



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.

ATEX



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 parameterization 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



Technical overview		
Bimetal relay ZE, ZB, Z5	6/2	
Overload relay ZW7	6/2	
Electronic overload relays ZEB, ZEV	6/4	
EMT6 thermistor overload relay for machine protection	6/4	

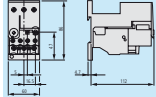
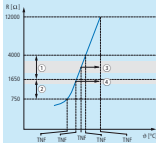
Ordering		
Bimetal relays for mini-contactor relays	6/6	
Bimetal relays up to 150A	6/8	
Bimetal relay greater than 150 A	6/12	
Overload relays	6/12	
Bimetal relay accessories	6/26	
ZEB Electronic overload relay	6/14	

Description		
ZEV electronic overload relay	6/19	

Ordering		
ZEV electronic overload relay	6/20	

Engineering		
ZEV, ZEB electronic overload relays	6/22	

Ordering		
EMT6 thermistor overload relay for machine protection	6/24	



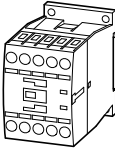
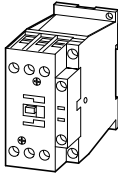
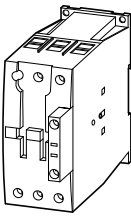
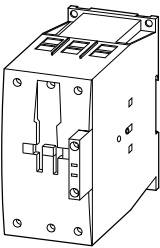
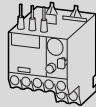
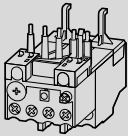
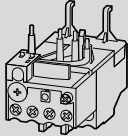
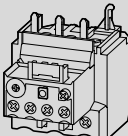
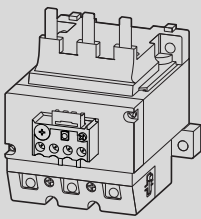
Engineering		
EMT6 thermistor overload relay for machine protection	6/25	
Selection criteria ZE, ZB, Z5, ZW7	6/28	
Characteristic curve ZB, Z5, ZW7	6/28	
UL/CSA short-circuit strength ZE, ZB, Z5, ZEV	6/29	

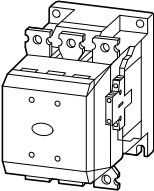
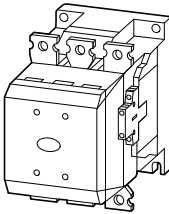
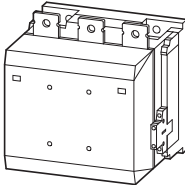
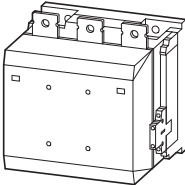
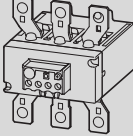
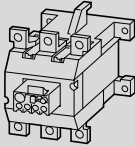
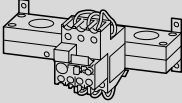
Technical data		
Bimetal relay for mini-contactor relays	6/30	
Bimetal relays up to 150A	6/30	
Overload relays greater than 150 A	6/31	
Overload relays	6/31	
ZEB electronic overload relay	6/33	
ZEV electronic overload relay	6/34	
EMT6 thermistor overload relay for machine protection	6/36	

Dimensions		
Bimetal relays for mini-contactor relays	6/37	
Bimetal relays up to 150A	6/37	
Bimetal relays greater than 150 A	6/39	
Overload relay	6/39	
ZEB electronic overload relay	6/40	
ZEV electronic overload relay	6/43	
EMT6 thermistor overload relay for machine protection	6/42	



Technical overview

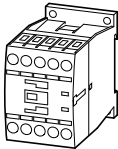
Setting ranges (A) (note max. current of the contactor)					
 DILEM  DILM7 DILM12 DILM9 DILM15  DILM17 DILM32 DILM25 DILM38  DILM40 DILM65 DILM50 DILM72  DILM80 DILM150 DILM95 DILM170 DILM115					
Overload relays					
ZE 0.1-12					
ZB12 0.1-16					
ZB32 0.1-38					
ZB65 6-75					
ZB150 35-175					
Z5-.../FF225A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

 DILM185A DILM225A	 DILM250 DILM300	 DILM400 DILM580 DILM500	 DILM650
			
			
			

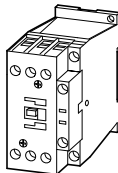
Setting ranges (A)
(note max. current of the contactor)



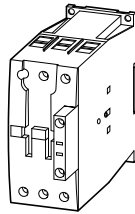
DILEM



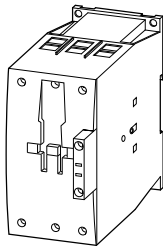
DILM7 DILM12
DILM9 DILM15



DILM17 DILM32
DILM25 DILM38



DILM40 DILM65
DILM50 DILM72



DILM80 DILM150
DILM95 DILM170
DILM115

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

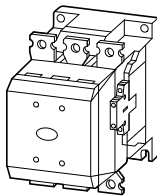
ZEB-XCT600
120-600

ZEB-XCT1000
200-1000

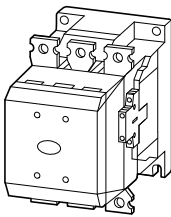
ZEB-XCT1500
300-1500

ZEV
1-820

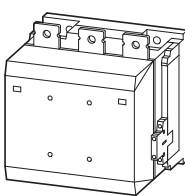
Thermistor overload relay for machine protection
EMT6((DB)K)



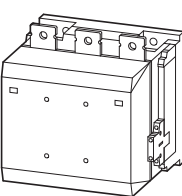
DILM185A
DILM225A



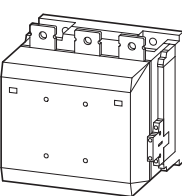
DILM250
DILM300



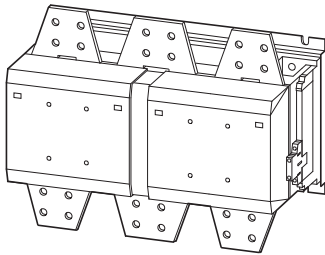
DILM400 DILM500
DILM580 DILM650



DILM750 DILM820



DILM1000



DILM1600

Ordering

Setting range of overload releases	Circuit symbol	Auxiliary contact	For use with	Short-circuit protection	
I_r A		N/O = normally open contact NC = normally closed contact		Type “1” coordination gG/gL	Type “2” coordination gG/gL
				A	A

ZE overload relays for mini contactor relays

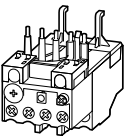
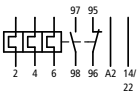
- Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102
- Test/off pushbutton
- Reset pushbutton manual/auto
- Trip-free release
- Direct mounting

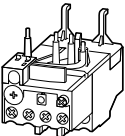
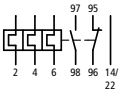
	0.1 – 0.16		1 N/O	1 NC	DILEM DIULEM/21/MV SDAINLEM	20	0.5
	0.16 – 0.24						1
	0.24 – 0.4						2
	0.4 – 0.6						2
	0.6 – 1						4
	1 – 1.6						6
	1.6 – 2.4						6
	2.4 – 4						10
	4 – 6						
	6 – 9						
	9 – 12						

Information relevant for export to North America

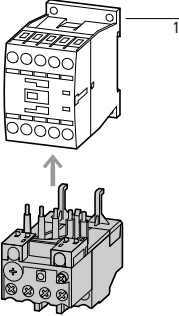
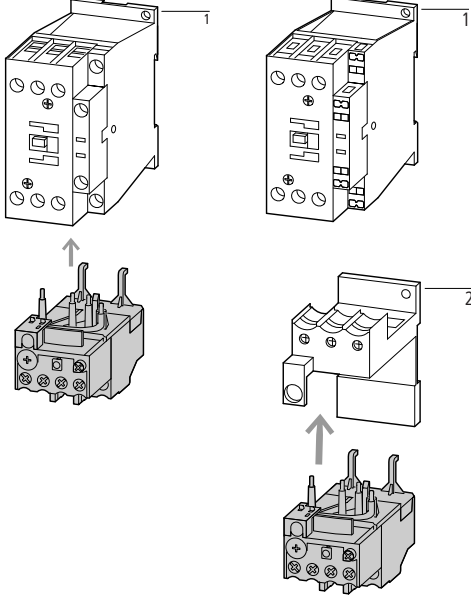
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP20, UL/CSA Type: -
See also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

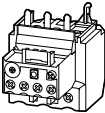
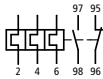
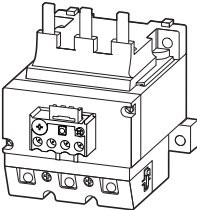
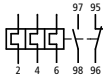
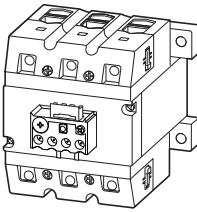
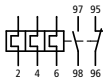
Part no. Article no.	Price See price list	Std. pack	Notes
ZE-0.16 014263		1 Off 	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors II (2) GD PTB 01 ATEX 3331 Observe manual AWB2300-1425D/GB.
ZE-0.24 014285			
ZE-0.4 014300			
ZE-0.6 014333			
ZE-1.0 014376			
ZE-1.6 014432			
ZE-2.4 014479			
ZE-4 014518			
ZE-6 014565			
ZE-9 014708			
ZE-12 014752			

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 A	Type "2" coordination gG/gL A
I _r A 							
ZB12 overload relay							
		1 N/O	1 NC	DILM7, DILM9, DILM12, DILM15, DIULM7, DIULM9, DIULM12, SDAINLM12, SDAINLM16, SDAINLM22	—	25	0.5
0.1 – 0.16							
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... DS7-34...SX012...	50	25
9 – 12							
12 – 16					—		

ZB32 overload relay							
		1 N/O	1 NC	DILM17, DILM25, DILM32, DILM38, DILMF8, DILMF11, DILMF14, DILMF17, DILMF25, DILMF32, DIULM17, DIULM25, DIULM32, SDAINLM30, SDAINLM45, SDAINLM55	—	25	0.5
0.1 – 0.16							
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

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 Suitable for Max. voltage R Rating	UL Listed, CSA certified Branch circuits
UL File No.	E29184		
UL CCN	NKCR		
CSA File No.	12528	Degree of Protection	600 V AC
CSA Class No.	3211-03	See also	IEC: IP20, UL/CSA Type: - → Page 6/29

Part no. Article no.	Price See price list	Std. pack	Notes
ZB12-0,16 278431			
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			
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			
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 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	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/26 Manual → Page 6/26
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 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	Fitted directly to the contactor Separate mounting  1 Contactor → Chapter 5 2 Base → Page 6/26 Manual → Page 6/26

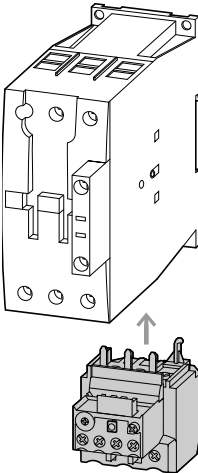
	Setting range of overload releases	Circuit symbol	Auxiliary contact	For use with	Short-circuit protection		
	I_r A 		N/O = normally open contact NC = normally closed contact		Type "1" coordination gG/gL A 	Type "2" coordination gG/gL A 	
ZB65 overload relay							
	6 – 10		1 N/O	1 NC	DILM40, DILM50, DILM65, DILM72, DILMF40, DILMF50, DILMF65, DIULM40, DIULM50, DIULM65, SDAINLM70, SDAINLM90, SDAINLM115	50	25
	10 – 16					63	35
	16 – 24					63	50
	24 – 40					125	63
	40 – 57					160	80
	50 – 65					160	100
	65 – 75					250	160
ZB150 overload relay							
	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
	50 – 70					250	160
	70 – 100					315	200
	95 – 125					315	250
	120 – 150					315	250
	145 – 175					315	250
ZB150 overload relay							
	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
	50 – 70					250	160
	70 – 100					315	200
	95 – 125					315	250
	120 – 150					315	250
	145 – 175					400	315

Information relevant for export to North America

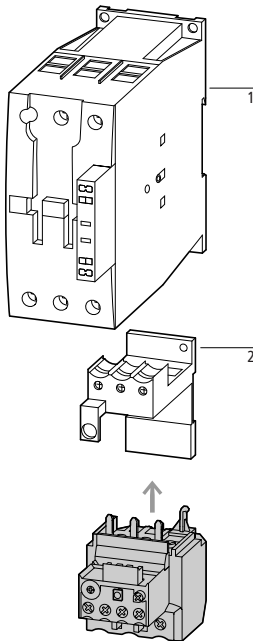
Product Standards	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified
Suitable for	Branch circuits
Max. Voltage Rating	600 V AC
Degree of Protection	IEC: IP00, UL/CSA Type: -
See also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

Part no. Article no.	Price See price list	Std. pack	Notes
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. II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
ZB65-16 278456			
ZB65-24 278457			
ZB65-40 278458			
ZB65-57 278459			
ZB65-65 278460			
ZB65-75 108792			
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. II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
ZB150-70 278463			
ZB150-100 278464			
ZB150-125 278465			
ZB150-150 278466			
ZB150-175 107316			
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. II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.
ZB150-70/KK 278469			
ZB150-100/KK 278470			
ZB150-125/KK 278471			
ZB150-150/KK 278472			
ZB150-175/KK 107317			

Fitted directly to the contactor



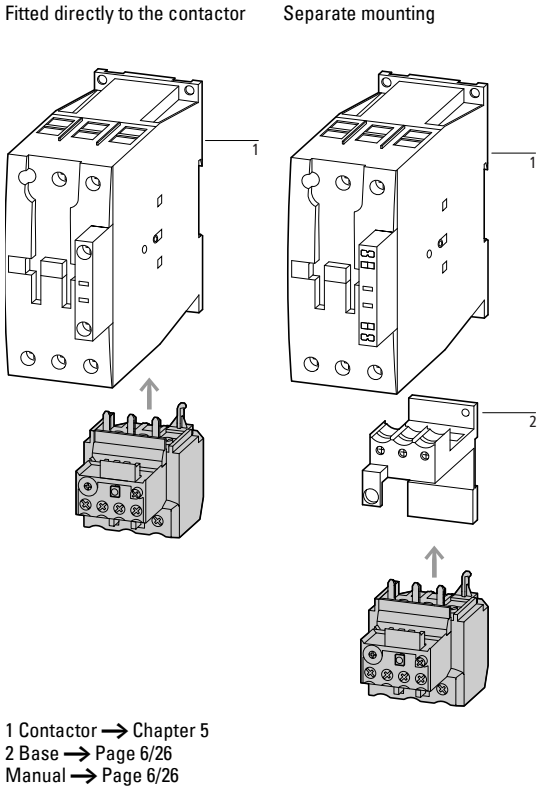
Separate mounting



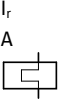
1 Contactor → Chapter 5

2 Base → Page 6/26

Manual → Page 6/26

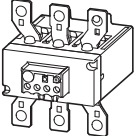
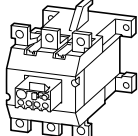


1 Contactor → Chapter 5
2 Base → Page 6/26
Manual → Page 6/26

Setting range of overload releases	Circuit symbol	Auxiliary contacts	For use with	Short-circuit protection	
				Type “1” coordination gG/gL	Type “2” coordination gG/gL
		N/O = normally open contact NC = normally closed contact			

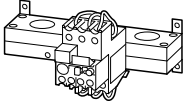
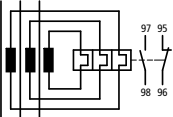
Z5 overload relays greater than 150A

- 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

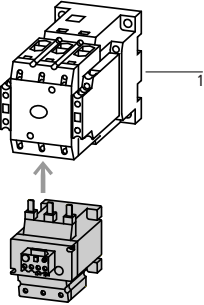
	50 – 70		1 N/O	1 NC	DILM185A DILM225A	250	160
	70 – 100					250	160
	95 – 125					315	200
	120 – 160					315	200
	160 – 220					315	250
	200 – 250					400	250
	50 – 70				DILM250	400	250
	70 – 100					400	315
	95 – 125					500	400
	120 – 160					500	400
	160 – 220					500	400
	200 – 250					500	400
	250 – 300					500	400
					DILM300A	500	400
						500	400

ZW7 current transformer-operated overload relays

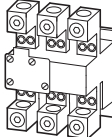
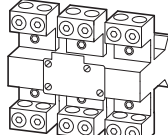
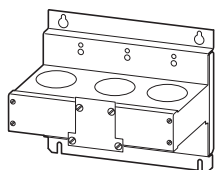
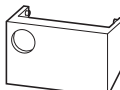
- Test/off button
 - Reset pushbutton manual/auto
 - Trip-free release
 - Protection with heavy starting duty
- Separate mounting

	42 – 63		1 N/O	1 NC	–	–	–
	60 – 90				–	–	–
	85 – 125				–	–	–
	110 – 160				–	–	–
	160 – 240				–	–	–
	190 – 290				–	–	–
	270 – 400				–	–	–
	360 – 540				–	–	–
	420 – 630				–	–	–
					–	–	–

Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
				 

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 Suitable for Max. Voltage Rating Degree of Protection See also
Z5-100/FF225A 139573				UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking Request filed for UL and CSA Branch circuits 600 V AC IEC: IP00, UL/CSA Type: - → Page 6/29
Z5-125/FF225A 139574				
Z5-160/FF225A 139575				
Z5-220/FF225A 139576				
Z5-250/FF225A 139577				
Z5-70/FF250 210070				Product Standards UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
Z5-100/FF250 210071				UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for Max. Voltage Rating Degree of Protection See also
Z5-125/FF250 210072				E29184 NKCR 12528 3211-03 UL Listed, CSA certified Branch circuits 600 V AC IEC: IP00, UL/CSA Type: - → Page 6/29
Z5-160/FF250 210073				
Z5-220/FF250 210074				Product Standards UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking Request filed for UL and CSA Branch circuits 600 V AC Degree of Protection IEC: IP00, UL/CSA Type: -
Z5-250/FF250 210075				
Z5-300/FF250 139578				

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
ZW7-90 002618				UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for Max. Voltage Rating Degree of Protection
ZW7-125 004991				E29184 NKCR 12528 3211-03 UL Listed, CSA certified Branch circuits 600 V AC IEC: IP00, UL/CSA Type: -
ZW7-160 007364				
ZW7-240 009737				
ZW7-290 052448				
ZW7-400 045329				
ZW7-540 047702				
ZW7-630 050075				
		1 Off		–

	Setting range of overload releases	Language	Can be used with	Part no. Article no.	Price See price list	Std. pack
	I_r A					
Current sensors						
	60 – 300	–	ZEB32-5-GF/KK ZEB32-5/KK	ZEB-XCT300¹⁾ 136511		1 off  
	120 – 600	–		ZEB-XCT600¹⁾ 136512		
	200 – 1000	–		ZEB-XCT1000¹⁾ 136517		
	300 – 1500	–		ZEB-XCT1500¹⁾ 136513		
						
Sealable shroud						
Cover to prevent adjustment of motor current (tamper-proof)	–	–	–	ZEB-XSC²⁾ 136514		1 off  
						
Reset adapter						
Cover to prevent adjustment of motor current (tamper-proof)	–	–	–	ZEB-XRB²⁾ 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)

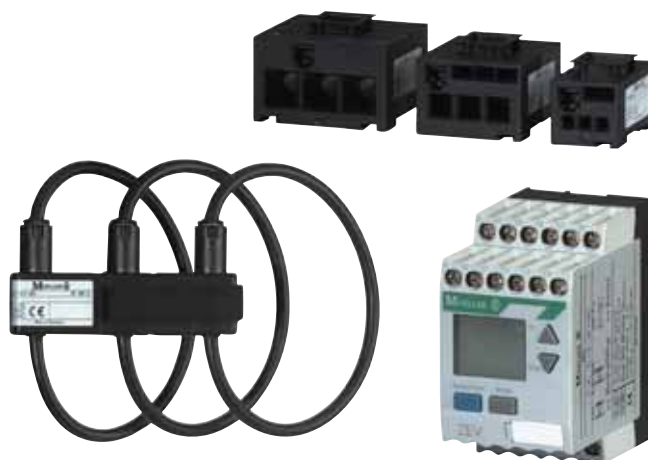
Information relevant for export to North America

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: -

ZEV

Description

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



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 protection system 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

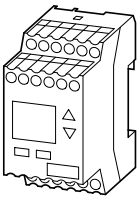
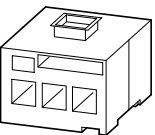
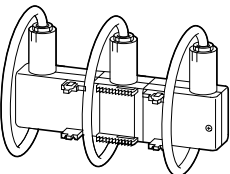
Engineering

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 Ø 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	ZEV¹⁾ 209634		1 off  	Suitable for protection of EEx e motors. Ex II (2) GD PTB 01 ATEX 3233 Observe manual AWB2300-1433.
Current sensors								
	–	6	1 – 25	DILEM DILM7...DILM25	ZEV-XSW-25²⁾ 209635		1 off  	–
	–	13	3 – 65	DILM7...DILM65	ZEV-XSW-65²⁾ 209636			
	–	21	10 – 145	DILM12...DILM150	ZEV-XSW-145²⁾ 209637			
	–	110	40 – 820	DILM40...DILM820	ZEV-XSW-820²⁾ 209641			
Connecting cables								
	200	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	ZEV-XVK-20¹⁾ 209643		1 off  	–
	400	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	ZEV-XVK-40¹⁾ 209644			
	800	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	ZEV-XVK-80¹⁾ 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 Ø 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	—	—	SSW40-0,3¹⁾ 028286		1 off	—
	—	40	—	—	SSW40-0,5¹⁾ 028305		 	
	—	40	—	—	SSW40-1¹⁾ 028306			
	—	65	—	—	SSW65-0,5¹⁾ 028307			
	—	65	—	—	SSW65-1¹⁾ 028316			
	—	120	—	—	SSW120-0,5¹⁾ 028319			
	—	120	—	—	SSW120-1¹⁾ 028321			
Mounting foot								
For screw fixing to mounting plate								
	—	—	—	ZEV ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145	ZB4-101-GF1²⁾ 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)

2)

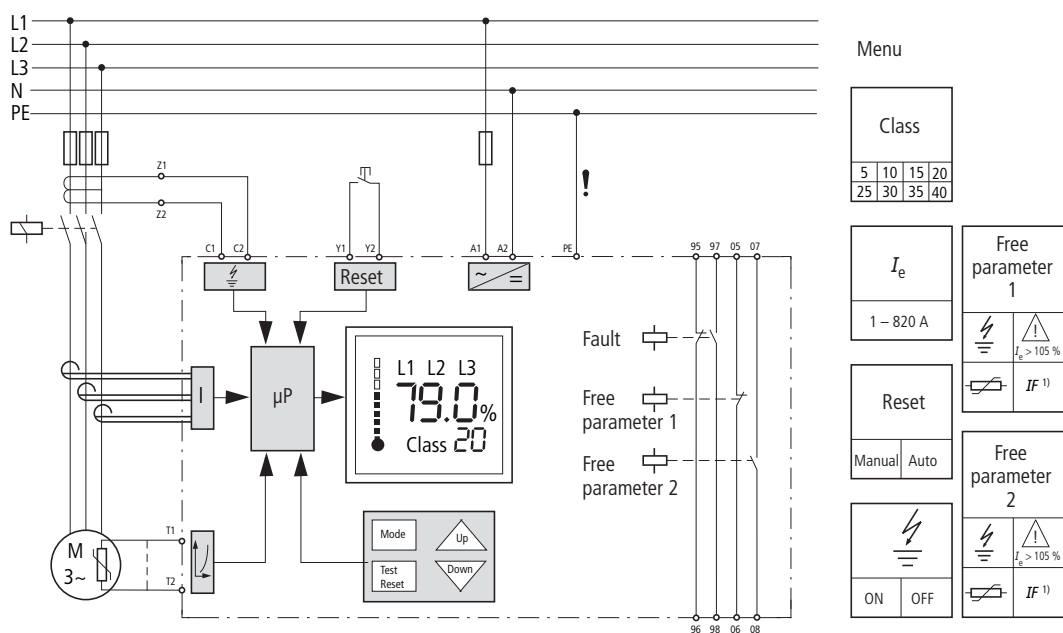
Information relevant for export to North America

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: -

Information relevant for export to North America

UL/CSA certification not required

Engineering



Inputs		Outputs	
A 1/A 2	Rated control voltage	95/96	NC overload/thermistor
T 1/T 2	Thermistor sensor	97/98	N/O overload/thermistor
C 1/C 2	SSW core-balance transformer	05/06	NC contact freely assignable
Y 1/Y 2	Remote reset	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 oversized 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:

Tripping 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

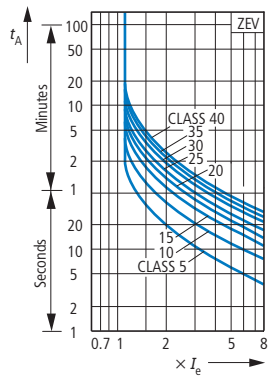
Rated motor currents < 1 A

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 ($\pm 20\%$)		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 $R = 3200 \Omega \pm 15\%$

Reset resistance $R = 1500 \Omega + 10\%$

Total PTC thermistor resistance $\sum R_K \leq 1500 \Omega$

at $R_K \leq 250 \Omega$ per sensor: 6 sensors

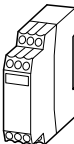
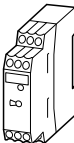
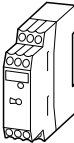
at $R_K \leq 100 \Omega$ per sensor: 9 sensors

Ready to respond after trip at 5 K under response temperature

Test button tripping time: 5 s



Ordering

Function	Rated operational current	Conventional thermal current	Rated control voltage	Part no. Article no.	Price See price list	Std. pack	Notes
	AC-15 240 V	AC-14 400 V					
	I _e A	I _e A	I _{th} A	U _s V			
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   II (2) G 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

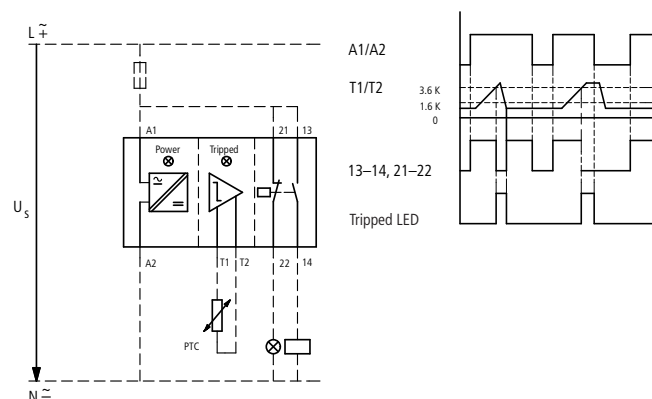


UL/CSA certification not required

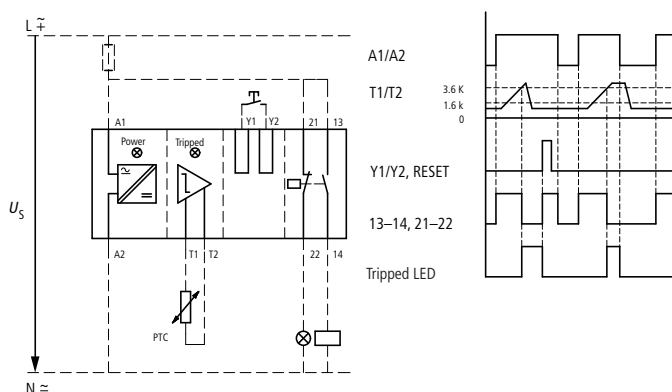
Engineering

Terminal marking according to EN 50005

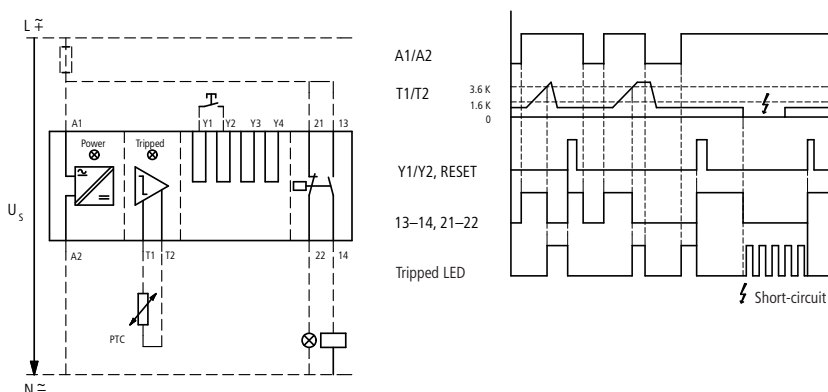
EMT6(-K), EMT6(-K)DB, EMT6-DBK
Auto



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

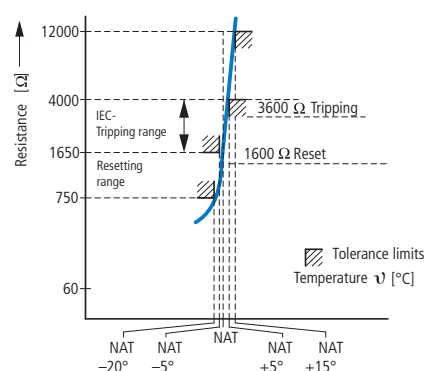
At $R_K \leq 250 \Omega$ per sensor: 6 sensors, at $R_K \leq 100 \Omega$ per sensor: 9 sensors in the winding (provided by user), max. cable length to sensor 250 m (not shielded);
Total PTC thermistor resistance $\sum R_K \leq 1500 \Omega$

Sensor circuit characteristic values at U_s and $+20^\circ\text{C}$

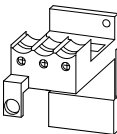
R_{T1-T2}	EMT6... U_{T1-T2} V DC max.	I_{T1-T2} mA max.
T1, T2 short-circuited	-	1.9
4 k Ω	3	0.8
T1-T2 open	5.1	-

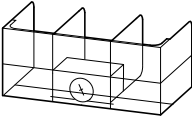
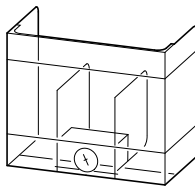
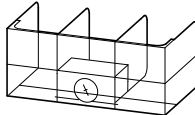
Functions that can be disconnected on the EMT6-DBK:

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 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: -
	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 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking UL File No. E29184 UL CCN NKCR CSA File No. 012528 CSA Class No. 3211-03 NA Certification 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 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking UL File No. E29184 UL CCN NKCR CSA File No. 012528 CSA Class No. 3211-03 NA Certification 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	

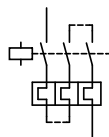
For use with			Part no. Article no.	Price See price list	Std. pack	Notes		
Covers								
	Direct mounting Z5-.../FF225 to DILM185A DILM225A		Z5/FF225A-XHB-Z 139579		1 off	Fitted directly to the contactor		
		DILM400 -XHB						
		DILM185A/ 225A						
		Z5/FF225A -XHB-Z						
		Z5-.../FF225A						
		Z5/FF250 -XHB						
	Z5-.../FF225A Z5-.../FF250		Z5/FF250-XHB 215217		1 off	Separate mounting	Fitted directly to the contactor	Fitted directly to the contactor
		Z5/FF250 -XHB				DILM400 -XHB	DILM400 -XHB	
		Z5-.../FF250/ FF225A				DILM250/ 300A	DILM185A/ 225A	
		Z5/FF250 -XHB				Z5/FF250 -XHB-Z	Z5/FF225A -XHB-Z	
						Z5-.../FF250	Z5-.../FF225A	
			Z5/FF250 -XHB	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.		



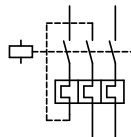
Engineering

Protection of single-phase and DC current motors:

1 pole

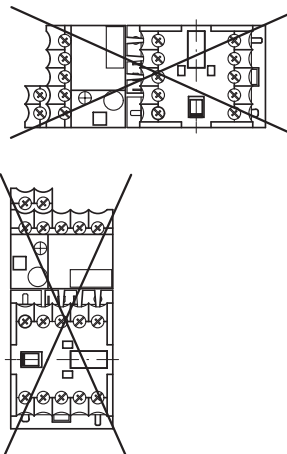


2 pole

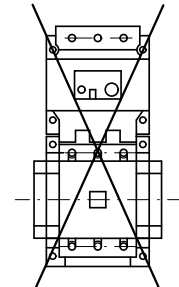


Mounting position:

ZE



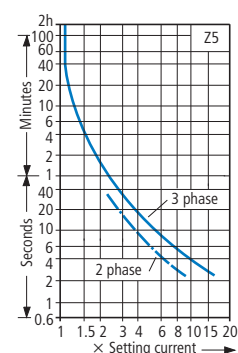
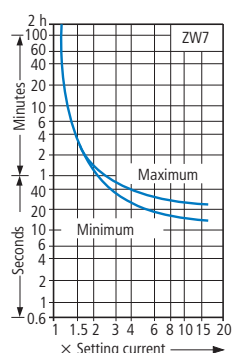
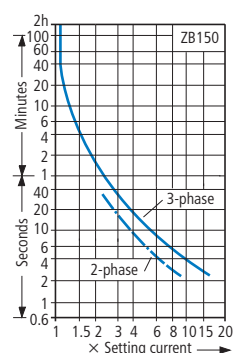
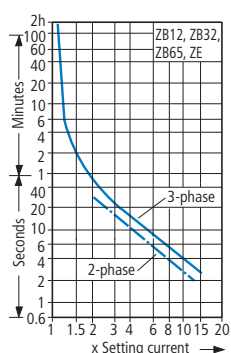
ZB12, ZB32, ZB65, ZB150, Z5



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 x (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 mm², 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	0.8
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27				g	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	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				Ø	mm
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

Notes¹⁾ Making and breaking conditions to DC-13, time constant as stated²⁾ See transparent overlay "Fuses" for time/current characteristics (please enquire)³⁾ Rated operational current DC-13, 60 V: N/O auxiliary contact 0.6 A⁴⁾ With opposite polarity⁵⁾ 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		mm ²	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		mm ²	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 (0.75 - 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



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 mm², 0.75 and 1 mm², 1 and 1.5 mm²

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

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	Ø	mm	6	13	21	110

Notes¹⁾ Operating range to IEC/EN 60947, PTB: -5°C to +50°C²⁾ 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

Dimensions

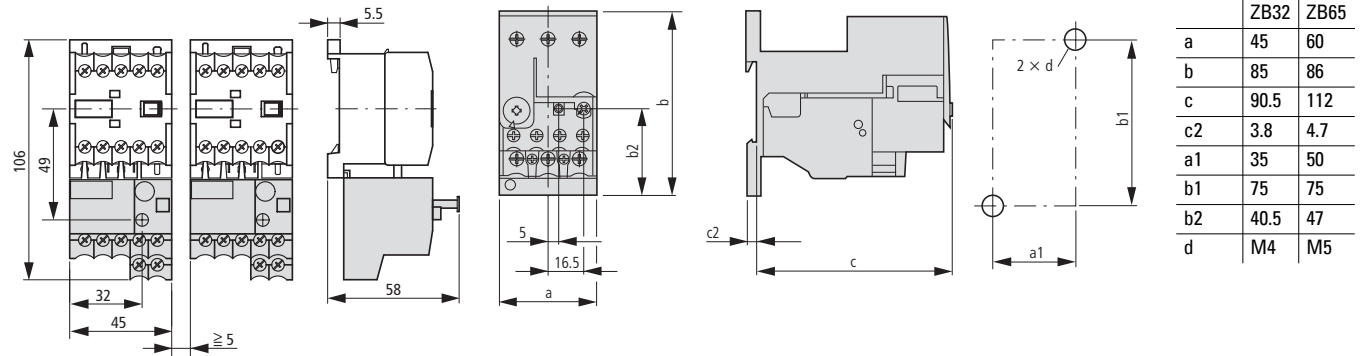
Overload relays

ZE-...

Base

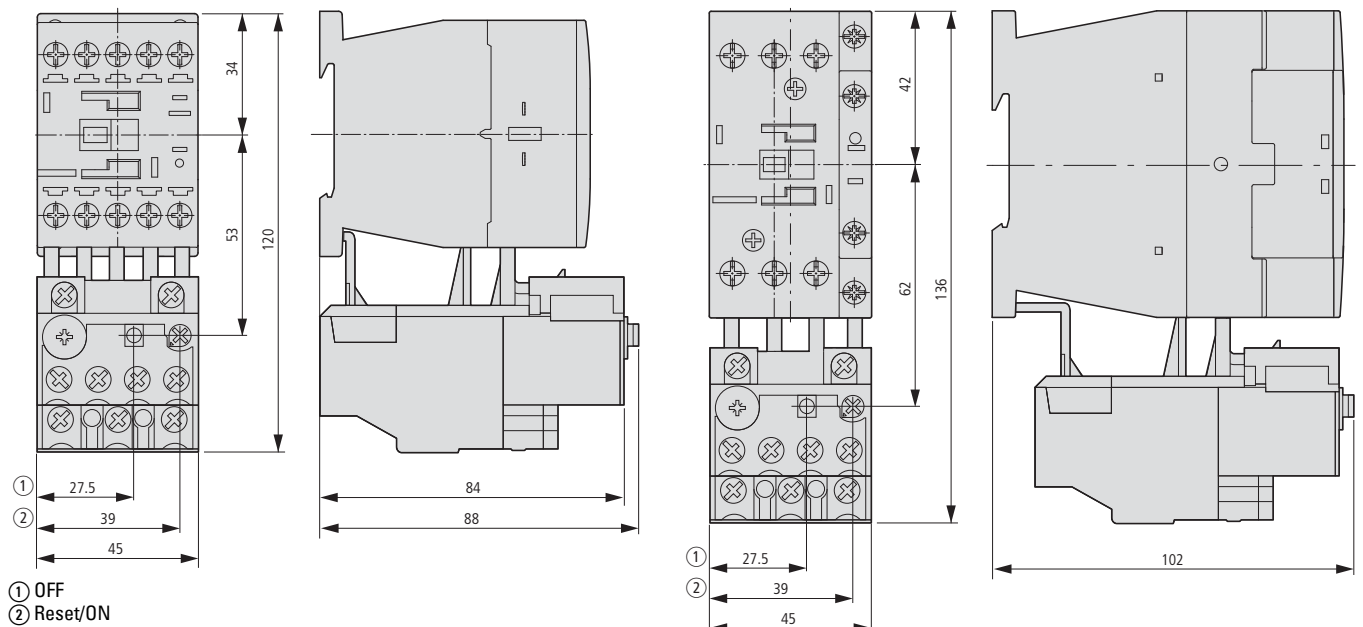
ZB32-XEZ

ZB65-XEZ



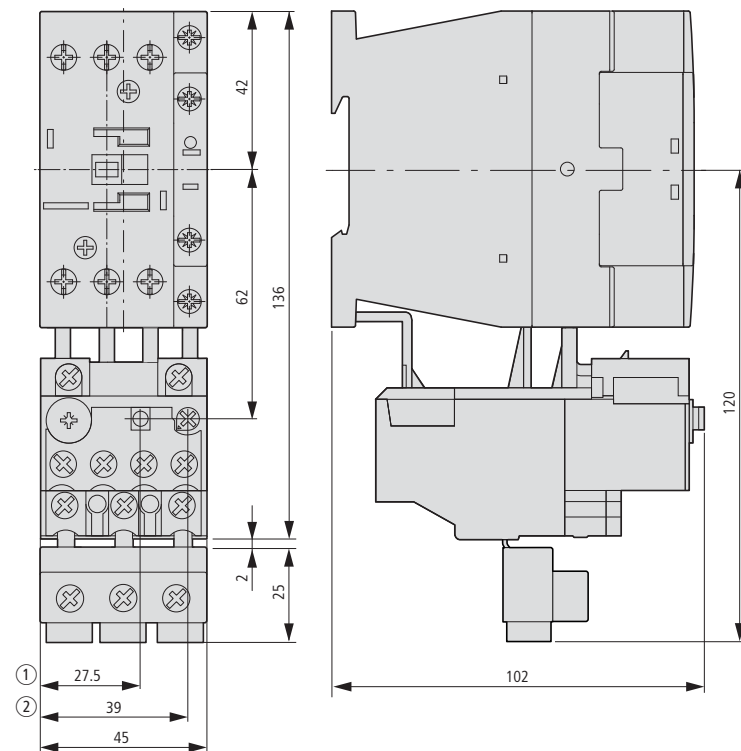
ZB12

ZB32



ZB32-38

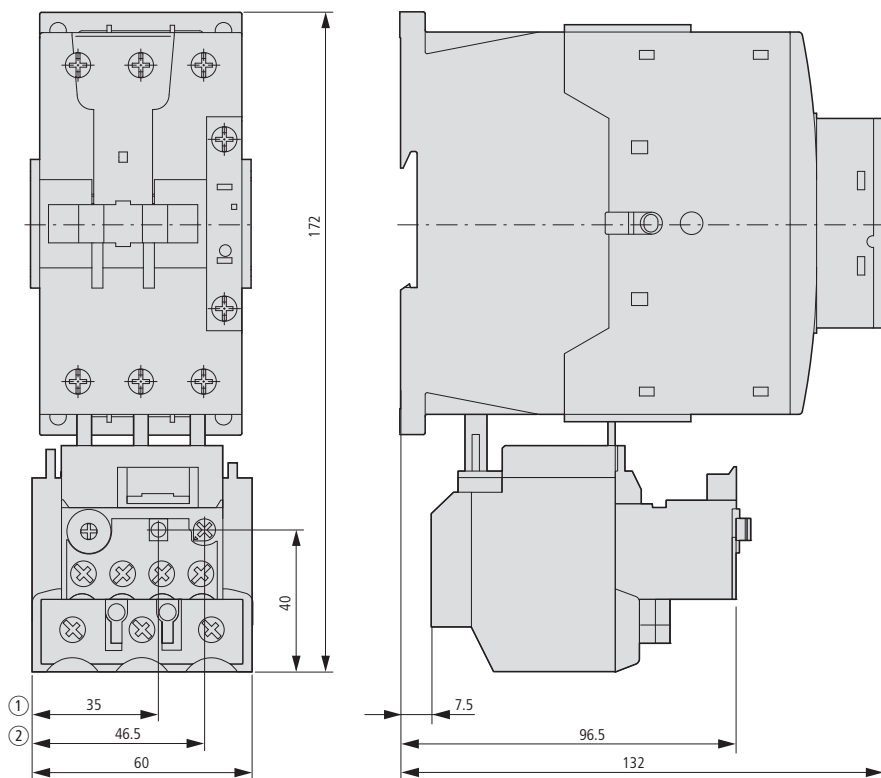
① OFF
② Reset/ON



Overload relays

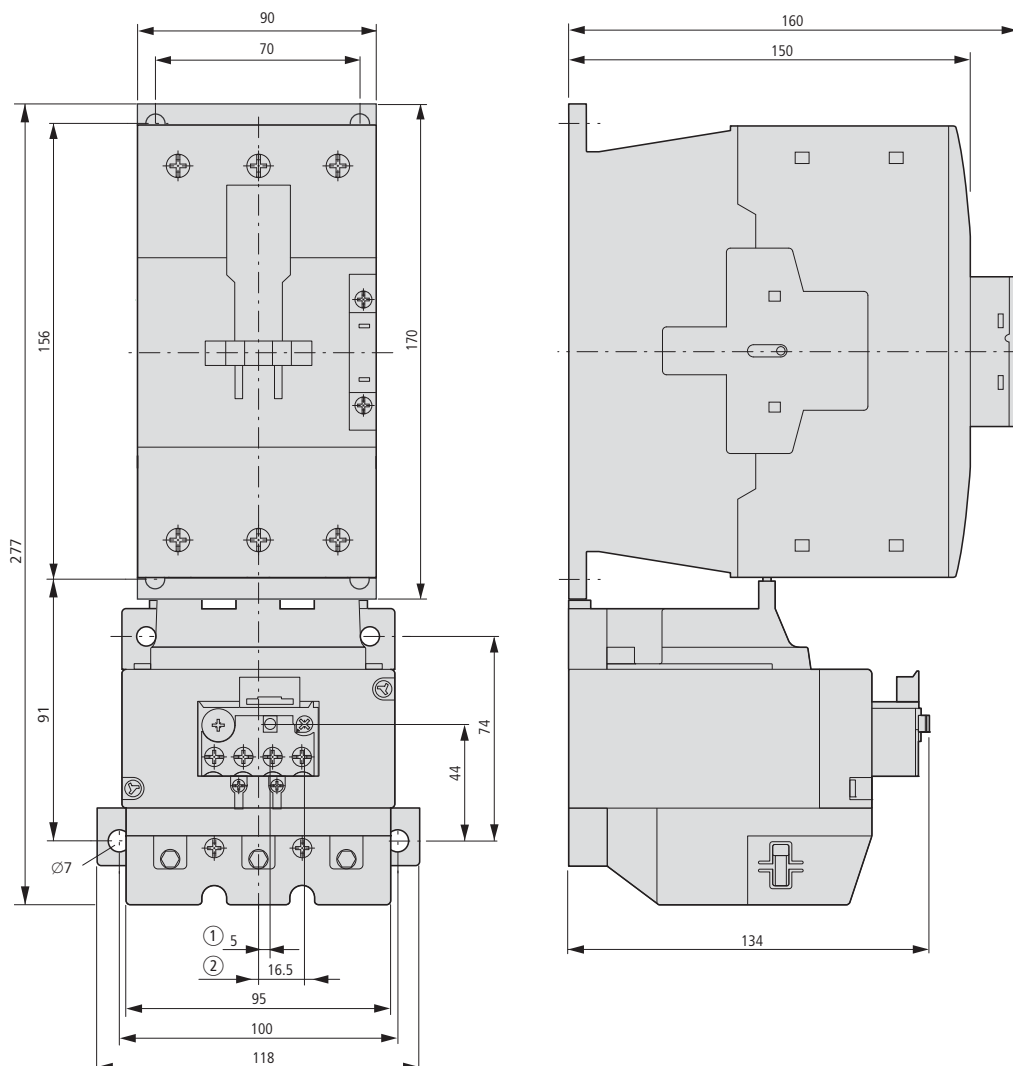
ZB65

- ① OFF
② Reset/ON



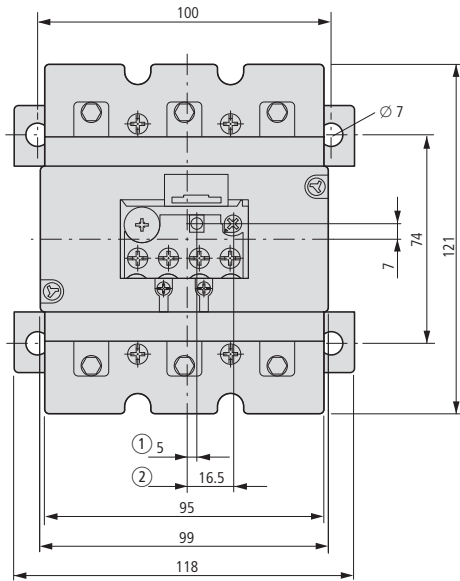
ZB150

- ① OFF
② Reset/ON



Overload relays

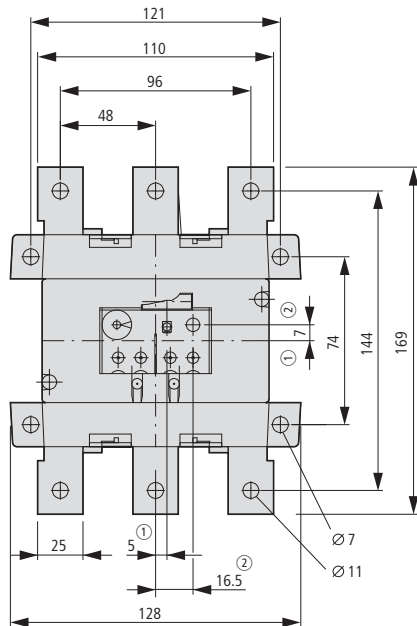
ZB150-50/KK



- ① OFF
- ② Reset/ON

Z5 overload relays greater than 150A

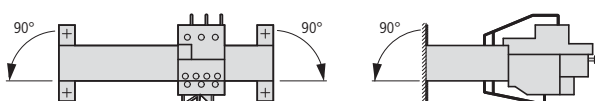
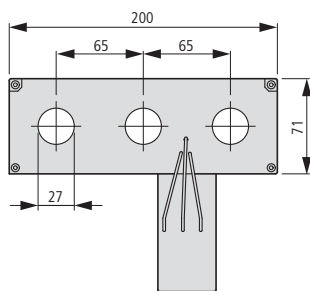
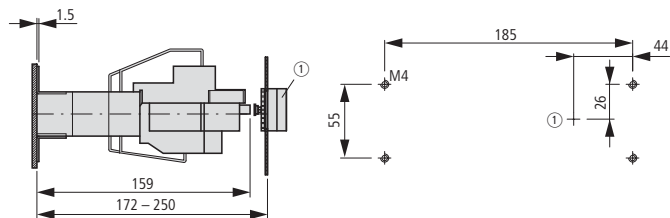
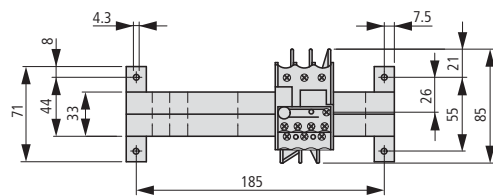
Z5-.../FF250



- ① OFF
- ② Reset/ON

Current transformer-operated overload relays

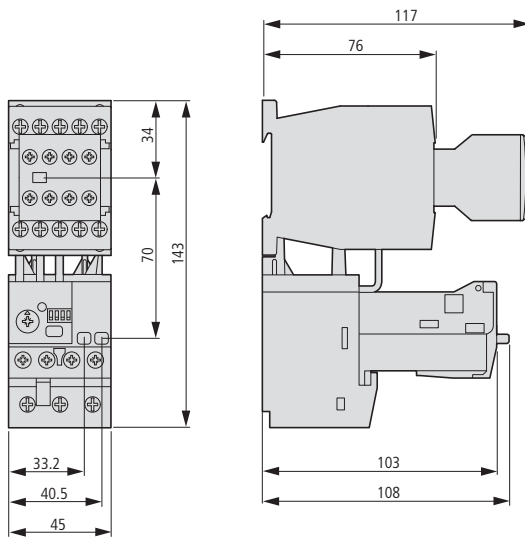
ZW7-...



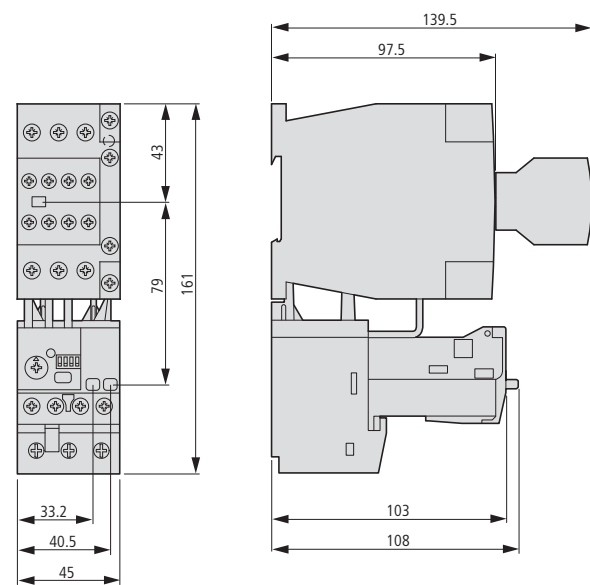
- ① Reset/ON

Electronic overload relays

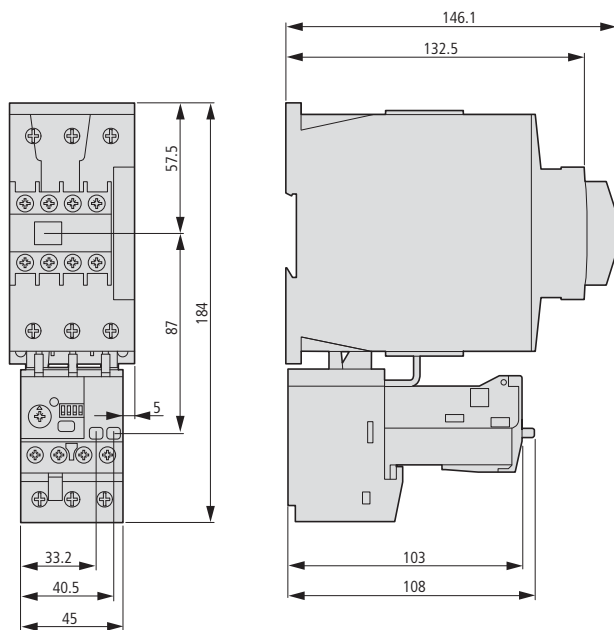
ZEB12



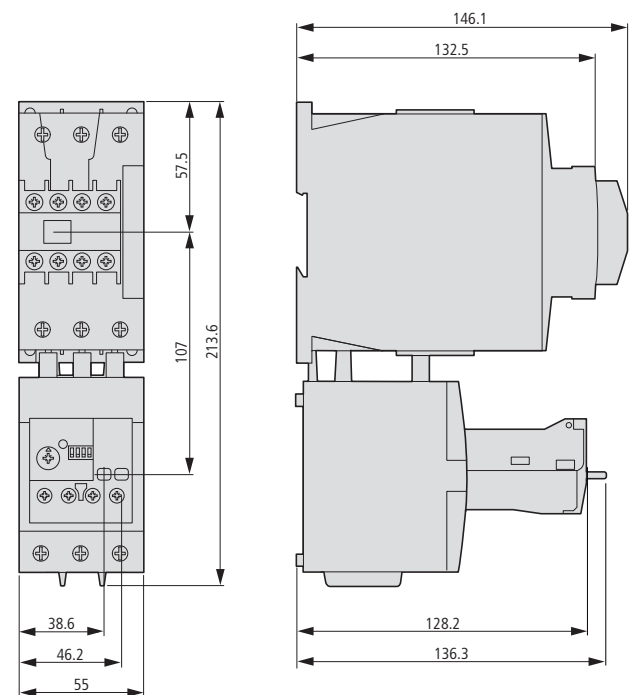
ZEB32



ZEB65-45

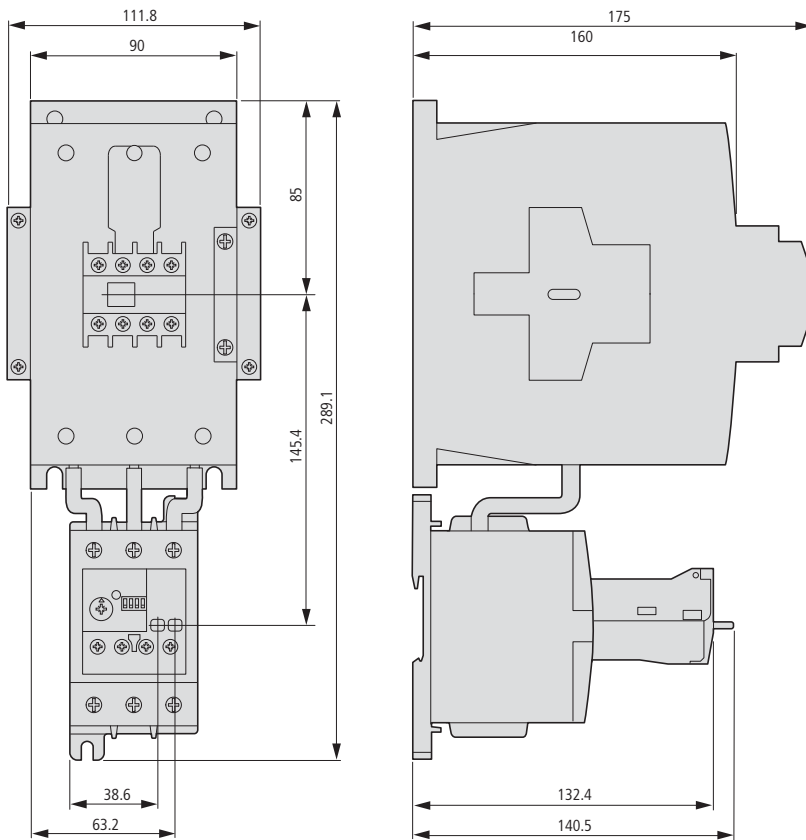


ZEB65-100

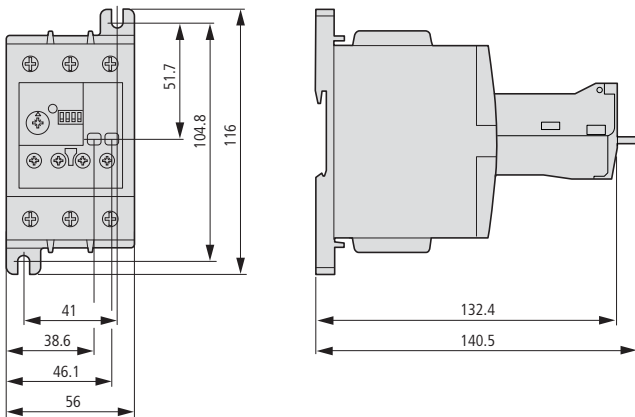


Electronic overload relays

ZEB150-100

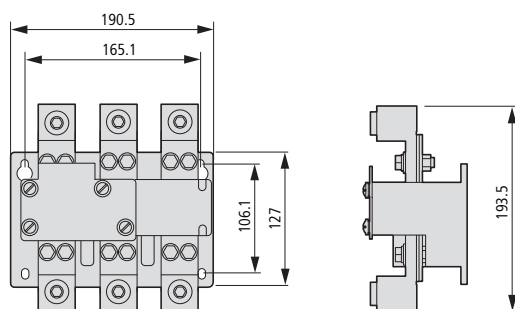


ZEB150-100/KK

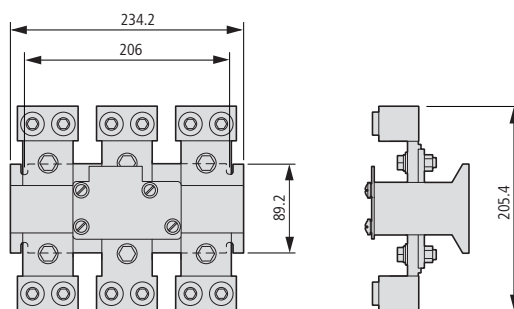


Current sensors

ZEB-XCT300

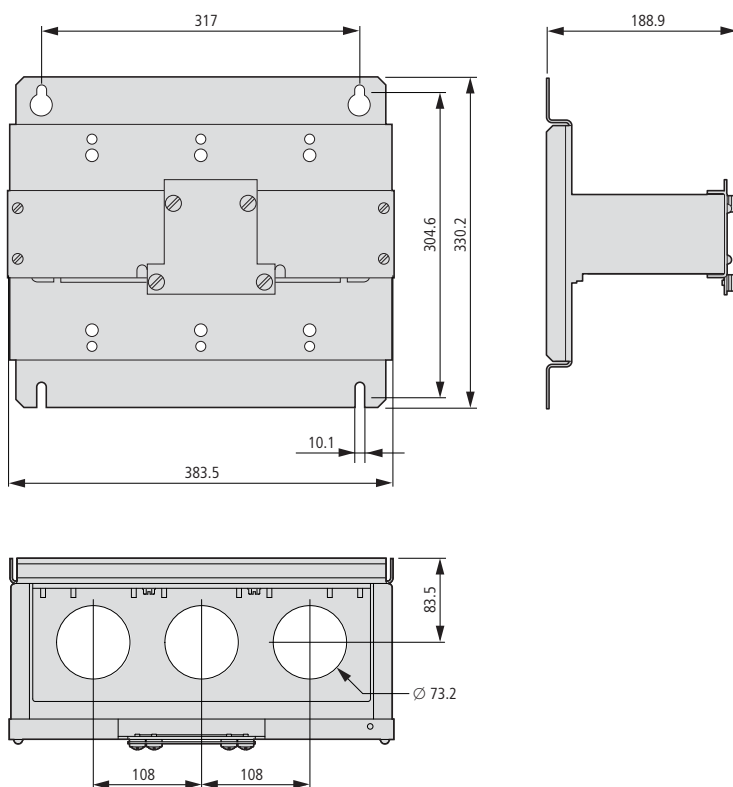


ZEB-XCT600



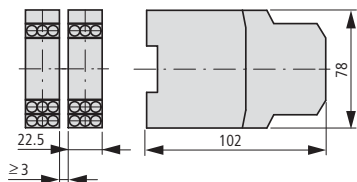
ZEB-XCT1000

ZEB-XCT1500



EMT6 thermistor overload relays for machine protection

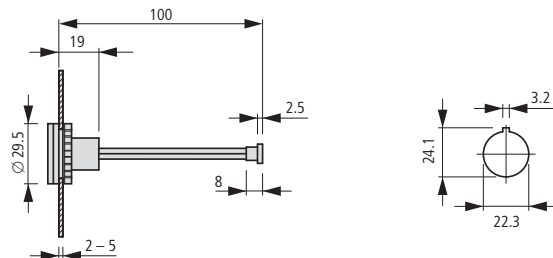
EMT6...



External reset button

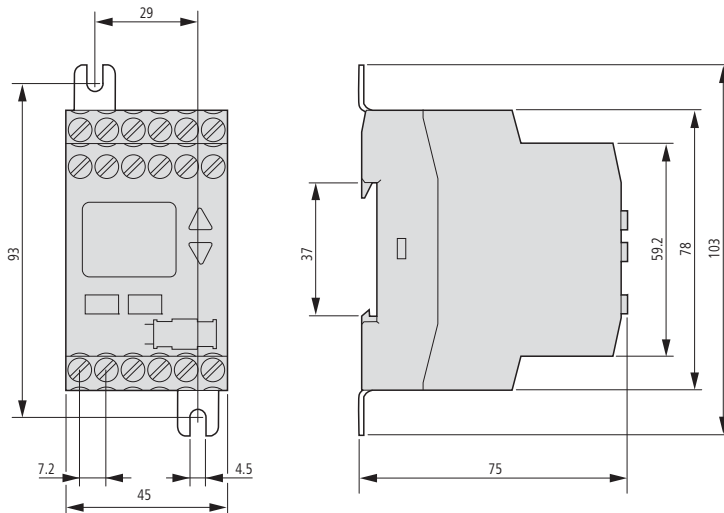
M22-DZ-B

M22-DZ-X



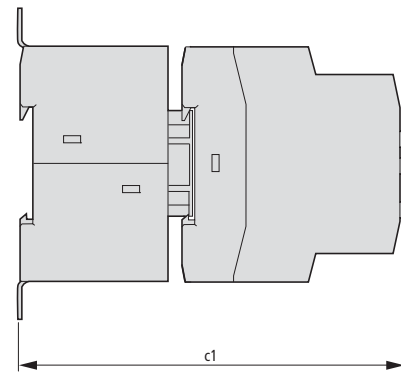
Electronic overload relays

ZEV



Electronic overload relays

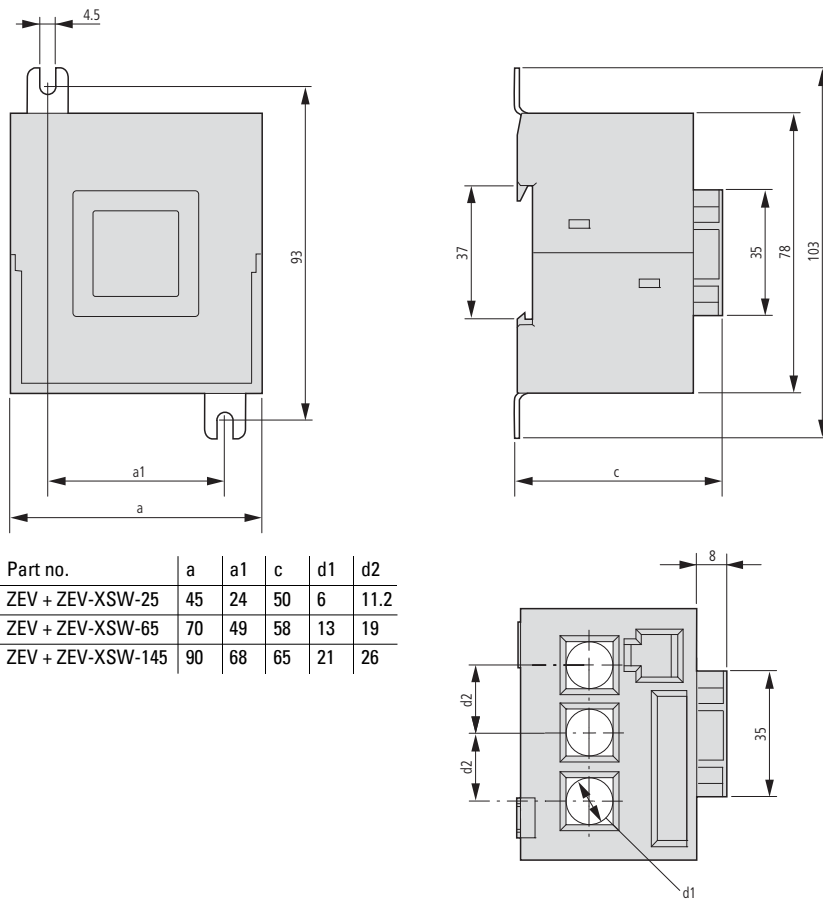
ZEV + ZEV-XSW-...



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

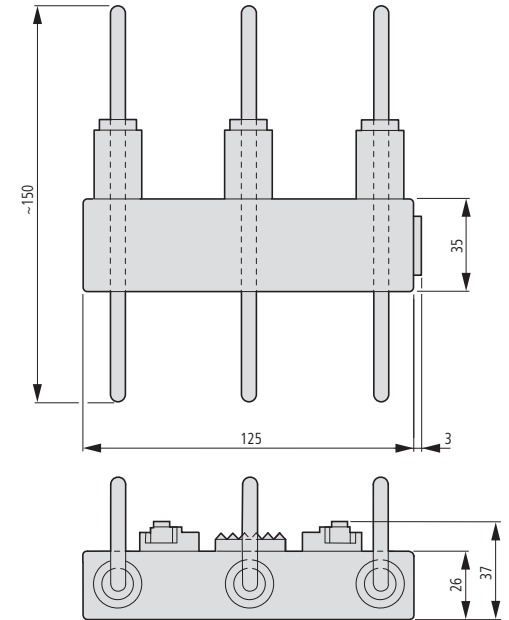
Current sensors

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

