DATASHEET - ZB12-10



Overload relay, ZB12, Ir= 6 - 10 A, 1 N/O, 1 N/C, Direct mounting, IP20



| Part no. | ZB12-10 |
|-------------------|------------|
| Catalog No. | 278440 |
| Alternate Catalog | XTOB010BC1 |
| No. | |
| EL-Nummer | 0004131835 |
| (Norway) | |

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 Reset pushbutton manual/auto Trip-free release |
| Mounting type | | | Direct mounting |
| с‡ | I _r | A | 6 - 10 |
| Contact sequence | | | $\begin{array}{c c} & 97 & 95 \\ \hline \\ \hline \\ 2 & 4 & 6 & 98 & 96 & A2 \\ 2 & 2 & 4 & 6 \end{array} \begin{array}{c} & 98 & 96 & A2 \\ & 14/ \\ & 22 \end{array}$ |
| Auxiliary contacts | | | |
| N/O = Normally open | | | 1 N/O |
| N/C = Normally closed | | | 1 N/C |
| For use with | | | DILM7, DILM9, DILM12, DILM15, DIULM7, DIULM9, DIULM12, SDAINLM12, SDAINLM16, SDAINLM22 DS7-34SX007 DS7-34SX009 |
| Short-circuit protection | | | |
| Type "1" coordination | gG/gL | A | 50 |
| Type "2" coordination | gG/gL | A | 25 |
| | | | |

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.

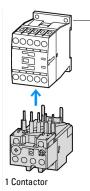


II(2)G [Ex d] [Ex e] [Ex px], II(2)D [Ex p] [Ex t]

PTB 10 ATEX 3010

Observe manual MN03407005Z-DE/EN.

Notes Fitted directly to the contactor



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Technical data

| ShandsFirst problemFirst problem | General | | | |
|---|---|------------------|-----------------|---------------------------------|
| Ambient Ampositor Ambient Ampositor Ambient Ampositor Ambient Ampositor Ambient Margonshire Impaint Ampositor ECREM 60447 Press - 5 - 6 - 65 - 6 - 65 - 6 - 65 - 6 - 65 | Standards | | | IEC/EN 60947, VDE 0660, UL, CSA |
| Image: Note: Section of Sectin of Section of Section of Section of Section of Section o | Climatic proofing | | | |
| Open File. 5 ⁴ C ² - 5 ⁴ C ² Biclead File. 5 ⁴ C ² - 5 ⁴ C ² Temperature compensation File. 5 ⁴ C ² Wight Controus Wight Controus More file. 5 ¹ C ² Controus Degree of Protection File. 5 ¹ C ² Degree of Protection | Ambient temperature | | | |
| Enclosed "C 3c - 4 Continuous Tampersture compensation K K Continuous Weight K K Sinal Additional Sinal Additional Sinal Additional Since Currents I use Sin | | | | |
| Tenperature compensation initial second se | Open | | °C | -25 - +55 |
| WeightIsIsIsIsIsMechanical shock resistanceIsIsIsIsIsDerare of ProtectionIsIsIsIsIsProtection against first contact when actuated from from (FM 1922)Is | Enclosed | | °C | - 25 - 40 |
| Muchanical abok resistance Note of Matching Information Informatio Information Information Information Informatin Informat | Temperature compensation | | | Continuous |
| initial strain strai | Weight | | kg | 0.145 |
| Protection against direct contact when actualted from from t(EM 50274)Image of an an actual stand sta | Mechanical shock resistance | | g | Sinusoidal |
| Altide n Max 200 Handem Control trip parts 500 Read involtors degree 600 Sete involtors degree 600 Read involtors degree 600 Sete involtors degree 600 Sete involtors and main contects 600 Between main fircuits and main contects 740 Between main incluits and main contects 740 Between main incluits and main contects 740 Current heat loss f3 conductors) 740 Current heat loss f3 conductors) 740 Solid 740 Solid 740 Solid 740 Solid or stranded 740 Solid or strande | Degree of Protection | | | IP20 |
| Anic onducting pathsVame Vame Name Name | Protection against direct contact when actuated from front (EN 50274) | | | Finger and back-of-hand proof |
| Rated impulse withstand voltageVac600Qerorlage category/pollution degreeIIIIIIIRated operational voltageVacVacSoldRated operational voltageVacVacSoldBetween autin contacts and main contactsVacVac400Between autin circuitsVacVac400Tumperstur compensation residual error > 40 °CVac202 %/KGetween autin circuitsVac202 %/KTumperstur compensation residual error > 40 °CVac202 %/KGetween autin circuitsVac202 %/KCurrent heat loss (3 conductors)Vac300Maximum settingVac300Maximum settingVac100SolidNac121 °CSolidNac121 °CFacilite with ferruleVac121 °CSolid or strandedVac121 °CTuminal careawVac121 °CPadriv scrowdriverVac121 °CSolid or strandedVac121 °CSolid or | | | m | Max. 2000 |
| Devolution degreeImage: solution volution outsideImage: solution volution | | | | |
| Red insultion voltageIV60Red operational voltageIVAC60Setisolation to EN 61140IIIBetween auxiliary contacts and main contactsVAC4040Between auxiliary contacts and main contactsVAC40205%/KBetween auxiliary contacts and main contactsIIIBetween auxiliary contacts and main contactsIVAC40Temperatur compensation residual error > 40 °CVAC40ICurrent backs (3 conductors)IIIIMaximum settingIIIIIMaximum settingIIIIISolidIIIIIISolid or strandedIIIIIISolid or strandedIIIIIIITerminal carcewII <td>Rated impulse withstand voltage</td> <td>U_{imp}</td> <td>V AC</td> <td>6000</td> | Rated impulse withstand voltage | U _{imp} | V AC | 6000 |
| Reted operational voltage U VAC 860 Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Between auxiliary contacts and main contacts VAC 40 Between main circuits VAC 40 Temperatur compensation residual error > 40 °C Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Current heat loss (3 conductors) Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Current heat loss (3 conductors) Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Current heat loss (3 conductors) Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Current heat loss (3 conductors) Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Maxware setting range Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Image: Safe isolation to EN 61140 Safe isolation to EN 61140 Image: Safe isolati | Overvoltage category/pollution degree | | | 111/3 |
| Safe isolation to EN 61140 Value 440 Between main circuits Value 440 Temparatur compensation residual error > 40 °C Value 400 Current heat loss (3 conductors) Value 400 Lower value of the satting range Value 2.25 %/K Maximum setting Value 6 Terminal capacities Value 7 Solid man 2.25 %/K Terminal capacities Maximum setting 8 Solid or stranded Maximum setting 8 Terminal capacities Maximum setting 8 Solid or stranded Maximum setting 8 Terminal capacities Maximum setting 8 Solid or stranded Maximum setting 8 Terminal carsew Maximum setting 8 Terminal screw Maximum setting 8 Terminal carsew Maximum setting 8 Terminal carsew Maximum setting 8 Terminal carsew Maximum setting 8 Terminal carsew/inver Solid or stranded Maximum setting Terminal carsew/inver Maximum setting 8 Pacidriw screwdriver Solid or stranded 10 Terminal capacities | Rated insulation voltage | Ui | V | 690 |
| Between auxiliary contacts and main contacts VAC 40 Between main circuits VAC 40 Temperatur compensation residual error > 40 °C VAC 40 Current heat loss (3 conductors) VAC 800 Lower value of the setting range VAC 800 Maximum setting VAC 800 Terminal capacities VAC 800 Solid VAC 800 Fexible with ferrule VAC 800 Solid or stranded VAC 800 Terminal capacitiver VAC 800 Solid or stranded VAC 800 Terminal screw VAC 800 Tightening torque VAC 800 Stripping length Vampet Size Terminal corewdriver Size Size Stripping length Vampet Yampet Pacidriv screwdriver Size Size Strander Screwdriver Yampet Yampet Read implies withstand voltage Yampet Yampet | Rated operational voltage | U _e | V AC | 690 |
| Between main circuits VAC 40 Temperatur compensation residual error > 40 °C 525 %/K Current heat loss (3 conductors) VM 52 Lower value of the setting range VM 52 Maximum setting VM 52 Terminal capacities Mm ² 52 Solid mm ² 52 Fexible with ferrule Mm ² 52 Solid or stranded Mm ² 1x (1 + 6) x(1 - 6) Solid or stranded MM 84 Terminal screw MM 84 Totage screwdriver Size Mm Pozidriv screwdriver Size Mm Totage screwdriver Size 1 Autiliary and control circuits Size 1 Autiliary and control circuits Size 1 Standard screwdriver Mma 1x (1 - 6) Overvoltage category/pollution degree Mm 1x (1 - 6) Green Standard screwdriver Size 1x (1 - 6) Autiliary and controt circuits Size 1x (| Safe isolation to EN 61140 | | | |
| Imperatur compensation residual error > 40 °C Imperature residual error > 40 °C Imperatureroror > 40 °C Imperatureror > 40 °C </td <td>Between auxiliary contacts and main contacts</td> <td></td> <td>V AC</td> <td>440</td> | Between auxiliary contacts and main contacts | | V AC | 440 |
| Current heat los (3 conductors) Image: | Between main circuits | | V AC | 440 |
| Lover value of the setting range Image: Setting range Image: Set im | Temperatur compensation residual error > 40 $^{\rm o}{\rm C}$ | | | ≦ 0.25 %/K |
| Maximum setting V 6 Terrinal capacities mm ² x11 - 6) Solid mm ² x11 - 6) Flexible with ferrule mm ² x11 - 4) Solid or stranded MM ² x11 - 4) Solid or stranded MM ² x11 - 4) Terrinal screw MM ² x11 - 4) Terrinal screw MM ² x11 - 4) Solid or stranded MM ² XIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII | Current heat loss (3 conductors) | | | |
| Terminal capacities Imma Terminal capacities Imma Solid Imma Solid Imma Flexible with ferrule Imma Solid or stranded Imma Solid or stranded Imma Terminal screw Imma Terminal screw Imma Stripping length Imma Tots Imma Pozidriv screwdriver Imma Standard screwdriver Imma Ret impulse withstand voltage Impa Overvoltage category/pollution degree Impa Imma Impa Imma Imma Imma Imma <td>Lower value of the setting range</td> <td></td> <td>W</td> <td>2.2</td> | Lower value of the setting range | | W | 2.2 |
| Solid mm mm ² x (1 - 6) x (1 - 6) Flexible with ferrule mm ² x (1 - 4) x (1 - 4) x (1 - 4) x (1 - 4) Solid or stranded AWG 8 - 8 Terminal screw MM 8 - 8 Tightening torque MM 18 Stripping length Mm 10 Tools Mm 10 Pozidriv screwdriver Size 2 Standard screwdriver Mm 1x (1 - 4) Attalitary and control circuits mm 10 Attalitary and control circuits mm 1x (1 - 4) Overvoltage category/pollution degree Mm 8 Iterminal capacities Mm 1x (1 - 4) | Maximum setting | | W | 6 |
| Image: Preside and the second seco | Terminal capacities | | mm ² | |
| Solid or stranded AWG 3e 3 Terminal screw AWG 3e 3 Tightening torque Ma Ma Tightening torque Mm 18 Stripping length mm 10 Tools mm 10 Pozidriv screwdriver Size Size Standard screwdriver Jung Van AuxLilary and control circuits Vimp 400 Overvoltage category/pollution degree Man IIV3 | Solid | | mm ² | |
| Terminal screwMetMetTightening torqueNm1.8Stripping lengthmm0ToolsNm1.8Pozidriv screwdriverSize2Standard screwdrivermm1.46Auxiliary and control circuitsJimpMetVervoltage category/pollution degreeJimpMetTerminal capacitiesmm²III/3 | Flexible with ferrule | | mm ² | |
| Tightening torqueNm1.8Stripping lengthnm0Toolsnm10Pozidriv screwdriversizeSizeStandard screwdrivermm1x6Auxiliary and control circuitsRated impulse withstand voltageVimpVOvervoltage category/pollution degreeVimpNmTerminal capacitiesmm211/3 | Solid or stranded | | AWG | 18 - 8 |
| Stripping length Imm Imm Tools Mm Imm Pozidriv screwdriver Size Size Standard screwdriver mm 1x6 Auxiliary and control circuits Imm Imm Overvoltage category/pollution degree Imm Imm Terminal capacities Imm Imm | Terminal screw | | | M4 |
| Tools Image: Marcine Size Size Size Size Size Size Size Siz | Tightening torque | | Nm | 1.8 |
| Pozidriv screwdriver Size Size Standard screwdriver mm 1 × 6 Auxiliary and control circuits Vimp V 400 Overvoltage category/pollution degree III/3 III/3 | Stripping length | | mm | 10 |
| Standard screwdriver mm 1 x 6 Auxiliary and control circuits Rated impulse withstand voltage Vimp V 4000 Overvoltage category/pollution degree III/3 III/3 | Tools | | | |
| Auxiliary and control circuits Rated impulse withstand voltage Uimp V 4000 Overvoltage category/pollution degree III/3 III/3 Terminal capacities mm ² III/3 | Pozidriv screwdriver | | Size | 2 |
| Rated impulse withstand voltage Uimp V 4000 Overvoltage category/pollution degree III/3 III/3 Terminal capacities mm ² III/3 | | | mm | 1 x 6 |
| Overvoltage category/pollution degree III/3 Terminal capacities mm ² | Auxiliary and control circuits | | | |
| Terminal capacities mm ² | Rated impulse withstand voltage | U _{imp} | V | 4000 |
| | Overvoltage category/pollution degree | | | 111/3 |
| Solid mm ² 1 x (0.75 - 4) | Terminal capacities | | mm ² | |
| | Solid | | mm ² | 1 x (0.75 - 4) |

| | | | 2 x (0.75 - 4) |
|--------------------------------------|-----------------|-----------------|---|
| Flexible with ferrule | | mm ² | 1 x (0.75 - 2.5) 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 | Ui | V AC | 500 |
| Rated operational voltage | U _e | V AC | 500 |
| Safe isolation to EN 61140 | | | |
| between the auxiliary contacts | | V AC | 240 |
| Conventional thermal current | I _{th} | А | 6 |
| Rated operational current | le | А | |
| AC-15 | | | |
| Make contact | | | |
| 120 V | Ι _e | А | 1.5 |
| 220 V 230 V 240 V | Ι _e | А | 1.5 |
| 380 V 400 V 415 V | ۱ _e | А | 0.5 |
| 500 V | Ι _e | А | 0.5 |
| Break contact | | | |
| 120 V | Ie | A | 1.5 |
| 220 V 230 V 240 V | Ie | A | 1.5 |
| 380 V 400 V 415 V | Ι _e | A | 0.9 |
| 500 V | le | A | 0.8 |
| DC L/R ≦ 15 ms | | | |
| | | | Switch-on and switch-off conditions based on DC-13, time constant as specified. |
| 24 V | ۱ _e | A | 0.9 |
| 60 V | Ι _e | A | 0.75 |
| 110 V | I _e | A | 0.4 |
| 220 V | Ι _e | А | 0.2 |
| Short-circuit rating without welding | | | |
| max. fuse | | A gG/gL | 6 |
| Notes | | | |

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 B600 at same polarity |
| DC operated | | R300 |
| Short Circuit Current Rating | SCCR | |
| 600 V High Fault | | |
| SCCR (fuse) | kA | 100 |
| max. Fuse | А | 15 Class J/CC |

Design verification as per IEC/EN 61439

| Fechnical data for design verification | | | |
|--|---|---|--|
| Rated operational current for specified heat dissipation | In | А | 10 |
| Heat dissipation per pole, current-dependent | P _{vid} | W | 2 |
| Equipment heat dissipation, current-dependent | P _{vid} | W | 6 |
| Static heat dissipation, non-current-dependent | P _{vs} | W | 0 |
| | Heat dissipation per pole, current-dependent Equipment heat dissipation, current-dependent | Rated operational current for specified heat dissipation In Heat dissipation per pole, current-dependent Pvid Equipment heat dissipation, current-dependent Pvid Static heat dissipation per pole, current-dependent Pvid | Rated operational current for specified heat dissipation In A Heat dissipation per pole, current-dependent Pvid W Equipment heat dissipation, current-dependent Pvid W Static heat dissipation per pole Pvid W |

| Heat dissipation capacity | P _{diss} | 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)

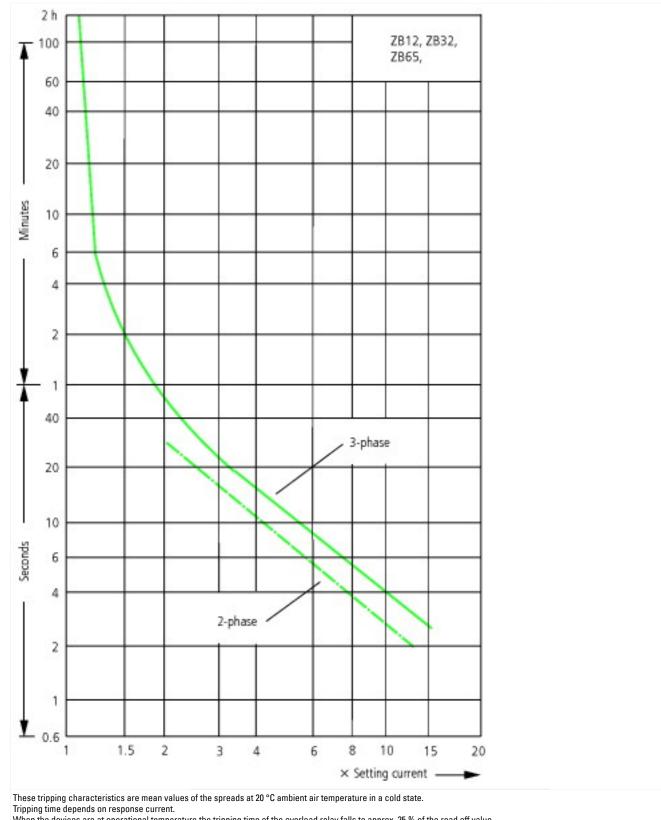
| Electric engineering, automation, process control engineering / Low-voltage switch technology / Overload protection device / Thermal overload relay (ecl@ss10.0.1-27-37-15-01 [AKF075014]) | | | |
|--|--|---|-------------------|
| Adjustable current range | | А | 6 - 10 |
| Max. rated operation voltage Ue | | 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



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

