Overload relay

Motor protection is a central task of electrical equipment for machinery. From cost-effective bimetal solutions to demanding full motor protection with cross-linkage - we offer the right solution for each application.

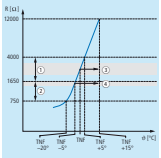
Bimetal relay - overload relay up to 630 A
Direct mounting on contactor saves mounting time +++ ATEX approval for the protection of EEx e motors up to 250 A +++ Comprehensive motor protection through phase failure sensitivity +++ Integrated test pushbutton facilitates high safety → Page 6/6

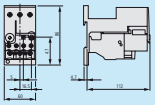
ZEB electronic overload relay - overload relay up to 1500 A
ATEX approval for protection of EEx e motors up to 1500 A +++ Adjustable tripping classes +++ Phase failure and unbalance protection +++ Optional earth fault detection +++ Additional current setting range (5:1) → Page 6/14

ZEV electronic overload relay - overload relay up to 820 A
Flexible mounting with Rogowski transformer +++ Simple paramerization reduces commissioning time +++ ATEX approval for protection of EEx e motors up to 820 A +++ Error messages in display shorten downtime +++ Adjustable tripping classes +++ Optional earth fault detection +++ Full motor protection through additional thermistor evaluation → Page 6/19

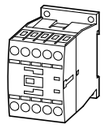
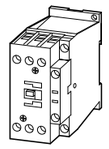
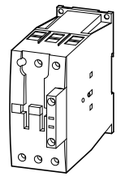
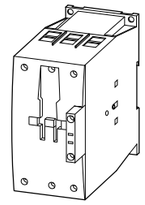
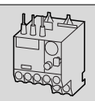
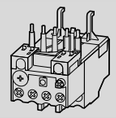
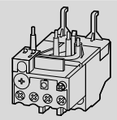
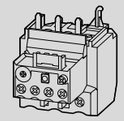
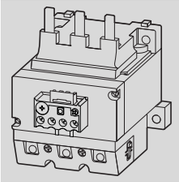
EMT6 thermistor overload relay for machine protection
Overload protection through direct evaluation of winding temperature +++ Quick detection of operating state through LED display +++ Suitable for overload monitoring of motors in EEx e range +++ Wide range power supply reduces amount of types → Page 6/24

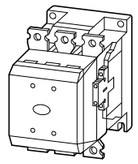
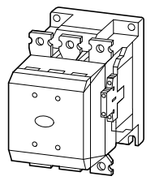
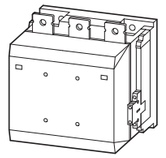
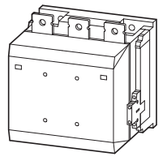
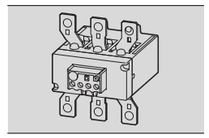
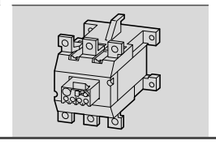
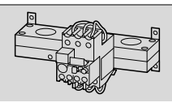
WWW.TM2A.PT info@tm2a.pt





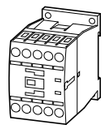
Technical overview

Setting ranges (A) (note max. current of the contactor)	 **DILEM**	 **DILM7 DILM12** **DILM9 DILM15**	 **DILM17 DILM32** **DILM25 DILM38**	 **DILM40 DILM65** **DILM50 DILM72**	 **DILM80 DILM150** **DILM95 DILM170** **DILM115**
Overload relays					
ZE 0.1-12					
ZB12 0.1-16					
ZB32 0.1-38					
ZB65 6-75					
ZB150 35-175					
Z5-.../FF225A 70-250					
Z5-.../FF250 50-300					
Current transformer-operated overload relay					
ZW7-... 42-630					

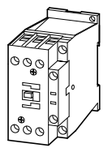
 **DILM185A** **DILM225A**	 **DILM250** **DILM300**	 **DILM400 DILM580** **DILM500**	 **DILM650**
			
			
			

Setting ranges (A)
(note max. current of the contactor)

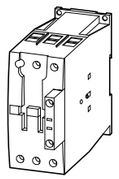
DILEM



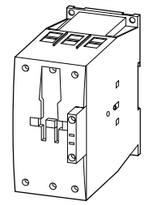
DILM7 DILM12
DILM9 DILM15



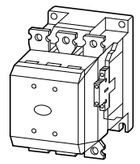
DILM17 DILM32
DILM25 DILM38



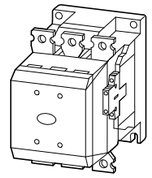
DILM40 DILM65
DILM50 DILM72



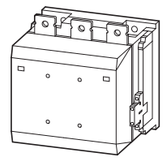
DILM80 DILM150
DILM95 DILM170
DILM115



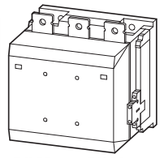
DILM185A
DILM225A



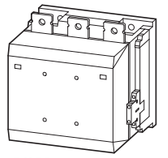
DILM250
DILM300



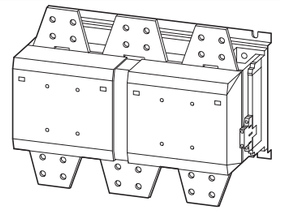
DILM400 DILM580
DILM500 DILM650



DILM750 DILM820



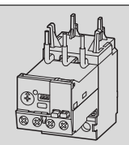
DILM1000



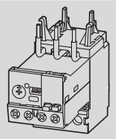
DILM1600

Electronic overload relays

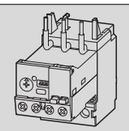
ZEB12
0.33-20



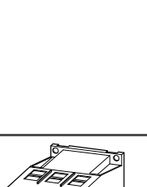
ZEB32
0.33-45



ZEB65
9-100



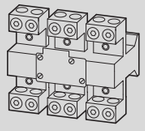
ZEB150
20-100



ZEB32-5-(GF)/KK combined with

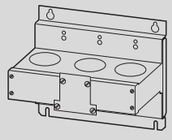
ZEB-XCT300
60-300

ZEB-XCT600
120-600

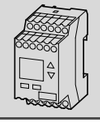


ZEB-XCT1000
200-1000

ZEB-XCT1500
300-1500

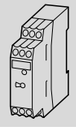


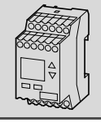
ZEV
1-820



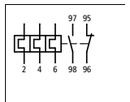
Thermistor overload relay for machine protection

EMT6((DB)K)

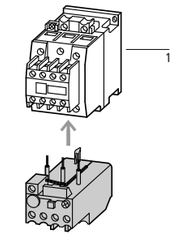




Ordering

Setting range of overload releases	Circuit symbol	Auxiliary contact		For use with	Short-circuit protection		Part no. Article no.	Price See price list	Std. pack	Notes
		N/O = normally open contact	NC = normally closed contact		Type "1" coordination	Type "2" coordination				
I_r					gG/gL	gG/gL				
A					A	A				
ZE overload relays for mini contactor relays										
0.1 – 0.16		1 N/O	1 NC	DILEM DIULEM/21/MV SDAINLEM	20	0.5	**ZE-0.16** 014263		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors II (2) GD PTB 01 ATEX 3331 Observe manual AWB2300-1425D/GB.
0.16 – 0.24						1	**ZE-0.24** 014285			
0.24 – 0.4						2	**ZE-0.4** 014300			
0.4 – 0.6						2	**ZE-0.6** 014333			
0.6 – 1						4	**ZE-1.0** 014376			
1 – 1.6						6	**ZE-1.6** 014432			
1.6 – 2.4						6	**ZE-2.4** 014479			
2.4 – 4						10	**ZE-4** 014518			
4 – 6							**ZE-6** 014565			
6 – 9							**ZE-9** 014708			
9 – 12							**ZE-12** 014752			

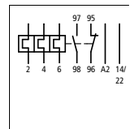
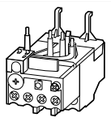
With side-by-side mounting, there must be a minimum clearance of 5 mm between overload relays.



1 Contactor → Chapter 5
Accessories → Page 6/26
Manual → Page 6/26

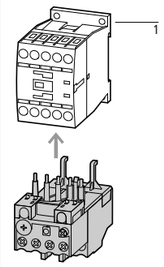
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -
See also	→ Page 6/29

Setting range of overload releases	Circuit symbol	Auxiliary contact		For use with		Short-circuit protection	
		N/O = normally open contact NC = normally closed contact		Contactors	Soft starters	Type "1" coordination gG/gL	Type "2" coordination gG/gL
I_r A						A	A
ZB12 overload relay							
0.1 – 0.16		1 N/O	1 NC	DILM7, DILM9, DILM12, DILM15, DIULM7, DIULM9, DIULM12, SDAINLM12, SDAINLM16, SDAINLM22	–	25	0.5
0.16 – 0.24							1
0.24 – 0.4							2
0.4 – 0.6							4
0.6 – 1							4
1 – 1.6							6
1.6 – 2.4							10
2.4 – 4					DS7-34…SX004…		16
4 – 6					DS7-34…SX005…		20
6 – 10					DS7-34…SX007… DS7-34…SX009…	50	25
9 – 12					DS7-34…SX012…		
12 – 16					–		
ZB32 overload relay							
0.1 – 0.16		1 N/O	1 NC	DILM17, DILM25, DILM32, DILM38, DILMF8, DILMF11, DILMF14, DILMF17, DILMF25, DILMF32, DIULM17, DIULM25, DIULM32, SDAINLM30, SDAINLM45, SDAINLM55	–	25	0.5
0.16 – 0.24							1
0.24 – 0.4							2
0.4 – 0.6							4
0.6 – 1							4
1 – 1.6							6
1.6 – 2.4							10
2.4 – 4							16
4 – 6							20
6 – 10						50	25
10 – 16					DS7-34...SX016...	63	35
16 – 24					DS7-34...SX024...	100	35
24 – 32					DS7-34...SX032...	125	63
32 – 38					–	125	63

Part no. Article no.	**Price** See price list	Std. pack	**Notes**
ZB12-0,16 278431		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1527D/GB. • Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting
ZB12-0,24 278432			
ZB12-0,4 278433			
ZB12-0,6 278434			
ZB12-1 278435			
ZB12-1,6 278436			
ZB12-2,4 278437			
ZB12-4 278438			
ZB12-6 278439			
ZB12-10 278440			
ZB12-12 278441			
ZB12-16 290168			
ZB32-0,16 278442		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1527D/GB. • Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting
ZB32-0,24 278443			
ZB32-0,4 278444			
ZB32-0,6 278445			
ZB32-1 278446			
ZB32-1,6 278447			
ZB32-2,4 278448			
ZB32-4 278449			
ZB32-6 278450			
ZB32-10 278451			
ZB32-16 278452			
ZB32-24 278453			
ZB32-32 278454			
ZB32-38 112474			

Fitted directly to the contactor



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Accessories → Page 6/26
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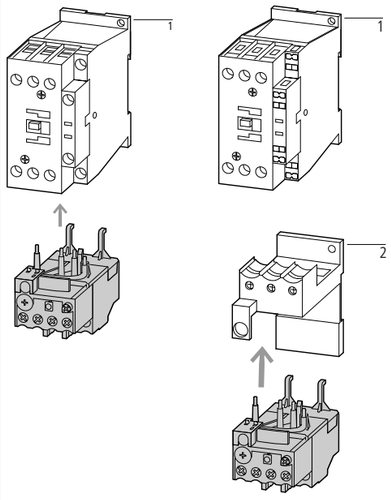
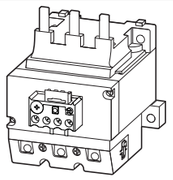
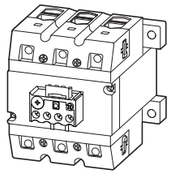
Fitted directly to the contactor Separate mounting



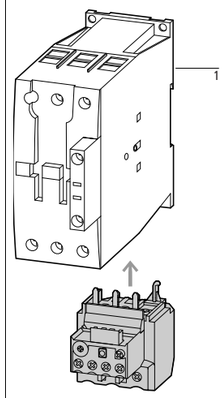
1 Contactor → Chapter 5
2 Base → Page 6/26
Manual → Page 6/26

Information relevant for export to North America

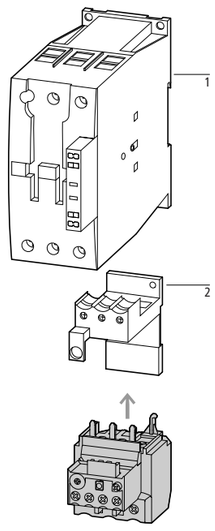
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking	NA Certification	UL Listed, CSA certified
		Suitable for	Branch circuits
UL File No.	E29184	Max. voltage R	
UL CCN	NKCR	Rating	600 V AC
CSA File No.	12528	Degree of Protection	IEC: IP20, UL/CSA Type: -
CSA Class No.	3211-03	See also	→ Page 6/29

	Setting range of overload releases I_r A	Circuit symbol	Auxiliary contact N/O = normally open contact NC = normally closed contact		For use with	Short-circuit protection Type "1" coordination gG/gL A	Short-circuit protection Type "2" coordination gG/gL A	Part no. Article no.	Price See price list	Std. pack	Notes
ZB65 overload relay											
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting											
	6 – 10		1 N/O	1 NC	DILM40, DILM50, DILM65, DILM72, DILMF40, DILMF50, DILMF65, DIULM40, DIULM50, DIULM65, SDAINLM70, SDAINLM90, SDAINLM115	50	25	**ZB65-10** 278455		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EExe motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
	10 – 16					63	35	**ZB65-16** 278456			
	16 – 24					63	50	**ZB65-24** 278457			
	24 – 40					125	63	**ZB65-40** 278458			
	40 – 57					160	80	**ZB65-57** 278459			
	50 – 65					160	100	**ZB65-65** 278460			
	65 – 75					250	160	**ZB65-75** 108792			
ZB150 overload relay											
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting											
	35 – 50		1 N/O	1 NC	DILM80, DILM95, DILM115, DILM150, DILM170 DILMF80, DILMF95, DILMF115, DILMF150, DIULM80, DIULM95, DIULM115, DIULM150, SDAINLM140, SDAINLM165, SDAINLM200, SDAINLM260	160	125	**ZB150-50** 278462		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
	50 – 70					250	160	**ZB150-70** 278463			
	70 – 100					315	200	**ZB150-100** 278464			
	95 – 125					315	250	**ZB150-125** 278465			
	120 – 150					315	250	**ZB150-150** 278466			
	145 – 175					315	250	**ZB150-175** 107316			
ZB150 overload relay											
• Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Separate mounting											
	35 – 50		1 N/O	1 NC	DILM80, DILM95, DILM115, DILM150, DILM170 DILMF80, DILMF95, DILMF115, DILMF150, DIULM80, DIULM95, DIULM115, DIULM150, SDAINLM140, SDAINLM165, SDAINLM200, SDAINLM260	160	125	**ZB150-50/KK** 278468		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
	50 – 70					250	160	**ZB150-70/KK** 278469			
	70 – 100					315	200	**ZB150-100/KK** 278470			
	95 – 125					315	250	**ZB150-125/KK** 278471			
	120 – 150					315	250	**ZB150-150/KK** 278472			
	145 – 175					400	315	**ZB150-175/KK** 107317			

Fitted directly to the contactor



Separate mounting



1 Contactor → Chapter 5
2 Base → Page 6/26
Manual → Page 6/26

Information relevant for export to North America

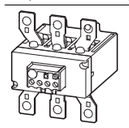
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -
See also	→ Page 6/29

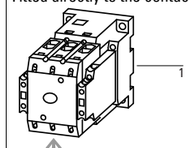
Setting range of overload releases	Circuit symbol	Auxiliary contacts		For use with	Short-circuit protection		Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
		N/O = normally open contact	NC = normally closed contact		Type "1" coordination gG/gL	Type "2" coordination gG/gL					
I_r A					A	A					

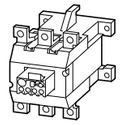
Z5 overload relays greater than 150A

- Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102
- Test/off pushbutton
- Reset pushbutton manual/auto
- Trip-free release

Direct mounting
Separate mounting



50 – 70	1 N/O	1 NC	DILM185A	250	160	**Z5-70/FF225A** 139572		1 Off	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Z5-…/FF225A for protecting EEx electric motors in preparation. Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/27	Product Standards: UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking NA Certification: Request filed for UL and CSA Suitable for: Branch circuits Max. Voltage Rating: 600 V AC Degree of Protection: IEC: IP00, UL/CSA Type: - See also: → Page 6/29
70 – 100			DILM225A	250	160	**Z5-100/FF225A** 139573				
95 – 125				315	200	**Z5-125/FF225A** 139574				
120 – 160				315	250	**Z5-160/FF225A** 139575				
160 – 220				400	250	**Z5-220/FF225A** 139576				
200 – 250				400	315	**Z5-250/FF225A** 139577				
				500	400					
50 – 70			DILM250	400	315	**Z5-70/FF250** 210070				
70 – 100				500	400	**Z5-100/FF250** 210071				
95 – 125				400	315	**Z5-125/FF250** 210072				
120 – 160				500	400	**Z5-160/FF250** 210073				
160 – 220				400	315	**Z5-220/FF250** 210074				
200 – 250				500	400	**Z5-250/FF250** 210075				
250 – 300			DILM300A	500	400	**Z5-300/FF250** 139578				
				500	400					

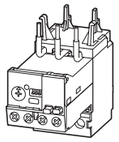
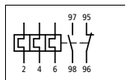
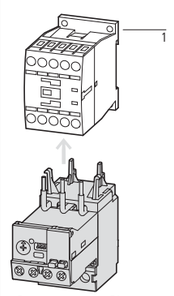
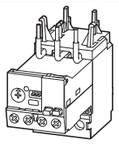
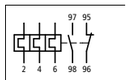
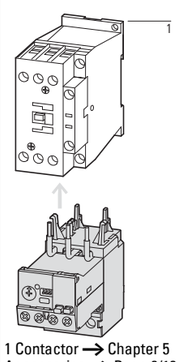
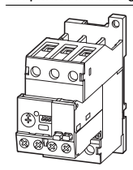
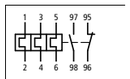


42 – 63	1 N/O	1 NC	–	–	–	**ZW7-63** 000245		1 Off	The main current characteristic values are defined by the main current wiring being used. Adjustment for smaller rated motor currents → Page 6/28	Product Standards: UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking UL File No.: E29184 UL CCN: NKCR CSA File No.: 12528 CSA Class No.: 3211-03 NA Certification: UL Listed, CSA certified Suitable for: Branch circuits Max. Voltage Rating: 600 V AC Degree of Protection: IEC: IP00, UL/CSA Type: -
60 – 90			–	–	–	**ZW7-90** 002618				
85 – 125			–	–	–	**ZW7-125** 004991				
110 – 160			–	–	–	**ZW7-160** 007364				
160 – 240			–	–	–	**ZW7-240** 009737				
190 – 290			–	–	–	**ZW7-290** 052448				
270 – 400			–	–	–	**ZW7-400** 045329				
360 – 540			–	–	–	**ZW7-540** 047702				
420 – 630			–	–	–	**ZW7-630** 050075		1 Off		–

ZW7 current transformer-operated overload relays

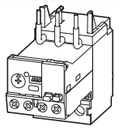
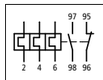
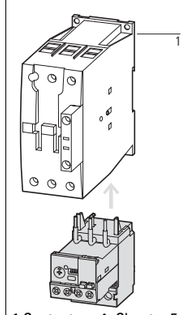
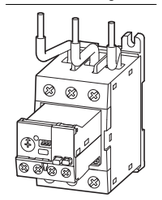
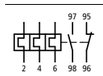
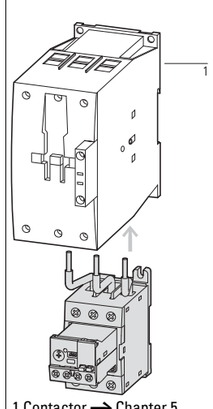
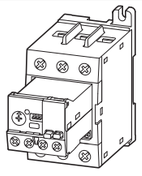
- Test/off button
- Reset pushbutton manual/auto
- Trip-free release
- Protection with heavy starting duty

Separate mounting

Ground fault detection	Setting range of overload releases I_r A	Circuit symbol	Auxiliary contact N/O = normally open contact NC = normally closed contact		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
ZEB12 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	0.33 – 1.65		1 N/O	1 NC	DILM7 DILM9 DILM12 DILM15 DIULM7 DIULM9 DIULM12 SDAINLM12 SDAINLM16 SDAINLM22	**ZEB12-1,65** 136480		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	Without	1 – 5					**ZEB12-5** 136481			
	Without	4 – 20					**ZEB12-20** 136482			
	With	0.33 – 1.65					**ZEB12-1,65-GF** 136483			
	With	1 – 5					**ZEB12-5-GF** 136484			
	With	4 – 20					**ZEB12-20-GF** 136485			
ZEB32 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	0.33 – 1.65		1 N/O	1 NC	DILM17 DILM25 DILM32 DILM38 DIULM17 DIULM25 DIULM32 SDAINLM30 SDAINLM45 SDAINLM55	**ZEB32-1.65** 136486		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	Without	1 – 5					**ZEB32-5** 136487			
	Without	4 – 20					**ZEB32-20** 136488			
	Without	9 – 45					**ZEB32-45** 136489			
	With	0.33 – 1.65					**ZEB32-1,65-GF** 136490			
	With	1 – 5					**ZEB32-5-GF** 136491			
	With	4 – 20					**ZEB32-20-GF** 136492			
	With	9 – 45					**ZEB32-45-GF** 136493			
Separate mounting									
	Without	0.33 – 1.65		1 N/O	1 NC	DILM17 DILM25 DILM32 DILM38 DIULM17 DIULM25 DIULM32 SDAINLM30 SDAINLM45 SDAINLM55	**ZEB32-1,65/KK** 136494		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	
	Without	1 – 5					**ZEB32-5/KK** 136495			
	Without	4 – 20					**ZEB32-20/KK** 136496			
	Without	9 – 45					**ZEB32-45/KK** 136497			
	With	0.33 – 1.65					**ZEB32-1,65-GF/KK** 136498			
	With	1 – 5					**ZEB32-5-GF/KK** 136499			
	With	4 – 20					**ZEB32-20-GF/KK** 136500			
	With	9 – 45					**ZEB32-45-GF/KK** 136501			

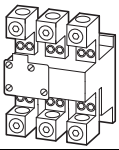
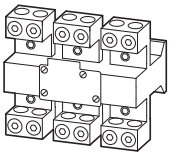
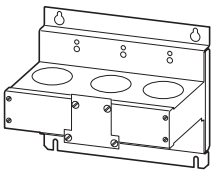
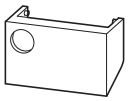
Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

Ground fault detection	Setting range of overload releases I_r A	Circuit symbol	Auxiliary contact N/O = normally open contact NC = normally closed contact		For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
ZEB65 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	9 – 45		1 N/O	1 NC	DILM40 DILM50 DILM65 DILM72 DIULM40 DIULM50 DIULM65 SDAINLM70 SDAINLM90 SDAINLM115	**ZEB65-45** 136502		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	With	9 – 45					**ZEB65-45-GF** 136503				
	Without	20 – 100					**ZEB65-100** 136504				
	With	20 – 100					**ZEB65-100-GF** 136505				
ZEB150 electronic overload relay									
• Phase-failure sensitivity • Test/off pushbutton • Reset button • Manual/Auto reset selectable • Protection with heavy starting duty (Class 5-30)									
Direct mounting									
	Without	20 – 100		1 N/O	1 NC	DILM80 DILM95 DILM115 DILM150 DIULM80 DIULM95 DIULM115 DIULM150 SDAINLM140 SDAINLM165 SDAINLM200 SDAINLM260	**ZEB150-100** 136506		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
	With	20 – 100		1 N/O	1 NC		**ZEB150-100-GF** 136507				
Separate mounting									
	Without	20 – 100		1 N/O	1 NC	DILM80 DILM95 DILM115 DILM150 DIULM80 DIULM95 DIULM115 DIULM150 SDAINLM140 SDAINLM165 SDAINLM200 SDAINLM260	**ZEB150-100/KK** 136508		1 Off	Suitable for protection of EEx e motors. II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	
	With	20 – 100		1 N/O	1 NC		**ZEB150-100-GF/KK** 136509				

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

	Setting range of overload releases I_r A	Language	Can be used with	**Part no.** Article no.	**Price** See price list	Std. pack
Current sensors						
	60 – 300	–	ZEB32-5-GF/KK ZEB32-5/KK	**ZEB-XCT300**[1] 136511		1off
	120 – 600	–		**ZEB-XCT600**[1] 136512		
	200 – 1000	–		**ZEB-XCT1000**[1] 136517		
	300 – 1500	–		**ZEB-XCT1500**[1] 136513		
Sealable shroud						
Cover to prevent adjustment of motor current (tamper-proof)						
	–	–	–	**ZEB-XSC**[2] 136514		1 off
Reset adapter						
Cover to prevent adjustment of motor current (tamper-proof)						
	–	–	–	**ZEB-XRB**[2] 136515		1 off
Documentation						
ZEB electronic overload relay Overload monitoring of EEx e motors						
	–	Deutsch English	ZEB12 ZEB32 ZEB65 ZEB150	**AWB2320-1633DE/EN** 136516		1 off

1)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -

2)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
NA Certification	Request filed for UL and CSA
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

Description

ZEV – electronic overload relay for motor currents from 1 – 820 A

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General

Technological advances require completely new approaches:
the application of newly developed sensor systems and tripping units has made motor protection considerably simpler and more cost-effective.
All Z overload relays perform the expected standard functions:
protection in the event of a phase failure, overload or current imbalance.
In addition to these tasks, the innovative ZEV motor protectionsystem can do much more today:

Application

Even the most severe starting situations can be dealt with by the ZEV motor-protective system. The enhanced tripping classes (up to CLASS40) provide reliable protection for motors with starting times of up to 1 second. Protection for any motor starting situation can be optimally set by preselecting one of the eight tripping classes between 5 and 40 seconds.
Ground faults are quickly detected with the external core-balance transformer. The integrated thermistor connection makes it possible to expand the relay into a motor protection system.

Handling

The LCD display guides users through setting menus and ensures easy, user-friendly operation.
In the event of an error, the display shows the cause of the error and allows for quick fault detection.
The 05-06 and 07-08 parameterizable auxiliary switches make it possible to implement additional signalling indications.
They can each be assigned one of the following functions:

- Early warning of overload
- Ground fault
- Thermistor tripping
- Internal fault

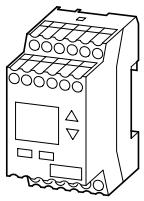
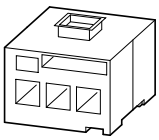
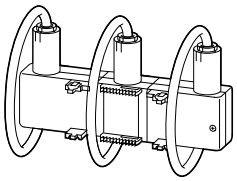
Engineering

The multi-voltage module adapts automatically to different voltages of 24 - 240 V, 50/60 Hz and 24 - 240 VDC, enabling its flexible use with all popular control voltages.

Mounting

Current sensors enable the innovative ZEV motor protection system to be used also for small motors. With large motor currents and cable cross-sections, the sensor cables are simply wound round the feeder cables.
This eliminates the need for main current wiring requiring the time-consuming adaption of cables to an additional device, as well as mounting plate drilling. Instead of this, the sensor is simply attached with a Velcro fastener.
This saves mounting time and expense. The volume of 58 times less than conventional transformers enables the saving of valuable mounting space in the control panel.

Ordering

	Length mm	Diameter ∅ mm	Overload release I_r A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
ZEV electronic motor-protective relay • Protection in the event of a phase failure • Test/off button • Reset button manual/auto • Protection with heavy starting duty • Trip-free release								
	–	–	1 – 820	DILEM…DILM820	**ZEV**[1] 209634		1 off	Suitable for protection of EEx e motors. II (2) GD PTB 01 ATEX 3233 Observe manual AWB2300-1433.
Current sensors								
	–	6	1 – 25	DILEM DILM7…DILM25	**ZEV-XSW-25**[2] 209635		1 off	–
	–	13	3 – 65	DILM7…DILM65	**ZEV-XSW-65**[2] 209636			
	–	21	10 – 145	DILM12…DILM150	**ZEV-XSW-145**[2] 209637			
	–	110	40 – 820	DILM40…DILM820	**ZEV-XSW-820**[2] 209641			
Connecting cables								
	200	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	**ZEV-XVK-20**[1] 209643		1 off	–
	400	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	**ZEV-XVK-40**[1] 209644			
	800	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	**ZEV-XVK-80**[1] 209645			

1)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

2)

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -
See also	→ Page 6/29

	Length mm	Diameter ∅ mm	Overload release I_r A	For use with	**Part no.** Article no.	**Price** See price list	Std. pack	**Notes**
SSW core-balance transformer								
For ground fault monitoring								
	–	40	–	–	**SSW40-0,3**[1] 028286		1 off	–
	–	40	–	–	**SSW40-0,5**[1] 028305			
	–	40	–	–	**SSW40-1**[1] 028306			
	–	65	–	–	**SSW65-0,5**[1] 028307			
	–	65	–	–	**SSW65-1**[1] 028316			
	–	120	–	–	**SSW120-0,5**[1] 028319			
	–	120	–	–	**SSW120-1**[1] 028321			
Mounting foot								
For screw fixing to mounting plate								
	–	–	–	ZEV ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145	**ZB4-101-GF1**[2] 061360		9 off	–
Documentation								
ZEV motor protection system Overload monitoring of EEx e motors								
German	–	–	–	–	**AWB2300-1433D** 259711		1 off	
English	–	–	–	–	**AWB2300-1433GB** 267430		1 off	

1)

Information relevant for export to North America

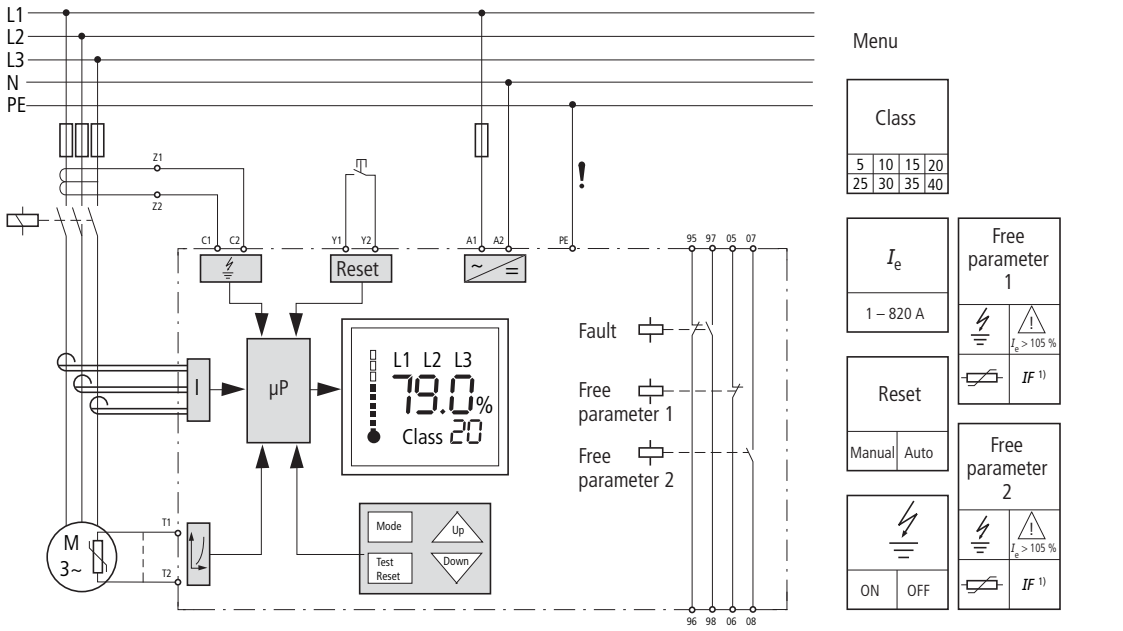
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

2)

Information relevant for export to North America

UL/CSA certification not required

Engineering



1) IF: Internal fault

Inputs	
A 1/A 2	Rated control voltage
T 1/T 2	Thermistor sensor
C 1/C 2	SSW core-balance transformer
Y 1/Y 2	Remote reset

Outputs	
95/96	NC overload/thermistor
97/98	N/O overload/thermistor
05/06	NC contact freely assignable
07/08	N/O contact freely assignable

Switchgear and cable sizing corresponding to the respective starting inertia (CLASS) for ZEV and ZEB

Switchgear is designed according to "CLASS 10" requirements for both normal and overload operation conditions. In order for the switchgear (circuit-breaker and contactor) and the cables not to be overloaded with long tripping times, they must be overdimensioned accordingly. The rated operational current, I_e, for switchgear and cables can be calculated with the following current factor taking the tripping class into account:

Trippling class	Class 5	Class 10	Class 15	Class 20	Class 25	Class 30	Class 35	Class 40
Current factor of rated operational current I_e	1.00	1.00	1.22	1.41	1.58	1.73	1.89	2.00

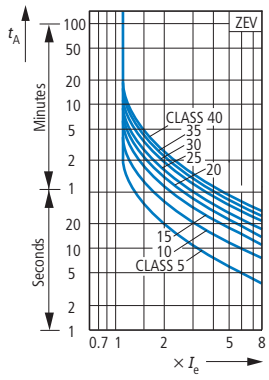
Rated motor currents < 1 A

When working with the ZEV-XSW-25 to ZEV-XSW-145 push-through sensors, the motor feeder cables for each phase are pushed through the corresponding-push-through openings. For motor currents smaller than 1 A, the motor feeder cables are placed in loops with the ZEV-XSW-25 unit. The specific number of loops depends on the rated motor current.

Number of loops n		4	3	2
Rated motor current I_N	A	0.25…0.32	0.33…0.49	0.5…0.99
Set current on the relay I_E between the lowest and highest values	A	1.00…1.28	1.00…1.47	1.00…1.98

The device's set current, I_E, is calculated as follows: $I_E = n \times I_N$

Tripping characteristics



With a phase failure or imbalance > 50 %, the ZEV will trip within 2.5 seconds.

Tripping times for ZEV electronic motor-protective relay

Tripping class, adjustable	**CLASS**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**
Tripping times in s (±20 %)		With 3-pole symmetric loading from cold state							
Current setting I_E	x 3	11.3	22.6	34	45.3	56.6	67.9	79.2	90.5
	x 4	8	15.9	23.9	31.8	39.8	47.7	55.7	63.6
	x 5	6.1	12.3	18.4	24.6	30.7	36.8	43	49.1
	x 6	5	10	15	20	25	30	35	40
	x 7.2	4.1	8.2	12.3	16.4	20.5	24.5	28.6	32.7
	x 8	3.6	7.3	10.9	14.6	18.2	21.9	25.5	29.2
	x 10	2.9	5.7	8.6	11.5	14.4	17.2	20.1	23

Reset time after overload trip

Overview of the reset time	**CLASS**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**
	t_{reset} min	5	6	7	8	9	10	11	12

Thermistor tripping

Rated trip resistance R = 3200 Ω ±15 %

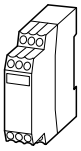
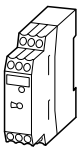
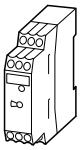
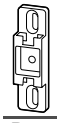
Reset resistance R = 1500 Ω +10 %

Total PTC thermistor resistance $\sum R_K \leq 1500\ \Omega$
at $R_K \leq 250\ \Omega$ per sensor: 6 sensors
at $R_K \leq 100\ \Omega$ per sensor: 9 sensors

Ready to respond after trip at 5 K under response temperature

Test button tripping time: 5 s

Ordering

	Function	Rated operational current AC-15 240 V I_e A	Rated operational current AC-14 400 V I_e A	Conventional thermal current I_{th} A	Rated control voltage U_s V	Part no. Article no.	Price See price list	Std. pack	Notes
EMT6 thermistor machine protection overload relays									
	Without automatic reset Mains and fault LED display	3	3	6	24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6**[1) 2)] 066166		1 off	Ⓔx II (2) G Ⓔx II (2) GD only for EMT6-K PTB 02 ATEX 3162 Observe the manual AWB 2327-1446 → Page 6/24 Can be snap fitted on a top-hat rail to IEC/EN 60715. Device clearance ≧ 3 mm.
					230 V 50/60 Hz	**EMT6(230V)**[1) 2)] 066400			
	Without automatic reset Mains and fault LED display Tripped in the event of a short-circuit in the sensor-cable				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-K**[2)] 269470			
	Selector switch with/without automatic reset For manual or remote resetting Test button Mains and fault LED display				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-DB**[1) 2)] 066167			
					230 V 50/60 Hz	**EMT6-DB(230V)**[1) 2)] 066401			
	Selector switch with/without automatic reset For manual or remote resetting Test button Mains and fault LED display Trip with short-circuit in the sensor cable				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-KDB**[2)] 269471			
	All-in-one device Selector switch with/without automatic reset Trip with short-circuit in the sensor cable Zero-voltage safe For manual or remote resetting Test button Short-circuit detection and retention can be deactivated Mains and fault LED display				24 - 240 V 50/60 Hz, 24 - 240 V DC	**EMT6-DBK**[2)] 066168			
Accessories									
Screw adapters for screw fixing									
						**CS-TE**[3)] 095853		10 off	–
Documentation									
EMT6 thermistor overload relay Overload monitoring of machines in the EEx e area									
	German					**AWB2327-1446D** 264853		1 off	
	English					**AWB2327-1446GB** 267010		1 off	

Notes

[1)] For EMT6, EMT6(230V), EMT6-DB and EMT6-DB(230V) applies: Provide additional short-circuit protection in the sensor circuit with a current monitoring relay.

[2)]

Information relevant for export to North America

Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -

[3)]

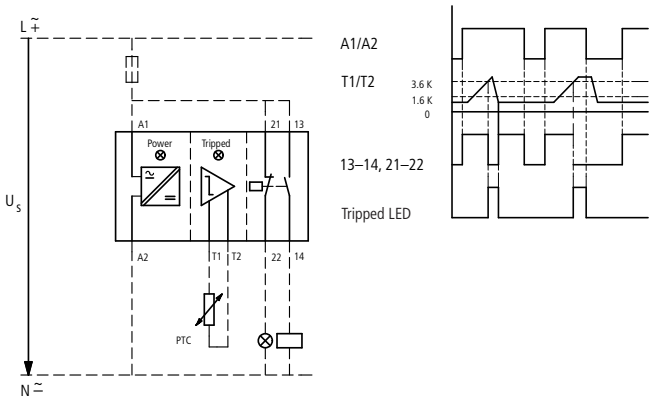
Information relevant for export to North America

UL/CSA certification not required

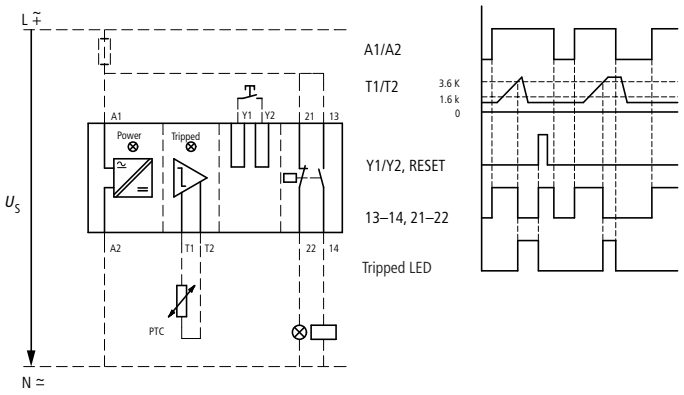
Engineering

Terminal marking according to EN 50005

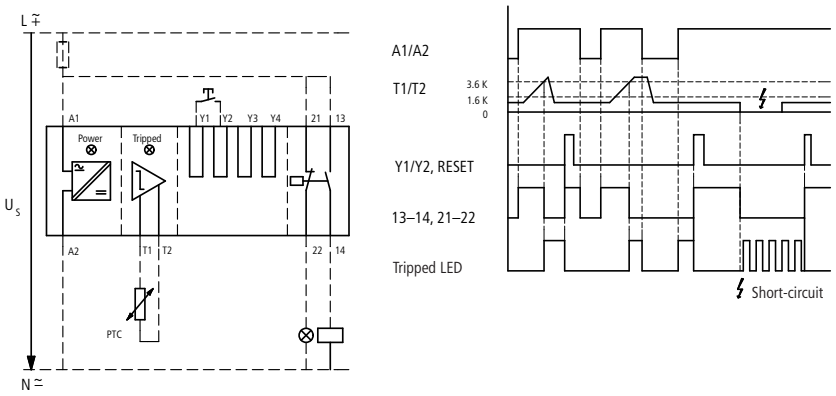
EMT6(-K), EMT6-(K)DB, EMT6-DBK
Auto



EMT6-(K)DB, EMT6-DBK
Manual



EMT6-DBK
Zero-voltage safe operation



LED display

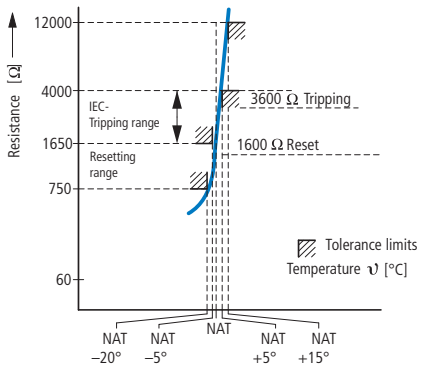
- Supply voltage present
- Device has tripped
- Device has tripped/short-circuit in the sensor circuit

Sensor circuit

At R_K ≦ 250 Ω per sensor: 6 sensors, at R_K ≦ 100 Ω per sensor: 9 sensors in the winding (provided by user), max. cable length to sensor 250 m (not shielded);
Total PTC thermistor resistance ∑ R_K ≦ 1500 Ω

Sensor circuit characteristic values at U_s and +20 °C

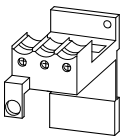
R_{T1-T2}	**EMT6...** U_{T1-T2} V DC max.	I_{T1-T2} mA max.
T1, T2 short-circuited	-	1.9
4 kΩ	3	0.8
T1-T2 open	5.1	-

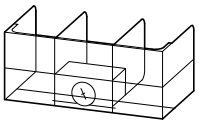
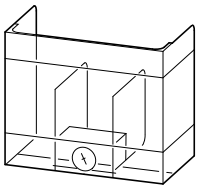
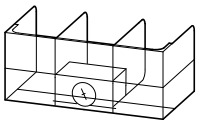
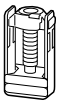
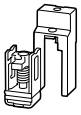


Functions that can be disconnected on the EMT6-DBK:

Function	Disconnection by link
Short-circuit monitoring	Y_1 - Y_3
Zero-voltage safety	Y_1 - Y_4

Ordering

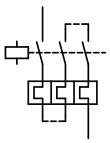
	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America	
Documentation							
Overload relays Overload monitoring of EEx e motors							
	ZE…	**AWB2300-1425D** 258704		1 off	German		
	ZB12… ZB32…	**AWB2300-1527D/GB** 284910			German/English		
	ZB65… ZB150…	**AWB2300-1545D/GB** 102065			German/English		
Bases							
For separate mounting							
	ZB32	**ZB32-XEZ** 278473		5 off	Can be snap fitted on a top-hat rail to IEC/EN 60715 or can be screw fitted. For ZB32-38, use BK25/3-PKZ0 additionally.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Max. Voltage Rating Degree of Protection	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking E29184 NKCR 12528 3211-03 UL Listed, CSA certified 600 V AC IEC: IP20, UL/CSA Type: -
	ZB65	**ZB65-XEZ** 278474		2 off			
Pushbuttons							
For enclosed Overload relay Mounting diameter: 22.3 mm							
External reset button, IP65							
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	**M22-DZ-B** 254833		10 off	Button plate, blue	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking E29184 NKCR 012528 3211-03 UL Listed, CSA certified
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	**M22-DZ-B-GB14** 254834		10 off	Button plate, blue RESET		
Off button, IP65							
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	**M22-DZ-X** 254835		10 off	Without button plate, add button plate.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking E29184 NKCR 012528 3211-03 UL Listed, CSA certified
Button plates							
	M22-DZ-X	**M22-XD-R** 216423		10 off	Button plate, red	UL/CSA certification not required	
	M22-DZ-X	**M22-XD-R-X0** 218153			Red button plate with white circle		
	M22-DZ-X	**M22-XD-R-GB0** 218194			Button plate red STOP		

	For use with		Part no. Article no.	Price See price list	Std. pack	Notes
Covers						
	Direct mounting Z5-…/FF225 to DILM185A DILM225A		**Z5/FF225A-XHB-Z** 139579		1 off	Fitted directly to the contactor DILM400 -XHB DILM185A/ 225A Z5/FF225A -XHB-Z Z5-.../FF225A Z5/FF250 -XHB
	Z5-…/FF225A Z5-…/FF250		**Z5/FF250-XHB** 215217		1 off	Separate mounting Z5/FF250 -XHB Z5-.../FF250/ FF225A Z5/FF250 -XHB Fitted directly to the contactor DILM400 -XHB DILM250/ 300A Z5/FF250 -XHB-Z Z5-.../FF250 Z5/FF250 -XHB Fitted directly to the contactor DILM400 -XHB DILM185A/ 225A Z5/FF225A -XHB-Z Z5-.../FF225A Z5/FF250 -XHB
	Direct mounting Z5-…/FF250 to DILM250 DILM300A		**Z5/FF250-XHB-Z** 215218		1 off	Fitted directly to the contactor DILM400 -XHB DILM250/ 300A Z5/FF250 -XHB-Z Z5-.../FF250 Z5/FF250 -XHB
Box terminals kit Consisting of 3 individual clamps		For connection of copper flat strip max. W x H mm				
With protective cover						
	Z5-…/FF250	24 x 26	**K-B-DIL6AM** 064062		1 off	When using box terminals the protective covers must be used.
With control circuit terminal and protective cover						
	Z5-…/FF250	24 x 26	**KS-B-DIL6AM** 064063		1 off	When using box terminals the protective covers must be used.

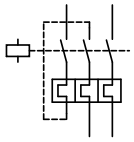
Engineering

Protection of single-phase and DC current motors:

1 pole

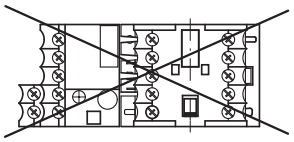


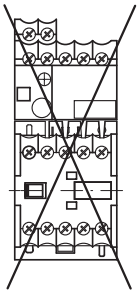
2 pole



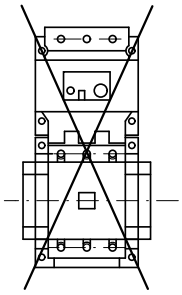
Mounting position:

ZE



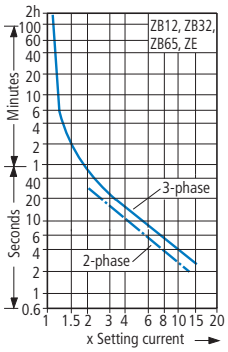


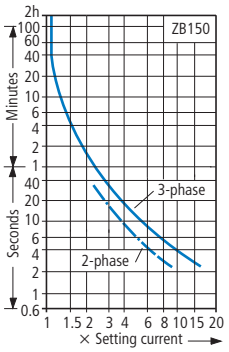
ZB12, ZB32, ZB65, ZB150, Z5

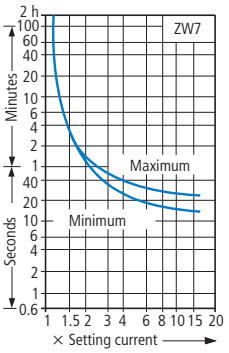


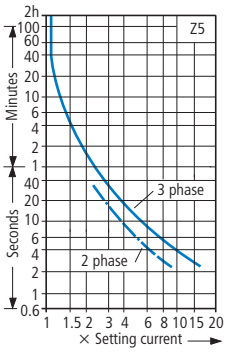
Tripping characteristics

These tripping characteristics are mean values of the spread at 20 °C ambient temperature in a cold state.
They show the tripping times in relation to the response current. When the devices are at operational temperature the tripping time of the overload relay drops to approx. 25 % of the value shown. Specific characteristics for each individual setting range can be found in the manual on → Page 6/26









Adaption of ZW7 to smaller rated motor currents

Number of loops	ZW7 -63	-90	-125	-160	-240	-290	-400	-540	-630
	Rated motor current I_N [A]								
1	42-63	60-90	85-125	110-160	160-240	190-290	270-400	360-540	420-630
2	21-31,5	30-45	42.5-62,5	55-80	80-120	95-145	135-200	180-270	210-315
3	14-21	20-30	28.3-41,7	36.7-53,3	53.3-80	63.3-96,7	90-133,3	120-180	140-210
4	10.5-15,8	15-22,5	21.3-31,3	27.5-40	40-60	47.5-72,5	67.5-100	90-135	105-157,5
5	8.4-12,6	12-18	17-25	22-32	32-48	38-58	54-80	72-108	84-126

Overload relay short-circuit strength

UL508, CSA-C22,2 No. 14/SCCR values

	Fuse acc. to NEC, CEC		CB	
	A	kA	A	kA
	600V AC		480V AC	
ZE-0,16	1	5	15	5
ZE-0.24	1	5	15	5
ZE-0.4	1	5	15	5
ZE-0.6	1	5	15	5
ZE-1,0	3	5	15	5
ZE-1.6	6	5	15	5
ZE-2.4	6	5	15	5
ZE-4	15	5	15	5
ZE-6	20	5	15	5
ZE-9	35	5	15	5
ZE-12	45	5	-	-
	600V AC			
ZB12(32)-0,16	1 CLASS J/CC	100	-	-
ZB12(32)-0,24	1 CLASS J/CC	100	-	-
ZB12(32)-0,4	1 CLASS J/CC	100	-	-
ZB12(32)-0,6	1 CLASS J/CC	100	-	-
ZB-12(32)-1,0	1 CLASS J/CC	100	-	-
ZB-12(32)-1,6	3 CLASS J/CC	100	-	-
ZB-12(32)-2,4	3 CLASS J/CC	100	-	-
ZB-12(32)-4	6 CLASS J/CC	100	-	-
ZB-12(32)-6	10 CLASS J/CC	100	-	-
ZB-12(32)-10	15 CLASS J/CC	100	-	-
ZB12-12	15 CLASS J/CC	100	-	-
ZB12-16	30 CLASS J/CC	100	-	-
ZB32-16	35 CLASS J	100	-	-
ZB32-24	45 CLASS J	100	-	-
ZB32-32	60 CLASS J	100	-	-
	600V AC		600V AC	
ZB65-10	15 CLASS J	100	40	5
ZB65-16	35 CLASS J	100	60	5
ZB65-24	45 CLASS J	100	90	5
ZB65-40	60 CLASS J	100	125	5
ZB65-57	110 CLASS J	100	150	10
ZB65-65	125 CLASS J	100	150	10
ZB65-75	125 CLASS J	100	150	10

	Fuse acc. to NEC, CEC		CB	
	A	kA	A	kA
	600V AC		600 V AC	
ZB150-50	225	5	200	5
ZB150-70	250	10	250	10
ZB150-100	400 CLASS J	10	400	10
ZB150-125	500 CLASS J	10	500	10
ZB150-150	600 CLASS J	10	600	10
ZB150-175	600 CLASS J	10	600	10
ZB150-50(KK)	110 CLASS J	100	200	5
ZB150-70(KK)	125 CLASS J	100	250	10
ZB150-100(KK)	200 CLASS J	100	400	10
ZB150-125(KK)	250 CLASS J	100	500	10
ZB150-150(KK)	300 CLASS J	100	600	10
ZB150-175(KK)	300 CLASS J	100	600	10
	600V AC		600V AC	
Z5-70/...	250	10	250	10
Z5-100/...	400 CLASS J	10	400	10
Z5-125/...	500 CLASS J	10	500	10
Z5-160/...	600 CLASS J	10	600	10
Z5-220/...	800 CLASS J	10	800	10
Z5-250/...	700 CLASS J	10	600	10
Z5-70/...	125 CLASS J	100	-	-
Z5-100/...	200 CLASS J	100	-	-
Z5-125/...	250 CLASS J	100	-	-
Z5-160/...	300 CLASS J	100	-	-
	600V AC		600V AC	
ZEV-XSW-25	-	5	-	5
ZEV-XSW-64	-	10	-	10
ZEV-XSW-145	-	10	-	10
ZEV-XSW-820	-	42	-	42

Technical data

			ZE	ZB12, ZB32	ZB65	ZB150(KK)
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						
Open[1]		°C	-25…50	-25…55	-25…55	-25…55
Enclosed[1]		°C	-25…40	-25…40	-25…40	-25…40
Temperature compensation			Continuous			
Mounting position			→ Page 6/28			
Weight		kg	0.07	0.15	0.25	1.64
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27		g	10	10	10	10
Protection type			IP20	IP20	IP00	IP00
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	8000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3
Rated insulation voltage						
AC	U_i	V AC	690	690	690	1000
Rated operating voltage	U_e	V AC	690	690	690	1000
Safe isolation according to EN 61140						
Between auxiliary contacts and main contacts		V AC	300	440	440	440
Between the main contacts		V AC	300	440	440	440
Overload relay setting range		A	0.1…12	0.1…38	6…75	25…175
Temperature compensation residual error > 40 °C		%/K	≦ 0.25	≦ 0.25	≦ 0.25	≦ 0.25
Short-circuit protection rating maximum fuse			→ Page 6/6	→ Page 6/8	→ Page 6/10	→ Page 6/10
Current heat loss (3 conductors)						
Lower value of setting range		W	2.5	2.5	3	16
Upper value of setting range		W	6	6	7.5	18
Terminal capacity						
Solid		mm^2	2 x (0.75 - 2.5)	2 x (1 - 6)[5]	2 x (1 - 16)[4]	2 x (4 - 16)
Flexible with ferrule		mm^2	2 x (0.5 - 1.5)	2 x (1 - 4)[5] 2 x (1 - 6)[3]	1 × (1…25) 2 x (1…10)[2]	1 x (4 - 70) 2 x (4 - 50)
Stranded		mm^2	–	–	1 x (16…25)	1 x (16…50) 2 x (16…50)
Solid or stranded		AWG	18 - 14	14 - 8[5]	14 - 2	3/0
Busbar	Width	mm	–	–	–	–
Terminal screw			M3.5	M4	M6	M10
Tightening torque		Nm	1.2	1.8[5]	3.5	10
Tools						
Pozidriv screwdriver		Size	2	2	2	–
Flat-blade screwdriver		mm	0.8 x 5.5	1 x 6	1 x 6	–
Hexagon socket	SW	mm	–	–	–	5

Notes

[1] Ambient temperature: Operating range to IEC/EN 60947, PTB: -5°C to +55°C
[2] Use identical cross-section when using two conductors
[3] 6 mm flexible with ferrules to DIN 46228
[4] With ZB65-XEZ max 1 x (1… 16)
[5] ZB32-38: solid and flexible with ferrule, 2.5 - 25 mm^2, 3 Nm tightening torque. AWG10-b, 27 lb-in tightening torque for solid or stranded conductors.

				Z5-…/FF225A(250)	ZW7
General					
Standards				IEC/EN 60947, VDE 0660, UL, CSA	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					
Open[1]			°C	-25…50	-25…50
Enclosed[1]			°C	-25…40	-25…40
Temperature compensation				Continuous	Continuous
Mounting position				→ Page 6/28	Any
Weight			kg	1.55	0.8
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27			g	10	10
Protection type				IP00	IP00
Protection against direct contact when actuated from front (EN 50274)				With terminal cover	Finger- and back-of-hand proof
Main contacts					
Rated impulse withstand voltage		U_{imp}	V AC	8000	6000
Overvoltage category/pollution degree				III/3	III/3
Rated insulation voltage					
AC		U_i	V AC	1000	690
Rated operating voltage		U_e	V AC	1000	690
Safe isolation according to EN 61140					
Between auxiliary contacts and main contacts			V AC	440	440
Between the main contacts			V AC	440	440
Overload relay setting range			A	50…300	42…630
Temperature compensation residual error > 40 °C			%/K	≦ 0.25	–
Short-circuit protection rating maximum fuse				→ Page 6/12	With overload relay in conjunction with a transformer as required for the contactor
Current heat loss (3 conductors)					
Lower value of setting range			W	16	3
Upper value of setting range			W	28	10
Terminal capacity					
Flexible with ferrule			mm^2	95	–
Stranded with ferrule			mm^2	120	–
Solid or stranded			AWG	250 MCM	–
Flat conductor.	Number of segments x width x thickness		mm	6 x 16 x 0.8[2]	–
Busbar		Width	mm	20 x 3	–
Push-through opening		∅	mm	–	27
Terminal screw				M8 x 25	–
Tightening torque			Nm	24	–
Tools					
Hexagonal socket		SW	mm	13	–

Notes

[1] Ambient temperature: Operating range to IEC/EN 60947, PTB: -5°C to +50°C
[2] Fixing with box terminals

			ZE	ZB12, ZB32	ZB65	ZB150(KK)	Z5-.../FF225 Z5-.../FF250	ZW7
Auxiliary and control circuits								
Rated impulse withstand voltage	U_{imp}	V	6000	6000	6000	6000	6000	6000
Overvoltage category/Pollution degree			III/3	III/3	III/3	III/3	III/3	III/3
Terminal capacity								
Solid		mm^2	2 x (0.75 - 2.5)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)
Flexible with ferrule		mm^2	2 x (0.5 - 1.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)
Solid or stranded		AWG	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)
Terminal screw			M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
Tools								
Pozidriv screwdriver		Size	2	2	2	2	2	2
Flat-blade screwdriver		mm	0.8 x 5.5	1 x 6	1 x 6	1 x 6	1 x 6	1 x 6
Auxiliary circuit rated insulation voltage	U_i	V AC	690	500	500	500	500	500
Rated operating voltage	U_e	V AC	500	500	500	500	500	500
Safe isolation according to EN 61140								
Between the auxiliary contacts		V AC	300	240	240	240	240	240
Conventional thermal current	I_{th}	A	6	6	6	6	6	6
Rated operational current								
AC-15								
N/O								
120 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
415 V	I_e	A	0.5	0.5	0.5	0.5	0.5	0.5
500 V	I_e	A	0.3	0.5	0.5	0.5	0.5	0.5
NC								
120 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5	1.5	1.5
415 V	I_e	A	0.7	0.9	0.9	0.9	0.9	0.9
500 V	I_e	A	0.5	0.8	0.8	0.8	0.8	0.8
DC-13 L/R ≦ 15 ms[1]								
24 V	I_e	A	0.9	0.9	0.9	0.9	0.9	0.9
60 V	I_e	A	0.75	0.75[3]	0.75[3]	0.75[3]	0.75[3]	0.75[3]
110 V	I_e	A	0.4	0.4	0.4	0.4	0.4	0.4
220 V	I_e	A	0.2	0.2	0.2	0.2	0.2	0.2
General Use								
AC operated		V	240 600	–	–	–	–	–
AC operated		A	1.5 0.6	–	–	–	–	–
DC operated		V	–	–	–	–	–	–
DC operated		A	–	–	–	–	–	–
Pilot Duty								
AC operated			D300	B300[4] B600[5]	B300[4] B600[5]	B300[4] B600[5]	B300[4] B600[5]	B300[4] B600[5]
DC operated			R300	R300	R300	R300	R300	R300
Short-circuit rating without welding								
Max. fuse[2]		A gG/gL	4	6	6	6	6	6

Notes

[1] Making and breaking conditions to DC-13, time constant as stated
[2] See transparent overlay "Fuses" for time/current characteristics (please enquire)
[3] Rated operational current DC-13, 60 V: N/O auxiliary contact 0.6 A
[4] With opposite polarity
[5] With same polarity

ZEB

			ZEB12, ZEB32	ZEB65-45	ZEB65-100	ZEB150
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						
Open		°C	–25…65	–25…65	–25…65	–25…65
Enclosed		°C	–25…65	–25…40	–25…40	–25…40
Temperature compensation			Continuous	Continuous	Continuous	Continuous
Mounting position			Any	Any	Any	Any
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27		g	15	15	15	15
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000
Overvoltage category/pollution degree			III / 3	III / 3	III / 3	III / 3
Rated insulation voltage						
AC	U_i	V AC	690	690	690	690
Rated operating voltage	U_e	V AC	690	690	690	690
Safe isolation according to EN 61140						
Between auxiliary contacts and main contacts		V AC	600	600	600	600
Between the main contacts		V AC	600	600	600	600
Overload relay setting range		A	0.3…45	9…45	20…100	20…100
Terminal capacity						
Solid		mm²	1 x 2.5 - 16	1 x 2.5 - 16	1 x 6 - 50	1 x 6 - 50
Solid or stranded		AWG	1 x 14 - 4	1 x 14 - 4	1 x 10 - 1	1 x 10 - 1
Auxiliary and control circuits						
Rated impulse withstand voltage	U_{imp}	V	6000	6000	6000	6000
Overvoltage category/pollution degree			III / 3	III / 3	III / 3	III / 3
Terminal capacity						
Solid		mm²	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)	2 x (0.75 - 4)
Flexible with ferrule		mm²	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)	2 x (0.75 - 2.5)
Solid or stranded		AWG	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)
Terminal screw			M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2	0.8 - 1.2
		lb-in	7 - 10.6	7 - 10.6	7 - 10.6	7 - 10.6
Tools						
Pozidriv screwdriver		Size	2	2	2	2
Flat-blade screwdriver		mm	1 x 6	1 x 6	1 x 6	1 x 6
Auxiliary circuit rated insulation voltage	U_i	V AC	500	500	500	500
Rated operating voltage	U_e	V AC	500	500	500	500
Safe isolation according to EN 61140						
Between the auxiliary contacts		V AC	240	240	240	240
Conventional thermal current	I_{th}	A	5	5	5	5
Rated operational current						
AC-15						
N/O						
120 V	I_e	A	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5
415 V	I_e	A	0.5	0.5	0.5	0.5
500 V	I_e	A	0.5	0.5	0.5	0.5
NC						
120 V	I_e	A	1.5	1.5	1.5	1.5
240 V	I_e	A	1.5	1.5	1.5	1.5
415 V	I_e	A	0.9	0.9	0.9	0.9
500 V	I_e	A	0.8	0.8	0.8	0.8
DC-13 L/R ≦ 15 ms						
24 V	I_e	A	0.9	0.9	0.9	0.9
60 V	I_e	A	0.75	0.75	0.75	0.75
110 V	I_e	A	0	0.4	0.4	0.4
220 V	I_e	A	0.2	0.2	0.2	0.2
Short-circuit rating without welding						
Max. fuse		A gG/gL	6	6	6	6

WWW.TM2A.PT info@tm2a.pt

ZEV

					ZEV
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	Open[1]			°C	-25…60[8]
	Enclosed[1]			°C	-25…40[8]
	Storage			°C	-40 - 80
Temperature compensation					Continuous
Mounting position					Any
Weight				kg	0.257
Shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27				g	15
Protection type					IP20
Protection against direct contact when actuated from front (EN 50274)					Finger- and back-of-hand proof
Main contacts					
Overload relay setting range				A	1…820[7]
Temperature compensation residual error > 40 °C				%/K	–
Short-circuit protection rating maximum fuse[3]					With overload relay in conjunction with a transformer as required for contactor
Tools	Pozidriv screwdriver			Size	1
	Flat-blade screwdriver			mm	0.8 x 5.5
Auxiliary and control circuits					
Rated impulse withstand voltage			U_{imp}	V	4000
Overvoltage category/pollution degree					III/3
Terminal capacities	Solid			mm^2	1 x (0.5 - 2.5) 2 x (0.5 - 1.5)[4]
	Flexible with ferrule			mm^2	1 x (0.5 - 2.5) 2 x (0.5 - 1.5)[4]
	Solid or stranded			AWG	1 x (18 - 14)
Terminal screw					M3.5
Tightening torque				Nm	0.8
Tools	Pozidriv screwdriver			Size	1
	Flat-blade screwdriver			mm	0.8 x 5.5
Auxiliary circuit rated insulation voltage			U_i	V AC	250
Rated operating voltage			U_e	V AC	240
Safe isolation according to EN 61140					
	Between the auxiliary contacts			V AC	240[5]
Conventional thermal current			I_{th}	A	6
Rated operational current					
AC-15 N/O	120 V		I_e	A	3[6]
	240 V		I_e	A	3[6]
	415 V		I_e	A	–
	500 V		I_e	A	–
NC	120 V		I_e	A	3
	240 V		I_e	A	3
	415 V		I_e	A	–
	500 V		I_e	A	–
DC-13 L/R ≦ 15 ms[2]	24 V		I_e	A	1
	60 V		I_e	A	–
	110 V		I_e	A	–
	220 V		I_e	A	–
Power consumption			$P_{max.}$	W	2.5
Short-circuit rating without welding					
	Max. fuse[3]			A gG/gL	6
Voltage tolerance	AC operated			x U_c	0.85…1.1
	DC operated			x U_c	0.85…1.1
Thermistor protection					
Total resistance (cold)				Ω	1500
Response value				Ω	2720…3680
Reset range				Ω	1500…1650
Reset time	Overload				→ Page 6/23
	Thermistor tripping				5 K under response temperature
	Ground fault protection				Immediate

Notes

[1] Ambient air temperature: open and enclosed operating range to IEC/EN 60947, PTB: -5°C to +50°C
[2] Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated
[3] See overlay "Fuses" for short-circuit rating time/current characteristic (please enquire)
[4] Terminal capacities auxiliary and control circuits, solid, flexible with ferrules: With connection of 2 conductors only the following combinations are permissible: 0.5 and 0.75 mm^2, 0.75 and 1 mm^2, 1 and 1.5 mm^2
[5] Safe isolation: Up to 240 V depending on contact assignment between mains and outputs no potential isolation to thermistor and summation current transformer input and current sensor (neighbouring contacts: U_s = 127 V)
[6] Rated operational current AC-15: contacts 95/96 and 97/98 3 A (contactor control), contacts 05/06 and 07/08 1.5 A (auxiliary contacts)
[7] Overload relay main contact setting range: setting range dependant on current sensor
[8] Main contacts terminal capacity solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section
Ambient temperature open and enclosed: limited readability of the LCD display at < -15°C

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ZEV

			ZEV-XSW-25	ZEV-XSW-65	ZEV-XSW-145	ZEV-XSW-820
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[1]						
Open		°C	-25…60	-25…60	-25…60	-25…60
Enclosed		°C	-25…40	-25…40	-25…40	-25…40
Storage		°C	-40 - 80	-40 - 80	-40 - 80	-40 - 80
Temperature compensation			Continuous	Continuous	Continuous	Continuous
Mounting position			Any	Any	Any	Any
Weight		kg	0.23	0.4	0.45	0.14
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27		g	15	15	15	15
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V	[2]	[2]	[2]	8000
Overvoltage category/pollution degree			[2]	[2]	[2]	III/3
Rated insulation voltage						
AC	U_i	V AC	[2]	[2]	[2]	1000
Rated operational voltage	U_e	V AC	[2]	[2]	[2]	1000
Safe isolation according to EN 61140						
Between busbar and sensor		V AC	–	–	–	500
Overload relay setting range						
Min. overload relay setting range		A	1	3	10	40
Max. overload relay setting range		A	25	65	145	820
Short-circuit protection rating maximum fuse			With overload relay in conjunction with a transformer as required for contactor			
Diameter	∅	mm	6	13	21	110

Notes

[1] Operating range to IEC/EN 60947, PTB: -5°C to +50°C

[2] The main current parameters are defined by the main current wiring which is used.

EMT6

				EMT6
General				
Standards				IEC/EN 60947, VDE 0660, EN 55011
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature				
Open			°C	-25…60
Enclosed			°C	-25…45
Storage			°C	-45 - 60
Mounting position				Any
Weight			kg	0.15
Shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27			g	10
Protection type				IP20
Protection against direct contact when actuated from front (EN 50274)				Finger- and back-of-hand proof
Safe isolation according to EN 61140				
Between the contacts			V AC	250
Between contacts and supply voltage			V AC	250
Auxiliary and control circuits				
Rated impulse withstand voltage		U_{imp}	V AC	6000
Overvoltage category/pollution degree				III/3
Auxiliary and control circuit terminal capacity				
Solid			mm^2	1 x 2.5 2 x (0.5 - 1.5)
Flexible with ferrule			mm^2	1 x 2.5 2 x (0.5 - 1.5)
Solid or stranded			AWG	20 - 14
Terminal screw				M3.5
Tightening torque			Nm	1.2
Tools				
Pozidriv screwdriver			Size	2
Flat-blade screwdriver			mm	1 x 6
Auxiliary circuit				
Rated insulation voltage		U_i	V	400
Rated operational current				
AC-14				
N/O				
415 V		I_e	A	3
NC				
415 V		I_e	A	3
AC-15				
N/O				
240 V		I_e	A	3
415 V		I_e	A	1
NC				
240 V		I_e	A	3
415 V		I_e	A	1
Max. short-circuit protective device				
Fuse		gG/gL	A	6
Control circuit				
Rated insulation voltage		U_i	V	240
Rated operational voltage		U_e	V	240[1)]
Voltage tolerance			x U_e	0.85 - 1.1
Power consumption				
AC			VA	3.5
DC			W	2
Trip at approx.			Ω	≥3600
Reset at approx.			Ω	≤1600

Notes [1)] EMT6(-DB)230V: U_e = 230 V

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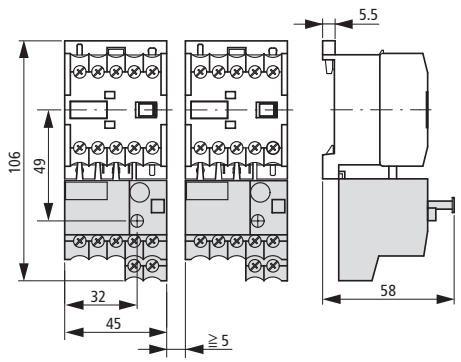
Dimensions

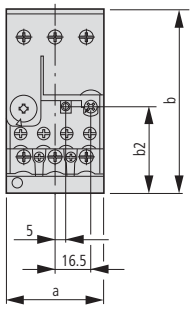
Overload relays

ZE-…

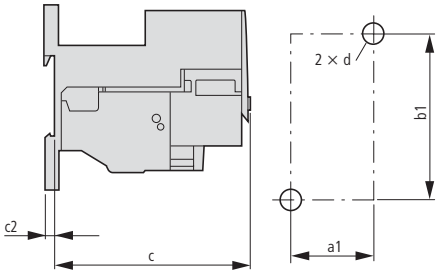


Base

ZB32-XEZ

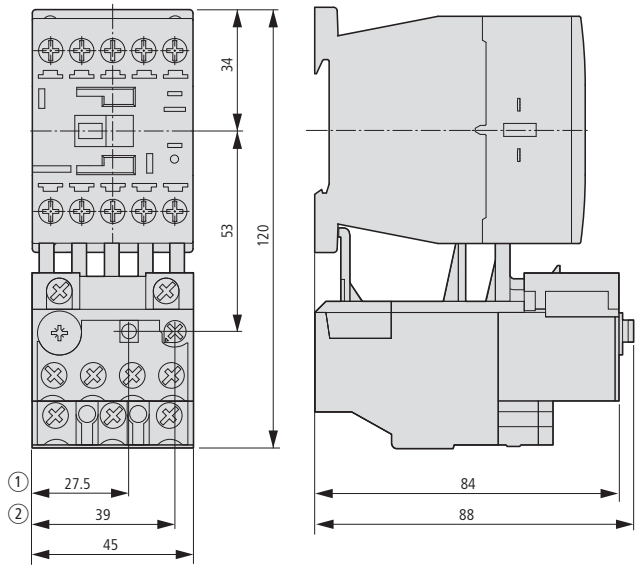


ZB65-XEZ



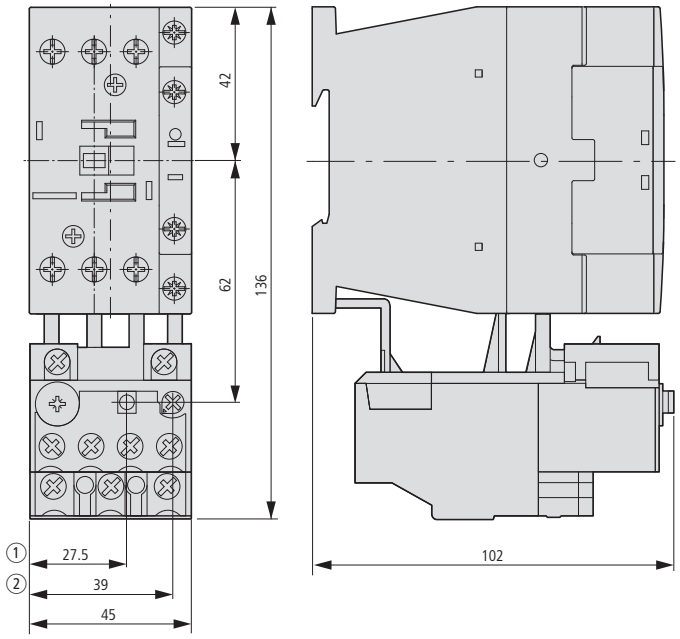
	ZB32	ZB65
a	45	60
b	85	86
c	90.5	112
c2	3.8	4.7
a1	35	50
b1	75	75
b2	40.5	47
d	M4	M5

ZB12

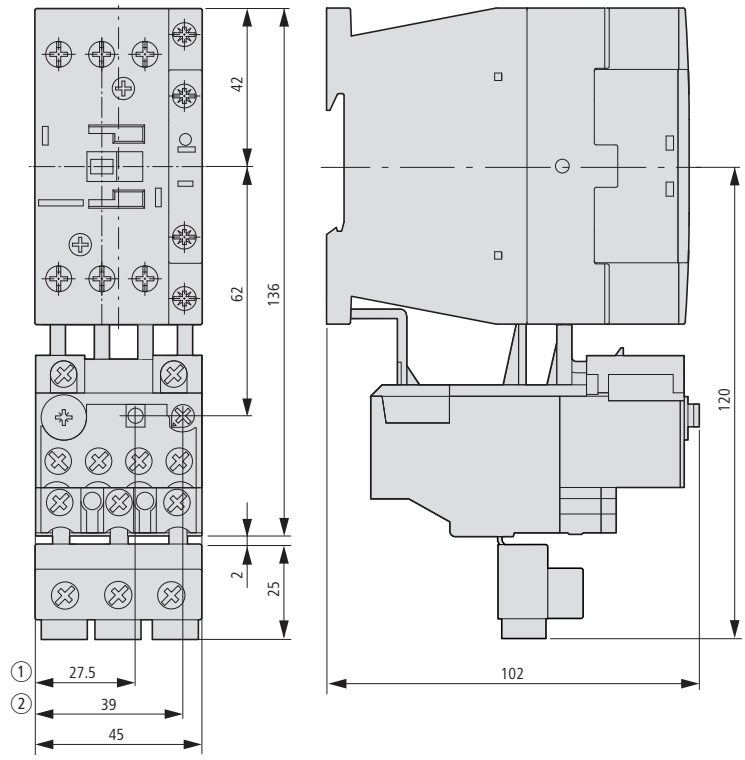


① OFF
② Reset/ON

ZB32



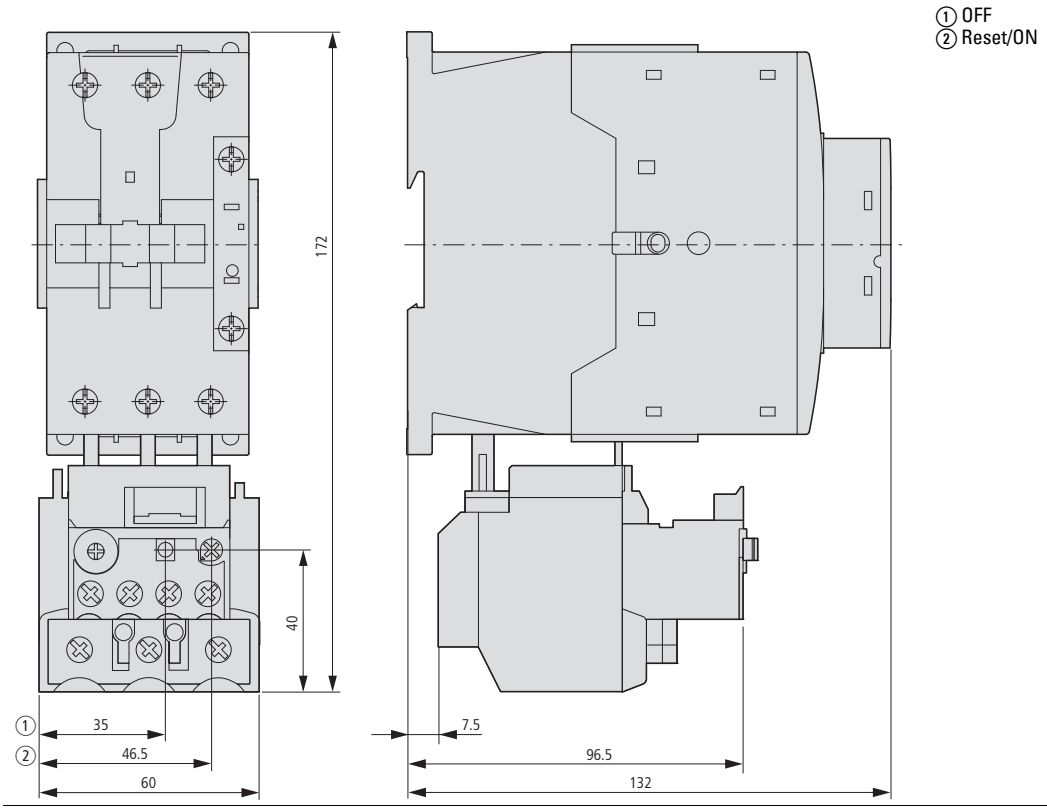
ZB32-38



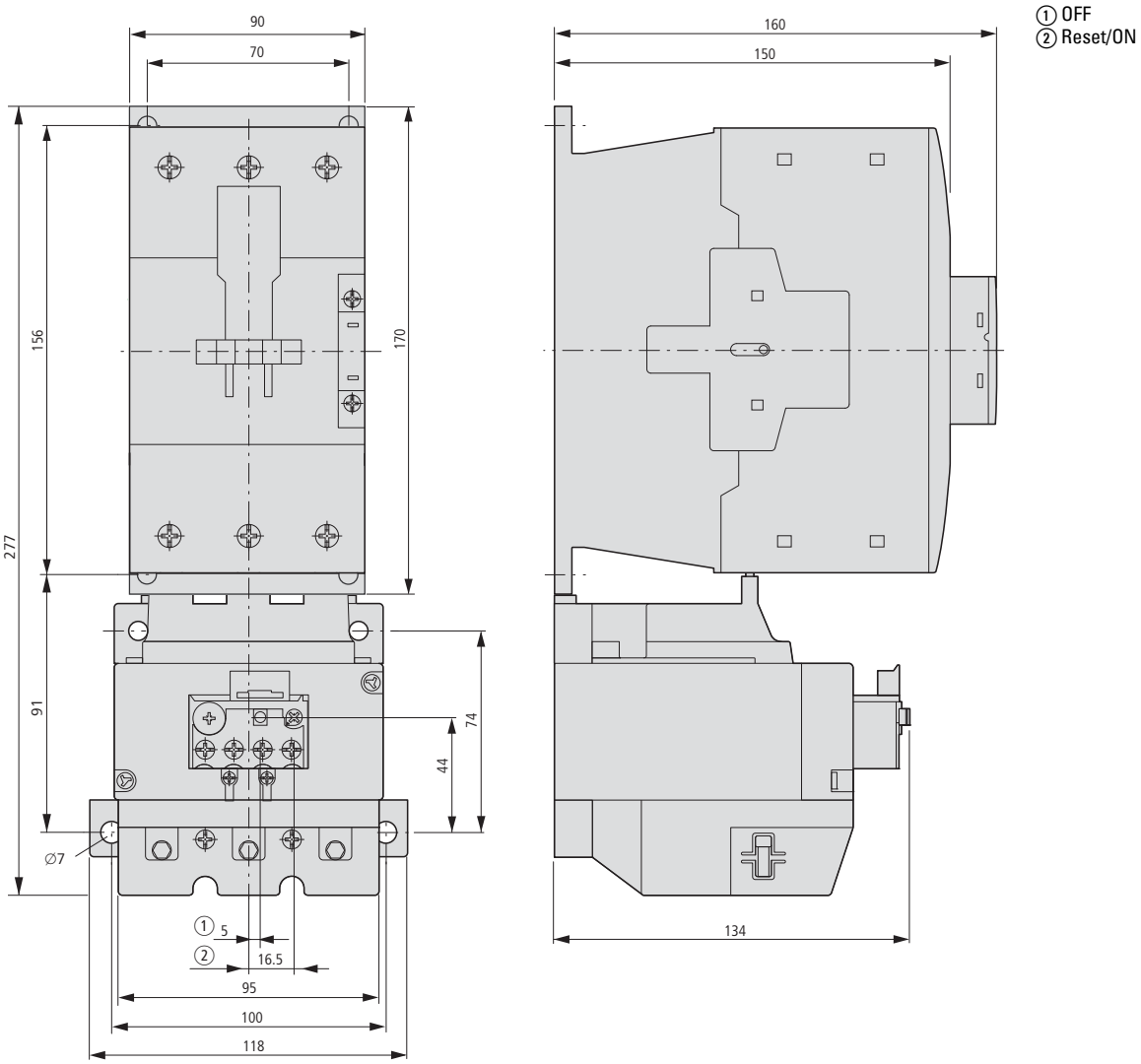
① OFF
② Reset/ON

Overload relays

ZB65

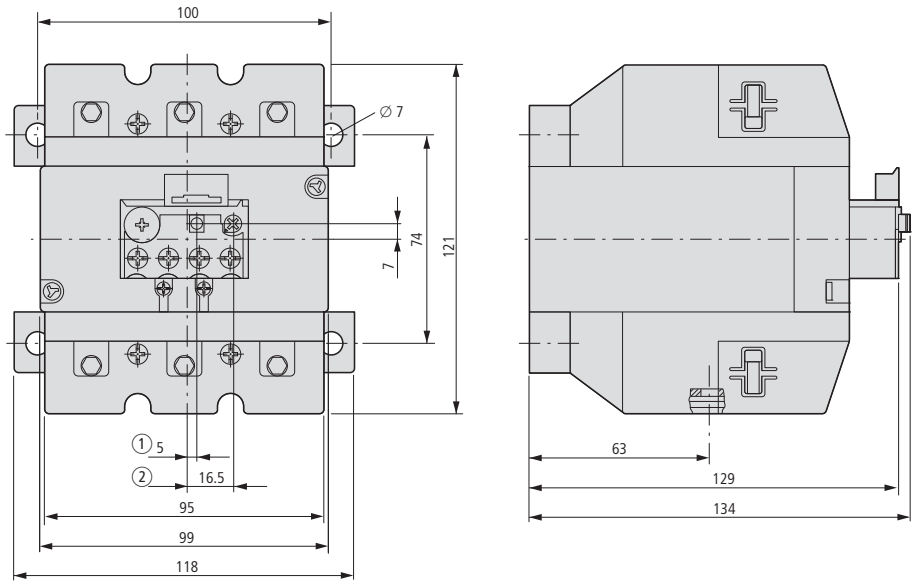


ZB150



Overload relays

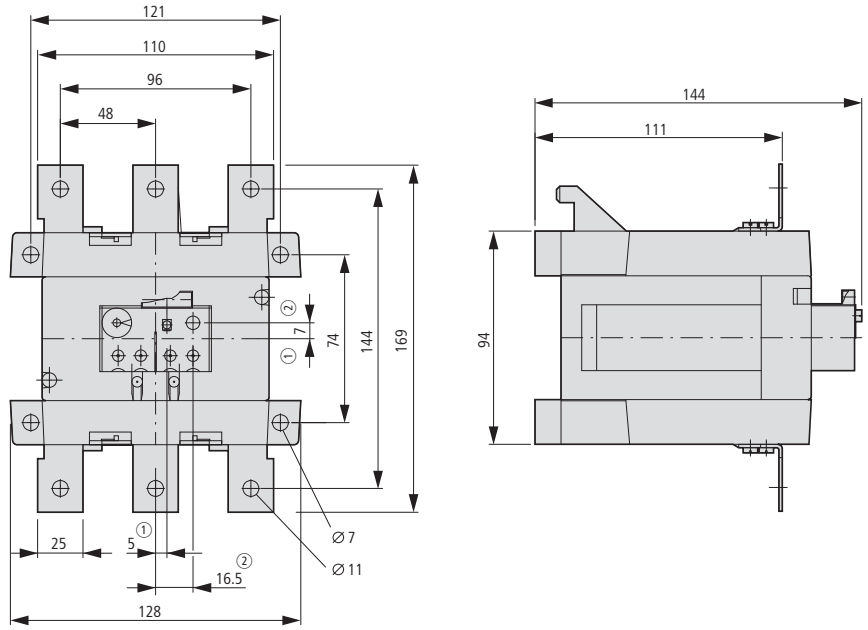
ZB150-50/KK



① OFF
② Reset/ON

Z5 overload relays greater than 150A

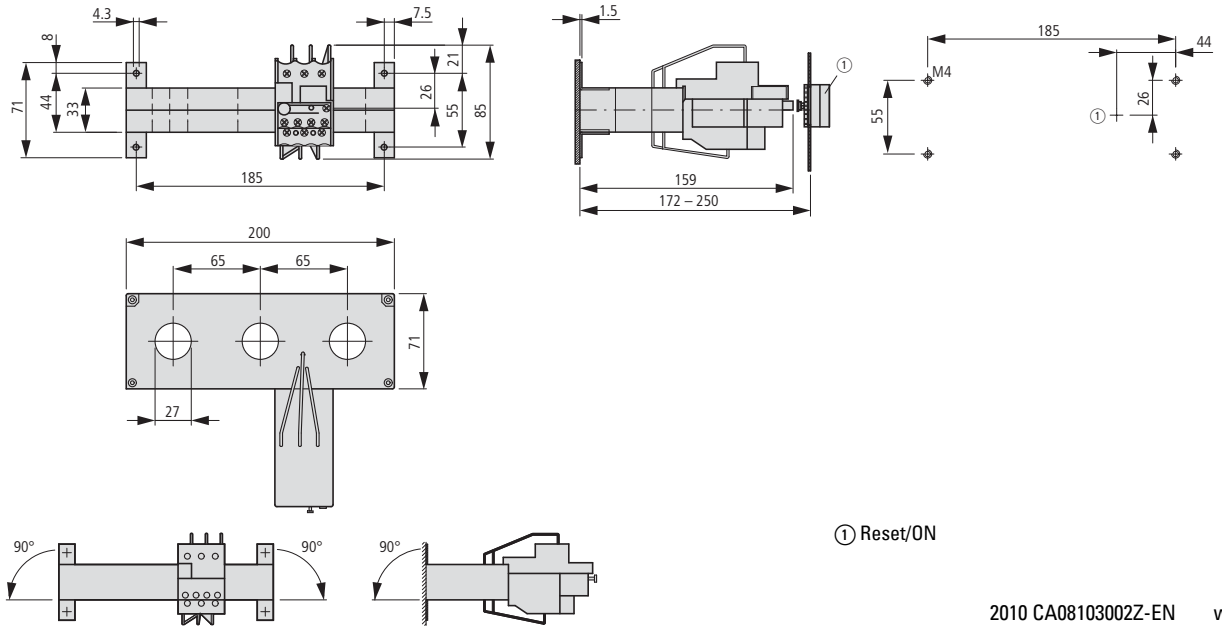
Z5-.../FF250



① OFF
② Reset/ON

Current transformer-operated overload relays

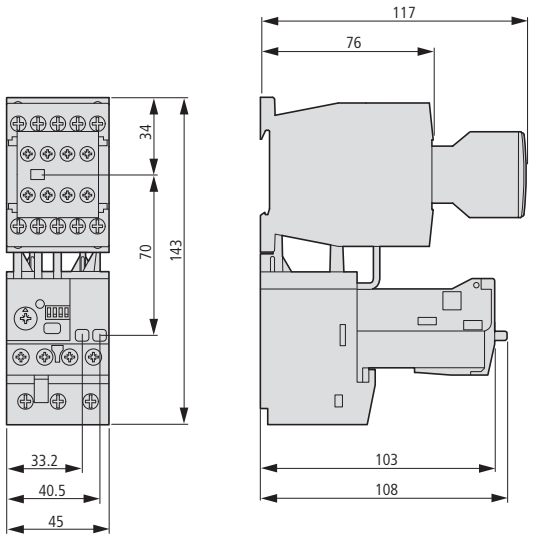
ZW7-…



① Reset/ON

Electronic overload relays

ZEB12



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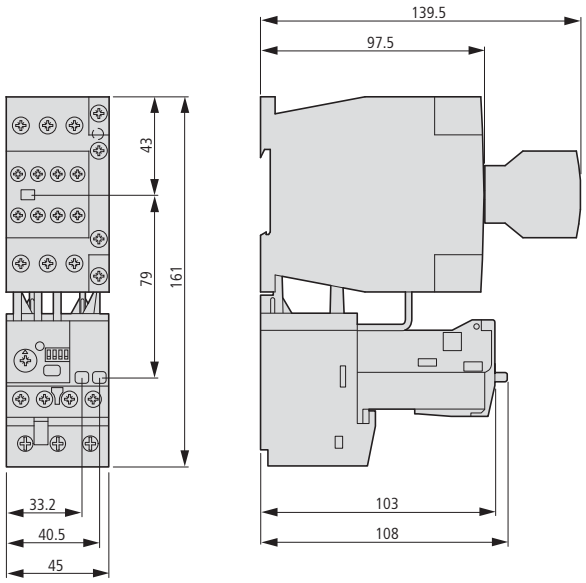
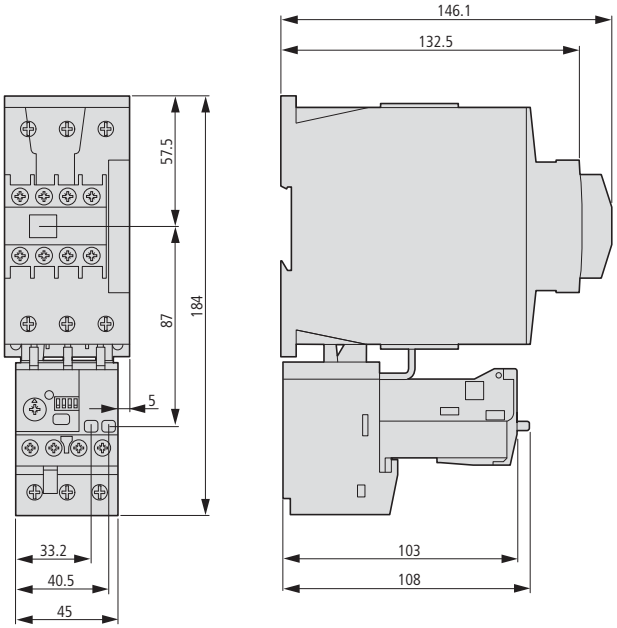
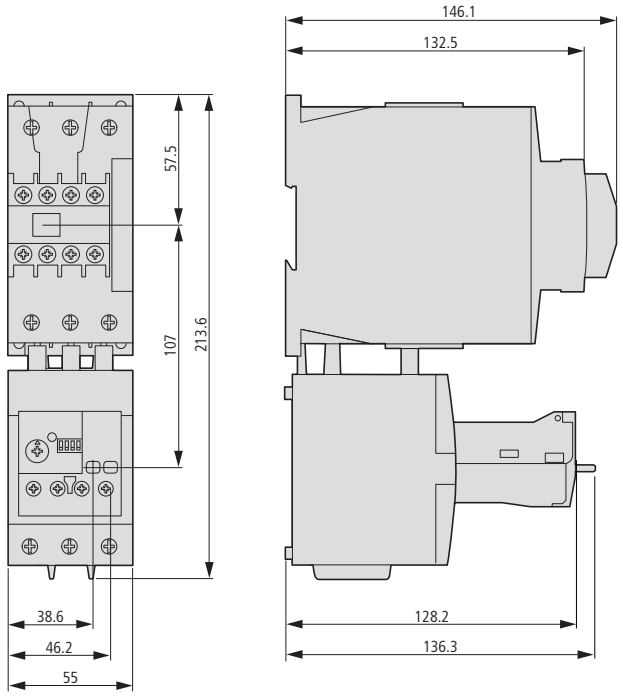


ZEB65-45

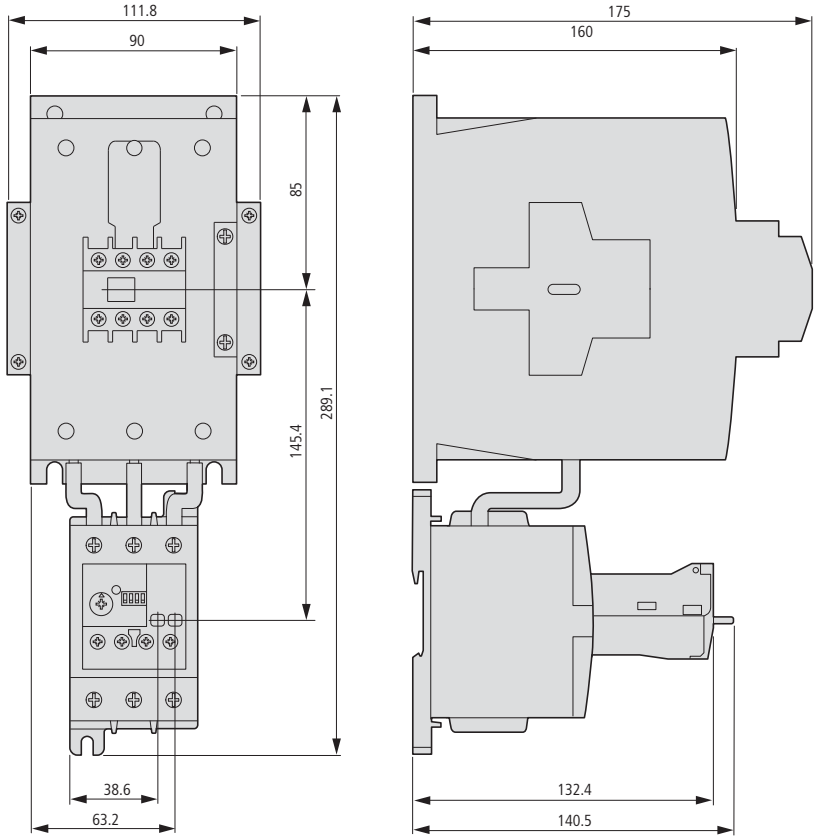


ZEB65-100

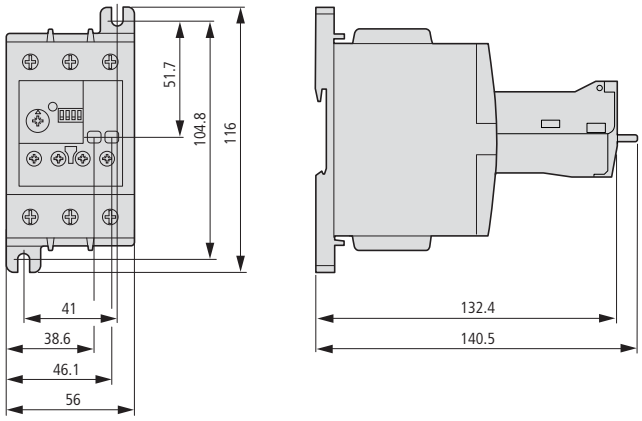


Electronic overload relays

ZEB150-100

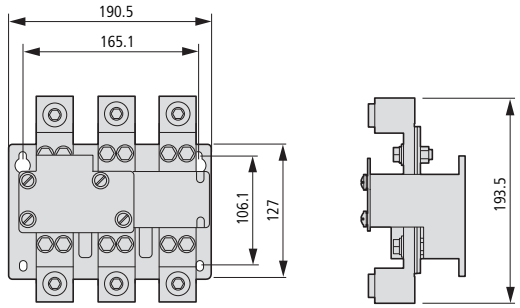


ZEB150-100/KK

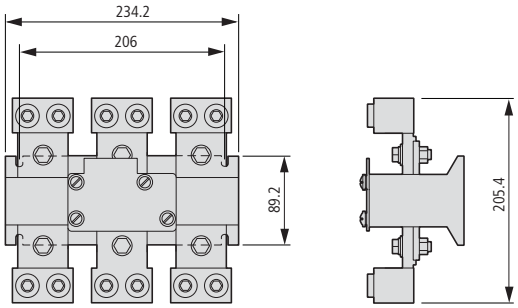


Current sensors

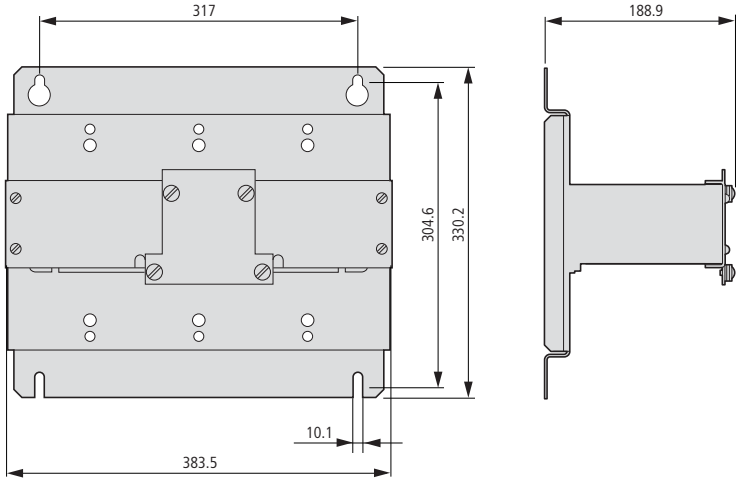
ZEB-XCT300

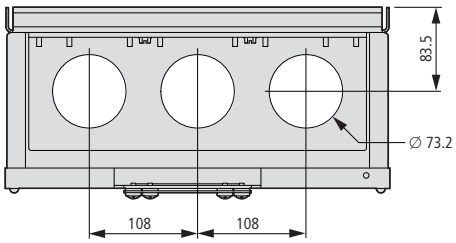


ZEB-XCT600



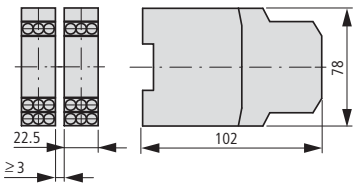
ZEB-XCT1000
ZEB-XCT1500





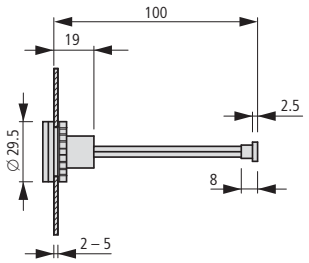
EMT6 thermistor overload relays for machine protection

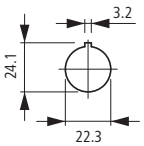
EMT6…



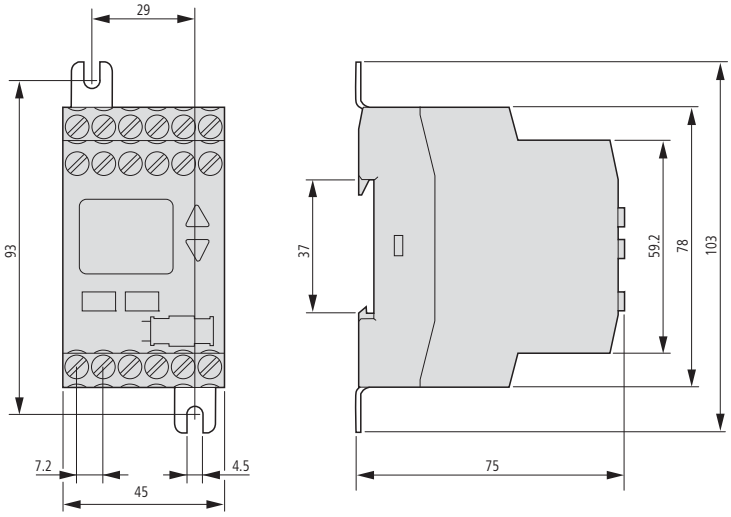
External reset button

M22-DZ-B
M22-DZ-X

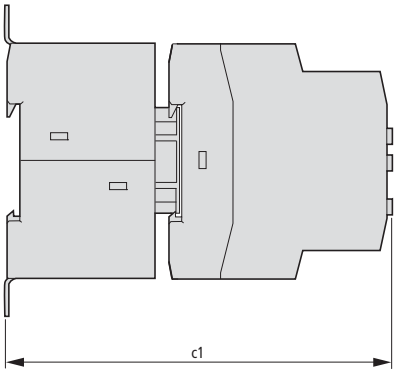




Electronic overload relays
ZEV

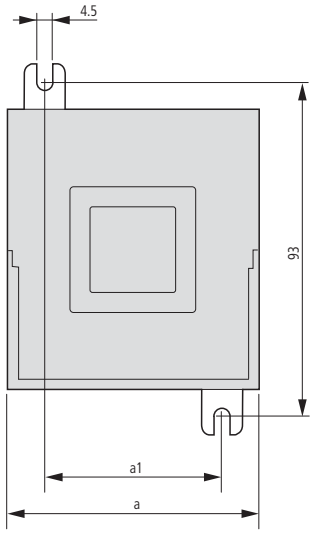


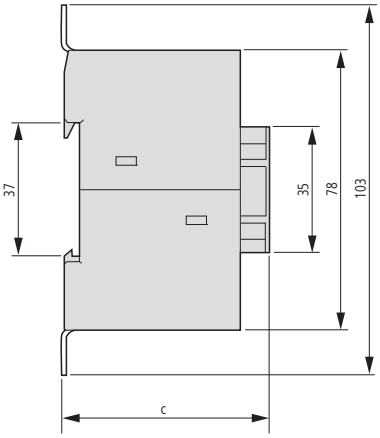
Electronic overload relays
ZEV + ZEV-XSW-...

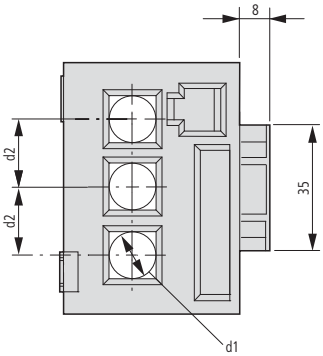


Part no.	c1
ZEV + ZEV-XSW-25	120
ZEV + ZEV-XSW-65	128
ZEV + ZEV-XSW-145	134

Current sensors
ZEV-XSW-...

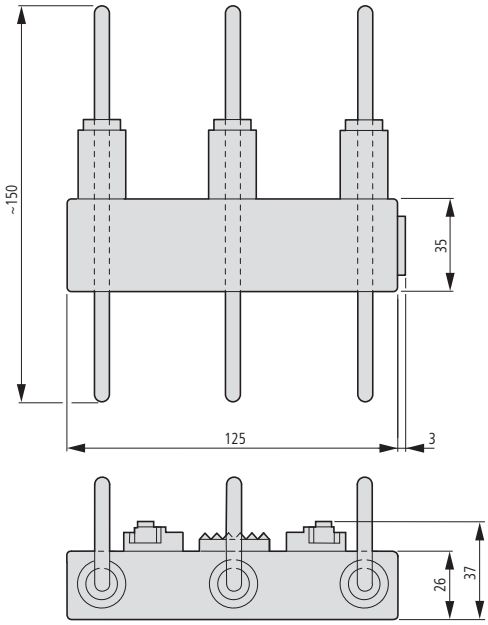






Part no.	a	a1	c	d1	d2
ZEV + ZEV-XSW-25	45	24	50	6	11.2
ZEV + ZEV-XSW-65	70	49	58	13	19
ZEV + ZEV-XSW-145	90	68	65	21	26

ZEV-XSW-820



Core-balance transformers
SSW...

Part no.	a	a1	a2	b	b1	c	d	e
SSW40-...	64	50	38	100	80	86	4.5	40
SSW65-...	75	60	43	124	100	112	4.5	65
SSW120-...	86.5	70	54.5	200	170	205	4.5	120