See Price List<br>See Price List<br>See Price List |
| 50-205  |                                     | ZWA-205(110–120V 50/60Hz)<br>ZWA-205(220–240V 50/60Hz)<br>ZWA-205(24V DC) | See Price List<br>See Price List<br>See Price List |
| 125-500   |                                     | ZWA-500(110–120V 50/60Hz)<br>ZWA-500(220–240V 50/60Hz)<br>ZWA-500(24V DC) | See Price List<br>See Price List<br>See Price List |
| 200-820   |                                     | ZWA-820(110–120V 50/60Hz)<br>ZWA-820(220–240V 50/60Hz)<br>ZWA-820(24V DC) | See Price List<br>See Price List<br>See Price List |
| <b>Current Transformers for Ground Fault protection</b>               |                                     |   |  |
| <b>Fault current Amps</b>   | <b>Window opening for load wire</b> |   |  |
| 0.3 A   | 40 mm (1.57 in.)                    | SSW40-0.3   | See Price List                                     |
| 0.5 A   |                                     | SSW40-0.5   | See Price List                                     |
| 1 A   |                                     | SSW40-1   | See Price List                                     |
| 0.5 A   | 65 mm (2.55 in.)                    | SSW65-0.5   | See Price List                                     |
| 1 A   |                                     | SSW65-1   | See Price List                                     |
| 0.5 A   | 120 mm (4.72 in.)                   | SSW120-0.5  | See Price List                                     |
| 1 A   |                                     | SSW120-1  | See Price List                                     |

# Electronic Overload Relays

## Selection of contactor according to starting duty (CLASS)

For normal starting and overload conditions, contactors are selected for "CLASS 10". In order that the contactors are not thermally overloaded during longer tripping times, the maximum rated operational current  $I_e$  must be reduced according to the CLASS setting.

$$I_{CLASS 5} = I_{CLASS 10} = I_e \quad I_{CLASS 15} = I_e \times 0.82 \quad I_{CLASS 20} = I_e \times 0.71 \quad I_{CLASS 25} = I_e \times 0.63 \quad I_{CLASS 30} = I_e \times 0.58$$

## Tripping devices with integral current transformer

Tripping devices **ZWA-6.3** through **ZWA-100** have an integral ring type current transformer. For motor currents less than 1.25 amps, the cables are looped through the ring openings. The number of loops is according to the Table shown below.

| Number of loops (n)           | 5        | 4         | 3         | 2         |
|-------------------------------|----------|-----------|-----------|-----------|
| Motor rated current $I_n$ (A) | 0.25-0.3 | 0.31-0.41 | 0.42-0.62 | 0.63-1.24 |

The setting current  $I_e$  of the device is calculated  $I_e = n \times I_n$

## Tripping limits with 3-pole symmetrical overload

|  |  |
|--|--|
| Response current:                          | > 110% of setting current<br>< 120% of setting current |
| Response time:                             | < 20 min starting from cold                            |
| Tripping time when test button is actuated | 5 sec  |
| Reset time on tripping                     | 5 min (no delay after test)                            |

## Tripping times for ZWA overload relays

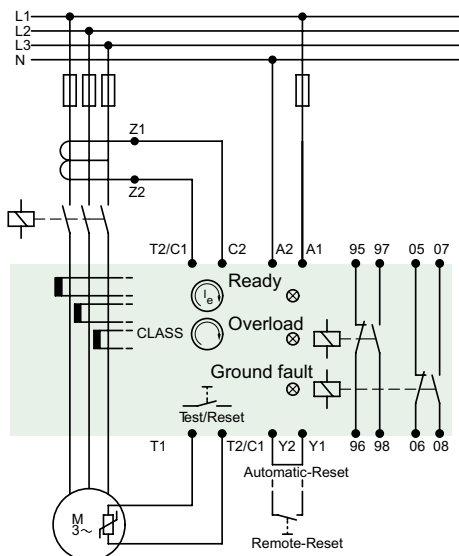
| Tripping class                                    | CLASS | 5    | 10   | 15   | 20   | 25   | 30 |
|---|-------|------|------|------|------|------|----|
| For 3-pole symmetrical loading starting from cold |       |      |      |      |      |      |    |
| Set current $I_e$                                 | X 3   | 12.5 | 25   | 37   | 48   | 56   | 75 |
|   | X 4   | 7.5  | 17   | 27.5 | 35   | 41   | 50 |
|   | X 5   | 6.9  | 13   | 19   | 27.5 | 34   | 41 |
|   | X 6   | 5.2  | 10.2 | 16   | 20.2 | 27.5 | 35 |
|   | X 7.2 | 4.3  | 9    | 13   | 17.5 | 20   | 26 |
|   | X 8   | 4    | 8    | 11   | 16   | 19   | 24 |


## Incoming

|         |   |
|---------|---|
| A 1/A 2 | Rated control voltage   |
| T 1/T 2 |   |
| C 1/C 2 | Thermistor sensor (supplied in short-circuit condition with bridge) |
| Y 1/Y 2 | Ground fault: <b>SSW</b> connection                                 |
|         | Hand or Auto Reset  |

## Outgoing

|       |            |                     |
|-------|------------|---------------------|
| 95/96 | NC contact | Overload/Thermistor |
| 97/98 | NO contact | Overload/Thermistor |
| 05/06 | NC contact | Ground Fault        |
| 07/08 | NO contact | Ground Fault        |



| 1  | 2                                  | 3                                 | 4                    | 5     | 6   |
|--|------------------------------------|-----------------------------------|----------------------|-------|---|
|  | For Use With:                      |                                   | Type                 | Price |   |
|  |                                    |                                   |                      | \$    |   |
| <b>Bases</b>   |                                    |                                   |                      |       |   |
|  | Z00<br>Z1                          | For separate mounting             | EZ00<br>EZ1          |       | Snap-on fastening on 35 mm mounting rail or panel mounted.  |
| <b>External reset button for enclosed overload relays IP 65</b>                  |                                    |                                   |                      |       |   |
|  | ZE<br>Z00<br>Z1<br>Z4<br>ZW7<br>Z5 | Front ring: matt chromed<br>black | MDE-287<br>MDE-287-S |       | Mounting diameter<br>22.5 mm<br>Blue button plate: RESET  |
|  | ZE<br>Z00<br>Z1<br>Z5<br>ZW7       |                                   | MDA-110<br>MDA-110-S |       | Red button plate: STOP  |
|  | Z4                                 |                                   | K-Z4                 |       |   |
|  | Z4                                 |                                   | H1-Z4                |       | Consisting of one cover with brackets for separate mounting. Consisting of two covers with brackets for separate mounting |
|  | Z4                                 |                                   | H2-Z4                |       |   |
|  | Z5                                 |                                   | HV DIL 6M            |       | For line and load bolt-on terminations. (2 pieces) Provides terminations with protection against accidental contact.      |
|  | ZWA-205                            |                                   | PDT-A2-CP04A         |       | <b>PDT-A2</b> covers are for use between a contactor and overload relay for direct mounting.                              |
|  | ZWA-500                            |                                   | PDT-A2-CP05A         |       |   |
|  | ZWA-820                            |                                   | PDT-A2-CP06A         |       |   |
|  | ZWA-820                            |                                   | PDT-A2-CP07A         |       |   |

# Thermistor Overload Relays

for protection of motors with P.T.C. Thermistors embedded in their windings

UL / CSA / IEC / CE

| 1 | 2  | 3                        | 4  | 5           | 6                      |
|---|--|--------------------------|--|-------------|------------------------|
|   | IEC Rated operational current $I_e$ at AC-15<br>220 V<br>230 V<br>240 V<br>A | UL/CSA Pilot Duty Rating | Rated operational voltage range $U_s$<br><br>V | <b>Type</b> | <b>Price</b><br><br>\$ |

## Thermistor overload relays for use with P.T.C. (Positive Temperature Coefficient) Thermistors

- With automatic reset
- Power ON and Fault indicating LED display



3

B300

24...240 V 50/60 Hz  
24...240 V DC

**EMT6**

Same device suitable for all above voltage and frequencies!

See Price List See Price List See Price List See Price List

- Selector switch with manual/automatic reset
- For manual or remote resetting
- Test button
- Power ON and Fault indicating LED display

3

B300

24...240 V 50/60 Hz  
24...240 V DC

**EMT6-DB**

Same device suitable for all above voltage and frequencies!

See Price List See Price List See Price List See Price List

### Multi-function device

- Selector switch with manual/automatic reset.
- Short-circuit recognition in the sensor circuit.
- Reliable fault signalling even under supply voltage failure. (Zero voltage safety)
- Manual or remote resetting
- Test button
- Short-circuit recognition and zero-voltage safety can be switched off
- Power ON and Fault indicating LED display



3

B300

24-240 V 50/60 Hz  
24-240 V DC

**EMT6-DBK**

Same device suitable for all above voltage and frequencies!

See Price List See Price List See Price List See Price List

### Accessories

#### Panel mount adapter



Without the adapter the EMT 6 is suitable for 35mm DIN rail mounting only. The adapter enables the EMT 6 to become a panel mounted device using conventional screws.

**CS-TE**

See Price List See Price List See Price List See Price List

Thermal Overload Relays Thermistor Overload Relays

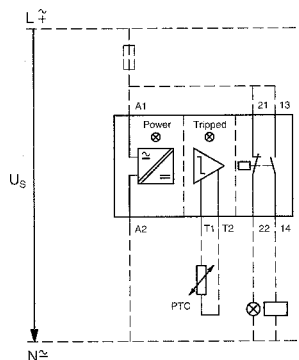
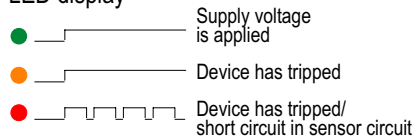
4



Terminal markings to EN 50 005

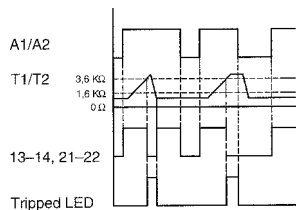
Flow diagrams LED display

Application notes



### EMT 6, EMT 6-DB, EMT 6-DBK

Auto



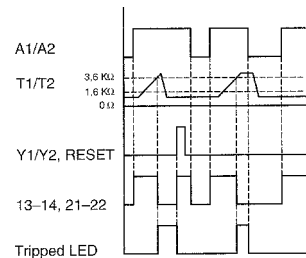
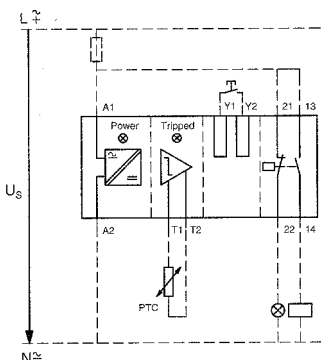
Snap fitting on 35mm DIN rail to EN 50 022-35x15

At  $R_K \leq 250 \Omega$  per sensor: 6 sensors, at  $R_K \leq 100 \Omega$  per sensor: 9 sensors in the winding (to be supplied by user). Max. length of thermistor cable (unscreened) 250m. Total thermistor resistance  $\sum R_K \leq 1500 \Omega$

Characteristic values of sensor circuit at  $U_s$  and  $+20^\circ C$

### EMT 6-DB, EMT 6-DBK

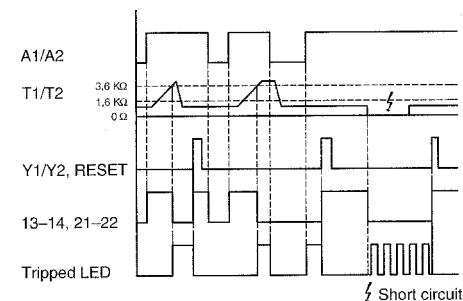
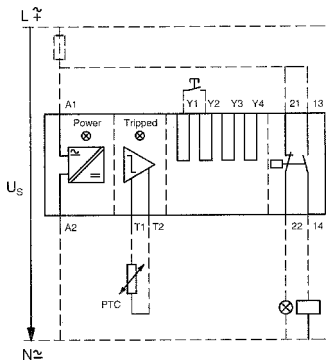
Manual



|                        | EMT 6...                    |                           |
|------------------------|-----------------------------|---------------------------|
| $R_{T1-T2}$            | $U_{T1-T2}$<br>V DC<br>max. | $I_{T1-T2}$<br>mA<br>max. |
| T1, T2 short-circuited | -                           | 1.9                       |
| 4 kΩ                   | 3                           | 0.8                       |
| T1-T2 open             | 5.1                         | -                         |

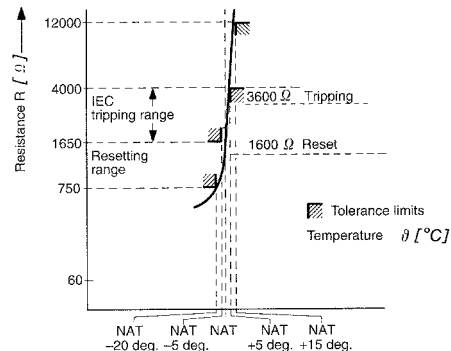
### EMT 6-DBK

Zero-voltage safe operation



Functions which can be disconnected on EMT 6-DBK:

| Function                  | Disconnection via jumper |
|---------------------------|--------------------------|
| Short-circuit recognition | $Y_1-Y_3$                |
| Zero-voltage safety       | $Y_1-Y_4$                |



# Overload Relays

## Standard features for ZE, Z00, Z1, Z4, Z5 and ZW7 overload relays

3 pole adjustable overload relay. Current transformer-operated overload relay for heavy starting duty (**ZW7**).

Auxiliary contacts: NO + NC.

For mounting directly on to contactor, or for separate mounting. (Type **ZE**, direct mounting on contactor only).

Temperature compensated.

**Clearly marked setting scale:** Facilitates accurate setting, even for intermediate values, to motor FLC.

**Setting lever for hand or auto reset:** Supplied set to "Hand" (with manual reset).

**Hand:** After tripping, reset button must be operated. Normally associated with two-wire controls for safety reasons and to prevent "pumping".

**Auto:** Automatic reset after tripping. Normally associated with three-wire controls.

**Reset button** (internal reset): To reset after tripping when reset lever is set to "Hand".

If fault still exists, trips free even if reset button is held down.

On enclosed devices use supplementary **MDE** external reset button.

**Test/OFF button:** To simulate tripping of overload relay.

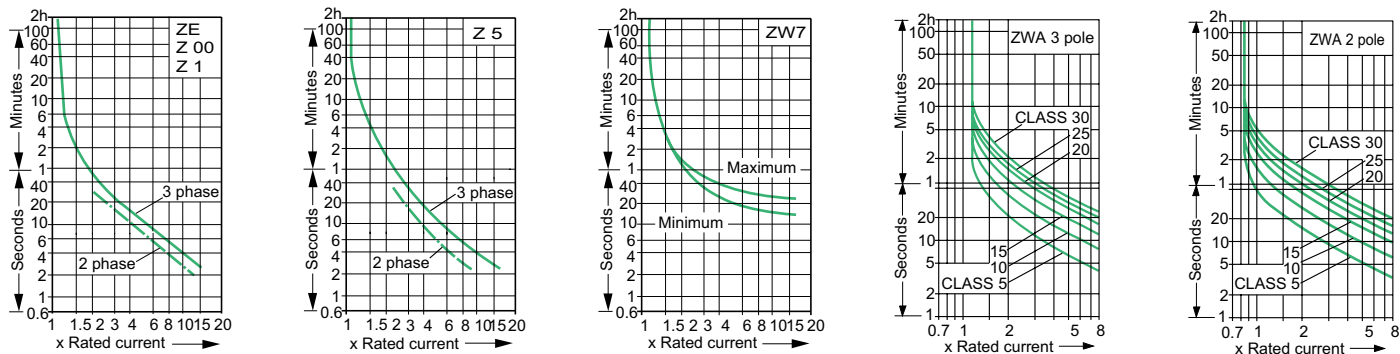
To de-energize self-maintaining contactors (OFF function for all types except **Z4**).

**Current transformer-operated overload relays:** The specified primary rated current applies to one cable loop.

For lower rated motor current, loop cable several times, e.g. **ZW7-63** for 21...31.5 A rated motor current: Loop cable twice.

## Tripping Characteristics:

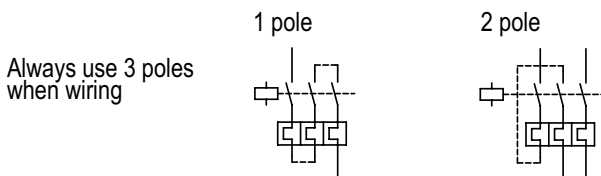
The tripping curves are average values of the tolerance curves at 20° C, starting from cold. Tripping time is given in relation to the tripping current. Specific characteristics for each individual setting range available on request.



**Special Note:** All types have adjustable dial for setting motor full load current. Trip current is 125% of set value. For motors with a service factor (SF) of 1.0, set dial to 90% of motor full load current.

| Type →   |                  |                              | ZE  | Z00   | Z1<br>(Z1-75)           | Z4 <sup>2)</sup>  | ZW7                                   |
|--|------------------|------------------------------|---|---|-------------------------|-------------------|---------------------------------------|
| <b>General</b>   |                  |                              |   |   |                         |                   |                                       |
| Specifications   |                  |                              | UL, CSA, IEC/EN 60 947, CE, DIN VDE 0660.....   |   |                         |                   |                                       |
| Climatic test  |                  |                              | Damp heat, constant, to IEC/EN 60 068-2-3.....<br>Damp heat, cyclic, to IEC/EN 60 068-2-30..... |   |                         |                   |                                       |
| Ambient temperature  | Open<br>Enclosed | max./min. °C<br>max./min. °C | + 50/-25.....<br>+ 40/-25.....  |   |                         |                   |                                       |
| Temperature compensation   |                  |                              | Continuous.....   |   |                         |                   |                                       |
| Dimensions   |                  |                              | Page 4/14.....  |   |                         |                   |                                       |
| Mechanical shock resistance<br>(sinusoidal shock 10 ms)  |                  |                              | g(m/sec <sup>2</sup> )<br>10.....   |   |                         |                   |                                       |
| Degree of protection   |                  |                              | IP<br>20      00.....   |   |                         |                   |                                       |
| Protection against direct contact when<br>actuated from the front by a perpendicular<br>test finger (DIN VDE 0106, Part 100) (IEC 536) |                  |                              | Finger-and back-of-hand-proof.....  |   | With terminal<br>covers |                   | Finger-and-<br>back-of-hand-<br>proof |
| <b>Main circuit</b>  |                  |                              |   |   |                         |                   |                                       |
| Rated voltage  |                  | V AC                         | 600.....  |   |                         |                   |                                       |
| Setting current  |                  | A                            | 0.1-12  | 0.1-24  | 6-63                    | 50-240<br>(63-75) | 42-540                                |
| Short-circuit protection<br>Maximum fuse or circuit breaker  |                  |                              | Page 4/2.....   |   | Page 4/3.....           |                   |                                       |
| Heat losses in the current paths   |                  |                              |   |   |                         |                   |                                       |
| Minimum setting  |                  | W                            | 2.5   | 2.5   | 3(7)                    | 16                | 3                                     |
| Maximum setting  |                  | W                            | 6   | 6   | 7.5(10)                 | 28                | 10                                    |
| Terminal capacities (max.)   |                  |                              |   |   |                         |                   |                                       |
| Solid or stranded  |                  | AWG                          | 18...14   | 14...8  | 14...2                  | 6...350 kcmil     | 8...500 kcmil                         |
| <b>Auxiliary contacts</b>  |                  |                              |   |   |                         |                   |                                       |
| Rated voltage  |                  | V AC/V DC                    | 300/300   | 600/300.....                                      |                         |                   |                                       |
| Pilot duty rating  |                  | AC<br>DC                     | D300<br>R300  | B600/B300 same polarity/opposite polarity<br>R300 |                         |                   |                                       |
| Rated operational current I <sub>o</sub><br>AC-15<br>Make/break<br>contacts  |                  |                              |   |   |                         |                   |                                       |
|  | 220/240V         | A                            | 1.5/1.5.....  |   |                         |                   |                                       |
|  | 380/415V         | A                            | 0.5/0.7      0.5/0.9.....   |   |                         |                   |                                       |
|  | 500V             | A                            | 0.3/0.5      0.5/0.8.....   |   |                         |                   |                                       |
| DC-13 <sup>1)</sup><br>L/R ≤ 15 ms<br>Make/break<br>contacts   |                  |                              |   |   |                         |                   |                                       |
|  | 24/60/110/220V   | A                            | 0.9/0.75/0.4/0.2.....   |   |                         |                   |                                       |

**Single phase applications (all types)**



1) Making and breaking currents to DC-13, time constant as stated.  
2) UL / CSA only.

# Overload Relays Technical Data

Thermal Overload Relays  
Thermistor Overload Relays

4

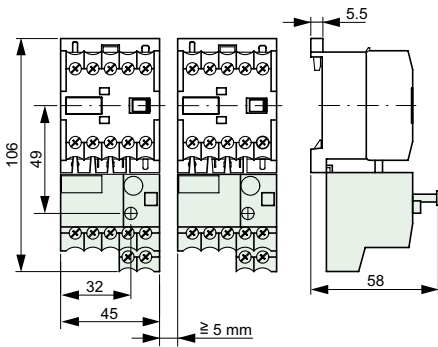
|  |                  |                              | Type →                 | Z5-I.K3   | Z5-I.K4 | Z5-FF250                  | ZWA                               |
|--|------------------|------------------------------|------------------------|---|---------|---------------------------|-----------------------------------|
| <b>General</b>   |                  |                              |                        |   |         |                           |                                   |
| Specifications   |                  |                              |                        | UL, CSA, IEC/EN 60 947, CE, DIN VDE 0660.....   |         |                           |                                   |
| Climatic test  |                  |                              |                        | Damp heat, constant, to IEC/EN 60 068-2-3.....<br>Damp heat, cyclic, to IEC/EN 60 068-2-30..... |         |                           |                                   |
| Ambient Temperature  | Open<br>Enclosed | max./min. °C<br>max./min. °C |                        | + 50/-25.....<br>+ 40/-25.....  |         |                           | + 70/-25                          |
| Temperature compensation   |                  |                              |                        | Continuous.....   |         |                           |                                   |
| Dimensions   |                  |                              |                        | Page 4/14.....  |         |                           |                                   |
| Mechanical shock resistance<br>(sinusoidal shock 10 ms)  |                  |                              | g(m/sec <sup>2</sup> ) | 10.....   |         |                           | 15/11                             |
| Degree of protection   |                  |                              | IP                     | 00.....   |         |                           | 20 (00 >100A)                     |
| Protection against direct contact when<br>actuated from the front by a perpendicular<br>test finger (DIN VDE 0106, Part 100) (IEC 536) |                  |                              |                        | Finger-and back-of-hand-proof   |         | With<br>terminal<br>cover | Finger-and-back-<br>of-hand-proof |
| <b>Main circuit</b>  |                  |                              |                        |   |         |                           |                                   |
| Rated voltage  |                  |                              | V AC                   | 600.....  |         |                           |                                   |
| Setting current  |                  |                              | A                      | 25-100  | 35-142  | 50-250                    | 1.25-820                          |
| Short-circuit protection<br>Maximum fuse or circuit breaker  |                  |                              |                        | Page 4/4.....   |         |                           | As required<br>for contactor      |
| Heat losses in the current paths   |                  |                              |                        |   |         |                           |                                   |
| Minimum setting  |                  |                              | W                      | < 16.....   |         |                           | —                                 |
| Maximum setting  |                  |                              | W                      | < 28.....   |         |                           | —                                 |
| Terminal capacities (max.)   |                  |                              |                        |   |         |                           |                                   |
| Solid or stranded  |                  |                              | AWG                    | 2   | 2/0     | 250kcmil                  | —                                 |
| <b>Auxiliary contacts</b>  |                  |                              |                        |   |         |                           |                                   |
| Rated voltage  |                  |                              | V AC/V DC              | 600/300.....  |         |                           |                                   |
| Pilot duty rating  |                  |                              | AC<br>DC               | B600/B300 same polarity/opposite polarity.....<br>R300.....                                     |         |                           |                                   |
| Rated operational current I <sub>o</sub>   |                  |                              |                        |   |         |                           |                                   |
| AC-15  |                  |                              |                        |   |         |                           |                                   |
| NO/NC  |                  |                              | A                      | —   |         |                           | 6/6                               |
| contacts   |                  |                              | A                      | 1.5/1.5.....  |         |                           | 3/3                               |
|  |                  |                              | A                      | 0.5/0.9.....  |         |                           | —                                 |
|  |                  |                              | A                      | 0.5/0.8.....  |         |                           | —                                 |
| DC-13 <sup>1)</sup>  |                  |                              |                        |   |         |                           |                                   |
| L/R ≤ 15 ms  |                  |                              |                        |   |         |                           |                                   |
| NO/NC  |                  |                              |                        |   |         |                           |                                   |
| contacts   |                  |                              | A                      | 0.9/0.75/0.4/0.2.....   |         |                           | 2 @ 24V                           |

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

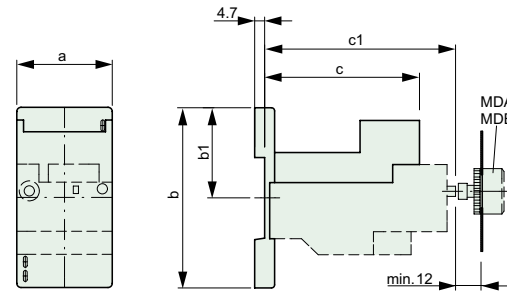
|  |                  |                              | EMT 6 Thermistor relay  |
|--|------------------|------------------------------|---|
| <b>General</b>   |                  |                              |   |
| Specifications   |                  |                              | UL, CSA, IEC/EN 60 947, CE, DIN VDE 0660, EN 55 011                                   |
| Climatic test  |                  |                              | Damp heat, constant, to IEC/EN 60 068-2-3<br>Damp heat, cyclic, to IEC/EN 60 068-2-30 |
| Ambient Temperature  | Open<br>Enclosed | max./min. °C<br>max./min. °C | + 60/-25<br>+ 45/-25  |
| Mounting position  |                  |                              | As desired  |
| Dimensions   |                  |                              | Page 4/17   |
| Weights  |                  | kg                           | 0.15  |
| Mechanical shock resistance<br>(sinusoidal shock 10 ms)  |                  | g(m/sec <sup>2</sup> )       | 10  |
| Degree of protection   |                  | IP                           | 20  |
| Protection against direct contact when actuated from the front by a perpendicular test finger (DIN VDE 0106, Part 100) (IEC 536) |                  |                              | Finger-and back-of-hand-proof   |
| <b>Auxiliary and Control Circuits</b>  |                  |                              |   |
| Terminal capacities  |                  |                              |   |
| Solid or stranded  |                  | AWG                          | 16...14   |
| Terminal Torque rating   |                  | Nm                           | 0.8...1.2   |
| <b>Auxiliary circuit</b>   |                  |                              |   |
| Rated insulation voltage U <sub>i</sub>  |                  | V                            | 400   |
| Rated operational voltage U <sub>e</sub>   |                  | V                            | 400   |
| UL/CSA Pilot duty rating   |                  | AC                           | B300  |
| IEC Rated operational current I <sub>e</sub>   |                  |                              |   |
| AC-14 NO/NC contacts   | 380/415V         | A                            | 3/3   |
| AC-15 NO/NC contacts   | 240V             | A                            | 3   |
|  | 380/415V         | A                            | 1/1   |
| Short Circuit rating without welding<br>Maximum Fuse   |                  | A gL                         | 6   |
| <b>Control Circuit</b>   |                  |                              |   |
| Rated insulation voltage U <sub>i</sub>  |                  | V                            | 240   |
| Rated operational voltage U <sub>e</sub>   |                  | V                            | 240   |
| Voltage Tolerance range  |                  |                              | 0.85...1.1 x U <sub>e</sub>   |
| Power Consumption  |                  | VA<br>W                      | 3.5<br>2  |
| Tripping takes place at appr.  |                  | Ω                            | ≥ 3600  |
| Recovery takes place at appr.  |                  | Ω                            | ≥ 1600  |

# Dimensions

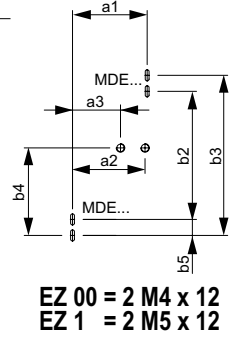
## ZE



## Z00 + EZ00 + MDE Z1 + EZ1 + MDE

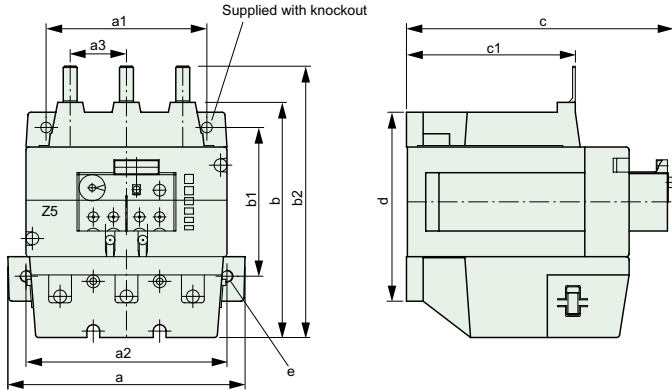


|    | EZ00 | EZ1  |
|----|------|------|
| a  | 45   | 60   |
| a1 | 35   | 50   |
| a2 | 34   | 41.5 |
| a3 | 22.5 | 30   |
| b  | 85   | 86   |
| b1 | 42.5 | 42.5 |
| b2 | 60   | —    |
| b3 | 75   | 75   |
| b4 | 41   | 36   |
| b5 | 7.5  | —    |
| c  | 73   | 112  |
| c1 | 90   | 102  |



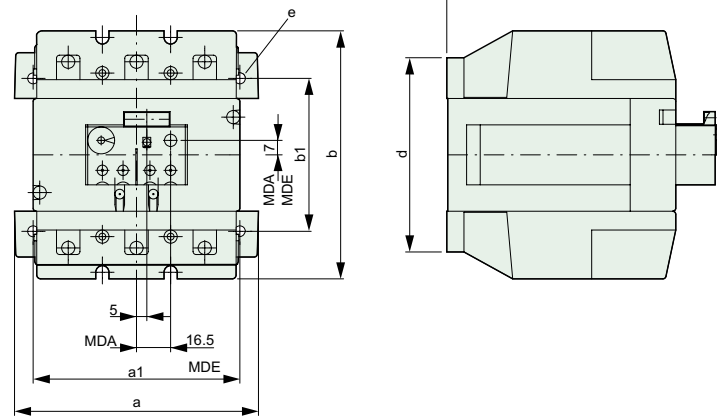
EZ 00 = 2 M4 x 12  
EZ 1 = 2 M5 x 12

## Z5-.../SK



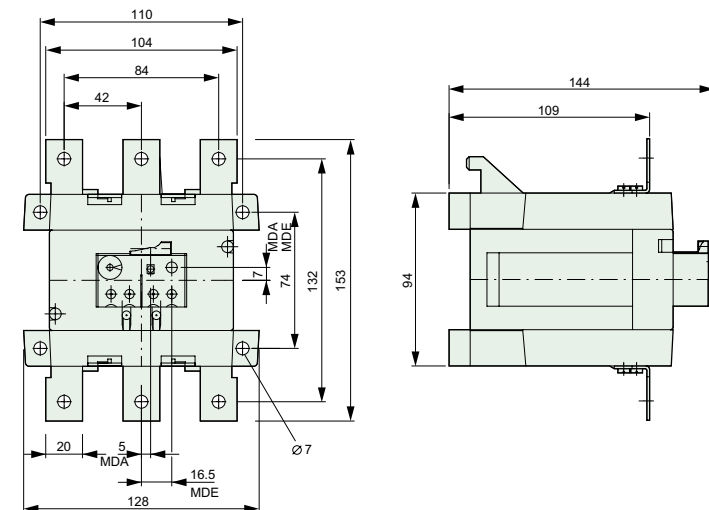
|    | Z5-.../SK3 | Z5-.../SK4 |
|----|------------|------------|
| a  | 100        | 118        |
| a1 | 80         | 80         |
| a2 | 80         | 100        |
| a3 | 28         | 28         |
| b  | 117        | 117        |
| b1 | 74         | 74         |
| b2 | 135        | 135        |
| c  | 133        | 133        |
| c1 | 82.5       | 84         |
| d  | 94         | 94         |
| e  | Ø 6        | Ø 7        |

## Z5-.../KK



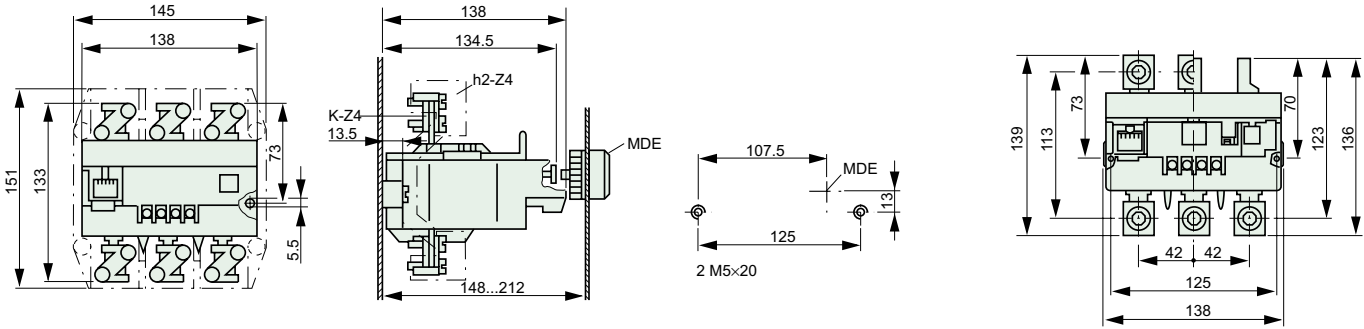
|    | Z5-.../KK3 | Z5-.../KK4 |
|----|------------|------------|
| a  | 100        | 118        |
| a1 | 80         | 100        |
| b  | 120        | 120        |
| b1 | 74         | 74         |
| c  | 133        | 133        |
| d  | 94         | 94         |
| e  | Ø 6        | Ø 7        |

## Z5-.../FF250



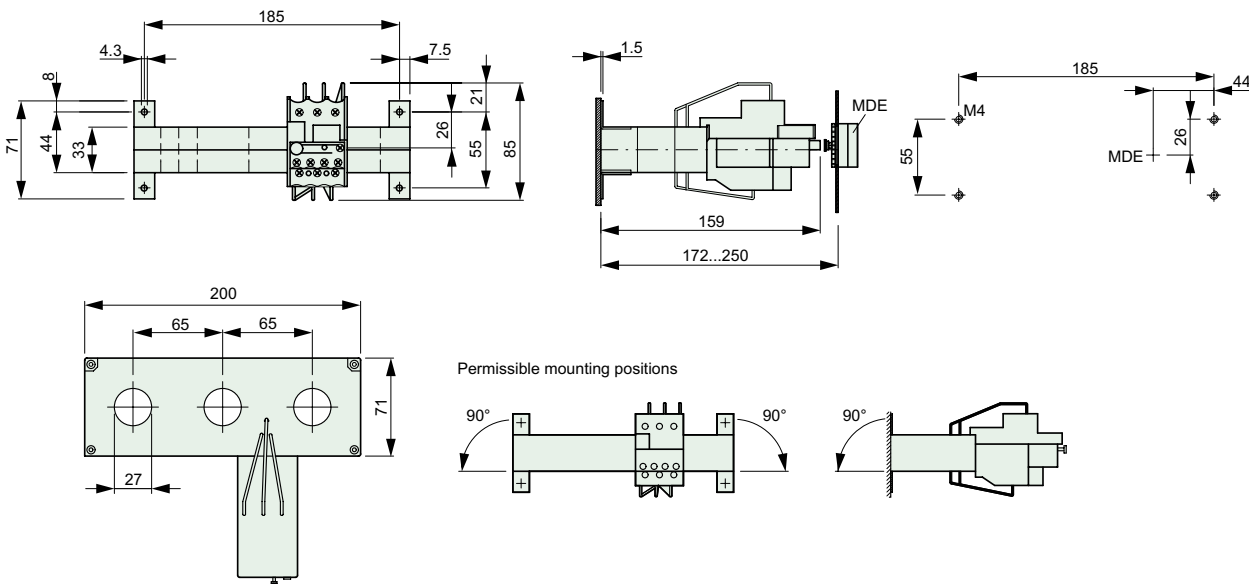
Z4... + K-Z4 + MDE

Z4-240/K-NA  
Z4-240-CNA



Current transformer operated overload relays

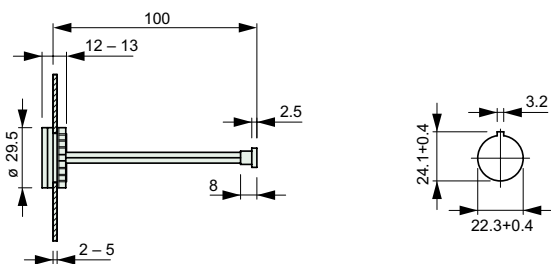
ZW7... + MDE



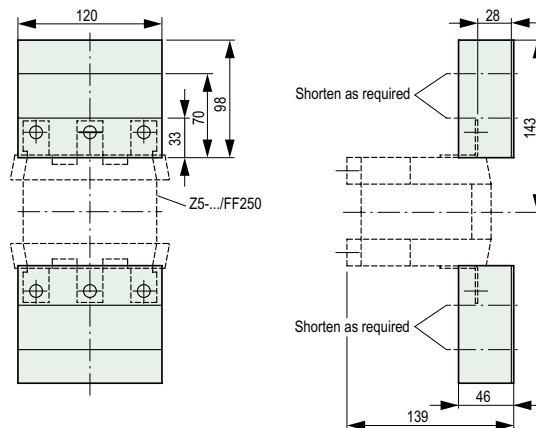
Permissible mounting positions

External reset buttons

MDE  
MDA



HV DIL 6M

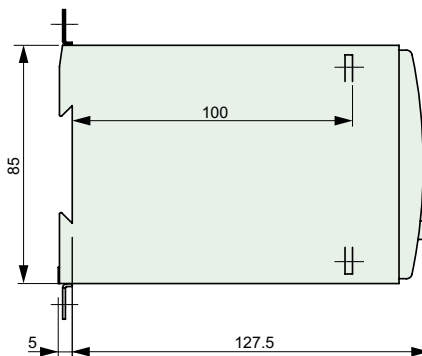
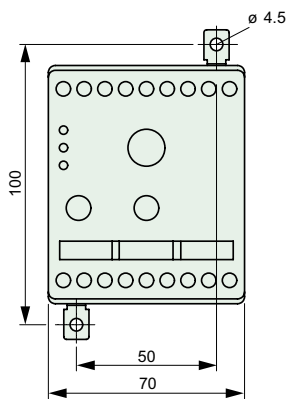


# Dimensions

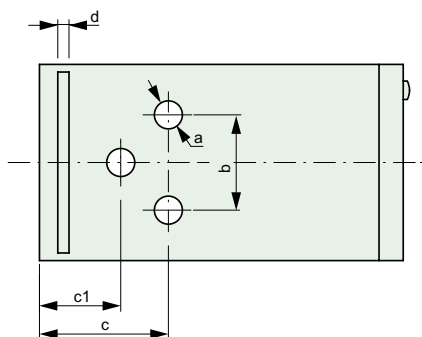
## ZWA-6.3, ZWA-25, ZWA-100

Thermal Overload Relays

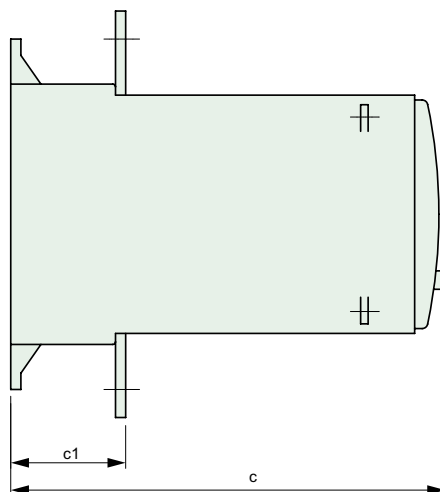
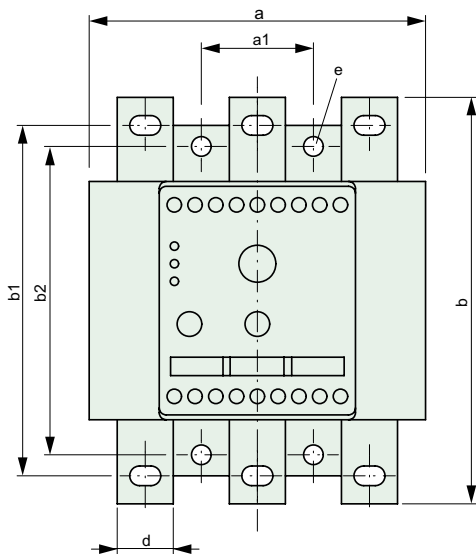
4



|    | ZWA-6.3<br>ZWA-25 | ZWA-100 |
|----|-------------------|---------|
| a  | 10                | 15      |
| b  | 34                | 29      |
| c  | 46                | 47      |
| c1 | 29                | 24      |
| d  | 4                 | -       |

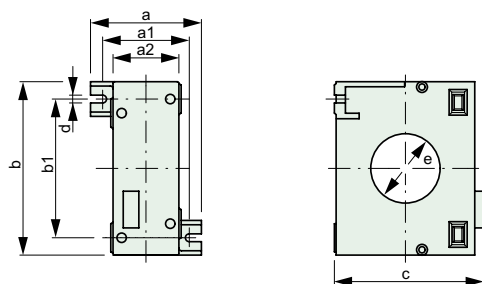


## ZWA-205, ZWA-500, ZWA-820



|    | ZWA-205 | ZWA-500 | ZWA-820 |
|----|---------|---------|---------|
| a  | 120     | 145     | 230     |
| a1 | 40      | 50      | 70      |
| b  | 145     | 160     | 175     |
| b1 | 125     | 130     | 135     |
| b2 | 110     | 105     | 120     |
| c  | 155     | 175     | 190     |
| c1 | 41      | 46      | 55      |
| d  | 20      | 30      | 40      |
| e  | 7       | 9       | 11      |

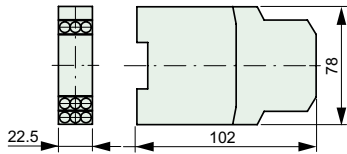
## SSW 40-..., SSW 65-..., SSW 120-...



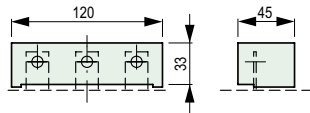
|    | SSW 40-... | SSW 65-... | SSW 120-... |
|----|------------|------------|-------------|
| a  | 64         | 75         | 86.5        |
| a1 | 50         | 60         | 70          |
| a2 | 38         | 43         | 54.5        |
| b  | 100        | 124        | 200         |
| b1 | 80         | 100        | 170         |
| c  | 86         | 112        | 205         |
| d  | 4.5        | 4.5        | 4.5         |
| e  | 40         | 65         | 120         |



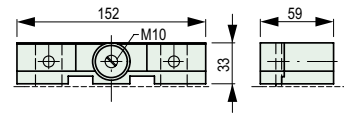
EMT 6 Thermistor Overload Relay



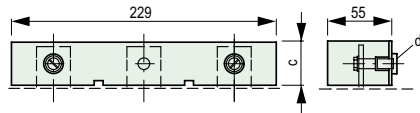
PDT-A2-CP 04A



PDT-A2-CP 05A

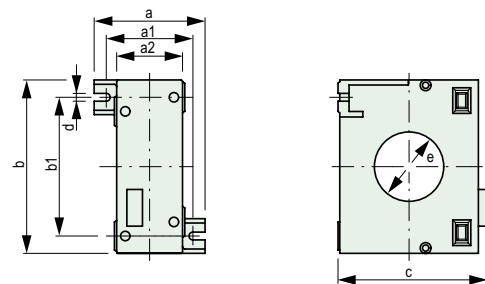


PDT-A2-CP 06A  
PDT-A2-CP 07A



| PDT-A2 | CP 06A | CP 07A |
|--------|--------|--------|
| c      | 38     | 48     |
| d      | M10    | M12    |

SSW 40-...  
SSW 65-...  
SSW 120-...



|    | SSW 40-... | SSW 65-... | SSW 120-... |
|----|------------|------------|-------------|
| a  | 64         | 75         | 86.5        |
| a1 | 50         | 60         | 70          |
| a2 | 38         | 43         | 54.5        |
| b  | 100        | 124        | 200         |
| b1 | 80         | 100        | 170         |
| c  | 86         | 112        | 205         |
| d  | 4.5        | 4.5        | 4.5         |
| e  | 40         | 65         | 120         |

