



278437  
ZB12-2,4

Overview

Specifications

Resources



Delivery program

Technical data

Design verification as per IEC/EN 61439

Technical data ETIM7.0

Approvals

Characteristics

Dimensions

## 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

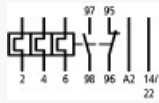
Description  
Test/off button  
Reset pushbutton manual/auto  
Trip-free release

Mbunting type  
Direct mounting



1.6 - 2.4 A

Contact sequence



### Auxiliary contacts

NO = Normally open  
1 NO

NC = Normally closed  
1 NC

For use with  
DILM7, DILM9, DILM12, DILM15,  
DIULM7, DIULM9, DIULM12,  
SDAINLM12,  
SDAINLM16,  
SDAINLM22

### Short-circuit protection

Type "1" coordination  $\frac{I}{t}$  [gG/gL]  
25 A

Type "2" coordination  $\frac{I}{t}$  [gG/gL]  
10 A

#### 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

Damp heat, cyclic, to IEC 60068-2-30

#### Ambient temperature

Operating range to IEC/EN 60947

PTB: -5 °C- +55 °C

#### Ambient temperature

Open

-25 - +55 °C

#### Ambient temperature

Enclosed

- 25 - 40 °C

#### Temperature compensation

Continuous

#### Weight

0.142 kg

#### Mechanical shock resistance

10

Sinusoidal

Shock duration 10 ms g

#### Degree of Protection

IP20

Protection against direct contact when actuated

from front (EN 50274)  
Finger and back-of-hand proof

Altitude  
Max. 2000 m

## Main conducting paths

Rated impulse withstand voltage [ $U_{imp}$ ]  
6000 V AC

Overvoltage category/pollution degree  
III/3

Rated insulation voltage [ $U_i$ ]  
690 V

Rated operational voltage [ $U_o$ ]  
690 V AC

Safe isolation to EN 61140  
Between auxiliary contacts and main contacts  
440 V AC

Safe isolation to EN 61140  
Between main circuits  
440 V AC

Temperature compensation residual error > 40 °C  
 0.25 %/K

Current heat loss (3 conductors)  
Lower value of the setting range  
2.5 W

Current heat loss (3 conductors)  
Maximum setting  
5.7 W

Terminal capacities  
Solid  
1 x (1 - 6)  
2 x (1 - 6) mm<sup>2</sup>

Terminal capacities  
Flexible with ferrule

1 x (1 - 4)  
2 x (1 - 4) mm<sup>2</sup>

Terminal capacities  
Solid or stranded  
18 - 8 AWG

Terminal screw  
M4

Tightening torque  
1.8 Nm

Stripping length  
10 mm

Tools  
Pozidriv screwdriver  
2 Size

Tools  
Standard screw driver  
1 x 6 mm

## Auxiliary and control circuits

Rated impulse withstand voltage [ $U_{imp}$ ]  
4000 V

Overvoltage category/pollution degree  
III/3

Terminal capacities  
Solid  
1 x (0.75 - 4)  
2 x (0.75 - 4) mm<sup>2</sup>

Terminal capacities  
Flexible with ferrule  
1 x (0.75 - 2.5)  
2 x (0.75 - 2.5) mm<sup>2</sup>

Terminal capacities  
Solid or stranded  
2 x (18 - 14) AWG

Terminal screw  
M3.5

Tightening torque  
1.2 Nm

Stripping length  
8 mm

Tools  
Poqidriv screwdriver  
2 Size

Tools  
Standard screwdriver  
1 x 6 mm

Rated insulation voltage [ $U_i$ ]  
500 V AC

Rated operational voltage [ $U_e$ ]  
500 V AC

Safe isolation to EN61140  
between the auxiliary contacts  
240 V AC

Conventional thermal current [ $I_{th}$ ]  
6 A

Rated operational current [ $I_e$ ]  
AC-15  
Make contact  
120 V [ $I_e$ ]  
1.5 A

Rated operational current [ $I_e$ ]  
AC-15  
Make contact  
220 V 230 V 240 V [ $I_e$ ]  
1.5 A

Rated operational current [ $I_e$ ]  
AC-15  
Make contact  
380 V 400 V 415 V [ $I_e$ ]  
0.5 A

Rated operational current [ $I_e$ ]  
AC-15  
Make contact  
500 V [ $I_e$ ]  
0.5 A

Rated operational current [ $I_e$ ]  
AC-15  
Break contact  
120 V [ $I_e$ ]  
1.5 A

Rated operational current [ $I_e$ ]  
AC-15  
Break contact  
220 V 230 V 240 V [ $I_e$ ]  
1.5 A

Rated operational current [ $I_e$ ]  
AC-15  
Break contact  
380 V 400 V 415 V [ $I_e$ ]  
0.9 A

Rated operational current [ $I_e$ ]  
AC-15  
Break contact  
500 V [ $I_e$ ]  
0.8 A

Rated operational current [ $I_e$ ]  
DC L/R  $\square$  15 ms  
Switch-on and switch-off conditions based on  
DC-13, time constant as specified.

Rated operational current [ $I_e$ ]  
DC L/R  $\square$  15 ms  
24 V [ $I_e$ ]  
0.9 A

Rated operational current [ $I_e$ ]  
DC L/R  $\square$  15 ms  
60 V [ $I_e$ ]  
0.75 A

Rated operational current [ $I_e$ ]  
DC L/R  $\square$  15 ms  
110 V [ $I_e$ ]  
0.4 A

Rated operational current [ $I_e$ ]

DC L/R □ 15 ms  
220 V [ $I_e$ ]  
0.2 A

Short-circuit rating without welding  
max. fuse  
6 A gG/gL

## 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  
Flot Duty  
AC operated  
B300 at opposite polarity  
B600 at same polarity

Auxiliary contacts  
Flot Duty  
DC operated  
R300

Short Circuit Current Rating  
600 V High Fault  
SCCR (fuse)  
100 kA

Short Circuit Current Rating  
600 V High Fault  
max. Fuse  
3 Class J/CCA

## DESIGN VERIFICATION AS PER IEC/EN 61439

### Technical data for design verification

Rated operational current for specified heat dissipation [ $I_n$ ]



2.4 A

Heat dissipation per pole, current-dependent [ $P_{\text{id}}$ ]  
1.9 W

Equipment heat dissipation, current-dependent  
[ $P_{\text{id}}$ ]  
5.7 W

Static heat dissipation, non-current-dependent [ $P_{\text{st}}$ ]  
0 W

Heat dissipation capacity [ $P_{\text{diss}}$ ]  
0 W

Operating ambient temperature min.  
-25 °C

Operating ambient temperature max.  
+55 °C

### **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 Strength of materials and parts  
10.2.3.1 Verification of thermal stability of  
enclosures  
Meets the product standard's requirements.

10.2 Strength of materials and parts  
10.2.3.2 Verification of resistance of insulating  
materials to normal heat  
Meets the product standard's requirements.

10.2 Strength of materials and parts  
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 Strength of materials and parts  
10.2.4 Resistance to ultra-violet (UV) radiation  
Meets the product standard's requirements.

10.2 Strength of materials and parts

10.2.5 Lifting

Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts

10.2.6 Mechanical impact

Does not apply, since the entire switchgear needs to be evaluated.

10.2 Strength of materials and parts

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 Insulation properties

10.9.3 Impulse withstand voltage

Is the panel builder's responsibility.

10.9 Insulation properties

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

1.6 - 2.4 A

Max. rated operation voltage  $U_e$

690 V

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

Characteristic curve



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



- OFF
- Reset/ON

