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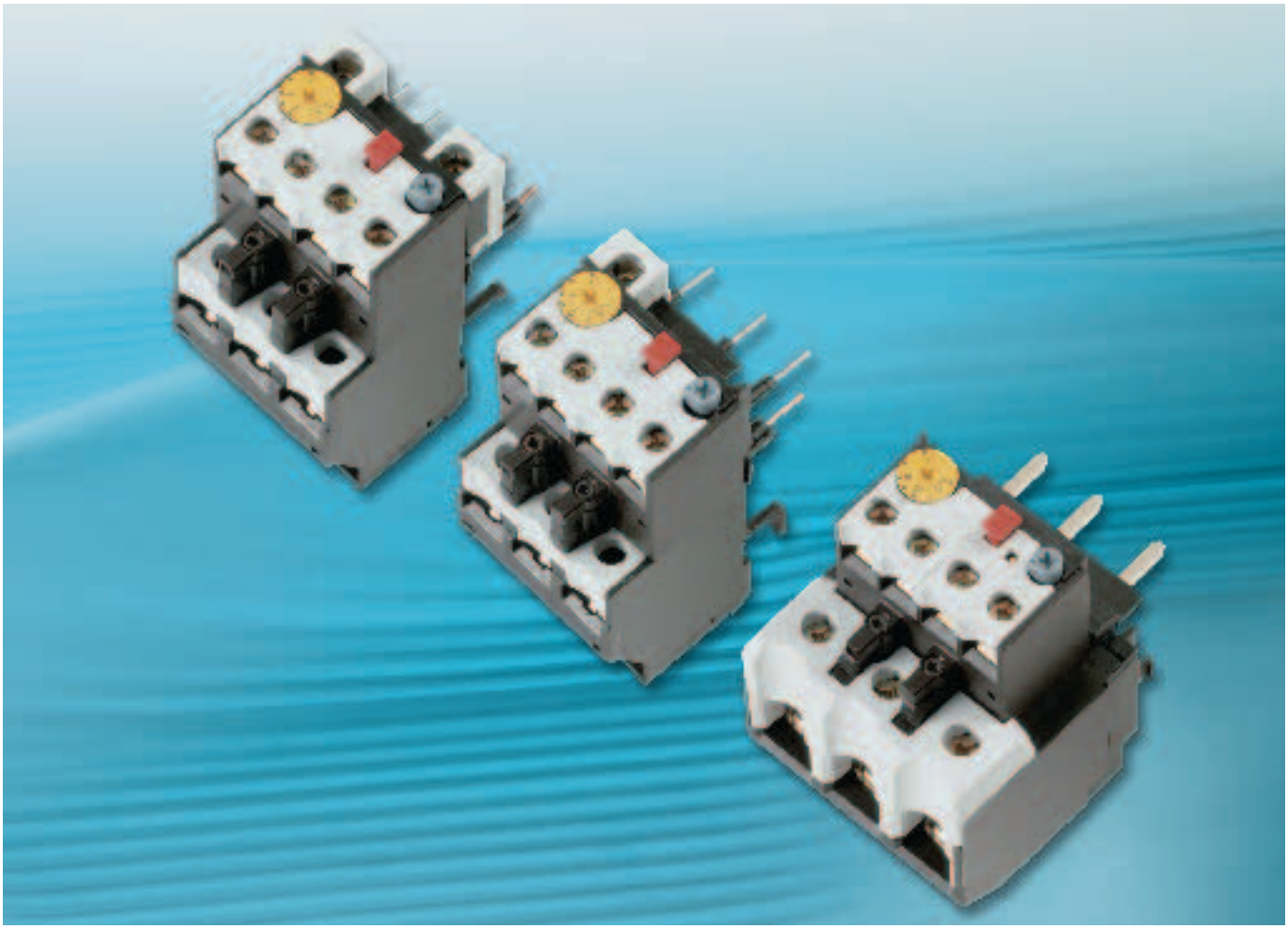
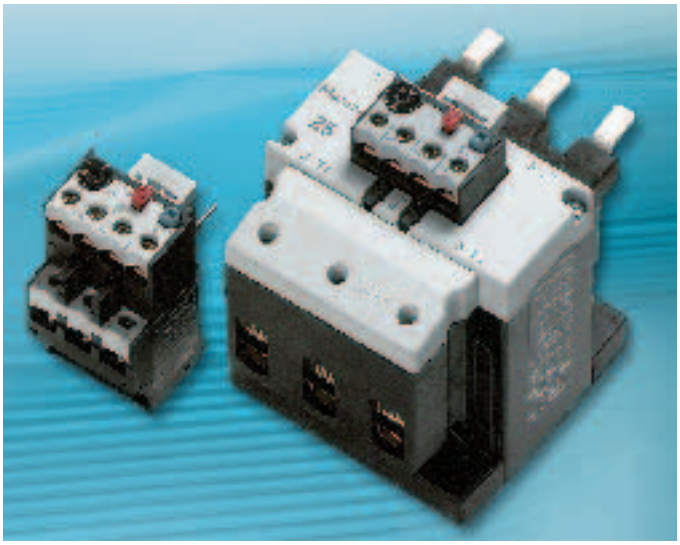
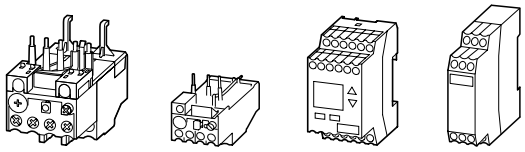




Overload relays



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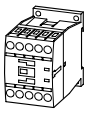
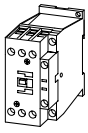
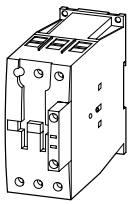
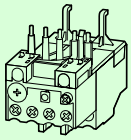
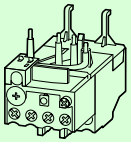
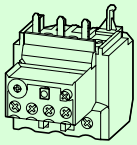
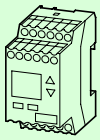
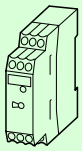
Setting ranges (A) (Note max. current of the contactor)	 **DILM7 DILM9 DILM12**	 **DILM17 DILM25 DILM32**	 **DILM40 DILM50 DILM65**
Overload relays			
ZB12[1] 0.1 – 12			
ZB32[1] 0.1 – 32			
ZB65[2] 6 – 65			
Electronic motor-protective relay			
ZEV 1 – 820			
Thermistor overload relays for machine protection			
EMT6((DB)K)			

Notes
[1] Available from June 2004
[2] Available from December 2004

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Setting ranges (A) (Note max. current of the contactor)	DILEEM DILEM	00M 00AM	0M 0AM	1M 1AM	2M 2AM	3M80 3AM85	4M115 4AM145	M185 M225 M250	M300 M400 M500	M580 M650	M750 M820 M1000
Overload relays											
ZE 0.1 – 9											
Z00 0.1 – 24											
Z1 6 – 75											
Z5-.../...K3 25 – 100											
Z5-.../...K4 35 – 150											
Z5-.../FF250 50 – 250											
Current transformer-operated overload relay											
ZW7-...[1] 42 – 630											
Electronic motor-protective relay											
ZEV[2] 1 – 820											
Thermistor overload relays for machine protection											
EMT6((DB)K)											

Notes
1) Can only be used up to DILM580
2) Can only be used up to DILM820

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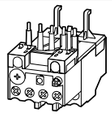
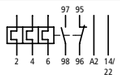
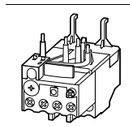
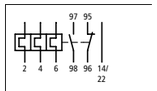
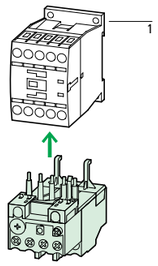
	Setting range Overload releases I_r A	Contact sequence	Auxiliary contacts M = Make	B = Break	For use with	Short-circuit protection Type "1" coordination gG/gL A	Type "2" coordination gG/gL A	Type Article no.	Price See Price List	Std. pack	Notes
ZB12 overload relay											
Phase failure sensitivity to IEC/EN 60947 For direct mounting											
	0.1 – 0.16		1 M	1 B	DILM7, DILM9, DILM12, DIULM7, DIULM9, DIULM12, SDAINLM12, SDAINLM16, SDAINLM22	25	0.5	**ZB12-0,16** 278431		1 off	Overload release: tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. Suitable for protection of EEx e-motors. EC prototype test certification on request.
	0.16 – 0.24						1	**ZB12-0,24** 278432			
	0.24 – 0.4						2	**ZB12-0,4** 278433			
	0.4 – 0.6						4	**ZB12-0,6** 278434			
	0.6 – 1						4	**ZB12-1,0** 278435			
	1 – 1.6						6	**ZB12-1,6** 278436			
	1.6 – 2.4						10	**ZB12-2,4** 278437			
	2.4 – 4						16	**ZB12-4** 278438			
	4 – 6						20	**ZB12-6** 278439			
	6 – 10					50	25	**ZB12-10** 278440			
	9 – 12					50	25	**ZB12-12** 278441			
ZB32 overload relay											
Phase failure sensitivity to IEC/EN 60947 For direct mounting											
	0.1 – 0.16		1 M	1 B	DILM17, DILM25, DILM32, DIULM17, DIULM25, DIULM32 SDAINLM30, SDAINLM45, SDAINLM55	25	0.5	**ZB32-0,16** 278442		1 off	Overload release: tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. Suitable for protection of EEx e-motors. EC prototype test certification on request.
	0.16 – 0.24						1	**ZB32-0,24** 278443			
	0.24 – 0.4						2	**ZB32-0,4** 278444			
	0.4 – 0.6						4	**ZB32-0,6** 278445			
	0.6 – 1						4	**ZB32-1,0** 278446			
	1 – 1.6						6	**ZB32-1,6** 278447			
	1.6 – 2.4						10	**ZB32-2,4** 278448			
	2.4 – 4						16	**ZB32-4** 278449			
	4 – 6						20	**ZB32-6** 278450			
	6 – 10					50	25	**ZB32-10** 278451			
	10 – 16					63	35	**ZB32-16** 278452			
	16 – 24					100	35	**ZB32-24** 278453			
	24 – 32					125	63	**ZB32-32** 278454			

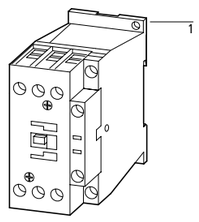
Notes

Fitted directly to the contactor

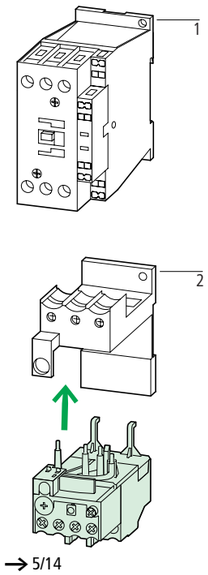


1 Contactor → 5/14

Fitted directly to the contactor



Separate mounting



1 Contactor → 5/14
2 Bases → 6/20

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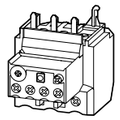
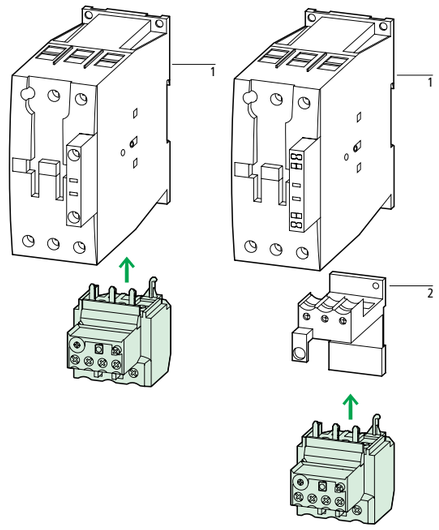
	Setting range Overload releases I_r A	Contact sequence	Auxiliary contacts M = Make	B = Break	For use with	Short-circuit protection Type "1" coordination gG/gL A	Type "2" coordination gG/gL A
ZB65 overload relays							
Phase failure sensitivity to IEC/EN 60947 For direct mounting							
	6 – 10		1 M	1 B	DILM40, DILM50, DILM65, DIULM40, DIULM50, DIULM65	50	25
	10 – 16					63	35
	16 – 24					63	50
	24 – 40					125	63
	40 – 57					160	80
	50 – 65					160	100

Type Article no.	Price See Price List	Std. pack		Notes
				ZB65 availability from December 2004
ZB65-10 278455		1 off	Overload release: tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. Suitable for protection of EEx e-motors. EC prototype test certification on request.	Fitted directly to the contactor / Separate mounting
ZB65-16 278456				
ZB65-24 278457				
ZB65-40 278458				
ZB65-57 278459				
ZB65-65 278460				



1 Contactor → 5/14
2 Bases → 6/20

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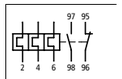
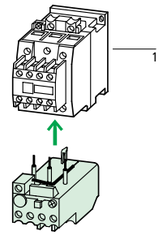
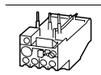
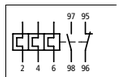
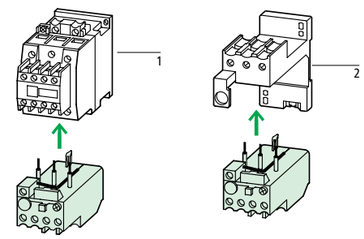
	Overload releases I_r A	Contact sequence	Auxiliary contacts M = Make	B = Break	For use with	Short-circuit protection Type "1" coordination gG/gL A	Type "2" coordination gG/gL A	Type Article no.	Price See Price List	Std. pack		Notes
ZE overload relay												
Phase failure sensitivity to IEC/EN 60947 For direct mounting Ex PTB 01 ATEX 3331												
	0.1 – 0.16		1 M	1 B	DILE(E)M DIULE(E)M/21/MV SDAINLEM	20	0.5	**ZE-0,16** 014263		5 off	–	Overload release: Tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. Ex Observe manual AWB2300-1425G. When fitted directly to the contactor a clearance of at least 5 mm is required between the overload relays.  1 Contactor → 5/14 Accessories → 6/20 Manual → 6/20
	0.16 – 0.24					20	1	**ZE-0,24** 014285				
	0.24 – 0.4					20	2	**ZE-0,4** 014300				
	0.4 – 0.6					20	2	**ZE-0,6** 014333				
	0.6 – 1					20	4	**ZE-1,0** 014376				
	1 – 1.6					20	6	**ZE-1,6** 014432				
	1.6 – 2.4					20	6	**ZE-2,4** 014479				
	2.4 – 4					20	10	**ZE-4** 014518				
	4 – 6					20		**ZE-6** 014565				
	6 – 9					20		**ZE-9** 014708				
Z00 overload relays												
Phase failure sensitivity to IEC/EN 60947 For direct mounting Ex PTB 02 ATEX 3165												
	0.1 – 0.16		1 M	1 B	DIL00(A)(B)M, DIL0(A)M, DIUL00(A)M/11, DIUL0(A)M/11, SDAINL00(A)M, SDAINL0(A)M	25	0.5	**Z00-0,16** 048313		1 off	–	Overload release: Tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. Ex Observe manual AWB2300-1476D/GB. **Fitted directly to the contactor** **Separate mounting**  1 Contactor → 5/14 2 Bases → 6/20 Accessories → 6/20 Manual → 6/20
	0.16 – 0.24					25	1	**Z00-0,24** 050686				
	0.24 – 0.4					25	2	**Z00-0,4** 053059				
	0.4 – 0.6					25	4	**Z00-0,6** 055432				
	0.6 – 1					25	4	**Z00-1,0** 057805				
	1 – 1.6					25	6	**Z00-1,6** 060178				
	1.6 – 2.4					25	10	**Z00-2,4** 062551				
	2.4 – 4					25	16	**Z00-4** 064924				
	4 – 6					25	20	**Z00-6** 067297				
	6 – 10					50	25	**Z00-10** 069670				
	10 – 16					63	35	**Z00-16** 072043				
	16 – 24					63	50	**Z00-24** 074416				

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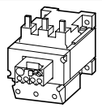
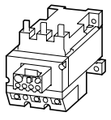
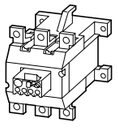
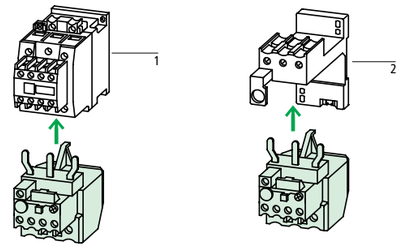
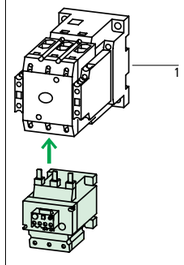
	Overload releases I_r A	Contact sequence	Auxiliary contacts M = Make	B = Break	For use with	Short-circuit protection Type "1" coordination gG/gL A	Type "2" coordination gG/gL A	Type Article no.	Price See Price List	Std. pack		Notes
Z1 overload relays												
Phase failure sensitivity to IEC/EN 60947												
PTB 02 ATEX 3165												
For direct mounting	6 – 10		1 M	1 B	DIL1(A)M DIL2(A)M DIUL1AM/11 DIUL2AM/11 SDAINL1(A)M SDAINL2(A)M	50	25	**Z1-10** 076789		1 off	–	Overload release: tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. Observe manual AWB2300-1476D/GB.
	10 – 16					63	35	**Z1-16** 079162				
	16 – 24					63	50	**Z1-24** 081535				
	24 – 40					125	80	**Z1-40** 083908				
	40 – 57					160	100	**Z1-57** 020257				
	50 – 63					160	100	**Z1-63** 086281				
Separate mounting	60 – 75		1 M	1 B	DIL1(A)M DIL2(A)M DIUL1AM/11 DIUL2AM/11 SDAINL1(A)M SDAINL2(A)M	250	160	**Z1-75** 065598		1 off	–	
Z5 Overload relays												
Phase failure sensitivity to IEC/EN 60947												
For direct mounting 	25 – 35		1 M	1 B	DIL3M80 DIL3AM85 DIUL3M80/11 DIUL3AM85/11 SDAINL3M125 SDAINL3AM150	125	100	**Z5-35/SK3** 071573		1 off	PTB 02 ATEX 3165	Overload release: Tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor. Observe manual AWB2300-1476D/GB.
	35 – 50					160	125	**Z5-50/SK3** 071572				
	50 – 70					250	160	**Z5-70/SK3** 071571				
	70 – 100					250	160	**Z5-100/SK3** 071570				
	35 – 50				DIL4M115 DIL4AM145 DIUL4M115/11 DIUL4AM145/11 SDAINL4M180 SDAINL4AM250	160	125	**Z5-50/SK4** 071565				
	50 – 70					250	160	**Z5-70/SK4** 071564				
	70 – 100					315	200	**Z5-100/SK4** 071563				
	95 – 125					315	250	**Z5-125/SK4** 071562				
	120 – 142					315	250	**Z5-150/SK4** 046556				
	50 – 70				DILM185 DILM225 DILM250	250	160	**Z5-70/FF250** 210070			–	
	70 – 100					315	200	**Z5-100/FF250** 210071				
	95 – 125					315	250	**Z5-125/FF250** 210072				
	120 – 160					400	250	**Z5-160/FF250** 210073				
	160 – 220					400	315	**Z5-220/FF250** 210074				
	200 – 250					400	315	**Z5-250/FF250** 210075				

Fitted directly to the contactor / **Separate mounting**



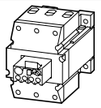
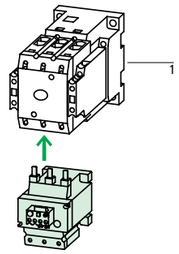
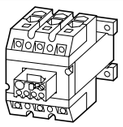
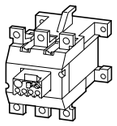
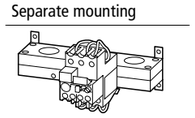
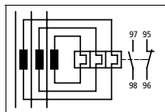
1 Contactor → 5/14
2 Bases → 6/20
Accessories → 6/20
Manual → 6/20

Fitted directly to the contactor



1 Contactor → 5/14
Accessories → 6/20
Manual → 6/20

Moeller HPL0211-2004/2005

	Overload releases I_r A	Contact sequence	Auxiliary contacts M = Make	B = Break	Short-circuit protection Type "1" coordination A gL/gG A	Type "2" coordination A gL/gG A	Type Article no.	Price See Price List	Std. pack			Notes
Z5 Overload relays												
Phase failure sensitivity to IEC/EN 60947												
Separate mounting												
	25 – 35		1 M	1 B	125	100	**Z5-35/KK3** 071569		1 off	Ex PTB 02 ATEX 3165	Overload release: tripping class 10 A Short-circuit protection: Observe the maximum permissible fuse of the contactor. Ex Observe manual AWB2300-1476D/GB.	**Z5: fitted directly to the contactor**  1 Contactor → 5/14 Accessories → 6/20 Manual → 6/20
	35 – 50				160	125	**Z5-50/KK3** 071568					
	50 – 70				250	160	**Z5-70/KK3** 071567					
	70 – 100				315	200	**Z5-100/KK3** 071566					
	35 – 50				160	125	**Z5-50/KK4** 071560					
	50 – 70				250	160	**Z5-70/KK4** 071559					
	70 – 100				315	200	**Z5-100/KK4** 071558					
	95 – 125				315	250	**Z5-125/KK4** 071557					
	120 – 150				315	250	**Z5-150/KK4** 046555					
	50 – 70				250	160	**Z5-70/FF250** 210070			–		
	70 – 100				315	200	**Z5-100/FF250** 210071					
	95 – 125				315	250	**Z5-125/FF250** 210072					
	120 – 160				400	250	**Z5-160/FF250** 210073					
	160 – 220				500	400	**Z5-220/FF250** 210074					
	200 – 250				500	400	**Z5-250/FF250** 210075					
ZW7 current transformer-operated overload relay												
Separate mounting												
	42 – 63		1 M	1 B	–	–	**ZW7-63** 000245		1 off	–	–	The main current parameters are defined by the main current wiring which is used.
	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					

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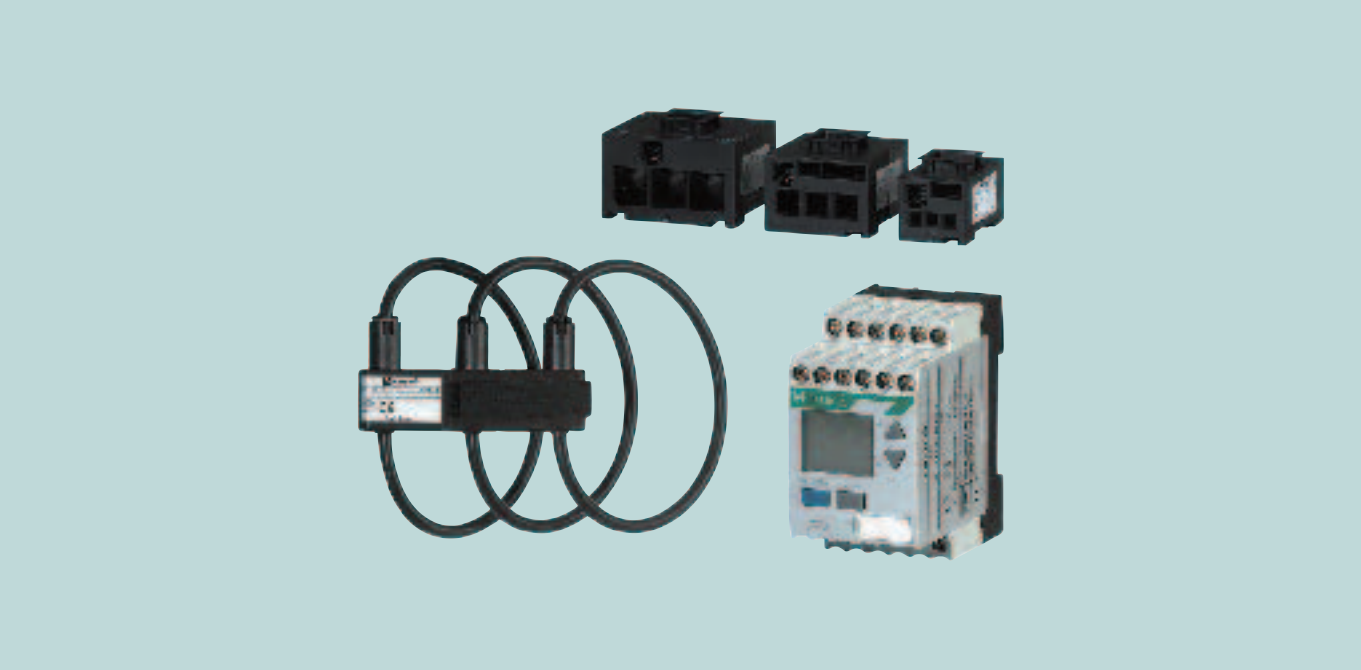
ZEV – the revolutionary overload relay for motor currents from 1 – 820 A



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 economical. All Z overload relays provide the standard functions: protection in the event of phase failure, overload, or current imbalance. The innovative ZEV motor-protective system from Moeller can now do all these things and much more:

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 40 seconds. Protection for any motor starting situation can be optimally set by preselecting one of the eight tripping classes between 5 and 40 seconds. An earth fault is quickly detected by the external core-balance transformers. The integrated thermistor connection allows the relay to be upgraded to provide a full motor-protective system.

Operation

The LCD display guides the user through the setting menus and ensures straight-forward operation. In the event of a fault, the display shows the cause of the fault and enables rapid fault identification.
Additional signal cables can be implemented via the freely configurable auxiliary contacts 05-06 and 07-08.
They can each be assigned one of the following functions:

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

Engineering

The multi-voltage module automatically adapts to different voltages from 24 – 240 V, 50/60 Hz, and 24 – 240 V DC, thus enabling flexible application with all conventional control voltages.

Mounting

Ring-type 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 incomers.
A main current wiring system and complex cable matching for an additional device are no longer necessary, neither is the drilling of the mounting plate. Instead, the sensors are simply fastened 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.

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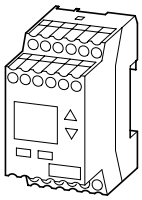
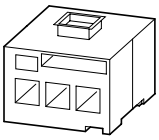
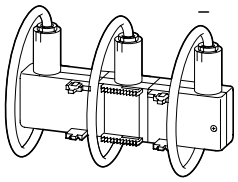
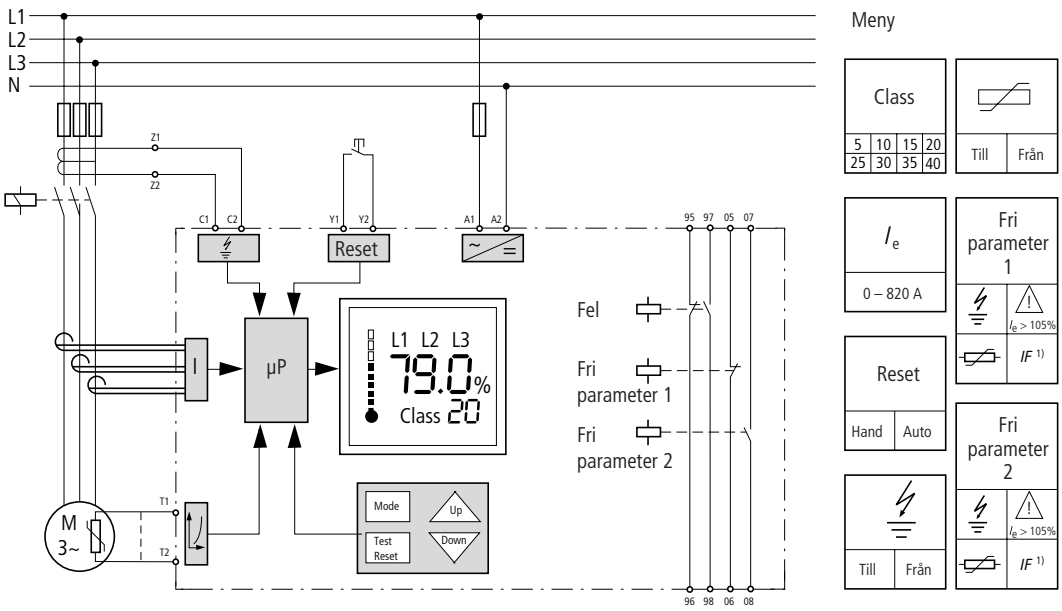
	Length mm	Diameter ∅ mm	Overload releases I_r A	For use with	Fault current A	**Type** Article no.	**Price** See Price List	Std. pack
ZEV electronic motor-protective relay								
PTB 01 ATEX 3233								
	–	–	1 – 820	DILEEM to DILM820	–	**ZEV** 209634		1 off
Current sensors								
		6	1 – 25	DILE(E)M DIL00(A)M DIL0(A)M	–	**ZEV-XSW-25** 209635		1 off
		13	3 – 65	DIL1(A)M DIL2(A)M	–	**ZEV-XSW-65** 209636		
		21	10 – 145	DIL3M80 DIL3AM85 DIL4M115 DIL4AM145	–	**ZEV-XSW-145** 209637		
	–	110	40 – 820	DILM185 to DILM820	–	**ZEV-XSW-820** 209641		
Connecting cables								
	200	–	–	ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 ZEV-XSW-820	–	**ZEV-XVK-20** 209643		1 off
	400	–	–		–	**ZEV-XVK-40** 209644		
	800	–	–		–	**ZEV-XVK-80** 209645		
SSW core-balance transformers								
For earth-leakage monitoring 		40	–	–	0.3	**SSW40-0,3** 028286		1 off
			–	–	0.5	**SSW40-0,5** 028305		
			–	–	1	**SSW40-1** 028306		
		65	–	–	0.5	**SSW65-0,5** 028307		
		65	–	–	1	**SSW65-1** 028316		
		120	–	–	0.5	**SSW120-0,5** 028319		
		120	–	–	1	**SSW120-1** 028321		
Documentation								
ZEV motor protective relay Overload monitoring of EEx e motors								
German						**AWB2300-1433D** 259711		1 off
English						**AWB2300-1433GB** 267430		1 off
Mounting foot								
	–	–	–	ZEV ZEV-XSW-25 ZEV-XSW-65 ZEV-XSW-145 PS4-... EM4-... LE4-...	–	**ZB4-101-GF1** 061360		9 off



1) *IF*: internal fault

Inputs			Outputs	
A 1/A 2	Rated control voltage		95/96	Break contact overload/thermistor
T 1/T 2	Thermistor sensor		97/98	Make contact overload/thermistor
C 1/C 2	SSW core-balance transformers		05/06	Break contact freely assignable
Y 1/Y 2	Remote reset		07/08	Make contact freely assignable

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

The switchgear is designed for "CLASS 10" in normal and overload operation. To ensure that the switchgear (circuit-breaker and contactor) as well as the cables are not overloaded with extended tripping times, they must be over-dimensioned accordingly. The rated operational current I_e for switchgear and cables can be calculated with the following current factor while 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 for rated operational current I_e	1.00	1.00	1.22	1.41	1.58	1.73	1.89	2.00

Relays with integrated sensor

With the ZEV-XSW-25 to ZEV-XSW-145 push-through sensors, the motor incomer cables for each phase are pushed through the respective push-through openings. On motor currents which are less than 1 A, the motor incomer cables with the ZEV-XSW-25 are inserted in loops. The number of loops depends on the rated motor current involved.

Number of loops n		4	3	2
Rated motor current I_N	A	0.31 – 0.4	0.41 – 0.62	0.63 – 1.24
Current settings on relay I_E between lowest and highest value	A	1.24 – 1.6	1.23 – 1.86	1.26 – 2.48

The current setting I_E of the device is calculated as: $I_E = n \times I_N$

Tripping times for ZEV electronic motor-protective relay

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

Recovery time after overload trip
(Overview of the recovery time in min)

CLASS	5	10	15	20	25	30	35	40
$t_{recovery}$ [min]	5	6	7	8	9	10	11	12

With unbalance > 50 % and with phase failure the trip occurs in 2.5 s

Thermistor tripping

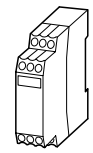
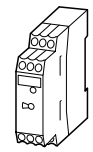
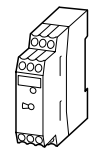
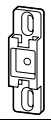
Rated trip resistance	R = 3200 Ω ±15 %
Recovery resistance	R = 1500 Ω +10 %

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

Ready to respond after trip at 5 K under response temperature

Test button tripping time: 5 s

EC prototype test certification number: PTB 01 ATEX 3233
For protection of motors in EEx e area, also order
AWB2300-1433G "ZEV motor-protective system, Overload monitoring of motors in EEX e areas".

	Description	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	**Type** Article no.	**Price** See Price List	Std. pack
Thermistor overload relays for machine protection								
	Without automatic reset Mains and fault LED display	3	3	6	24 – 240 V 50/60 Hz, 24 – 240 V DC	**EMT6** 066166		1 off
	Without automatic reset Mains and fault LED display Trip with short-circuit in the sensor cable				24 – 240 V 50/60 Hz, 24 – 240 V DC	**EMT6-K** 269470		
	Without automatic reset Mains and fault LED display				230 V 50/60 Hz	**EMT6(230V)** 066400		
	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** 066167		
	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** 269471		
	Selector switch with/without automatic reset For manual or remote resetting Test button Mains and fault LED display				230 V 50/60 Hz	**EMT6-DB(230V)** 066401		
	Multifunction 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 recognition and zero-voltage safety can be deactivated Mains and fault LED display				24 – 240 V 50/60 Hz, 24 – 240 V DC	**EMT6-DBK** 066168		
Accessories								
Screw adapter For screw fixing								
		–	–	–	–	**CS-TE** 095853		1 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

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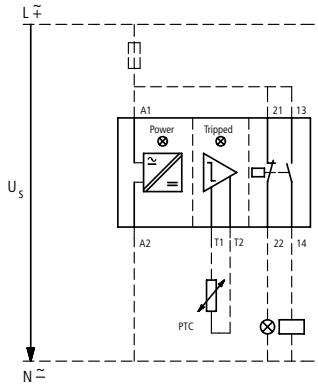
Terminal marking according to EN 50005

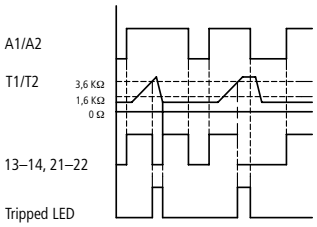
Notes

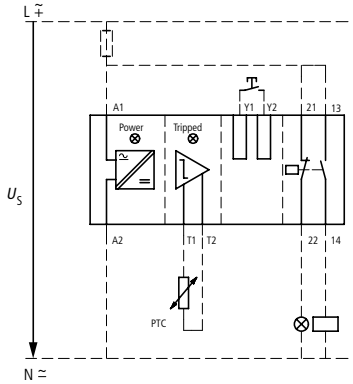
Flow diagrams
LED display

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

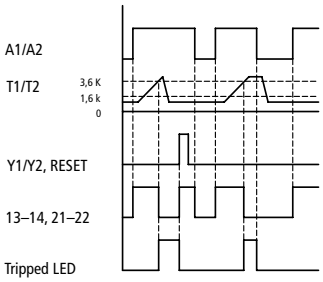


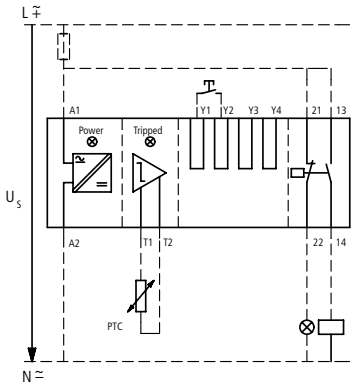
EMT6-K, EMT6-(K)DB, EMT6-DBK
Auto



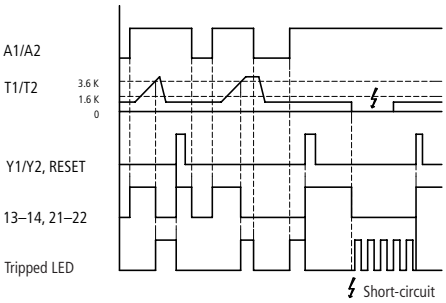


EMT6-(K)DB, EMT6-DBK
Manual





EMT6-DBK
Zero-voltage safe operation



Ex
PTB 02 ATEX 3162
With the EMT6, EMT6(230V), EMT6-DB and EMT6-DB(230V) an additional short-circuit protection in the sensor circuit with current monitor is to be provided. Observe the AWB2327-1446 manual (→ 6/18).

Can be snap fitted on a top-hat rail to IEC/EN 60715.

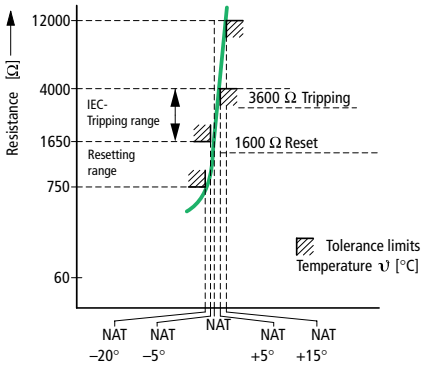
At $R_K \leqq 250\ \Omega$ per sensor: 6 sensors,
At $R_K \leqq 100\ \Omega$ per sensor: 9 sensors in the winding (provided by user), max. cable length to sensor 250 m (not screened);
Total PTC thermistor resistance $\Sigma R_K \leqq 1500\ \Omega$

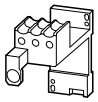
Sensor characteristic values at U_s and +20 °C

$R_{T1\text{-}T2}$	EMT6... $U_{T1\text{-}T2}$ V DC max.	$I_{T1\text{-}T2}$ 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 via link
Short-circuit detection	$Y_1 - Y_3$
Zero voltage safety	$Y_1 - Y_4$



		For use with	**Type** Article no.	**Price** See Price List	Std. pack	
Documentation						
Overload relays Overload monitoring of EEx e motors	–	ZE...	**AWB2300-1425D** 258704		1 off	German
		Z00... Z1... Z5...	**AWB2300-1476D/GB** 264852		1 off	German/English
Bases						
For separate mounting		Z00	**EZ00** 022630		5 off	Can be snap fitted on a top-hat rail to IEC/EN 60715 or can be screw fitted.
		Z1	**EZ1** 025003		2 off	
		ZB32	**ZB32-XEZ** 278473		1 off	
		ZB65	**ZB65-XEZ** 278474		1 off	
Push-buttons For enclosed overload relays Mounting diameter: 22.3 mm						
IP65 external reset button		ZE... Z00... Z1... Z5... ZW7... ZB12 ZB32 ZB65	**M22-DZ-B** 254833		10 off	Blue button plate
			M22-DZ-B-GB14 254834			Blue button plate: RESET
Off button, IP65			**M22-DZ-X** 254835			Without button plate, button plate must be added
Button plates	–	M22-DZ-X	**M22-XD-R** 216423			Red button plate
			M22-XD-R-X0 218153			Red button plate with white circle
			M22-XD-R-GB0 218194			Red button plate: STOP

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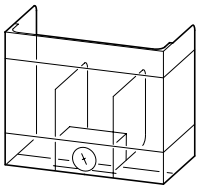
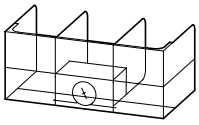
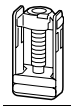
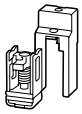
	For use with	Type Article no.	Price See Price List	Std. pack	
Covers					
	Z5-.../FF250	**Z5/FF250-XHB** 215217		1 off	Overload relays for separate mounting Z5/FF250 -XHB Z5-.../FF250
	Direct mounting Z5-.../FF250 to DILM185, DILM225, DILM250	**Z5/FF250-XHB-Z** 215218		1 off	Z5/FF250 -XHB Overload relay fitted directly to contactor DIL M400 -XHB DIL M185/ 225/250 Z5/FF250 -XHB-Z Z5-.../FF250 Z5/FF250 -XHB

	For use with	For connection of: Copper flat strip W × H max. mm²	Type Article no.	Price See Price List	Std. pack	Notes
Set of box terminals Consisting of 3 individual clamps						
With protective						
	Z5-.../FF250	24 × 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 × 26	**KS-B-DIL6AM** 064063		1 off	When using box terminals the protective covers **must** be used.

Selection data	ZE	ZB12 ZB32 ZB65 Z00 Z1	Z5	ZW7	ZEV
Phase-failure sensitivity	●	●	●	–	●
Temperature compensation	●	●	●	●	●
Auxiliary switch 1 M + 1 B	●	●	●	●	●
Test/off button	●	●	●	●	●
Reset button manual/auto	●	●	●	●	●
Separate mounting	–	●	●	●	●
Protection of EEx e-motors (PTB)	●	●	●	–	●
Protection with heavy starting duty	–	–	–	●	●
Trip-free release	●	●	●	●	●

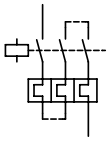
● standard features

EC prototype test certification number

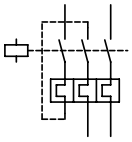
ZEV	PTB 01 ATEX 3233
ZE	PTB 01 ATEX 3331
Z00	PTB 02 ATEX 3165
Z1	PTB 02 ATEX 3165
Z5	PTB 02 ATEX 3165
EMT6	PTB 02 ATEX 3162
ZB...	on request

Protection of single-phase and DC current motors:

1-pole

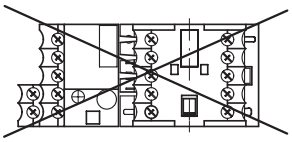


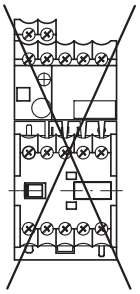
2-pole



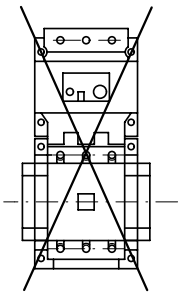
Mounting position:

ZE





ZB12, ZB32, ZB65, Z00, Z1, Z5



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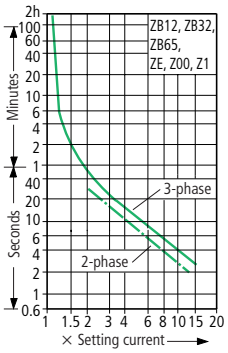
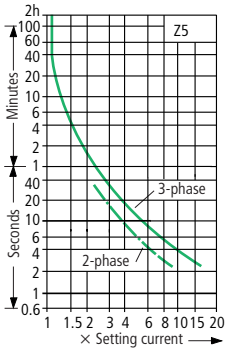
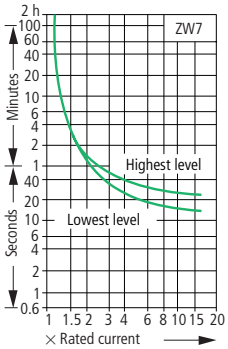
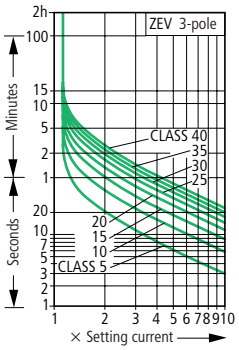
These tripping characteristics are mean values of the spread at 20 °C ambient temperature in a cold state. Tripping time depends on response current. With devices at operating temperature the tripping time of the overload relay reduces to approx. 25 % of the read off value. Specific characteristics for each individual setting range can be found in the manual on → page 6/20.









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

			ZB12, ZB32	ZB65	ZE	Z00	Z1
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	-25/50	-25/50	-25/50	-25/50
Enclosed[1]		°C	-25/40	-25/40	-25/40	-25/40	-25/40
Temperature compensation			Continuous				
Mounting position			→ page 6/24	→ page 6/24	→ page 6/24	→ page 6/24	→ page 6/24
Weight		kg	→ page 20/22	→ page 20/22	→ page 20/22	→ page 20/22	→ page 20/22
Mechanical shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27		g	10	10	10	10	10
Degree of protection			IP00	IP00	IP20	IP00	IP00
Protection against direct contact when actuated from front (IEC 536)			Finger- and back-of-hand proof				
Main contacts							
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000	6000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	690	690	690	690	690
Rated operational voltage	U_e	V AC	690	690	690	690	690
Safe isolation to VDE 0106 Part 101 and Part 101/A1							
Between auxiliary contacts and main contacts		V AC	440	440	300	440	440
between the main contacts		V AC	440	440	300	440	440
Overload relay setting range		A	0.1 – 32	6 – 75	0.1 – 9	0.1 – 24	6 – 75
Temperature compensation residual error > 20°C		%/K	≦0.25	≦0.25	≦0.25	≦0.25	≦0.25
Short-circuit protection rating maximum fuse			→ page 6/5	→ page 6/7	→ page 6/9	→ page 6/9	→ page 6/11
Current heat loss (3 conductors)							
Lower value of setting range		W	2.5	3	2.5	2.5	3[3]
Upper value of setting range		W	6	7.5	6	6	7.5[3]
Terminal capacity							
Solid		mm²	2 × (1 – 6)	2 × (1 – 16)	2 × (0.75 – 2.5)	2 × (1 – 6)	2 × (1 – 16)[2]
Flexible without ferrules		mm²	–	–	–	–	–
Flexible with ferrule		mm²	2 × (1 – 4) 2 × (1 – 6)[4]	1 × 25 2 × (1 – 10)[2]	2 × (0.5 – 1.5)	2 × (1 – 4) 2 × (1 – 6)[4]	1 × 25 2 × (1 – 10)[2]
Solid or stranded		AWG	14 – 8	14 – 2	18 – 14	14 – 8	14 – 2
Terminal screw			M4	M6	M3.5	M4	M6
Tightening torque		Nm	1.8	3.5	1.2	1.8	3.5
Main contacts							
Tools							
Pozidriv screwdriver		Size	2	2	2	2	2
Standard screwdriver		mm	1 × 6	1 × 6	0.8 × 5.5	1 × 6	1 × 6

Notes

[1] Ambient temperature: operating range to IEC/EN 60947, PTB: -5°C to +50°C
[2] Main contacts terminal capacity solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section
[3] Current heat loss (3 conductors) main contacts Z1-75: lower values of setting range: 7 W, upper value of setting range: 10 W
[4] 6 mm² flexible with ferrules to DIN 46228

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			Z5-.../.K3	Z5-.../.K4	Z5-.../FF250	ZW7
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	-25/50	-25/50	-25/50
Enclosed[1]		°C	-25/40	-25/40	-25/40	-25/40
Temperature compensation			Continuous			
Mounting position			→ page 6/24	→ page 6/24	→ page 6/24	As required
Weight		kg	→ page 20/22	→ page 20/22	→ page 20/22	→ page 20/22
Mechanical shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27		g	10	10	10	10
Degree of protection			IP00	IP00	IP00	IP00
Protection against direct contact when actuated from front (IEC 536)			Finger- and back-of-hand proof		With terminal cover	Finger- and back-of-hand proof
Main contacts						
Rated impulse withstand voltage	U_{imp}	V AC	8000	8000	8000	6000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	1000	1000	1000	690
Rated operational voltage	U_e	V AC	1000	1000	1000	690
Safe isolation to VDE 0106 Part 101 and Part 101/A1						
Between auxiliary contacts and main contacts		V AC	440	440	440	440
between the main contacts		V AC	440	440	440	440
Overload relay setting range		A	25 – 100	35 – 142	50 – 250	40 – 630
Temperature compensation residual error > 20 °C		%/K	≦0.25	≦0.25	≦0.25	–
Short-circuit protection rating maximum fuse			→ page 7/8	→ page 7/8	→ page 7/8	–[2]
Current heat loss (3 conductors)						
Lower value of setting range		W	16	16	16	3
Upper value of setting range		W	28	28	28	10
Terminal capacity						
Solid		mm²	16	16	–	–
Flexible without ferrules		mm²	50	70	–	–
Flexible with ferrule		mm²	50	70	–	–
Stranded		mm²	50	70	–	–
Flexible with cable lug		mm²	–	–	95	–
Stranded with cable lug		mm²	–	–	120	–
Solid or stranded		AWG	2	2/0	250 MCM	–
Flat conductor	Number of segments × width × thickness	mm	6 × 9 × 0.8	6 × 16 × 0.8	6 × 16 × 0.8[3]	–
Busbar	Width	mm	–	–	20 × 3	–
Push-through opening	∅	mm	–	–	–	27
Terminal screw			M8	M10	M8 × 25	–
Tightening torque		Nm	6	10	24	–
Tools						
Hexagon socket-head screw	SW	mm	4	5	–	–
Hexagon socket head screw	SW	mm	–	–	13	–

Notes
[1] Ambient temperature: operating range to IEC/EN 60947, PTB: -5°C to +50°C
[2] With overload relay in conjunction with a transformer as required for the contactor
[3] Fixing with box terminals

			ZB12, ZB32	ZB65	ZE	Z00	Z1
Auxiliary and control circuit connections							
Rated impulse withstand voltage	U_{imp}	V	6000	6000	6000	6000	6000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3
Terminal capacity							
Solid		mm²	2 × (0.75 – 4)	2 × (0.75 – 4)	2 × (0.75 – 2.5)	2 × (0.75 – 4)	2 × (0.75 – 4)
Flexible with ferrule		mm²	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.5 – 1.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)
Solid or stranded		AWG	2 × (18 – 12)	2 × (18 – 12)	2 × (18 – 12)	2 × (18 – 12)	2 × (18 – 12)
Terminal screw			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
Tools							
Pozidriv screwdriver		Size	2	2	2	2	2
Standard screwdriver		mm	1 × 6	1 × 6	0.8 × 5.5	1 × 6	1 × 6
Auxiliary circuit rated insulation voltage	U_i	V AC	500	500	690	500	500
Rated operational voltage	U_e	V AC	500	500	500	500	500
Safe isolation to VDE 0106 Part 101 and Part 101/A1							
Between the auxiliary contacts		V AC	240	240	300	240	240
Conventional thermal current	I_{th}	A	6	6	6	6	6
Rated operational current							
AC–15							
Make contact 120 V	I_e	A	1.5	1.5	1.5	1.5	1.5
Make contact 240 V	I_e	A	1.5	1.5	1.5	1.5	1.5
Make contact 415 V	I_e	A	0.5	0.5	0.5	0.5	0.5
Make contact 500 V	I_e	A	0.5	0.5	0.3	0.5	0.5
Break contact 120 V	I_e	A	1.5	1.5	1.5	1.5	1.5
Break contact 240 V	I_e	A	1.5	1.5	1.5	1.5	1.5
Break contact 415 V	I_e	A	0.9	0.9	0.7	0.9	0.9
Break contact 500 V	I_e	A	0.8	0.8	0.5	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
60 V	I_e	A	0.75	0.75	0.75	0.75	0.75
110 V	I_e	A	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
Short-circuit rating without welding							
Max. fuse[2)]		A gG/gL	6	6	4	6	6

Notes
[1)] Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated
[2)] See overlay "Fuses" for short-circuit rating time/current characteristic (please enquire)

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			Z5-.../.K3	Z5-.../.K4	Z5-.../FF250	ZW7
Auxiliary and control circuit connections						
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 × (0.75 – 4)	2 × (0.75 – 4)	2 × (0.75 – 4)	2 × (0.75 – 4)
Flexible with ferrule		mm^2	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)
Solid or stranded		AWG	2 × (18 – 12)	2 × (18 – 12)	2 × (18 – 12)	2 × (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
Tools						
Pozidriv screwdriver		Size	2	2	2	2
Standard screwdriver		mm	1 × 6	1 × 6	1 × 6	1 × 6
Auxiliary circuit rated insulation voltage	U_i	V AC	500	500	500	500
Rated operational voltage	U_e	V AC	500	500	500	500
Safe isolation to VDE 0106 Part 101 and Part 101/A1						
Between the auxiliary contacts		V AC	240	240	240	240
Conventional thermal current	I_{th}	A	6	6	6	6
Rated operational current						
AC–15						
Make contact 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
Break contact 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[1)]						
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	0.4	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[2)]		A gG/gL	6	6	6	6

Notes

[1)] Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated
[2)] See overlay "Fuses" for short-circuit rating time/current characteristic (please enquire)

			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			As required
Weight		kg	→ page 20/22
Mechanical shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27		g	15
Degree of protection			IP20
Protection against direct contact when actuated from front (IEC 536)			Finger- and back-of-hand proof
Main contacts			
Overload relay setting range		A	1 – 820[7]
Temperature compensation residual error > 20°C		%/K	–
Short-circuit protection rating maximum fuse			With overload relay in conjunction with a transformer as required for the contactor
Terminal screw			M3.5
Tightening torque		Nm	0.8
Tools			
Pozidriv screwdriver		Size	1
Standard screwdriver		mm	0.8 × 5.5
Auxiliary and control circuit connections			
Rated impulse withstand voltage	U_{imp}	V	4000
Overvoltage category/pollution degree			III/3
Terminal capacity			
Solid		mm²	1 × (0.5 – 2.5) 2 × (0.5 – 1.5)[4]
Flexible with ferrule		mm²	1 × (0.5 – 2.5) 2 × (0.5 – 1.5)[4]
Solid or stranded		AWG	1 × (18 – 14)
Terminal screw			M3.5
Tightening torque		Nm	0,8
Tools			
Pozidriv screwdriver		Size	1

				ZEV
Standard screwdriver			mm	0.8 × 5.5
Auxiliary circuit rated insulation voltage		U_i	V AC	250
Rated operational voltage		U_e	V AC	240
Safe isolation to VDE 0106 Part 101 and Part 101/A1				
Between the auxiliary contacts			V AC	240[5]
Conventional thermal current		I_{th}	A	6
Rated operational current				
AC–15				
Make contact	120 V	I_e	A	3[6]
	240 V	I_e	A	3[6]
	415 V	I_e	A	–
	500 V	I_e	A	–
Break contact	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[2]			A gG/	6
Pick-up and drop-out values				
AC operated			× U_c	0.85 – 1.1
DC operated			× U_c	0.85 – 1.1
Thermistor protection				
Total resistance (cold)			Ω	1500
Response value			Ω	2720 – 3680
Reset range			Ω	1500 – 1650
Recovery time				
Overload				→ page 6/17
Thermistor tripping				5 K under response temperature
Earth-fault protection				Immediate

Notes

1) Ambient 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) Ambient temperature open and enclosed: limited readability of the LCD display at < -15 °C
9) Main contacts terminal capacity solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section

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			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						
Open		°C	-25/60	-25/60	-25/60	-25/60
Enclosed		°C	-25/40	-25/40	-25/40	-25/40
Storage[1]		°C	-40/80	-40/80	-40/80	-40/80
Temperature compensation			Continuous	Continuous	Continuous	Continuous
Mounting position			As required	As required	As required	As required
Weight		kg	→ page 20/22	→ page 20/22	→ page 20/22	→ page 20/22
Mechanical shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27		g	15	15	15	15
Degree of protection			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (IEC 536)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V AC	–[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 to VDE 0106 Part 101 and Part 101/A1						
Between busbar and sensor		V AC	–	–	–	500
Overload relay setting range		A	1 – 25	3 – 65	10 – 145	40 – 820
Short-circuit protection rating maximum fuse			With overload relay in conjunction with a transformer as required for the contactor			
Push-through opening	∅	mm	6	13	21	110

Notes
[1] Ambient temperature: 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
General			
Standards			IEC/EN 60947, VDE 0660, EN 55011
Climatic proofing			Damp heat, constant, to IEC 60 068-2-78; Damp heat, cyclic, to IEC 60 068-2-30
Ambient temperature			
Open		°C	-25/60
Enclosed		°C	-25/45
Storage		°C	-45/60
Mounting position			As required
Weight		kg	0.15
Mechanical shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27		g	10
Degree of protection			IP20
Protection against direct contact when actuated from front (IEC 536)			Finger- and back-of-hand proof
Safe isolation to VDE 0106 Part 101 and Part 101/A1			
between the contacts		V AC	250
between contacts and supply voltage		V AC	250
Auxiliary and control circuit connections			
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 × 2.5 2 × (0.5 – 1.5)
Flexible with ferrule		mm^2	1 × 2.5 2 × (0.5 – 1.5)
Solid or stranded		AWG	20 – 14
Terminal screw			M3.5
Tightening torque		Nm	1.2
Tools			
Pozidriv screwdriver		Size	2
Standard screwdriver		mm	1 × 6
Auxiliary circuit			
Rated insulation voltage	U_i	V	400
Rated operational current			
AC–14			
Make contact			
415 V	I_e	A	3
Break contact			
415 V	I_e	A	3
AC–15			
Make contact			
240 V	I_e	A	3
415 V	I_e	A	1
Break contact			
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)]
Pick-up and drop-out values		× U_e	0.85 – 1.1
Power consumption			
AC		VA	3.5
DC		W	2
Trip at approx.		Ω	≧3600
Recovery at approx.		Ω	≦1600

Notes

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

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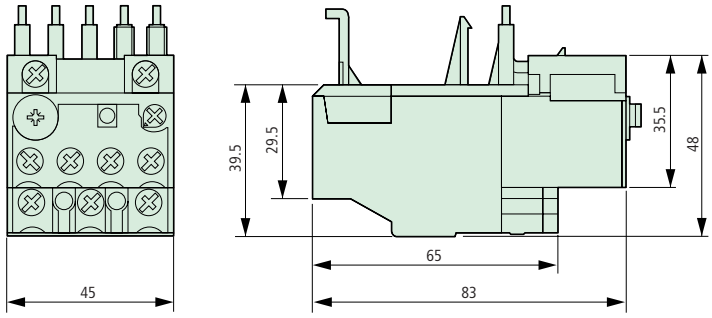
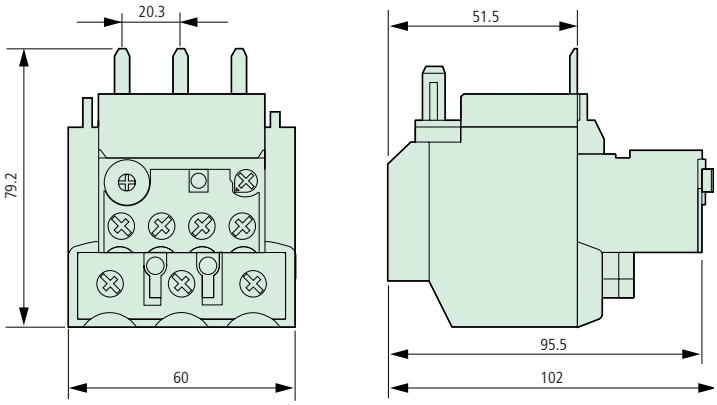
Overload relays

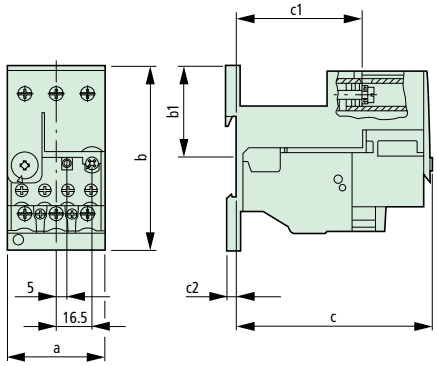
ZB12/ZB32



ZB65



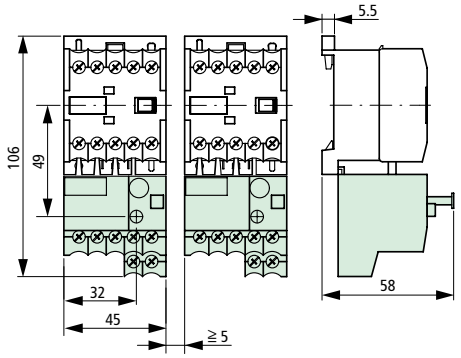
ZB32-XEZ
ZB65-XEZ



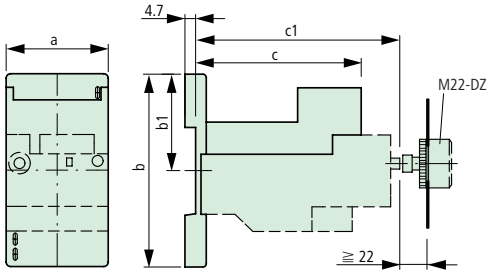
	ZB32	ZB65
a	45	60
b	85	86
b1	42.5	42.5
c	90.5	112
c1	58.3	80.5
c2	3.8	4.7

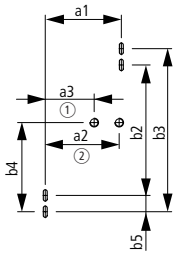
Overload relays

ZE



Z00 + EZ00
Z1 + EZ1

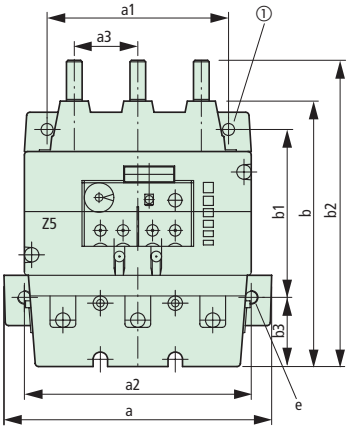


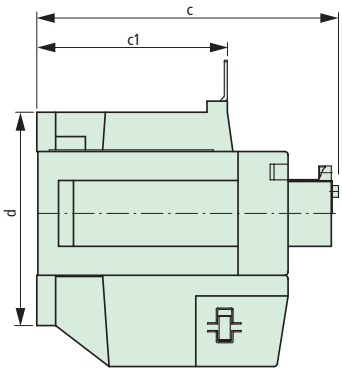


① = OFF
② = RESET/ON

	EZ00 2 × M4 × 12	EZ1 2 × M5 × 15
a	45	60
a1	35	50
a2	34	41.5
a3	22.5	30
b	85	86
b1	42.5	42.5
b2	60	–
b3	75	75
b4	41	36
b5	7.5	–
c	73	112
c1	90	102

Z5-.../SK

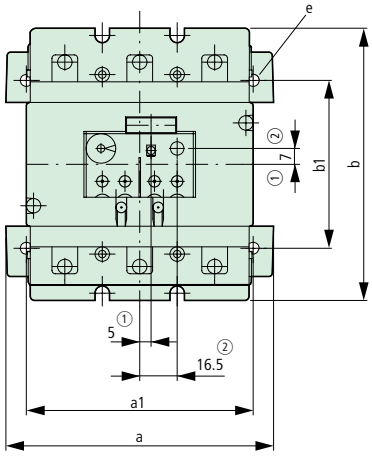


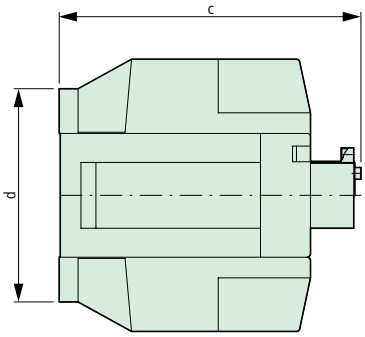


① = knockout, closed when delivered

	Z5-.../SK3	Z5-.../SK4
a	100	118
a1	80	80
a2	80	100
a3	28	28
b	117	117
b1	74	74
b2	135	135
b3	22	23
c	133	133
c1	82.5	84
d	94	94
e	∅6	∅7

Z5-.../KK





	Z5-.../KK3	Z5-.../KK4
a	100	118
a1	80	100
b	120	120
b1	74	74
c	133	133
d	94	94
e	∅6	∅7

① = OFF
② = RESET/ON

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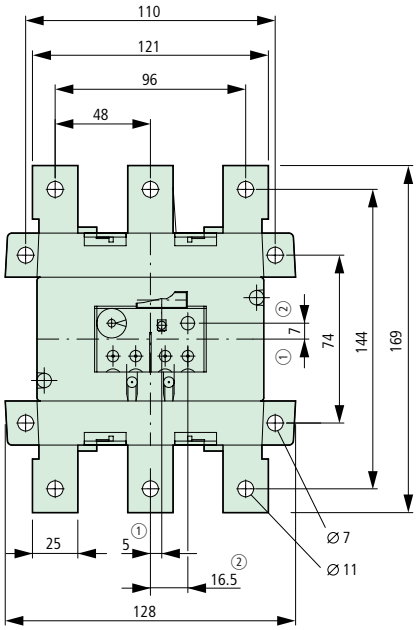
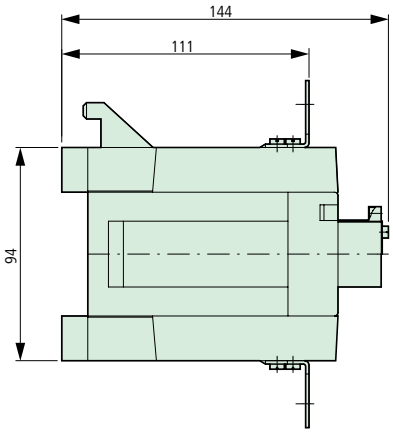
Overload relays

Z5-.../FF250

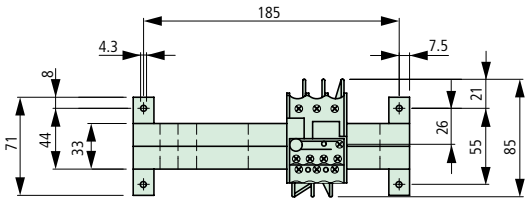


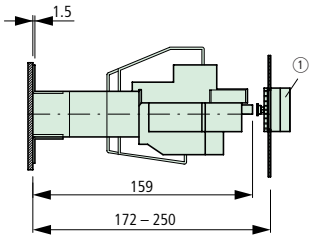


① = OFF
② = RESET/ON

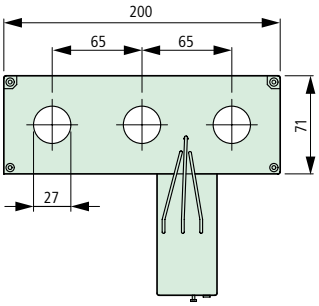
Current transformer-operated overload relay

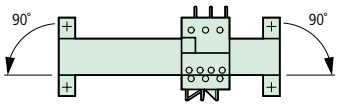
ZW7-...

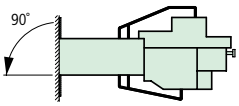




① = RESET/ON

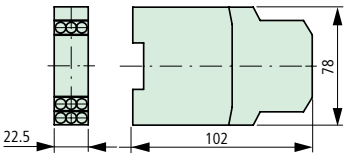




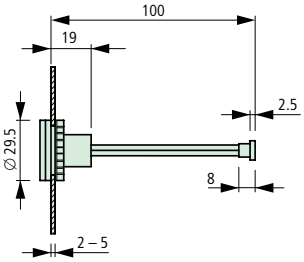


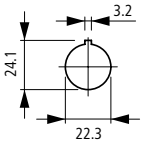
Thermistor overload relays for machine protection

EMT6-(-DB)
EMT6-DBK



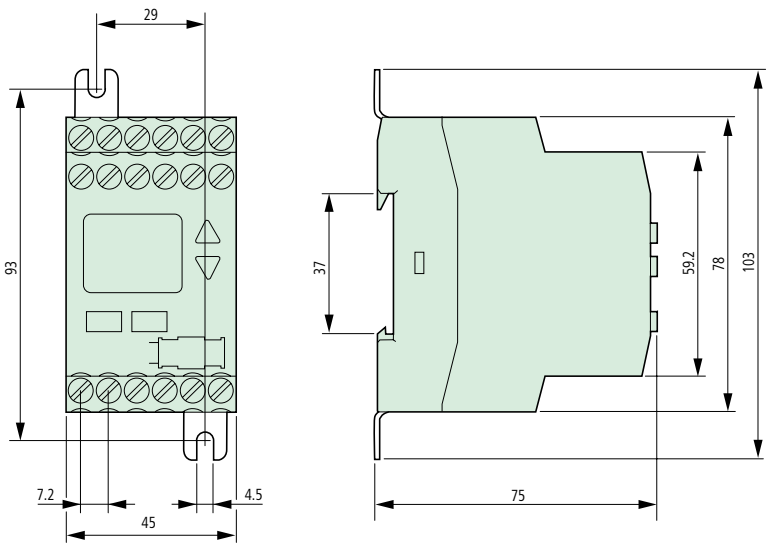
M22-DZ-... external reset button
OFF button M22-DZ-...





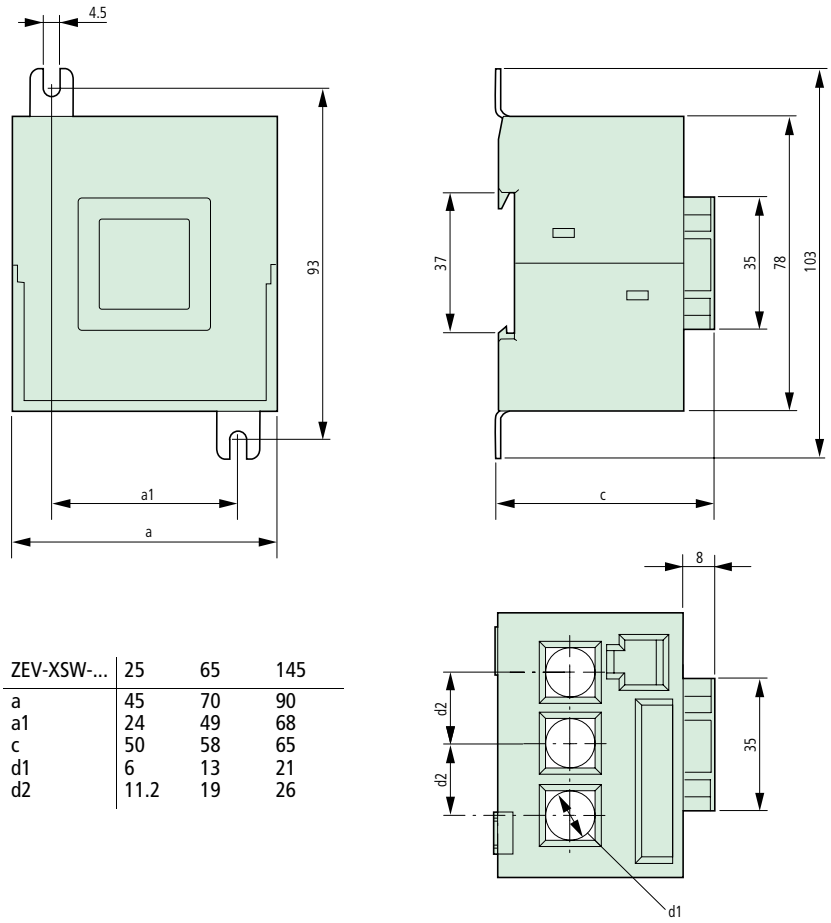
Overload relays

ZEV



Current sensors

ZEV-XSW-...



ZEV-XSW-...	25	65	145
a	45	70	90
a1	24	49	68
c	50	58	65
d1	6	13	21
d2	11.2	19	26

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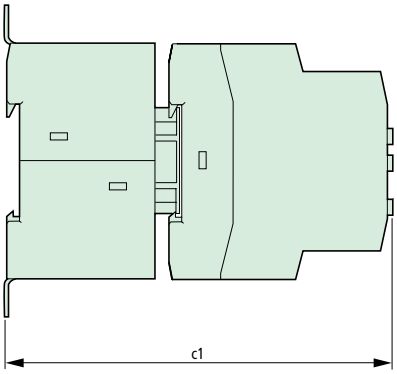
Overload relays

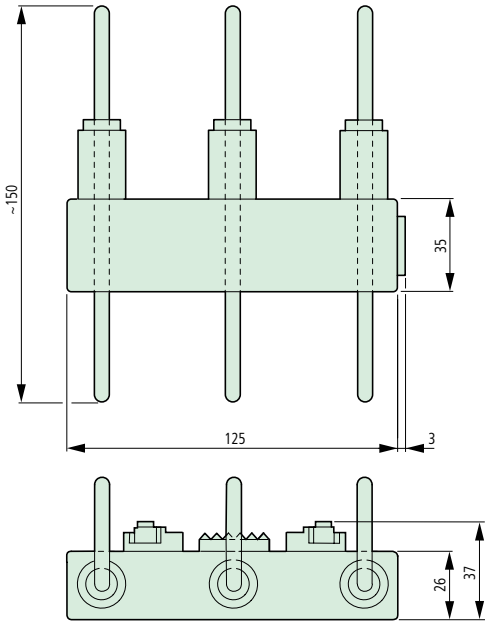
ZEV + ZEV-XSW-...



ZEV + ZEV-XSW-...	25	65	145
c1	120	128	134

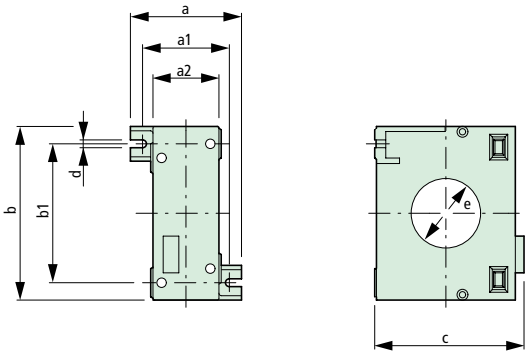
Current sensor

ZEV-XSW-820



Core-balance transformer

SSW40-...
SSW65-...
SSW120-...



	SSW40-...	SSW65-...	SSW120-...
a	64	75	86.5
a1	50	60	70
a2	38	43	54.5
b	100	124	200
b1	80	100	170
c	86	112	205
d	4.5	4.5	4.5
e	40	65	120