



Overload relay, ZB12, I<sub>r</sub>= 0.6 - 1 A, 1 N/O, 1 N/C, Direct mounting, IP20

Part no.

Catalog No.

Alternate Catalog No.

EL-Nummer (Norway)

ZB12-1

278435

XTOB001BC1

0004131830

Similar to illustration

Delivery program

|                           |                |   |                                                                      |
|---------------------------|----------------|---|----------------------------------------------------------------------|
| Product range             |                |   | Overload relay ZB up to 150 A                                        |
| Product range             |                |   | Accessories                                                          |
| Accessories               |                |   | Overload relays                                                      |
| Frame size                |                |   | ZB12                                                                 |
| Phase-failure sensitivity |                |   | IEC/EN 60947, VDE 0660 Part 102                                      |
| Description               |                |   | Test/off button<br>Reset pushbutton manual/auto<br>Trip-free release |
| Mounting type             |                |   | Direct mounting                                                      |
|                           | I <sub>r</sub> | A | 0.6 - 1                                                              |
| Contact sequence          |                |   |                                                                      |

Auxiliary contacts

|                       |  |  |                                                                                                    |
|-----------------------|--|--|----------------------------------------------------------------------------------------------------|
| N/O = Normally open   |  |  | 1 N/O                                                                                              |
| N/C = Normally closed |  |  | 1 N/C                                                                                              |
| For use with          |  |  | DILM7, DILM9, DILM12, DILM15,<br>DIULM7, DIULM9, DIULM12,<br>SDAINLM12,<br>SDAINLM16,<br>SDAINLM22 |

Short-circuit protection

|                           |       |   |    |
|---------------------------|-------|---|----|
| Type "1" coordination<br> | gG/gL | A | 25 |
| Type "2" coordination<br> | gG/gL | A | 4  |

Notes

Overload release: tripping class 10 A

short-circuit protective device: Observe the maximum permissible fuse of the contactor with direct device mounting.

Suitable for protection of Ex e-motors.



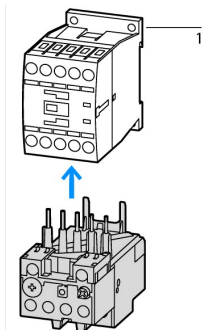
II(2)G [Ex d] [Ex e] [Ex px], II(2)D [Ex p] [Ex t]

PTB 10 ATEX 3010

Observe manual MN03407005Z-DE/EN.

Notes

Fitted directly to the contactor



1 Contactor

## Technical data

### General

|                                                                       |  |    |                                                                                |
|-----------------------------------------------------------------------|--|----|--------------------------------------------------------------------------------|
| Standards                                                             |  |    | IEC/EN 60947, VDE 0660, UL, CSA                                                |
| Climatic proofing                                                     |  |    | Damp heat, constant, to IEC 60068-2-78<br>Damp heat, cyclic, to IEC 60068-2-30 |
| Ambient temperature                                                   |  |    |                                                                                |
|                                                                       |  |    | Operating range to IEC/EN 60947<br>PTB: -5 °C - +55 °C                         |
| Open                                                                  |  | °C | -25 - +55                                                                      |
| Enclosed                                                              |  | °C | - 25 - 40                                                                      |
| Temperature compensation                                              |  |    | Continuous                                                                     |
| Weight                                                                |  | kg | 0.141                                                                          |
| Mechanical shock resistance                                           |  | g  | 10<br>Sinusoidal<br>Shock duration 10 ms                                       |
| Degree of Protection                                                  |  |    | IP20                                                                           |
| Protection against direct contact when actuated from front (EN 50274) |  |    | Finger and back-of-hand proof                                                  |
| Altitude                                                              |  | m  | Max. 2000                                                                      |

### Main conducting paths

|                                                |           |                 |                            |
|------------------------------------------------|-----------|-----------------|----------------------------|
| Rated impulse withstand voltage                | $U_{imp}$ | V AC            | 6000                       |
| Overvoltage category/pollution degree          |           |                 | III/3                      |
| Rated insulation voltage                       | $U_i$     | V               | 690                        |
| Rated operational voltage                      | $U_e$     | V AC            | 690                        |
| Safe isolation to EN 61140                     |           |                 |                            |
| Between auxiliary contacts and main contacts   |           | V AC            | 440                        |
| Between main circuits                          |           | V AC            | 440                        |
| Temperatur compensation residual error > 40 °C |           |                 | ≤ 0.25 %/K                 |
| Current heat loss (3 conductors)               |           |                 |                            |
| Lower value of the setting range               |           | W               | 2.5                        |
| Maximum setting                                |           | W               | 6.9                        |
| Terminal capacities                            |           | mm <sup>2</sup> |                            |
| Solid                                          |           | mm <sup>2</sup> | 1 x (1 - 6)<br>2 x (1 - 6) |
| Flexible with ferrule                          |           | mm <sup>2</sup> | 1 x (1 - 4)<br>2 x (1 - 4) |
| Solid or stranded                              |           | AWG             | 18 - 8                     |
| Terminal screw                                 |           |                 | M4                         |
| Tightening torque                              |           | Nm              | 1.8                        |
| Stripping length                               |           | mm              | 10                         |
| Tools                                          |           |                 |                            |
| Pozidriv screwdriver                           |           | Size            | 2                          |
| Standard screwdriver                           |           | mm              | 1 x 6                      |

### Auxiliary and control circuits

|                                       |           |                 |                |
|---------------------------------------|-----------|-----------------|----------------|
| Rated impulse withstand voltage       | $U_{imp}$ | V               | 4000           |
| Overvoltage category/pollution degree |           |                 | III/3          |
| Terminal capacities                   |           | mm <sup>2</sup> |                |
| Solid                                 |           | mm <sup>2</sup> | 1 x (0.75 - 4) |

|                                      |                 |                 |                                                                                 |
|--------------------------------------|-----------------|-----------------|---------------------------------------------------------------------------------|
|                                      |                 |                 | 2 x (0.75 - 4)                                                                  |
| Flexible with ferrule                |                 | mm <sup>2</sup> | 1 x (0.75 - 2.5)<br>2 x (0.75 - 2.5)                                            |
| Solid or stranded                    |                 | AWG             | 2 x (18 - 14)                                                                   |
| Terminal screw                       |                 |                 | M3.5                                                                            |
| Tightening torque                    |                 | Nm              | 1.2                                                                             |
| Stripping length                     |                 | mm              | 8                                                                               |
| Tools                                |                 |                 |                                                                                 |
| Pozidriv screwdriver                 |                 | Size            | 2                                                                               |
| Standard screwdriver                 |                 | mm              | 1 x 6                                                                           |
| Rated insulation voltage             | U <sub>i</sub>  | V AC            | 500                                                                             |
| Rated operational voltage            | U <sub>e</sub>  | V AC            | 500                                                                             |
| Safe isolation to EN 61140           |                 |                 |                                                                                 |
| between the auxiliary contacts       |                 | V AC            | 240                                                                             |
| Conventional thermal current         | I <sub>th</sub> | A               | 6                                                                               |
| Rated operational current            | I <sub>e</sub>  | A               |                                                                                 |
| AC-15                                |                 |                 |                                                                                 |
| Make contact                         |                 |                 |                                                                                 |
| 120 V                                | I <sub>e</sub>  | A               | 1.5                                                                             |
| 220 V 230 V 240 V                    | I <sub>e</sub>  | A               | 1.5                                                                             |
| 380 V 400 V 415 V                    | I <sub>e</sub>  | A               | 0.5                                                                             |
| 500 V                                | I <sub>e</sub>  | A               | 0.5                                                                             |
| Break contact                        |                 |                 |                                                                                 |
| 120 V                                | I <sub>e</sub>  | A               | 1.5                                                                             |
| 220 V 230 V 240 V                    | I <sub>e</sub>  | A               | 1.5                                                                             |
| 380 V 400 V 415 V                    | I <sub>e</sub>  | A               | 0.9                                                                             |
| 500 V                                | I <sub>e</sub>  | A               | 0.8                                                                             |
| DC L/R ≤ 15 ms                       |                 |                 |                                                                                 |
|                                      |                 |                 | Switch-on and switch-off conditions based on DC-13, time constant as specified. |
| 24 V                                 | I <sub>e</sub>  | A               | 0.9                                                                             |
| 60 V                                 | I <sub>e</sub>  | A               | 0.75                                                                            |
| 110 V                                | I <sub>e</sub>  | A               | 0.4                                                                             |
| 220 V                                | I <sub>e</sub>  | A               | 0.2                                                                             |
| Short-circuit rating without welding |                 |                 |                                                                                 |
| max. fuse                            |                 | A gG/gL         | 6                                                                               |

## Notes

**Notes** Ambient air temperature: Operating range to IEC/EN 60947, PTB: -5°C to +55°C

Main circuits terminal capacity solid and flexible conductors with ferrules: When using 2 conductors use equal cross-sections.

## Rating data for approved types

|                              |  |      |                                                    |
|------------------------------|--|------|----------------------------------------------------|
| Auxiliary contacts           |  |      |                                                    |
| Pilot Duty                   |  |      |                                                    |
| AC operated                  |  |      | B300 at opposite polarity<br>B600 at same polarity |
| DC operated                  |  |      | R300                                               |
| Short Circuit Current Rating |  | SCCR |                                                    |
| 600 V High Fault             |  |      |                                                    |
| SCCR (fuse)                  |  | kA   | 100                                                |
| max. Fuse                    |  | A    | 1 Class J/CC                                       |

## Design verification as per IEC/EN 61439

|                                                          |                  |   |     |
|----------------------------------------------------------|------------------|---|-----|
| Technical data for design verification                   |                  |   |     |
| Rated operational current for specified heat dissipation | I <sub>n</sub>   | A | 1   |
| Heat dissipation per pole, current-dependent             | P <sub>vid</sub> | W | 2.3 |
| Equipment heat dissipation, current-dependent            | P <sub>vid</sub> | W | 6.9 |
| Static heat dissipation, non-current-dependent           | P <sub>vs</sub>  | W | 0   |

|                                                                                                                        |                   |    |                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------|-------------------|----|----------------------------------------------------------------------------------------------------------------------------------|
| Heat dissipation capacity                                                                                              | P <sub>diss</sub> | W  | 0                                                                                                                                |
| Operating ambient temperature min.                                                                                     |                   | °C | -25                                                                                                                              |
| Operating ambient temperature max.                                                                                     |                   | °C | 55                                                                                                                               |
| IEC/EN 61439 design verification                                                                                       |                   |    |                                                                                                                                  |
| 10.2 Strength of materials and parts                                                                                   |                   |    |                                                                                                                                  |
| 10.2.2 Corrosion resistance                                                                                            |                   |    | Meets the product standard's requirements.                                                                                       |
| 10.2.3.1 Verification of thermal stability of enclosures                                                               |                   |    | Meets the product standard's requirements.                                                                                       |
| 10.2.3.2 Verification of resistance of insulating materials to normal heat                                             |                   |    | Meets the product standard's requirements.                                                                                       |
| 10.2.3.3 Verification of resistance of insulating materials to abnormal heat and fire due to internal electric effects |                   |    | Meets the product standard's requirements.                                                                                       |
| 10.2.4 Resistance to ultra-violet (UV) radiation                                                                       |                   |    | Meets the product standard's requirements.                                                                                       |
| 10.2.5 Lifting                                                                                                         |                   |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.2.6 Mechanical impact                                                                                               |                   |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.2.7 Inscriptions                                                                                                    |                   |    | Meets the product standard's requirements.                                                                                       |
| 10.3 Degree of protection of ASSEMBLIES                                                                                |                   |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.4 Clearances and creepage distances                                                                                 |                   |    | Meets the product standard's requirements.                                                                                       |
| 10.5 Protection against electric shock                                                                                 |                   |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.6 Incorporation of switching devices and components                                                                 |                   |    | Does not apply, since the entire switchgear needs to be evaluated.                                                               |
| 10.7 Internal electrical circuits and connections                                                                      |                   |    | Is the panel builder's responsibility.                                                                                           |
| 10.8 Connections for external conductors                                                                               |                   |    | Is the panel builder's responsibility.                                                                                           |
| 10.9 Insulation properties                                                                                             |                   |    |                                                                                                                                  |
| 10.9.2 Power-frequency electric strength                                                                               |                   |    | Is the panel builder's responsibility.                                                                                           |
| 10.9.3 Impulse withstand voltage                                                                                       |                   |    | Is the panel builder's responsibility.                                                                                           |
| 10.9.4 Testing of enclosures made of insulating material                                                               |                   |    | Is the panel builder's responsibility.                                                                                           |
| 10.10 Temperature rise                                                                                                 |                   |    | The panel builder is responsible for the temperature rise calculation. Eaton will provide heat dissipation data for the devices. |
| 10.11 Short-circuit rating                                                                                             |                   |    | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.12 Electromagnetic compatibility                                                                                    |                   |    | Is the panel builder's responsibility. The specifications for the switchgear must be observed.                                   |
| 10.13 Mechanical function                                                                                              |                   |    | The device meets the requirements, provided the information in the instruction leaflet (IL) is observed.                         |

## Technical data ETIM 7.0

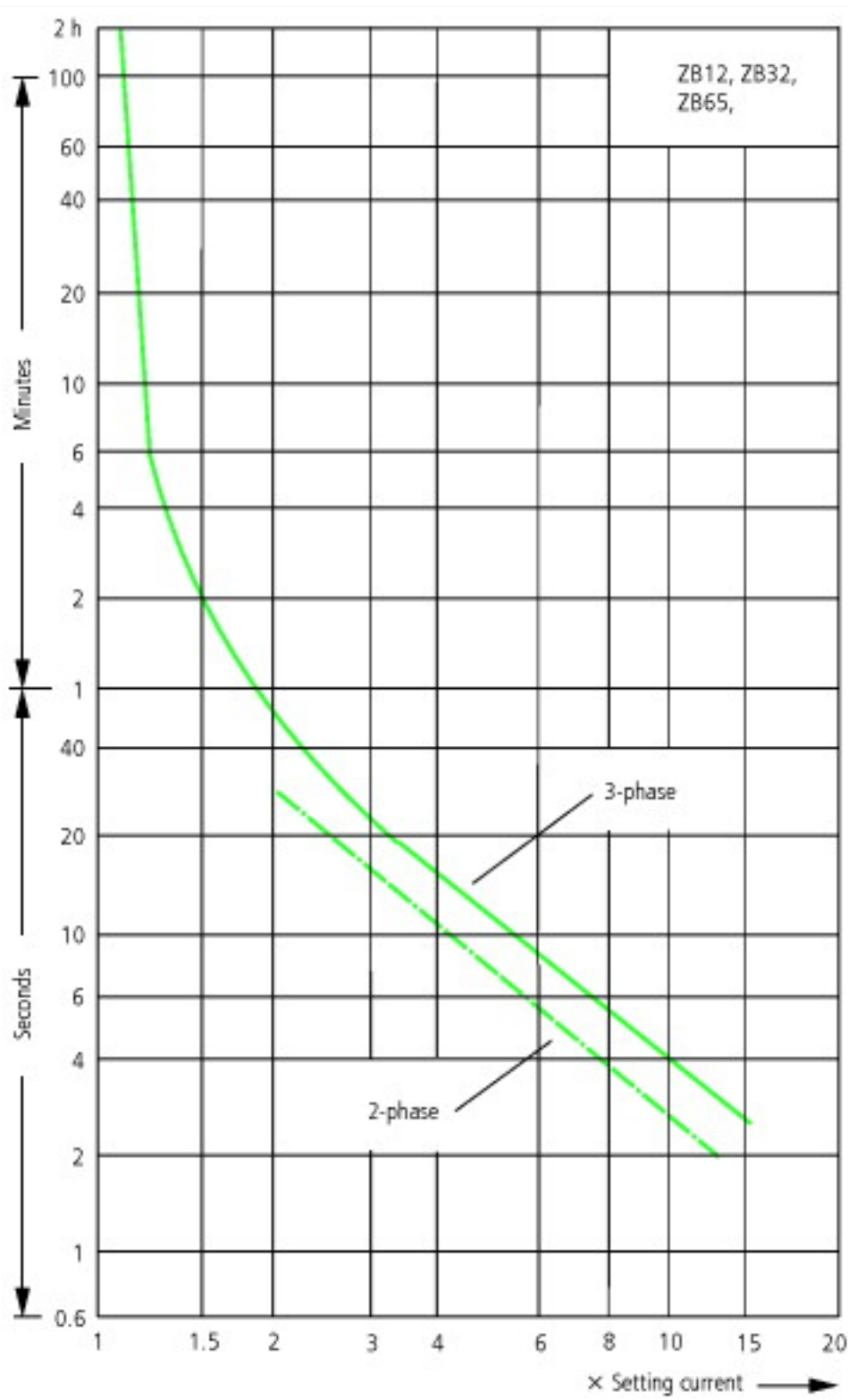
|                                                                                                                                                                                            |  |   |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|-------------------|
| Low-voltage industrial components (EG000017) / Thermal overload relay (EC000106)                                                                                                           |  |   |                   |
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Overload protection device / Thermal overload relay (ecI@ss10.0.1-27-37-15-01 [AKF075014]) |  |   |                   |
| Adjustable current range                                                                                                                                                                   |  | A | 0.6 - 1           |
| Max. rated operation voltage U <sub>e</sub>                                                                                                                                                |  | V | 690               |
| Mounting method                                                                                                                                                                            |  |   | Direct attachment |
| Type of electrical connection of main circuit                                                                                                                                              |  |   | Screw connection  |
| Number of auxiliary contacts as normally closed contact                                                                                                                                    |  |   | 1                 |
| Number of auxiliary contacts as normally open contact                                                                                                                                      |  |   | 1                 |
| Number of auxiliary contacts as change-over contact                                                                                                                                        |  |   | 0                 |
| Release class                                                                                                                                                                              |  |   | CLASS 10          |
| Reset function input                                                                                                                                                                       |  |   | No                |
| Reset function automatic                                                                                                                                                                   |  |   | Yes               |
| Reset function push-button                                                                                                                                                                 |  |   | Yes               |

## Approvals

|                                      |  |  |                                                                          |
|--------------------------------------|--|--|--------------------------------------------------------------------------|
| Product Standards                    |  |  | IEC/EN 60947-4-1; UL 60947-4-1; CSA - C22.2 No. 60947-4-1-14; CE marking |
| UL File No.                          |  |  | E29184                                                                   |
| UL Category Control No.              |  |  | NKCR                                                                     |
| CSA File No.                         |  |  | 12528                                                                    |
| CSA Class No.                        |  |  | 3211-03                                                                  |
| North America Certification          |  |  | UL listed, CSA certified                                                 |
| Specially designed for North America |  |  | No                                                                       |
| Suitable for                         |  |  | Branch circuits                                                          |

|                      |                           |
|----------------------|---------------------------|
| Max. Voltage Rating  | 600 V AC                  |
| Degree of Protection | IEC: IP20, UL/CSA Type: - |

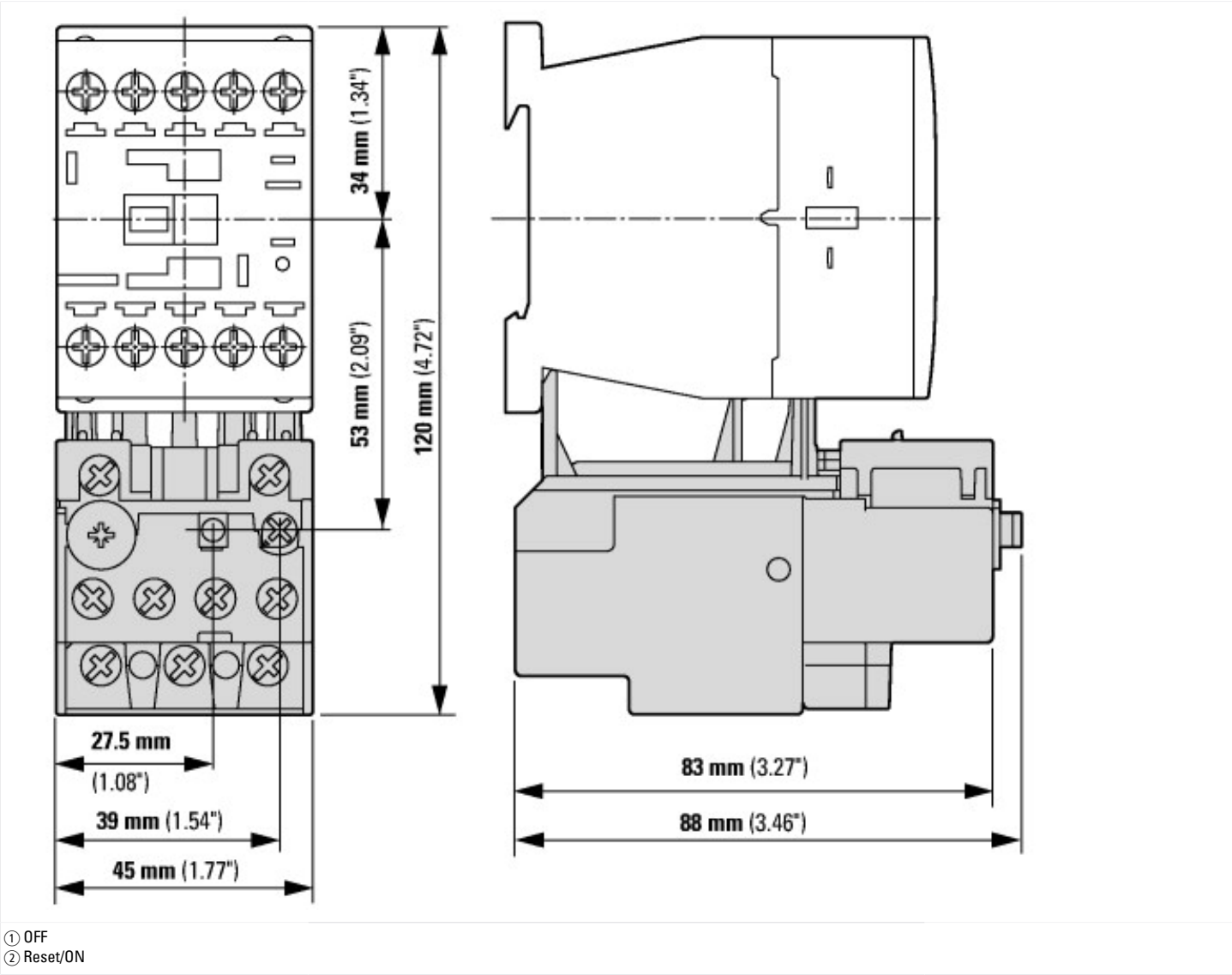
Characteristics



These tripping characteristics are mean values of the spreads at 20 °C ambient air temperature in a cold state.  
Tripping time depends on response current.  
When the devices are at operational temperature the tripping time of the overload relay falls to approx. 25 % of the read off value.

1: Minimum level, 3-phase  
2: Maximum level, 3-phase  
3: Minimum marker, 2-phase  
4: Highest marker, 2-phase

Dimensions



Additional product information (links)

|                                                                                                                                            |                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IL03407015Z (AWA2300-2114) Overload relay</b>                                                                                           |                                                                                                                                                                                   |
| IL03407015Z (AWA2300-2114) Overload relay                                                                                                  | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407015Z2020_06.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407015Z2020_06.pdf</a> |
| <b>IL03407195Z Sealable shroud</b>                                                                                                         |                                                                                                                                                                                   |
| IL03407195Z Sealable shroud                                                                                                                | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407195Z2018_06.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWA_INSTRUCTIONS/IL03407195Z2018_06.pdf</a> |
| <b>MN03407004Z (AWB2300-1527D/GB) ZB12/XTOB...BC1 and ZB32/XTOB...CC1 overload relays, overload monitoring of Ex e motors</b>              |                                                                                                                                                                                   |
| MN03407004Z (AWB2300-1527D/GB) ZB12/XTOB...BC1 and ZB32/XTOB...CC1 overload relays, overload monitoring of Ex e motors - Deutsch / English | <a href="https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN03407004Z_DE_EN.pdf">https://es-assets.eaton.com/DOCUMENTATION/AWB_MANUALS/MN03407004Z_DE_EN.pdf</a>             |