# DATASHEET - ZB12-0,16



Overload relay, ZB12, Ir= 0.1 - 0.16 A, 1 N/O, 1 N/C, Direct mounting, IP20



Part no.	ZB12-0.16
Catalog No.	278431
Alternate Catalog	XTOBP16BC1
No.	
EL-Nummer	0004131826
(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‡	l <sub>r</sub>	A	0.1 - 0.16
Contact sequence			$\begin{array}{c c} & 97 & 95 \\ \hline \\ \hline \\ 2 & 4 & 6 & 98 & 96 & A2 \\ 2 & 4 & 6 & 98 & 96 & A2 \\ 2 & 2 & 4 & 6 \end{array}$
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
Short-circuit protection			
Type "1" coordination	gG/gL	A	25
Type "2" coordination	gG/gL	A	0.5

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.

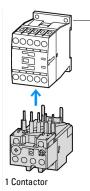


II(2)G [Ex d] [Ex e] [Ex px], II(2)D [Ex p] [Ex t]

PTB 10 ATEX 3010

Observe manual MN03407005Z-DE/EN.

Notes Fitted directly to the contactor



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# Technical data

Rated impulse withstand voltage Uimp V 400   Overvoltage category/pollution degree III/3 III/3   Terminal capacities mm <sup>2</sup> III/3	General			
Ambient Ampositor     partially interfaction (Constraints in ECCEN 6004)       Ambient Ampositor     Prime is the constraints (Constraints in ECCEN 6004)       Bignen     Constraints in ECCEN 6004)       Bignen     Since 6004       Bignen	Standards			IEC/EN 60947, VDE 0660, UL, CSA
Image: Procession and and controls in the section of the sectin of the section of the section of the section of the se	Climatic proofing			
Open     FBL 5°C     FBL 5°C       Open     FBL 5°C     SPC       Enclosed     FC     S-S-S       Temperature composition     FC     S-S-A       Weight     FR     Second     Second       Mechnical block resistance     FR     Second     Second       Degree of Protection     FR     Second     Second       Patterion sequestification contract Weight contract (FBMS274)     FR     Second     Second       Patterion sequestification contract Weight contract (FBMS274)     FR     Second     Second       Patterion sequestification contract Weight contract (FBMS274)     FR     Second     Second       Patterion sequestification contract Weight contract (FBMS274)     FR     Second     Second       Patterion Second Patterion S	Ambient temperature			
Enclosed     C     25-30       Enclosed     C     25-30       Weight     C     10     C       Weight     C     10     Sinusular       Machenial shok resistance     Sinusular     Sinusular     Sinusular       Degree of Protection     Protection Tomes     Fead     Sinusular       Protection segment direct contact when actuated from fort (M 50274)     Mon     Mac. 2000       Minusular     Control of Sinusular     Mon     Mac. 2000       Protection segment direct contact when actuated from fort (M 50274)     Mon     Mac. 2000       Moneting performation for direct contact when actuated from fort (M 50274)     Mon     Mac. 2000       Devertions composition for direct contact when actuated from fort (M 50274)     Mon     Mac. 2000       Devertions composition for direct contact when actuated from fort (M 50274)     Mon     Mon       Read insultation voltage     Mon     Mon     Mon       Between actic fort for direct contact when actuated from fort (M 50274)     V     Mon       Between actuatic soft for direct contact when actuated from fort (M 50274)     V     Mon       Between actuatic actuate				
Temperature compensation     Image: section     <	Open		°C	-25 - +55
WeightIsIsIsIsMechanical shock resistanceIsIsIsIsIsDerare of ProtectionIsIsIsIsIsProtection against first contact when actuated from from (EN 50224)ImIs <td< td=""><td>Enclosed</td><td></td><td>°C</td><td>- 25 - 40</td></td<>	Enclosed		°C	- 25 - 40
Markanical abok resistance     Name     Name <th< td=""><td>Temperature compensation</td><td></td><td></td><td>Continuous</td></th<>	Temperature compensation			Continuous
Image: set of the set of th	Weight		kg	0.141
Protection against direct contact when actuated from from FIQN 502244Final and back-of-hand proofAiture does a contact from from FIQN 502244Nax 2000Main contact from from FIQN 502244VampVampVampReter from from from from FIQN 502244VampVampVampReter from from from from FIQN 502244VampVampVampReter from from from from from from from fro	Mechanical shock resistance		g	Sinusoidal
Altide n Max 200   Hater conducting paths 500   Read insultor voltage 600   Overvoltage catagory/pollution degree 90   Read insultor voltage Va 90   Read insultor voltage Va 90   Read insultor voltage Va 90   Sate voltage interview Va 90   Sate voltage interview Va 90   Current heat loss 12 conductors) Va 90   Lower value of the sating range Ma 90   Satid Sate voltage Na 11   Sate voltage Na 90 12   Inversitiem Na Na 11   Sate voltage interview Na 12 12   Sate voltage interview Na 12 12   Sate voltage interview Na 13 12   Sate	Degree of Protection			IP20
Anic orducting pathsVanoVanoVanoVanoMonoRetad impulse withstand voltageImportImportImportImportRetad insultation voltageImportImportImportImportRetad insultation voltageImportImportImportImportRetad insultation voltageImportImportImportRetad insultation voltageImport	Protection against direct contact when actuated from front (EN 50274)			Finger and back-of-hand proof
Rete on pulse withstand voltage     Yeac     600       Overvoltage categon/pollution degree     III     IIII       Rete operational voltage     Vice     90       Rete operational voltage     Vice     Vice       Between auxiainy contacts and main contacts     Vice     Vice       Between auxiainy contacts and main contacts     Vice     Vice       Between auxiainy contacts and main contacts     Vice     Vice       Important contacts     Vice     Vice       Important contacts and main contacts     Vice     Vice       Important contacts     Vice     Vice       Important contacts     Vice     Vice       Important contact     Vice     Vice       I			m	Max. 2000
Overvitege extegory/polution degreeImage: solution degreeIm				
Reted insultion voltage     Ui     Vi     60       Reted operational voltage     Ui     50     500       Setisolation to EN 61140     VI     40     500       Between auxiliary contacts and main contacts     VI     40     500       Between auxiliary contacts and main contacts     VI     40     500       Between auxiliary contacts and main contacts     VI     40     500       Temperatur compensation residual error >40°C     VI     500	Rated impulse withstand voltage	U <sub>imp</sub>	V AC	6000
Reted operational voltage Ue VAC 60   Setives auxiliary contacts and main contacts VAC 40   Between auxiliary contacts and main contacts VAC 40   Between main circuits VAC 505 %K   Temperatur compensation residual error > 40 °C VAC 505 %K   Current bat loss (3 conductors) VAC 505 %K   Maximum setting VAC 70 70   Maximum setting range VAC 70 70   Solid Maximum setting WA 70   Solid or stranded VAC 81-8   Stranded recentrier Maximum setting Maximum setting   Solid or stranded Maximum setting Maximum setting	Overvoltage category/pollution degree			III/3
Safe isolation to EN 61140 Feed VAC 40   Between main circuits VAC 40   Temperatur compensation residual error > 40 °C VAC 40   Current heat loss (3 conductors) VAC 40   Lower value of the setting range VAC 40   Maximum setting VAC 40   Terminal capacities VAC 40   Solid Marin VAC 40   Solid or stranded VAC 40 40   Terminal carge Marin VAC 40   Solid or stranded VAC 40 50   Solid or stranded VAC Marin 50   Terminal carge VAC Marin 50   Solid or stranded VAC 40 50   Solid or stranded VAC Marin 50   Terminal carge VAC Marin 50   Solid or stranded VAC Marin 50   Terminal carge VAC Marin 50   Solid or stranded VAC Marin 50   Terminal carge VAC Marin 50   Solid or stranded VAC 50 50   Pacitiry screwdriver Solid or stranded </td <td>Rated insulation voltage</td> <td>Ui</td> <td>V</td> <td>690</td>	Rated insulation voltage	Ui	V	690
Between auxiliary contacts and main contactsIVAC40Between main circuitsVAC40Temperatur compensation residual error > 40 °CVAC40Current heat loss (3 conductors)V05.55 %/KLower value of the setting rangeVW5.61Maximum settingVM5.61Terminal capacitiesVM5.61SolidVM5.61Fexible with ferruleVM5.61Solid or strandedVM5.61Terminal screwVM16.6Tightening torqueVM16.6Stripping lengthVM16.6TotalVM16.6Terminal capacitiesVM16.6Terminal screwVM16.6Terminal screwVM16.6Stripping lengthVM16.6TotalVM16.6Auxiliary and control circuitsVM16.6Auxiliary and control circuitsVM16.6Convoltage category/pollution digreeVM10.6Overvoltage category/pollution digreeVM10.6Convoltage category/pollution digreeVM10.6Convoltage category/pollution digreeVM10.6Convoltage category/pollution digreeVM10.6Convoltage category/pollution digreeVM10.6Convoltage category/p	Rated operational voltage	Ue	V AC	690
Between main circuits     VAC     40       Temperatur compensation residual error > 40 °C     52 %/K       Current heat loss (3 conductors)     VM     1       Lower value of the setting range     VM     5.4       Maximum setting     mn2     1.4 (1.6)       Solid     mn2     1.4 (1.6)       Solid or stranded     VM     8.8       Terminal screw     MM     1.8 (1.6)       Total screwdriver     Size     mn2     1.4 (1.6)       Total screwdriver     Size     MA     MA       Total screwdriver     Size     MM     1.8 (1.6)       Total screwdriver     Size     Size     MM       Total screwdriver     Size     Size     1.6       Total screwdriver     Size     1.6     1.6       Total screwdriver     Size     1.6     1.6       Coervoltage category/pollution degree     Mm     1.6     1.6	Safe isolation to EN 61140			
Imperatur compensation residual error > 40°C     Imperatur compensation residual error >	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   N   2     Maximum setting   Solid   Solid   Solid     Terminal capacities   mmail   Image: Solid   Solid     Solid   mmail   Solid   Solid   Solid     Flexible with ferrule   mmail   Solid   Soli	Temperatur compensation residual error > 40 $^{\rm o}{\rm C}$			≦ 0.25 %/K
Maximum setting   Maximum setting   54     Terminal capacities   ma <sup>2</sup> x11 - 6)     Solid   ma <sup>2</sup> x11 - 6)     Flexible with ferrule   ma <sup>2</sup> x11 - 4)     Solid or stranded   AWG   8-8     Terminal screw   Maximum setting   Maximum setting     Toting forque   Maximum setting   Maximum setting     Toting forque   Maximum setting   Maximum setting     Toting screwdriver   Maximum setting   Maximum setting     Toting screwdriver   Maximum setting   Maximum setting     Totard screwdriver   Maximum setting   Maximum setting     Auxiliary and control circuits   Maximum setting   Maximum setting     Auxing setting set	Current heat loss (3 conductors)			
Terminal capacities   Image:	Lower value of the setting range		W	2.1
Solid   mm <sup>2</sup> x(1 - 6)     Flexible with ferrule   mm <sup>2</sup> x(1 - 4)     Solid or stranded   AWG   8-8     Terminal screw   MM   8-8     Tightening torque   MM   8-8     Tightening torque   MM   8-8     Torping length   MM   8-8     Tools   MM   18-0     Pozidriv screwdriver   MM   19-0     Standard screwdriver   MM   19-0     Atkliary and control circuits   Mm   19-0     Read impulse withstand voltage   Ming   Ym     Overvoltage category/pollution degree   Ming   Ym     Imming capacities   Mm <sup>2</sup> MM	Maximum setting		W	5.4
Image:	Terminal capacities		mm <sup>2</sup>	
Solid or stranded Solid or stran	Solid		mm <sup>2</sup>	
Terminal screwMainMainTightening torqueNm1.8Stripping lengthnm0ToolsNm1.8Pozidriv screwdriverNm1.8Standard screwdriverSize1Rated impulse withstand voltageMain1.8Overvoltage category/pollution degreeMain1/10Immain LapacitiesMainMain	Flexible with ferrule		mm <sup>2</sup>	
Tightening torque Nm 18   Stripping length mm 10   Tools nm 10   Pozidriv screwdriver Size Nm 1x6   Standard screwdriver mm 1x6   Auxiliary and control circuits Vimp Vimp 400   Overvoltage category/pollution degree Mm 11/3   Terminal capacities mm <sup>2</sup> 11/3	Solid or stranded		AWG	18 - 8
Stripping length mm 10   Tools Mm 10   Pozidriv screwdriver Size 2   Standard screwdriver mm 1x6   Auxiliary and control circuits Imp 400   Overvoltage category/pollution degree Imp 11/3   Terminal capacities Imp Imp	Terminal screw			M4
Tools Image: Marcine stream of the stream	Tightening torque		Nm	1.8
Pozidriv screwdriver Size Size   Standard screwdriver mm 1 × 6   Auxiliary and control circuits Vimp V 4000   Overvoltage category/pollution degree III/3 III/3	Stripping length		mm	10
Standard screwdriver mm 1 x 6   Auxiliary and control circuits I x 6   Rated impulse withstand voltage Vimp V   Overvoltage category/pollution degree III/3   Terminal capacities mm <sup>2</sup>	Tools			
Auxiliary and control circuits   Rated impulse withstand voltage Vimp V 4000   Overvoltage category/pollution degree III/3 III/3	Pozidriv screwdriver		Size	2
Rated impulse withstand voltage Uimp V 400   Overvoltage category/pollution degree III/3 III/3   Terminal capacities mm <sup>2</sup> III/3	Standard screwdriver		mm	1 x 6
Overvoltage category/pollution degree III/3   Terminal capacities III/3	Auxiliary and control circuits			
Terminal capacities mm <sup>2</sup>	Rated impulse withstand voltage	U <sub>imp</sub>	V	4000
	Overvoltage category/pollution degree			111/3
Solid 1 x (0.75 - 4)	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) 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 <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>	А	6
Rated operational current	le	А	
AC-15			
Make contact			
120 V	Ι <sub>e</sub>	А	1.5
220 V 230 V 240 V	Ι <sub>e</sub>	А	1.5
380 V 400 V 415 V	۱ <sub>e</sub>	А	0.5
500 V	Ι <sub>e</sub>	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 <sub>e</sub>	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 <sub>e</sub>	A	0.9
60 V	Ι <sub>e</sub>	A	0.75
110 V	I <sub>e</sub>	A	0.4
220 V	Ι <sub>e</sub>	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	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>	А	0.16
Heat dissipation per pole, current-dependent	P <sub>vid</sub>	W	1.8
Equipment heat dissipation, current-dependent	P <sub>vid</sub>	W	5.4
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 leafiet (IL) is observed.

### **Technical data ETIM 7.0**

Low-voltage industrial components (EG000017) / Thermal overload relay (EC000106)

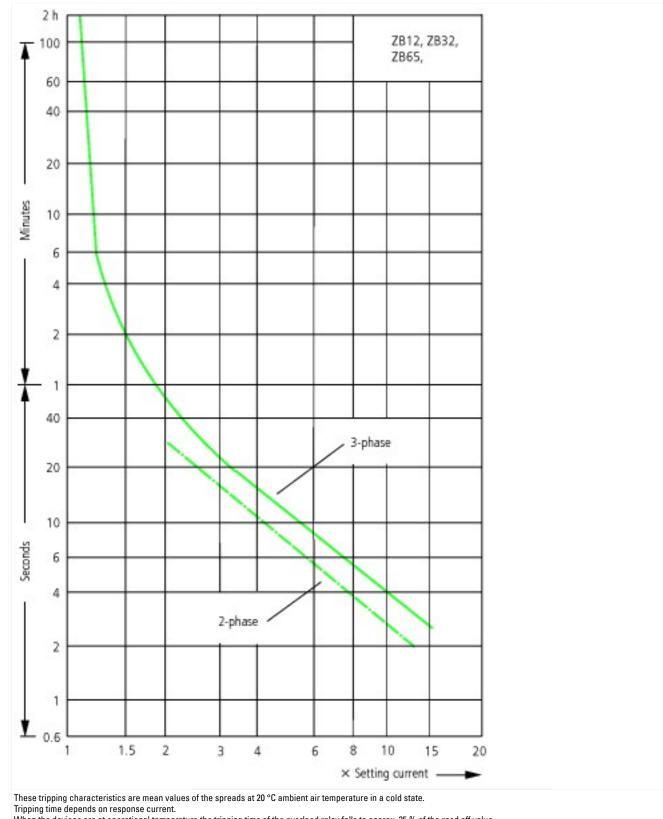
Electric engineering, automation, process control engineering / Low-voltage switch technology / Overload protection device / Thermal overload relay (ecl@ss10.0.1-27-37-15-01 [AKF075014])				
Adjustable current range		А	0.1 - 0.16	
Max. rated operation voltage Ue		V	690	
Mounting method			Direct attachment	
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	D V AC
Degree of Protection	IEC:	C: 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**

