

xStart Switching, protecting and actuating motors



Moeller is Eaton

EATON

Powering Business Worldwide



xCommand
Control and Indication



xStart
Switching, protecting and actuating motors



xCommand
xSystem
Automation, control and visualization



Matching of Voltage and Current



xEnergy
Xpole
Energy distribution, switching and protection



Xboard
Optimal switchgear enclosure



SmartWire-Darwin Communication System



Foot and palm switches FAK, pilot devices RMO, signal towers SL

Position switches LS, pressure switches MCS, sensors

Cam switches T, switch-disconnectors P up to 315 A



Mini contactor relays, contactor relay, contactors DIL

Overload relay Z..., ZEB, ZEV, EMT6

Motor protective circuit breaker PKZ and PKE

MSC motor-starter combinations

DS, DM soft starters

Frequency inverters M-Max™, H-Max™



Timing relays DILET, ETR; measuring relays EMR and monitoring relays EMR

Easy control relay MFD-Titan multi-function display

Safety relay easySafety, safety-related control relay ESR5

Automation solutions, SPS, I/O systems, visualisation

Transformers STN, UTI; universal power supply units AING



Busbar system SASY – accessories for control panel building

Compact circuit-breakers NZM, compact switch-disconnectors N up to 1600 A

IZM circuit-breakers, IN switch-disconnectors up to 6300 A

Circuit-breakers, fuses



Insulated enclosures CI, small enclosures CI-K

CS sheet steel wall-mounting enclosure



Commercial and logistic notes, approvals, After Sales Service, type / alphabetical index



Mini contactor relays, contactor relay, contactors

Continual operation requires high operational reliability in the components used. The DILM contactor achieves the best lifespan values in AC-3 applications and is ideal for heavy AC-4 jogging.



Mini contactor relay DILE..., contactor relays, contactors up to 12 A AC-3 at 400 V

Compact dimensions for the highest packing densities +++ Extended performance range up to 5.5 kW at 400 V

AC and DC contactor system DILM..., contactor relays, 3 pole contactors up to 170 A AC-3 at 400 V, 4 pole contactors up to 200 A AC-1

Easier engineering through identical construction sizes for AC- and DC-operated contactors +++ Energy savings and higher packing density in control panel due to minimized heat dissipation +++ High wiring security through doubled box terminals +++ Less coupler relays: direct actuation from the PLC for contactors up to 32 A +++ Easy engineering through integrated suppressor circuits for DC +++ Uniform accessories for 3- and 4-pole contactors +++ Mechanical interlock double conductor run mountable without additional separation gap +++ Direct fieldbus connection through the communication system SmartWire-Darwin, through plug-in type protective module

High rated contactors - contactors up to 1600 A AC-3 at 400 V, contactors up to 2600 A AC-1

Compact dimensions with high switching power +++ Direct actuation from the PLC saves coupler relays +++ Easy engineering through wide range coils +++ Cost and energy savings for control panel ventilation due to reduced heat dissipation +++ Long lifespan through vacuum technology from 580 A



Eaton After Sales Service

Testing switching devices in compliance with regulations applicable to this technology
→ Chapter 22



SmartWire-Darwin

The DIL product range offers contact elements which can be connected to the SmartWire-Darwin communication system. → Protective modules, Page 5/62



Ordering

Mini contactor relays DILER, DILEEM, DILEM

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Ordering

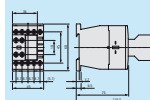
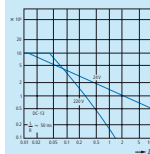
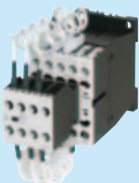
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Ordering

CMD contactor monitoring device	5/68
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Ordering

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Ordering

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Dimensions

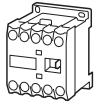
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Ordering

Rated operational current AC-15		Conventional free air thermal current	Contact N/O = normally open contact NC = normally closed contact	Distinctive number	Circuit symbol	For use with
220 V	380 V					
230 V	400 V	I_{th}				
240 V	415 V					
I_e	I_e	I_{th}				
A	A					

DILER mini contactor relays

Screw terminals



6	3	10	4 N/O	–	40E		DILE...
			3 N/O	1 NC	31E		DILE...
			2 N/O	2 NC	22E		DILE...

Notes

Coil terminal marking as specified in EN 50005
Contact numbers to EN 50011
The following applies to DC-operated contactors:

- Integrated diode-resistor combination
- Coil rating 2.6 W

Information relevant for export to North America

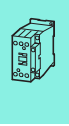


Product Standards

UL File No.
UL CCN
CSA File No.
CSA Class No.
NA Certification

IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05;
CE marking
E29184
NKCR
012528
3211-03
UL Listed,
CSA certified

HPL05003EN



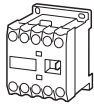
AC operation		DC operation		Std. pack	Notes
Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
DILER-40(230V50HZ) 051759		DILER-40-G(24VDC) 010223		5 off 	With screw terminals: Accessories 1 Suppressor → 5/8 2 Auxiliary contact modules → 5/6 Further actuating voltages → 5/70
DILER-31(230V50HZ) 051768		DILER-31-G(24VDC) 010157			
DILER-22(230V50HZ) 051777		DILER-22-G(24VDC) 010042			

Rated operational current	Max. motor rating for three-phase motors, 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 50 °C		Contact	Circuit symbol	For use with
	AC-3	AC-3			AC-4						
380 V 400 V I_e	220 V 230 V P	380 V 400 V P	660 V 690 V P	220 V 230 V P	380 V 400 V P	660 V 690 V P	Open $I_{th} = I_e$	Enclosed $I_{th} = I_e$	N/O = normally open contact NC = normally closed contact		
A	kW	kW	kW	kW	kW	kW	A	A			

DILEM contactors

3 pole with auxiliary contact

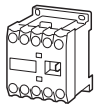
Screw terminals



6.6	1.5	3	3	1.1	2.2	2.2	20	16	1 N/O	–		...DILEM DILE...
6.6	1.5	3	3	1.1	2.2	2.2	20	16	–	1 NC		DILE...
9	2.2	4	4	1.5	3	3	20	16	1 N/O	–		...DILEM DILE...
9	2.2	4	4	1.5	3	3	20	16	–	1 NC		DILE...
12	3.5	5.5	6.5	2	3	2.2	20	16	1 N/O	–		...DILEM DILE...
12	3.5	5.5	6.5	2	3	2.2	20	16	–	1 NC		DILE...

4 pole

Screw terminals



9	2.2	4	4	1.5	3	3	20	16	–	–		...DILEM DILE...
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1)

Information relevant for export to North America



Product Standards

IEC/EN 60947-4-1;
UL 508; CSA-C22.2
No. 14-05; CE marking

UL File No.

E29096

UL CCN

NLDX

CSA File No.

012528

CSA Class No.

3211-04

NA Certification

UL Listed, CSA certified

See also

→ Page 5/84

2)

Information relevant for export to North America



Product Standards

IEC/EN 60947-4-1;
UL 508; CSA-C22.2 No. 14-05; CE marking

UL File No.

E29096

UL CCN

NLDX

CSA File No.

012528

CSA Class No.


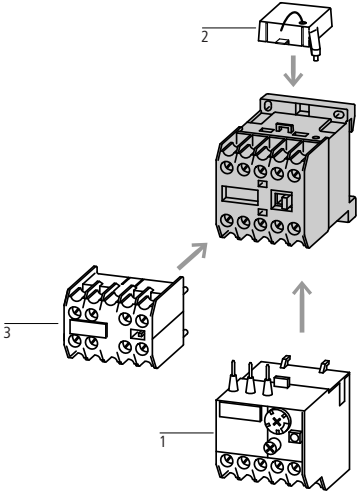

2411-03, 3211-04

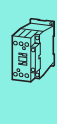
NA Certification

UL Listed, request filed for CSA

HPL05005EN

DILEM

AC operation		DC operation		Std. pack	Notes
Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
DILEEM-10(230V50HZ)¹⁾ 051608		DILEEM-10-G(24VDC)¹⁾ 051643		5 off 	With screw terminals: 
DILEEM-01(230V50HZ)¹⁾ 051633		DILEEM-01-G(24VDC)¹⁾ 051650			
DILEM-10(230V50HZ)¹⁾ 051786		DILEM-10-G(24VDC)¹⁾ 010213			
DILEM-01(230V50HZ)¹⁾ 051795		DILEM-01-G(24VDC)¹⁾ 010343			
DILEM12-10(230V50HZ)²⁾ 127075		DILEM12-10-G(24VDC)²⁾ 127132			
DILEM12-01(230V50HZ)²⁾ 127091		DILEM12-01-G(24VDC)²⁾ 127137			
DILEM4(230V50HZ)¹⁾ 051804		DILEM4-G(24VDC)¹⁾ 012701		5 off 	Accessories 1 Overload relay → Chapter 6 2 Suppressor → 5/8 3 Auxiliary contact module → 5/6 Enclosures totally insulated Further actuating voltages → 5/70 Accessories → 5/8



Contact	Rated operational current		Conventional thermal current I_{th} A	Distinctive number/type of combinations with basic device		
	AC-15			DILER-40(-G)	DILER-31(-G)	DILER-22
N/O = normally open contact	220 V	380 V	A	-	-	-
S _F = NO early-make	230 V	400 V				
NC = normally closed contact	240 V	415 V				
Ö _S = NC late-break	I _e	I _e				
	A	A				

Auxiliary contact modules

Screw terminals



2 pole	-	-	2 NC	-	4	2	10	-	-	-
	1 N/O	-	1 NC	-	4	2	10	-	-	-
4 pole	2 N/O	-	2 NC	-	4	2	10	-	-	-
2 pole	-	-	2 NC	-	4	2	10	42E	33	24
	1 N/O	-	1 NC	-	4	2	10	51E	42	33
	2 N/O	-	-	-	4	2	10	60E	51	42
	-	1 S _F	-	1 Ö _S	4	2	10	51	42	33
4 pole	-	-	4 NC	-	4	2	10	44E	35	26
	1 N/O	-	3 NC	-	4	2	10	53E	44	35
	2 N/O	-	2 NC	-	4	2	10	62E	53	44
	3 N/O	-	1 NC	-	4	2	10	71E	62	53
	4 N/O	-	-	-	4	2	10	80E	71	62
	1 N/O	1 S _F	1 NC	1 Ö _S	4	2	10	62	53	44















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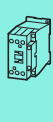










Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified




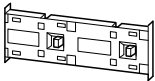


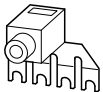


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DILE

Circuit symbol	Can be combined with contactor	Part no. Article no.	Price See price list	Std. pack	Notes
	DILEM-10(-G)(...) DILEM-4(-G)(...) DILEEM-10(-G)(...) DILEM12-10(-G)(...)	02DILEM 010064		5 off 	With interlocked opposing contacts
		11DILEM 010080			
		22DILEM 010112			
	DILEM-10(-G)(...) DILEM-01(-G)(...) DILEM-4(-G)(...) DILER40(-G) DILER31(-G) DILER22 DILEEM-10(-G)(...) DILEEM-01(-G)(...) DILEM12-10(-G)(...) DILEM12-01(-G)(...)	02DILE 010240			The following applies to ...DILEM auxiliary contacts: • Contacts to EN 50012 The following applies to ...DILE auxiliary contacts: • Contacts to EN 50005 Contacts according to EN50012 are to be preferred. Type E combinations comply with EN 50011 and are to be given preference. No interlocked opposing contacts in NO early-makes and NC late-breaks.
		11DILE 010224			
		20DILE 010208			
		11DDILE 049824			
		04DILE 010256			
		13DILE 002397			
		22DILE 010288			
		31DILE 048912			
		40DILE 010304			
		22DDILE 049823			
					With interlocked opposing contacts



Actuating voltage U _s V AC	Circuit symbol	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Suppressor circuits						
Varistor suppressor						
	24 - 48 AC 110 - 250 AC 380 - 415 AC		DILE...	VGDILE48 010320 VGDILE250 010336 VGDILE415 010463	10 off 	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29096 UL CCN NLDX CSA File No. 012528 CSA Class No. 3211-03 NA Certification UL Listed, CSA certified
RC-Suppressor						
	24 - 48 AC 110 - 250 AC		DILE...	RCDILE48 044264 RCDILE250 046320	10 off  10 off 	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29184 UL CCN NKCR2 CSA File No. - NA Certification UL Recognized
Notes						
For AC operated contactors 50 - 60 Hz. DC operated contactor relays have an integrated suppressor. Note drop-out delay.						

		For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Mechanical interlocks						
For mechanical connection of contactor and timing relays in combinations. 0 mm distance between contactors.						
		DILE... DILET...	VODILE 026634		50 off 	UL/CSA certification not required
Mechanical interlock						
For contactors with the same or different magnet system. 0 mm distance between contactors. Mechanical lifespan 2.5 x 10 ⁶ operations. Additional auxiliary contact modules possible.						
	-	DILE...	MVDILE 010113		5 off 	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29184 UL CCN NKCR2 CSA File No. 012528 CSA Class No. 3211-07 NA Certification UL Recognized, CSA certified
Paralleling link						
For parallel connection of contacts						
	-	DILE... DILE...	BT480 ²⁾ 052785		100 off	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29096 UL CCN NLDX CSA File No. 012528 CSA Class No. 3211-07 NA Certification UL Listed, CSA certified
Consisting of two four-pole paralleling links.						
		DILEEM DILEM12 DILEM	P1DILEM ²⁾ 019095		5 off 	UL Listed, CSA certified

Notes

¹⁾ Not protected against accidental contact as specified in VDE 0106 Part 100.

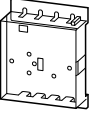



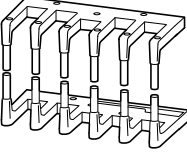


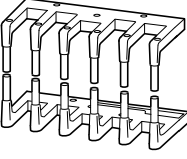


²⁾ 4th pole can be broken off

4 pole: I_{th} = 60 A open

3 pole: I_{th} = 50 A open

AC-1 current carrying capacity of the open contactor increases by a factor of 2.5

Protected against accidental contact in accordance with VDE 0106 Part 100

Contact sequence	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Sealable shrouds					
Transparent Snap-fitting on contactor. Can be used with open installation or on service distribution board. Protection type: IP40 front Can be drilled to accommodate timing relay setting dials.					
	DILE... DILET...	HDILE 010482		1 off  	UL/CSA certification not required
Start-point bridge					
	DILEEM DILEM12 DILEM	S1DILEM¹⁾ 220218		20 off	
Reversing starter wiring kit					
Main current wiring for reversing combinations					
	DILEEM (+MVDILEM) DILEM12 (+MVDILEM) DILEM (+MVDILEM)	MVS-WB-EM²⁾ 220209		1 off  	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E36332 UL CCN NLRV7 CSA File No. 012528 CSA Class No. 3211-06 NA Certification UL Listed, CSA certified
Star-delta wiring kit					
Main current wiring for star-delta combination incl. star-point bridge					
	DILE(E)M (+MVDILEM) DILE(E)M12 (+MVDILEM) DILE(E)M star contactor	MVS-SB-EM³⁾ 220213		1 off  	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E36332 UL CCN NLRV7 CSA File No. 012528 CSA Class No. 3211-06 NA Certification UL Listed, CSA certified

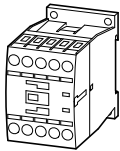
Notes

- ¹⁾ Protected against accidental contact in accordance with VDE 0106 Part 100
- ²⁾ The following control cables are integrated in addition to electrical interlock:
- Q11: A1 - Q12: 21
 - Q11: 21 - Q12: A1
 - Q11: A2 - Q12: A2
- For use with overload relay separate mounting.
- ³⁾ The following control cables are integrated in addition to electrical interlock:
- Q13: A1 - Q15: 21
 - Q13: 21 - Q15: A1
 - Q13: A2 - Q15: A2
- For use with overload relay separate mounting.

Contact		Rated operational current		Conventional thermal current	Distinctive number	Can be combined with auxiliary contact	Circuit symbol
N/O = normally open contact	NC = normally closed contact	AC-15		I_{th}			
		220 V	380 V	A			
		230 V	400 V				
		240 V	415 V				
		I_e	I_e				
		A	A				

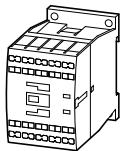
Basic devices with positively driven contacts

Screw terminals



4 N/O	–	4	4	16	40E	DILA-XHI(V)...	
3 N/O	1 NC				31E	DILA-XHI(V)...	
2 N/O	2 NC				22E	DILA-XHI(V)...	

Spring-loaded terminals



4 N/O	–	4	4	16	40E	DILA-XHIC(V)...	
3 N/O	1 NC				31E	DILA-XHIC(V)...	
2 N/O	2 NC				22E	DILA-XHIC(V)...	

Notes

Contact numbers to EN 50011
 Coil terminal markings to EN 50005
 The following applies to DC-operated contactors:




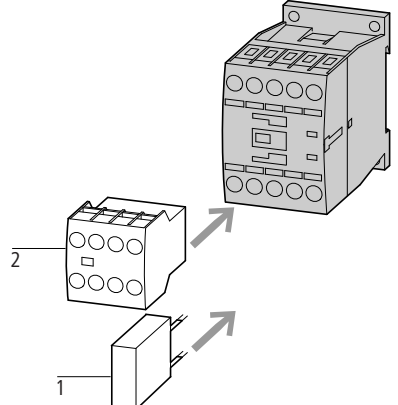



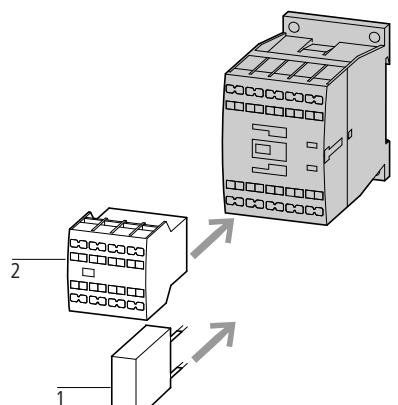
- Integrated suppressor circuit

Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

HPL05011EN

AC operation		Std. pack	Circuit symbol	DC operation		Std. pack	Notes
Part no. Article no.	Price See price list			Part no. Article no.	Price See price list		
DILA-40(230V50HZ) 276329	1 off 		DILA-40(24VDC) 276344	1 off 	With screw terminals: 	Accessories 1 Suppressor → 5/54 2 Auxiliary contact modules → 5/38 Further actuating voltages → 5/72	
DILA-31(230V50HZ) 276364			DILA-31(24VDC) 276379				
DILA-22(230V50HZ) 276399			DILA-22(24VDC) 276414				
DILAC-40(230V50HZ) 276441	1 off 		DILAC-40(24VDC) 276456	1 off 	With spring-loaded terminals: 	Accessories 1 Suppressor → 5/54 2 Auxiliary contact modules → 5/38 Further actuating voltages → 5/72	
DILAC-31(230V50HZ) 276473			DILAC-31(24VDC) 276488				
DILAC-22(230V50HZ) 276505			DILAC-22(24VDC) 276520				



Contact	Rated operational current		Conventional thermal current	Circuit symbol
N/O = normally open contact S _F = NO early-make NC = normally closed contact Ö _S = NC late-break	AC-15		I _{th}	
	220 V	380 V		
	230 V	400 V		
	240 V	415 V		
	I _e	I _e	A	

DILA auxiliary contact modules

Screw terminals



2 pole									
-	-	2 NC	-	4	4	16			
1 N/O	-	1 NC	-	4	4	16			
2 N/O	-	-	-	4	4	16			
-	1 S _F	-	1 Ö _S	4	4	16			



4 pole									
-	-	4 NC	-	4	4	16			
1 N/O	-	3 NC	-	4	4	16			
2 N/O	-	2 NC	-	4	4	16			
3 N/O	-	1 NC	-	4	4	16			
4 N/O	-	-	-	4	4	16			
1 N/O	1 S _F	1 NC	1 Ö _S	4	4	16			

Spring-loaded terminals



2 pole									
-	-	2 NC	-	4	4	16			
1 N/O	-	1 NC	-	4	4	16			
2 N/O	-	-	-	4	4	16			
-	1 S _F	-	1 Ö _S	4	4	16			



4 pole									
-	-	4 NC	-	4	4	16			
1 N/O	-	3 NC	-	4	4	16			
2 N/O	-	2 NC	-	4	4	16			
3 N/O	-	1 NC	-	4	4	16			
4 N/O	-	-	-	4	4	16			
1 N/O	1 S _F	1 NC	1 Ö _S	4	4	16			



Information relevant for export to North America

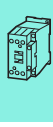


Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

HPL05013EN

DILA...XHI...

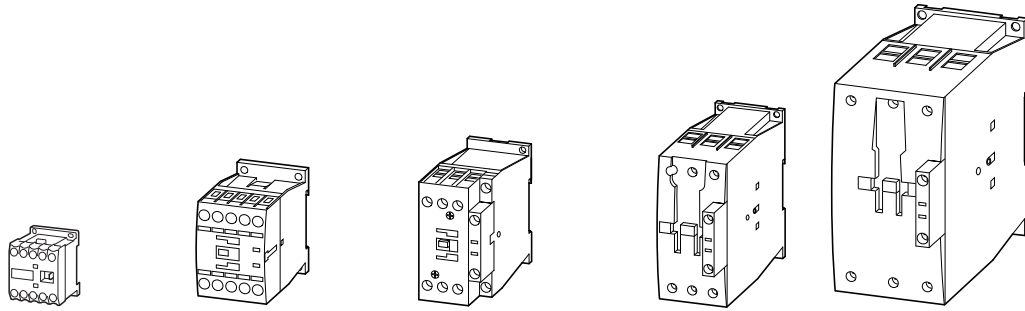
Distinctive number/type of combinations			Part no.	Price	Std. pack	Description	Notes
DILA(C)-40	DILA(C)-31	DILA(C)-22	Article no.	See price list			
42E	33	24	DILA-XHI02 276420		5 off 	With interlocked opposing contacts	Type E combinations comply with EN 50011 and must be given preference. The other combinations comply with EN 50005. The DC operated contactor DILA(C)-22 must only be combined with 2 pole auxiliary contacts.
51E	42	33	DILA-XHI11 276421				
60E	51	42	DILA-XHI20 276422				
51	42	33	DILA-XHIV11 276423			-	
44E	35	26	DILA-XHI04 276424			With interlocked opposing contacts	
53E	44	35	DILA-XHI13 276425				
62E	53	44	DILA-XHI22 276426				
71E	62	53	DILA-XHI31 276427				
80E	71	62	DILA-XHI40 276428				
62	53	44	DILA-XHIV22 276429			-	
42E	33	24	DILA-XHIC02 276526		5 off 	With interlocked opposing contacts	Type E combinations comply with EN 50011 and must be given preference. The other combinations comply with EN 50005. The DC operated contactor DILA(C)-22 must only be combined with 2 pole auxiliary contacts.
51E	42	33	DILA-XHIC11 276527				
60E	51	42	DILA-XHIC20 276528				
51	42	33	DILA-XHICV11 276529			-	
44E	35	26	DILA-XHIC04 276530			With interlocked opposing contacts	
53E	44	35	DILA-XHIC13 276531				
62E	53	44	DILA-XHIC22 276532				
71E	62	53	DILA-XHIC31 276533				
80E	71	62	DILA-XHIC40 276534				
62	53	44	DILA-XHICV22 276535			-	



DILM, DILE(E)M, DILMP

Technical overview

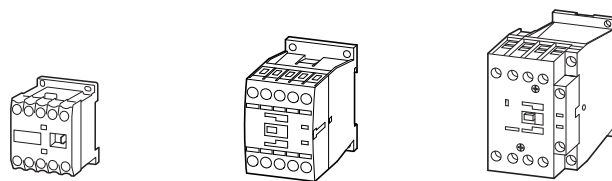
Contactors
3 pole



DIL	EEM	EM	EM12	M7	M9	M12	M15	M17	M25	M32	M38	M40	M50	M65	M80	M95	M115	M150	M170
Basic devices	Page → 5/4		→ 5/18			→ 5/18			→ 5/20			→ 5/50							
Complete units	Page -		→ Page 5/24			-			→ Page 5/24			→ Page 5/26			→ Page 5/26				

Rated-operational voltage	kW		kW		kW		kW		kW		kW		kW		kW		kW		kW	
AC-3 Rated operational power for 3-phase motors 50–60 Hz																				
220 V – 230 V	1.5	2.2	3	2.2	2.5	3.5	4	5	7.5	10	11	12.5	15.5	20	25	30	37	48	52	
380 V – 400 V	3	4	5.5	3	4	5.5	7.5	7.5	11	15	18.5	18.5	22	30	37	45	55	75	90	
440 V	3.3	4.6	5.5	4.5	5.5	7.5	8.4	10.5	15.5	20	21	25	32	41	51	60	75	95	105	
500 V	3	4	5.5	3.5	4.5	7	7.5	12	17.5	23	24	28	36	47	58	70	85	110	120	
660 V/690 V	3	4	4	3.5	4.5	6.5	7	11	14	17	21	23	30	35	63	75	90	96	140	
1000 V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AC-4 Rated operational power for 3-phase motors 50–60 Hz	▲ Increase in life span for DILM7 – DILM150 to 200000 operations																			
220 V – 230 V	1.1	1.5	1.5	1	1.5	2	2	2.5	3.5	4	4	5	6	7	12	16	17	20	20	
380 V – 400 V	2.2	3	3	2.2	2.5	3	3	4.5	6	7	7	9	10	12	20	26	28	33	33	
440 V	2.4	3.3	3.3	2.4	3	3.6	3.6	5.5	7	8	8	10	12	14	25	32	35	41	41	
500 V	2.2	3	3	2.5	2.8	3.5	3.5	6	8	9	9	11	13	16	29	36	40	47	47	
660 V/690 V	2.2	3	3	2.9	3.6	4.4	4.4	6.5	8.5	10	10	12	14	17	26	35	43	48	48	
1000 V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AC-1 Rated operational power under resistive load, 40 °C																				
220 V – 230 V	8	8	8	8	8	8	8	15	17	17	17	22	30	37	42	49	61	72	85	
380 V – 400 V	13	13	13	14	14	14	14	26	29	29	29	39	53	65	72	85	105	125	150	
440 V	15	15	15	16	16	16	16	30	34	34	34	45	58	71	80	94	116	138	170	
500 V	18	18	18	19	19	19	19	34	38	38	38	51	66	81	90	107	132	156	194	
660 V/690 V	23	23	23	25	25	25	25	45	51	51	51	68	91	111	125	148	182	216	268	
1000 V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conventional thermal Current $I_{th} = I_e$ open at 40 °C	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	22	22	22	22	22	22	22	40	45	45	45	60	80	98	110	130	160	190	225	

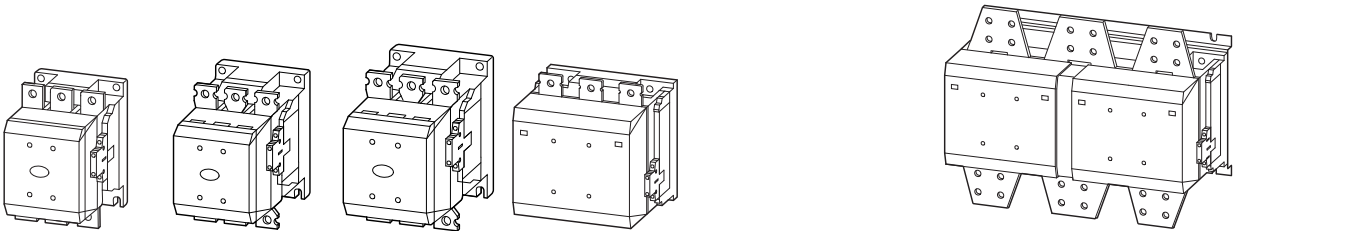
Contactors
4 pole



DIL	EM4	MP20	MP32
Rated operational voltage	Page → 5/4	→ Page 5/36	→ Page 5/36
AC-1 Conventional free air thermal current $I_{th} = I_e$ open, at 40 °C up to 690 V	A 22	A 22	A 32

DILM, DILH, DILMP

Contactors
3 pole



M185A M225A M250 M300A M400 M500 M580 M650 M750 M820 M1000 M1600 H1400 H2000 H2200 H2600

→ Page 5/32 → Page 5/32 → Page 5/32 → Page 5/32 → Page 5/34

kW kW kW kW kW kW kW kW kW kW kW kW kW kW kW kW

55	70	75	90	125	155	185	205	240	260	315	500	-	-	-	-
90	110	132	160	200	250	315	355	400	450	560	900	-	-	-	-
115	142	157	190	255	345	370	420	480	525	650	1000	-	-	-	-
132	160	180	215	290	360	420	470	550	600	730	1180	-	-	-	-
175	215	240	286	344	344	560	630	720	750	1000	1600	-	-	-	-
108	108	108	132	132	132	600	600	800	800	1000	1770	-	-	-	-

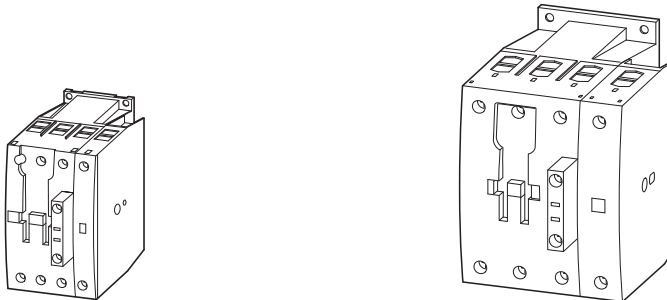
41	51	62	75	92	112	143	161	181	209	260	430	-	-	-	-
75	90	110	132	160	200	250	280	315	355	450	750	-	-	-	-
85	102	125	140	186	229	290	326	367	418	520	830	-	-	-	-
96	116	143	172	214	260	330	370	417	474	590	940	-	-	-	-
127	155	189	229	283	344	440	494	556	633	780	1300	-	-	-	-
108	108	108	132	132	132	509	509	678	678	1000	1650	-	-	-	-

121	139	155	177	221	310	354	376	398	443	443	717	620	886	1075	1269
210	241	268	306	382	535	612	650	689	766	766	1247	1071	1531	1870	2207
243	279	310	354	443	620	709	753	797	886	886	1371	1240	1773	2058	2427
277	317	352	403	503	705	806	856	906	1007	1007	1558	1410	2015	2338	2758
365	419	465	532	664	930	1064	1130	1196	1330	1330	2151	1861	2660	3227	3806
554	635	705	806	1007	1410	1612	1712	1813	2015	2015	2420	2417	3223	4676	5516

A A A A A A A A A A A A A A A

337 356 400 430 612 857 980 1041 1102 1225 1225 2200 1714 2450 2700 3185

Contactors
4 pole



MP45 MP63 MP80 MP125 MP160 MP200

→ Page 5/36 → Page 5/36 → Page 5/36

A A A A A A

45 63 80 125 160 200

DILM7...DILM170

System overview

Contactors up to 90 kW (AC-3/400 V) 1

3 pole
→ Page 5/18

4 pole
→ Page 5/36

Suppressor circuits 2
→ Page 5/54

Overload relays 3
→ Page 6/8

Auxiliary contact modules 4
→ Page 5/38

Auxiliary contact modules 5
→ Page 5/38

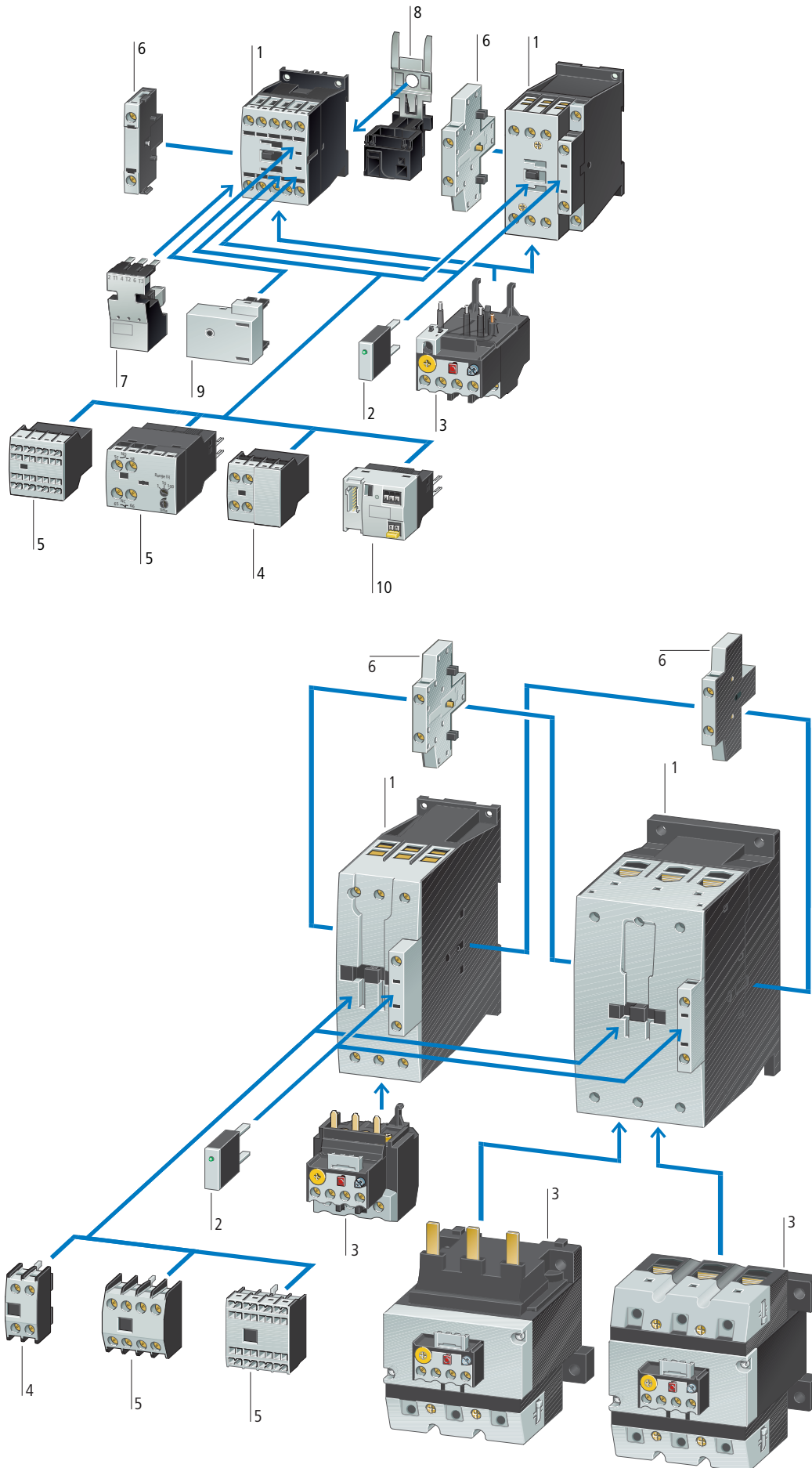
Auxiliary contact modules 6
→ Page 5/41

Motor feeder plug 7
→ Page 5/62

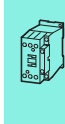
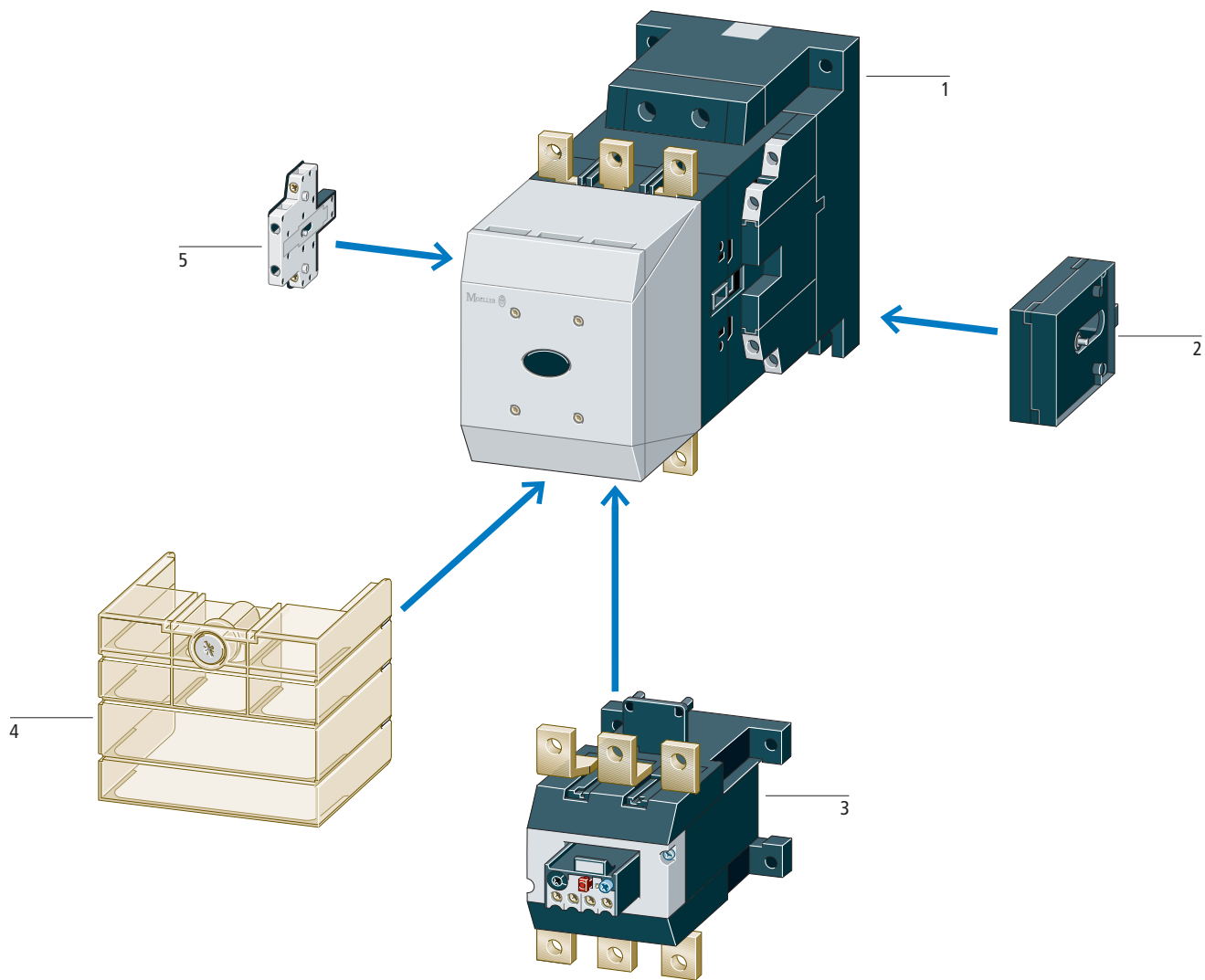
PE module with contact plate 8
→ Page 5/62

Motor suppressor module
→ Page 5/63

SmartWire-Darwin contactor module 10
→ Page 5/62



DILM185... DILH2600



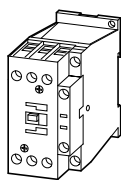
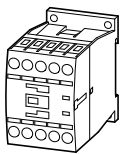
Contactors 90 – 900 kW (AC-3/400 V) Comfort series	1	Mechanical interlock	2	Terminal shroud	4
→ Page 5/32		→ Page 5/56		→ Page 5/65	
Standard range 90 – 250 kW	1	Overload relays	3	Auxiliary contact modules	5
→ Page 5/30		→ Page 6/12		→ Page 5/41	

Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration	Circuit symbol
	AC-3		AC-3		AC-4				
380 V 400 V	220 V	380 V	660 V	220 V	380 V	660 V	Open	N/O = normally open contact NC = normally closed contact	
	230 V	400 V	690 V	230 V	400 V	690 V			
I_e A	P	P	P	P	P	P	$I_{th} = I_e$	A	
	kW	kW	kW	kW	kW	kW			

Basic device

Screw terminals

3 pole




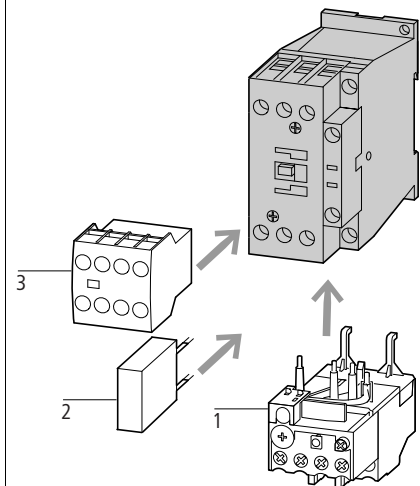
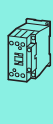
7	2.2	3	3.5	1	2.2	2.9	20	1 N/O	–	
7	2.2	3	3.5	1	2.2	2.9	20	–	1 NC	
9	2.5	4	4.5	1.5	2.5	3.6	20	1 N/O	–	
9	2.5	4	4.5	1.5	2.5	3.6	20	–	1 NC	
12	3.5	5.5	6.5	2	3	4.4	20	1 N/O	–	
12	3.5	5.5	6.5	2	3	4.4	20	–	1 NC	
15.5	4	7.5	7	2	3	4.4	20	1 N/O	–	
15.5	4	7.5	7	2	3	4.4	20	–	1 NC	
18	5	7.5	11	2.5	4.5	6.5	35	1 N/O	–	
18	5	7.5	11	2.5	4.5	6.5	35	–	1 NC	
25	7.5	11	14	3.5	6	8.5	40	1 N/O	–	
25	7.5	11	14	3.5	6	8.5	40	–	1 NC	
32	10	15	17	4	7	10	40	1 N/O	–	
32	10	15	17	4	7	10	40	–	1 NC	
38	11	18.5	21	4	7	10	40	1 N/O	–	
38	11	18.5	21	4	7	10	40	–	1 NC	

Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

Can be combined with auxiliary contact	AC operation		DC operation		Std. pack	Notes
	Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
	DILM7-10(230V50HZ) 276550		DILM7-10(24VDC) 276565		1 off 	<p>Contacts to EN 50 012.</p> <p>For all DC operated contactors DILM7 - DILM15 the following applies:</p> <ul style="list-style-type: none"> • Integrated varistor-suppressor circuit. <p>For DC operated contactors DILM17 - DILM170 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics <p>For AC operated contactors DILM115 - DILM170 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics • With mirror contact. <p>For DILM7-01 – DILM38-01 the following applies:</p> <ul style="list-style-type: none"> • With mirror contact. <p>¹⁾ Electrical lifespan → 5/91</p>
	DILM7-01(230V50HZ) 276585		DILM7-01(24VDC) 276600			
	DILM9-10(230V50HZ) 276690		DILM9-10(24VDC) 276705			
	DILM9-01(230V50HZ) 276725		DILM9-01(24VDC) 276740			
	DILM12-10(230V50HZ) 276830		DILM12-10(24VDC) 276845			
	DILM12-01(230V50HZ) 276865		DILM12-01(24VDC) 276880			
	DILM15-10(230V50HZ)¹⁾ 290058		DILM15-10(24VDC)¹⁾ 290073			
	DILM15-01(230V50HZ)¹⁾ 290093		DILM15-01(24VDC)¹⁾ 290108			
	DILM17-10(230V50HZ) 277004		DILM17-10(RDC24) 277018			
	DILM17-01(230V50HZ) 277036		DILM17-01(RDC24) 277050			
	DILM25-10(230V50HZ) 277132		DILM25-10(RDC24) 277146			
	DILM25-01(230V50HZ) 277164		DILM25-01(RDC24) 277178			
	DILM32-10(230V50HZ) 277260		DILM32-10(RDC24) 277274			
	DILM32-01(230V50HZ) 277292		DILM32-01(RDC24) 277306			
	DILM38-10(230V50HZ)¹⁾ 112428		DILM38-10(RDC24)¹⁾ 112442			
	DILM38-01(230V50HZ)¹⁾ 112456		DILM38-01(RDC24)¹⁾ 112470			



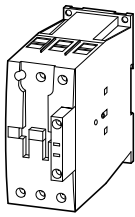
Accessories	Page
1 Overload relay	→ Chapter 6
2 Suppressor	→ 5/54
3 Auxiliary contact module	→ 5/38
Further actuating voltages	→ 5/73
Accessories	→ 5/56

Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz							Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration	Circuit symbol
AC-3 380 V 400 V	AC-3 220 V 380 V 660 V 230 V 400 V 690 V		AC-4 220 V 380 V 660 V 230 V 400 V 690 V					Open	N/O = normally open contact NC = normally closed contact	
I_e A	P kW	P kW	P kW	P kW	P kW	P kW	$I_{th} = I_e$ A			

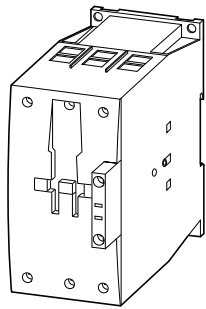
Basic device

Screw terminals

3 pole



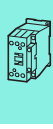
40	12.5	18.5	23	5	9	12	50	-	-	
50	15.5	22	30	6	10	14	65	-	-	
65	20	30	35	7	12	17	80	-	-	
72	25	37	35	7	12	17	80	-	-	
80	25	37	63	12	20	26	90	-	-	
95	30	45	75	16	26	35	110	-	-	
115	37	55	90	17	28	43	130	-	-	
150	48	75	96	20	33	48	160	-	-	
170	52	90	140	20	33	48	185	-	-	



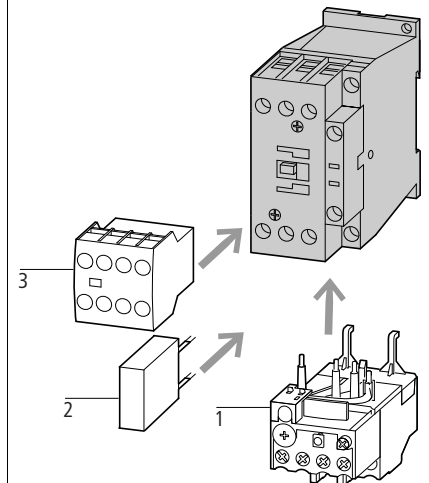
Information relevant for export to North America



Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
 UL File No. E29096
 UL CCN NLDX
 CSA File No. 012528
 CSA Class No. 2411-03, 3211-04
 NA Certification UL Listed, CSA certified
 See also → Page 5/84



Can be combined with auxiliary contact	AC operation		DC operation		Std. pack	Notes
	Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM40(230V50HZ) 277766		DILM40(RDC24) 277780		1 off 	Contacts to EN 50012. For all DC operated contactors DILM7 - DILM15 the following applies: • Integrated varistor-suppressor circuit. For DC operated contactors DILM17 - DILM170 the following applies: • Integrated suppressor circuit in actuating electronics For AC operated contactors DILM115 - DILM170 the following applies: • Integrated suppressor circuit in actuating electronics For DILM7-01 – DILM38-01 the following applies: • With mirror contact. 1) Electrical lifespan → 5/91
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM50(230V50HZ) 277830		DILM50(RDC24) 277844			
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM65(230V50HZ) 277894		DILM65(RDC24) 277908			
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM72(230V50HZ)¹⁾ 107670		DILM72(RDC24)¹⁾ 107671			
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM80(230V50HZ) 239402		DILM80(RDC24) 239416			
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM95(230V50HZ) 239480		DILM95(RDC24) 239510			
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM115(RAC240) 239548		DILM115(RDC24) 239555			
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM150(RAC240) 239588		DILM150(RDC24) 239591			
DILM150-XHI(V).. DILM1000-XHI(V)..	DILM170(RAC240)¹⁾ 107013		DILM170(RDC24)¹⁾ 107016			

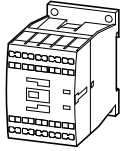


- | Accessories | Page |
|----------------------------|-------------|
| 1 Overload relay | → Chapter 6 |
| 2 Suppressor | → 5/54 |
| 3 Auxiliary contact module | → 5/38 |
| Further actuating voltages | → 5/75 |
| Accessories | → 5/56 |

Rated operational current AC-3	Max. motor rating for three-phase motors 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration N/O = normally open contact NC = normally closed contact	Circuit symbol
	AC-3		AC-3		AC-4				
380 V 400 V I_e A	220 V 230 V P kW	380 V 400 V P kW	660 V 690 V P kW	220 V 230 V P kW	380 V 400 V P kW	660 V 690 V P kW	Open $I_{th} = I_e$ A		

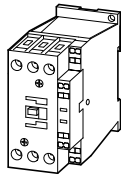
Basic device

Spring-loaded terminals
3 pole

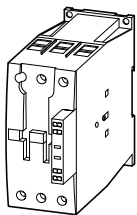


7	2.2	3	3.5	1	2.2	2.9	20	1 N/O	–	
7	2.2	3	3.5	1	2.2	2.9	20	–	1 NC	
9	2.5	4	4.5	1.5	2.5	3.6	20	1 N/O	–	
9	2.5	4	4.5	1.5	2.5	3.6	20	–	1 NC	
12	3.5	5.5	6.5	2	3	4.4	20	1 N/O	–	
12	3.5	5.5	6.5	2	3	4.4	20	–	1 NC	
15.5	4	7.5	7	2	3	4.4	20	1 N/O	–	
15.5	4	7.5	7	2	3	4.4	20	–	1 NC	

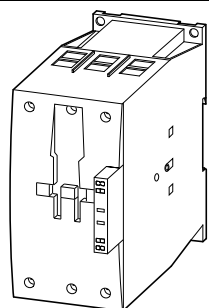
Spring-loaded terminals on auxiliary and control circuit terminals
3 pole



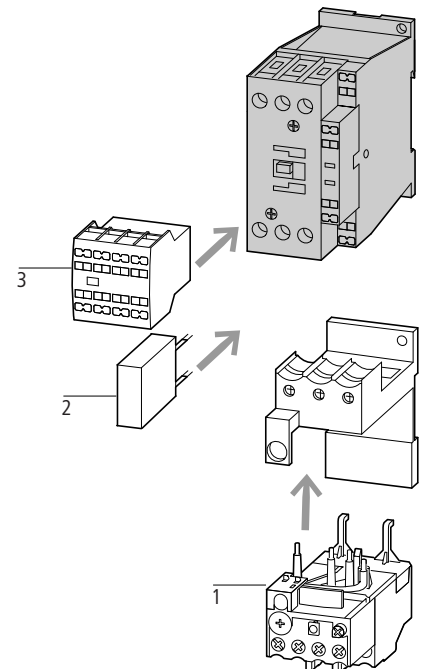
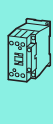
18	5	7.5	11	2.5	4.5	6.5	35	1 N/O	–	
18	5	7.5	11	2.5	4.5	6.5	35	–	1 NC	
25	7.5	11	14	3.5	6	8.5	40	1 N/O	–	
25	7.5	11	14	3.5	6	8.5	40	–	1 NC	
32	10	15	17	4	7	10	40	1 N/O	–	
32	10	15	17	4	7	10	40	–	1 NC	
40	12.5	18.5	23	5	9	12	50	–	–	
50	15.5	22	30	6	10	14	65	–	–	
65	20	30	35	7	12	17	80	–	–	



80	25	37	63	12	20	26	90	–	–	
95	30	45	75	16	26	35	110	–	–	
115	37	55	90	17	28	43	130	–	–	
150	48	75	96	20	33	48	160	–	–	



Can be combined with auxiliary contact	AC operation		DC operation		Std. pack	Notes									
	Part no. Article no.	Price See price list	Part no. Article no.	Price See price list											
DILM32-XHIC.. DILA-XHIC(V)..	DILMC7-10(230V50HZ) 277389		DILMC7-10(24VDC) 277404		1 off 	<p>Contacts to EN 50 012.</p> <p>For DILMC7 – DILMC15 the following applies:</p> <ul style="list-style-type: none"> • Auxiliary coil, and main current terminals with spring-loaded terminals. <p>For DILMC17 – DILMC150 the following applies:</p> <ul style="list-style-type: none"> • Auxiliary connections, coil connections with spring-loaded connection terminals. • Main current connections with screw terminals. <p>For DC operated contactors DILMC7 - DILMC15 the following applies:</p> <ul style="list-style-type: none"> • Integrated varistor-suppressor circuit. <p>For DC operated contactors DILMC17 - DILMC150 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics <p>For AC operated contactors DILMC115 - DILMC150 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics <p>For DILMC7-01 – DILMC32-01 the following applies:</p> <ul style="list-style-type: none"> • With mirror contact. 									
DILA-XHIC(V)..	DILMC7-01(230V50HZ) 277421		DILMC7-01(24VDC) 277436												
DILM32-XHIC.. DILA-XHIC(V)..	DILMC9-10(230V50HZ) 277453		DILMC9-10(24VDC) 277468												
DILA-XHIC(V)..	DILMC9-01(230V50HZ) 277485		DILMC9-01(24VDC) 277500												
DILM32-XHIC.. DILA-XHIC(V)..	DILMC12-10(230V50HZ) 277517		DILMC12-10(24VDC) 277532												
DILA-XHIC(V)..	DILMC12-01(230V50HZ) 277549		DILMC12-01(24VDC) 277564												
DILM32-XHIC... DILA-XHIC(V)... DILA-XHIC(V)..	DILMC15-10(230V50HZ) 293911 DILMC15-01(230V50HZ) 293946		DILMC15-10(24VDC) 293926 DILMC15-01(24VDC) 293961												
DILM32-XHIC.. DILA-XHIC(V)..	DILMC17-10(230V50HZ) 277581		DILMC17-10(RDC24) 277595	1 off 	<p>Accessories</p> <table border="0"> <tr> <td>1 Overload relay</td> <td>→ Chapter 6</td> </tr> <tr> <td>2 Suppressor</td> <td>→ 5/54</td> </tr> <tr> <td>3 Auxiliary contact module</td> <td>→ 5/38</td> </tr> <tr> <td>Further actuating voltages</td> <td>→ 5/77</td> </tr> <tr> <td>Accessories</td> <td>→ 5/56</td> </tr> </table> <p>Information relevant for export to North America</p> <p>Product Standards IEC/EN 60947-4-1; UL 5080; CSA-C22.2 No. 14-05; CE marking</p> <p>UL File No. E29096 UL CCN NLDX CSA File No. 012528 CSA Class No. 2411-03, 3211-04 NA Certification UL Listed, CSA certified See also → Page 5/84</p>	1 Overload relay	→ Chapter 6	2 Suppressor	→ 5/54	3 Auxiliary contact module	→ 5/38	Further actuating voltages	→ 5/77	Accessories	→ 5/56
1 Overload relay	→ Chapter 6														
2 Suppressor	→ 5/54														
3 Auxiliary contact module	→ 5/38														
Further actuating voltages	→ 5/77														
Accessories	→ 5/56														
DILA-XHIC(V)..	DILMC17-01(230V50HZ) 277611		DILMC17-01(RDC24) 277625												
DILM32-XHIC.. DILA-XHIC(V)..	DILMC25-10(230V50HZ) 277641		DILMC25-10(RDC24) 277655												
DILA-XHIC(V)..	DILMC25-01(230V50HZ) 277671		DILMC25-01(RDC24) 277685												
DILM32-XHIC.. DILA-XHIC(V)..	DILMC32-10(230V50HZ) 277701		DILMC32-10(RDC24) 277715												
DILA-XHIC(V)..	DILMC32-01(230V50HZ) 277731		DILMC32-01(RDC24) 277745												
DILM150-XHIC(V).. DILM1000-XHIC..	DILMC40(230V50HZ) 277965		DILMC40(RDC24) 277979												
	DILMC50(230V50HZ) 277995		DILMC50(RDC24) 278009												
	DILMC65(230V50HZ) 278025		DILMC65(RDC24) 278039												
	DILMC80(230V50HZ) 239618		DILMC80(RDC24) 239652												
	DILMC95(230V50HZ) 239685		DILMC95(RDC24) 239715												
	DILMC115(RAC240) 239736		DILMC115(RDC24) 239741												
	DILMC150(RAC240) 239751		DILMC150(RDC24) 239765												



Accessories

1 Overload relay	→ Chapter 6
2 Suppressor	→ 5/54
3 Auxiliary contact module	→ 5/38
Further actuating voltages	→ 5/77
Accessories	→ 5/56

Information relevant for export to North America



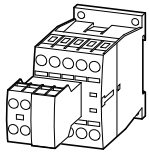
Product Standards IEC/EN 60947-4-1; UL 5080; CSA-C22.2 No. 14-05; CE marking

UL File No. E29096
UL CCN NLDX
CSA File No. 012528
CSA Class No. 2411-03, 3211-04
NA Certification UL Listed, CSA certified
See also → Page 5/84

Rated operational current AC-3	Max. motor rating for three-phase motors 50 - 60 Hz						Conventional free air thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration: ⊕ = Safety function by positive opening according to IEC/EN 60947-5-1	Circuit symbol
	AC-3		AC-4						
380 V 400 V	220 V	380 V	660 V	220 V	380 V	660 V	Open $I_{th} = I_e$	N/O = normally open contact NC = normally closed contact	
	230 V	400 V	690 V	230 V	400 V	690 V			
I_e	P	P	P	P	P	P			
A	kW	kW	kW	kW	kW	kW	A		

DILM complete device

Screw terminals


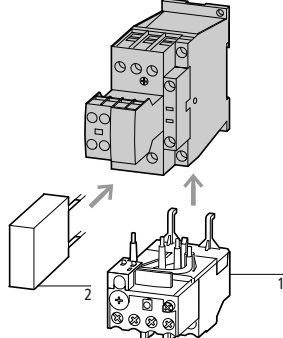


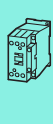
7	2.2	3	3.5	1	2.2	2.9	20	2 N/O	1 NC	
7	2.2	3	3.5	1	2.2	2.9	20	2 N/O	1 NC	
7	2.2	3	3.5	1	2.2	2.9	20	3 N/O	2 NC	
9	2.5	4	4.5	1.5	2.5	3.6	20	2 N/O	1 NC	
9	2.5	4	4.5	1.5	2.5	3.6	20	2 N/O	1 NC	
9	2.5	4	4.5	1.5	2.5	3.6	20	3 N/O	2 NC	
12	3.5	5.5	6.5	2	3	4.4	20	2 N/O	1 NC	
12	3.5	5.5	6.5	2	3	4.4	20	2 N/O	1 NC	
12	3.5	5.5	6.5	2	3	4.4	20	3 N/O	2 NC	
15.5	4	7.5	7	2	3	4.4	20	2 N/O	2 NC	
18	5	7.5	11	2.5	4.5	6.5	35	2 N/O	1 NC	
18	5	7.5	11	2.5	4.5	6.5	35	2 N/O	1 NC	
18	5	7.5	11	2.5	4.5	6.5	35	3 N/O	2 NC	
25	7.5	11	14	3.5	6	8.5	40	2 N/O	1 NC	
25	7.5	11	14	3.5	6	8.5	40	2 N/O	1 NC	
25	7.5	11	14	3.5	6	8.5	40	3 N/O	2 NC	
32	10	15	17	4	7	10	40	2 N/O	1 NC	
32	10	15	17	4	7	10	40	2 N/O	1 NC	
32	10	15	17	4	7	10	40	3 N/O	2 NC	

Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05;
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

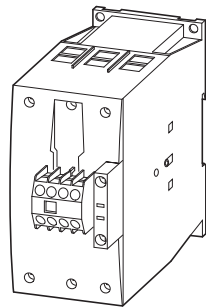
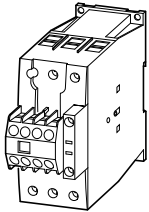
AC operation		DC operation		Std. pack	Notes
Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
DILM7-21(230V50HZ) 276620		DILM7-21(24VDC) 276635		1 off 	 <p>Accessories</p> <p>1 Overload relay 2 Suppressor Accessories</p> <p>Page</p> <p>→ Chapter 6 → 5/54 → 5/56</p> <p>For all DC operated contactors DILM7 - DILM15 the following applies:</p> <ul style="list-style-type: none"> • Integrated varistor suppressor circuit. <p>For DC operated contactors DILM17 - DILM170 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics <p>For AC operated contactors DILM115 - DILM170 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics <p>For DILM7 - DILM150 the following applies:</p> <ul style="list-style-type: none"> • With mirror contact. <p>Contacts to EN 50012</p>
DILM7-22(230V50HZ) 106360		DILM7-22(24VDC) 106367			
DILM7-32(230V50HZ) 276655		DILM7-32(24VDC) 276670			
DILM9-21(230V50HZ) 276760		DILM9-21(24VDC) 276775			
DILM9-22(230V50HZ) 106361		DILM9-22(24VDC) 106368			
DILM9-32(230V50HZ) 276795		DILM9-32(24VDC) 276810			
DILM12-21(230V50HZ) 276900		DILM12-21(24VDC) 276915			
DILM12-22(230V50HZ) 106362		DILM12-22(24VDC) 106369			
DILM12-32(230V50HZ) 276935		DILM12-32(24VDC) 276950			
DILM15-22(230V50HZ) 106363		DILM15-22(24VDC) 106370			
DILM17-21(230V50HZ) 277068		DILM17-21(RDC24) 277082			
DILM17-22(230V50HZ) 106364		DILM17-22(RDC24) 106371			
DILM17-32(230V50HZ) 277100		DILM17-32(RDC24) 277114			
DILM25-21(230V50HZ) 277196		DILM25-21(RDC24) 277210			
DILM25-22(230V50HZ) 106365		DILM25-22(RDC24) 106372			
DILM25-32(230V50HZ) 277228		DILM25-32(RDC24) 277242			
DILM32-21(230V50HZ) 277324		DILM32-21(RDC24) 277338			
DILM32-22(230V50HZ) 106366		DILM32-22(RDC24) 106373			
DILM32-32(230V50HZ) 277356		DILM32-32(RDC24) 277370			



Rated operational current AC-3	Max. motor rating for three-phase motors 50 - 60 Hz						Conventional free air thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact configuration: ⊕ = Safety function by positive opening according to IEC/EN 60947-5-1	Circuit symbol
	AC-3		AC-4						
380 V 400 V	220 V 230 V	380 V 400 V	660 V 690 V	220 V 230 V	380 V 400 V	660 V 690 V	Open $I_{th} = I_e$	N/O = normally open contact NC = normally closed contact	
I_e	P	P	P	P	P	P	A		
A	kW	kW	kW	kW	kW	kW			

DILM complete device

Screw terminals


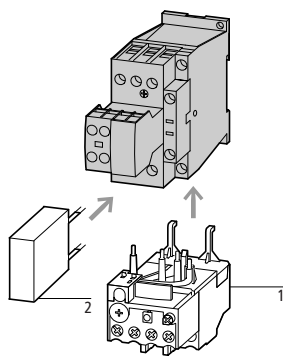


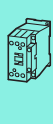
Rating (A)	12.5	18.5	23	5	9	12	50	2 N/O	2 NC	Circuit symbol
40	12.5	18.5	23	5	9	12	50	2 N/O	2 NC	
50	15.5	22	30	6	10	14	65	2 N/O	2 NC	
65	20	30	35	7	12	17	80	2 N/O	2 NC	
80	25	37	63	12	20	26	90	2 N/O	2 NC	
95	30	45	75	16	26	35	110	2 N/O	2 NC	
115	37	55	90	17	28	43	130	2 N/O	2 NC	
150	48	75	96	20	34	48	160	2 N/O	2 NC	

Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05;
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84

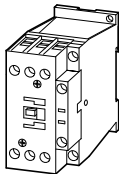
AC operation		DC operation		Std. pack	Notes
Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
DILM40-22(230V50HZ) 277798		DILM40-22(RDC24) 277812		1 off 	 <p>Accessories</p> <p>1 Overload relay → Chapter 6</p> <p>2 Suppressor → 5/54</p> <p>Accessories → 5/56</p> <p>For DC operated contactors DILM17 - DILM170 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics <p>For AC operated contactors DILM115 - DILM170 the following applies:</p> <ul style="list-style-type: none"> • Integrated suppressor circuit in actuating electronics <p>For DILM7 - DILM150 the following applies:</p> <ul style="list-style-type: none"> • With mirror contact. <p>Contacts to EN 50012</p>
DILM50-22(230V50HZ) 277862		DILM50-22(RDC24) 277876			
DILM65-22(230V50HZ) 277926		DILM65-22(RDC24) 277940			
DILM80-22(230V50HZ) 239449		DILM80-22(RDC24) 239463			
DILM95-22(230V50HZ) 239527		DILM95-22(RDC24) 239541			
DILM115-22(RAC240) 239578		DILM115-22(RDC24) 239581			
DILM150-22(RAC240) 239598		DILM150-22(RDC24) 239601			



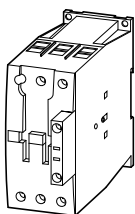
Pole	Rated operational current		Max. motor rating, three-phase motors, 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C	Contact	Circuit symbol
	AC-3	AC-3	AC-3		AC-4		AC-4				
	380 V 400 V	220 V 230 V	380 V 400 V	660 V 690 V	220 V 230 V	380 V 400 V	660 V 690 V	Open	Contact configuration: ⊕ = Safety function by positive opening according to IEC/EN 60947-5-1 N/O = normally open contact NC = normally closed contact		
	I_e A	P kW	P kW	P kW	P kW	P kW	P kW	$I_{th} = I_e$ A			

Basic device

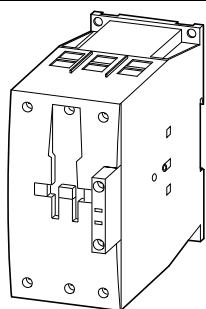
Screw terminals



3 pole	7	2.2	3	3.5	1	2.2	2.9	20	1 N/O	–	
	7	2.2	3	3.5	1	2.2	2.9	20	–	1 NC	
	9	2.5	4	4.5	1.5	2.5	3.6	20	1 N/O	–	
	9	2.5	4	4.5	1.5	2.5	3.6	20	–	1 NC	
	12	3.5	5.5	6.5	2	3	4.4	20	1 N/O	–	
	12	3.5	5.5	6.5	2	3	4.4	20	–	1 NC	
	18	5	7.5	11	2.5	4.5	6.5	35	1 N/O	–	
	18	5	7.5	11	2.5	4.5	6.5	35	–	1 NC	
	25	7.5	11	14	3.5	6	8.5	40	–	1 NC	
	25	7.5	11	14	3.5	6	8.5	40	1 N/O	–	
	32	10	15	17	4	7	10	40	1 N/O	–	
	32	10	15	17	4	7	10	40	–	1 NC	



3 pole	40	12.5	18.5	23	5	9	12	50	–	–	
	50	15.5	22	30	6	10	14	65	–	–	
	65	20	30	35	7	12	17	80	–	–	

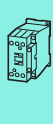



3 pole	80	25	37	63	12	20	26	90	–	–	
	95	30	45	75	16	26	35	110	–	–	
	115	37	55	90	17	28	43	130	–	–	
	150	48	75	96	20	33	48	160	–	–	

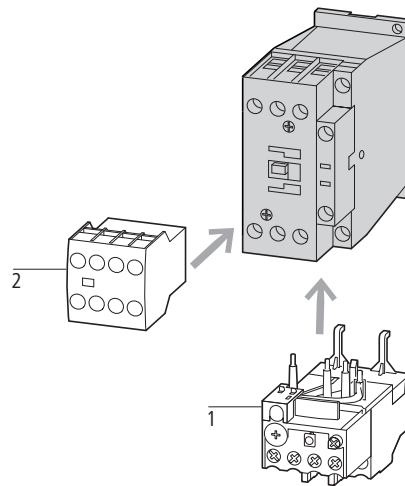
2) Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05;
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified
See also	→ Page 5/84



AC operation Part no. Article no.	Price See price list	Std. pack	Notes
DILMF8-10(RAC240) 104413		1 off 	Contactors suitable for semi-conductor industry according to SEMI F47. Contactors hum-free, suitable for building services automation. Operating mechanism adjustable from 50 Hz to 400 Hz.
DILMF8-01(RAC240) 104417			For all contactors the following applies: • Integrated suppressor circuit For DILMF8-01 – DILMF32-01 the following applies: • With mirror contact. Contacts to EN 50 012.
DILMF11-10(RAC240) 104421			
DILMF11-01(RAC240) 104425			
DILMF14-10(RAC240) 104429			
DILMF14-01(RAC240) 104433			
DILMF17-10(RAC240) 104437			
DILMF17-01(RAC240) 104441			
DILMF25-01(RAC240) 104449			
DILMF25-10(RAC240) 104445			
DILMF32-10(RAC240) 104453			
DILMF32-01(RAC240) 104457			
DILMF40(RAC240) 104461			
DILMF50(RAC240) 104465			
DILMF65(RAC240) 104469			
DILMF80(RAC240) 104473			
DILMF95(RAC240) 104477			
DILMF115(RAC240) 104481			
DILMF150(RAC240) 104485			



Accessories	Page
1 Overload relay	→ Chapter 6
2 Auxiliary contact modules	→ 5/38
Further actuating voltages	→ 5/80
Accessories	→ 5/56

Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz						Conventional thermal current $I_{th} = I_e$ AC-1 at 40 °C Open $I_{th} = I_e$	Circuit symbol	For use with
	AC-3	AC-3		AC-4					
380 V	220 V	380 V	660 V	220 V	380 V	660 V		A	
400 V	230 V	400 V	690 V	230 V	400 V	690 V			
I_e	P	P	P	P	P	P			
A	kW	kW	kW	kW	kW	kW			

Standard device for currents greater than 150 A

DILM complete device

	250	75	132	240	62	110	189	400		DILM820-XHI...
	300	90	160	195	75	132	160	430		DILM820-XHI...
	400	125	200	344	92	160	283	612		DILM820-XHI...
	500	155	250	344	112	200	344	857		DILM820-XHI...
	580	185	315	344	112	200	344	920		DILM820-XHI...

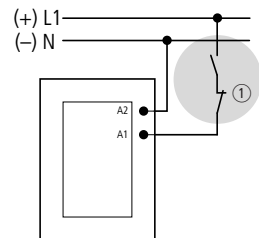
Notes

¹⁾ Availability from August 2010.
Previous DILM300/22, see Online Catalog at <http://ecat.moeller.net>

For all contactors the following applies:

- 660 V, 690 V or 1000 V: do not reverse directly
- Integrated suppressor circuit in actuating electronics.

DILM...-S contactors are actuated conventionally







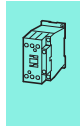
① Stopping in the event of an emergency (emergency switching off)

Accessories

- Auxiliary contact modules → 5/40
- Enclosures totally insulated
- Further actuating voltages → 5/81

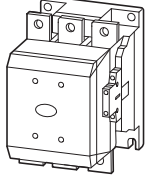
Page

Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America												
															
DILM250-S/22(220-240V50/60HZ) 274190		1 off 	<table border="0"> <tr> <td>Product Standards</td> <td>IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking</td> </tr> <tr> <td>UL File No.</td> <td>E29096</td> </tr> <tr> <td>UL CCN</td> <td>NLDX</td> </tr> <tr> <td>CSA File No.</td> <td>1017510</td> </tr> <tr> <td>CSA Class No.</td> <td>3211-04</td> </tr> <tr> <td>NA Certification</td> <td>UL Listed, CSA certified</td> </tr> </table>	Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking	UL File No.	E29096	UL CCN	NLDX	CSA File No.	1017510	CSA Class No.	3211-04	NA Certification	UL Listed, CSA certified
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking														
UL File No.	E29096														
UL CCN	NLDX														
CSA File No.	1017510														
CSA Class No.	3211-04														
NA Certification	UL Listed, CSA certified														
DILM300A-S/22(220-240V50/60HZ)¹⁾ 139559		1 off 	Request filed for UL and CSA												
DILM400-S/22(220-240V50/60HZ) 274196		1 off 	<table border="0"> <tr> <td>Product Standards</td> <td>IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking</td> </tr> <tr> <td>UL File No.</td> <td>E29096</td> </tr> <tr> <td>UL CCN</td> <td>NLDX</td> </tr> <tr> <td>CSA File No.</td> <td>012528</td> </tr> <tr> <td>CSA Class No.</td> <td>3211-04</td> </tr> <tr> <td>NA Certification</td> <td>UL Listed, CSA certified</td> </tr> </table>	Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking	UL File No.	E29096	UL CCN	NLDX	CSA File No.	012528	CSA Class No.	3211-04	NA Certification	UL Listed, CSA certified
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking														
UL File No.	E29096														
UL CCN	NLDX														
CSA File No.	012528														
CSA Class No.	3211-04														
NA Certification	UL Listed, CSA certified														
DILM500-S/22(220-240V50/60HZ) 274199			Additional approvals, → Page 5/86												
DILM570-S/22(220-240V50/60HZ) 110744															

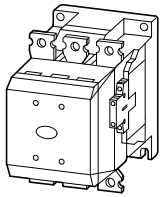


Rated operational current	Max. motor rating for three-phase motors 50 - 60 Hz									Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$	Circuit symbol			
	AC-3			AC-3			AC-4							
380 V 400 V	220 V	380 V	660 V	1000 V	220 V	380 V	660 V	1000 V	220 V	380 V	660 V	1000 V	A	
I_e	P	P	P	P	P	P	P	P	P	P	P	P		
A	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW	kW		

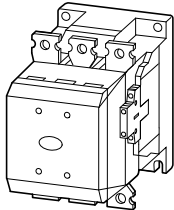
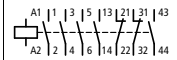
Contactors, comfort DILM



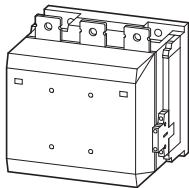
185	55	90	140	108	41	75	102	77	275
225	70	110	150	108	51	90	110	77	315



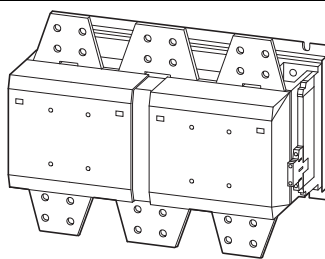
250	75	132	195	108	62	110	160	109	330
300	90	160	195	132	75	132	160	109	350



400	125	200	344	132	92	160	283	132	500
500	155	250	344	132	112	200	344	132	700



580	185	315	560	600	143	250	440	509	800
650	205	355	630	600	161	280	494	509	850
750	240	400	720	800	181	315	556	678	900
820	260	450	750	800	209	355	633	678	1000
1000	315	560	1000	1100	260	450	780	1000	1000



1600	500	900	1600	1770	430	750	1300	1650	1800
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Notes


¹⁾ Availability from August 2010.
Previous DILM185/22 to DILM300/22, see Online Catalog at <http://ecat.moeller.net>

- For all contactors the following applies:
- 660 V, 690 V or 1000 V: do not reverse directly
 - Integrated suppressor circuit in actuating electronics.

When operating contactors DILM580 to DILM1600 behind a frequency inverter or mains with strong harmonic loads, the suppressor circuit on the load side must be removed.
During high-voltage tests, the suppressor circuit on the load-side for DILM580 to DILH2600 contactors must be disconnected (see instructional leaflet).

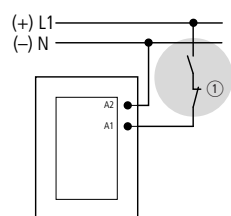
Control voltages
RA250 Δ 110 V - 250 V AC/DC
RAW250 Δ 230 V - 250 V AC/DC

Accessories	Page
Auxiliary contact modules	→ 5/40
Suppressor circuits on load side	→ 5/65
Enclosures totally insulated	
Further actuating voltages	→ 5/76

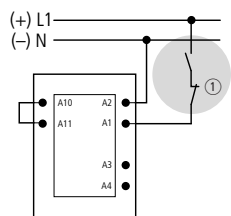
Part no.	Price See price list	Std. pack	Notes
DILM185A/22(RAC240) ¹⁾ 139537	1 off 		
DILM225A/22(RAC240) ¹⁾ 139547			
DILM250/22(RA250) ²⁾ 208201			
DILM300A/22(RA250) ^{1) 2)} 139556			
DILM400/22(RA250) ³⁾ 208209			
DILM500/22(RA250) ³⁾ 208213			
DILM580/22(RA250) ³⁾ 208216			
DILM650/22(RA250) ³⁾ 208219			
DILM750/22(RA250) ³⁾ 208222			
DILM820/22(RA250) ³⁾ 208225			
DILM1000/22(RA250) ³⁾ 267214			
DILM1600/22(RAW250) ³⁾ 106727			

Conventional
A1/A2 are attached to power supply as normal

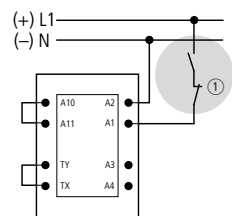
DILM 185 A, DILM 225 A



DILM250 to DILM1000, DILH1400

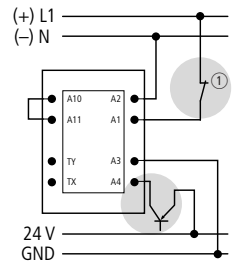
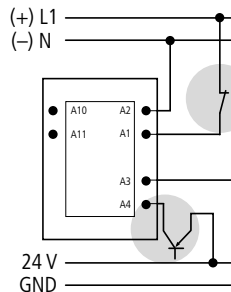
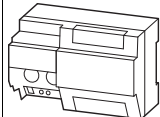


DILM1600 to DILH 2600



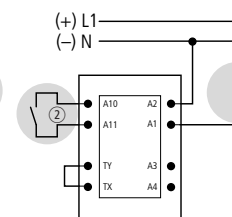
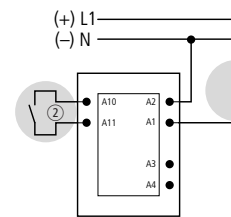
Directly from the PLC

A 24 V output from the PLC can be directly connected to the terminals A4/A24.



From a low-power command device

Low-power actuating devices such as PCB relays, pilot devices or position switches can be directly connected to A10/A11.



- ① Stopping in the event of an emergency (emergency switching off)
- ② Max. cable capacitance 6 nF

Information relevant for export to North America



1)
NA Certification Request filed for UL and CSA

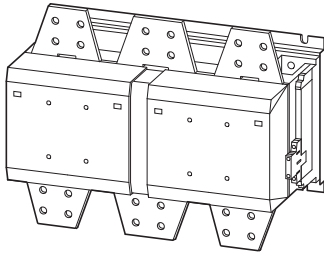
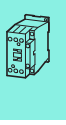
2)
Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No. E29096
UL CCN NLDX
CSA File No. 1017510
CSA Class No. 3211-04
NA Certification UL Listed, CSA certified

3)
Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No. E29096
UL CCN NLDX
CSA File No. 012528
CSA Class No. 3211-04
NA Certification UL Listed, CSA certified
See also Additional approvals → Page 5/86

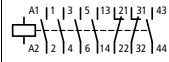
Conventional thermal current $I_{th} = I_e$ Circuit symbol
 AC-1 at 60 °C
 Open
 $I_{th} = I_e$
 A

Part no.	Price See price list	Std. pack
----------	-------------------------	-----------

DILH comfort devices AC-1



- 1400
- 2000
- 2200
- 2600



DILH1400/22(RAW250) ¹⁾ 272441		1 off
DILH2000/22(RAW250) ¹⁾ 272442		
DILH2200/22(RAW250) ¹⁾ 111793		
DILH2600/22(RAW250) ²⁾ 125945		

Notes

For all contactors the following applies:

- 660 V, 690 V or 1000 V: do not reverse directly
- Integrated suppressor circuit in actuating electronics.

When operating contactors DILM580 to DILM1600 behind a frequency inverter or mains with strong harmonic loads, the suppressor circuit on the load side must be removed.

During high-voltage tests, the suppressor circuit on the load-side for DILM580 to DILH2600 contactors must be disconnected (see instructional leaflet).

Control voltages

RAW250 \triangleq 230 V - 250 V AC/DC

Accessories

Auxiliary contact modules

Page

→ 5/40

Suppressor circuits on load side

→ 5/65

Enclosures

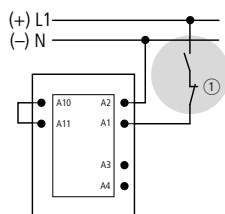
totally insulated

Notes

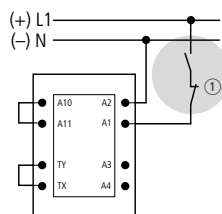
Conventional

A1/A2 are attached to power supply as normal

DILH1400

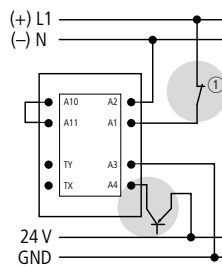
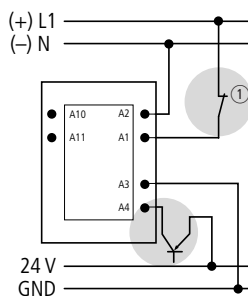
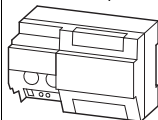


DILM1600 to DILH 2600



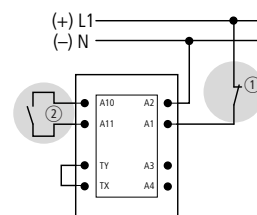
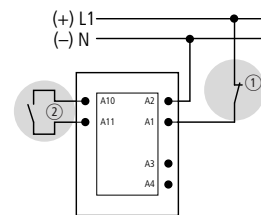
Directly from the PLC

A 24 V output from the PLC can be directly connected to the terminals A4/A24.



From a low-power command device

Low-power actuating devices such as PCB relays, pilot devices or position switches can be directly connected to A10/A11.



- ① Stopping in case of emergency (Emergency-stop)
- ② Max. cable capacitance 6 nF

Information relevant for export to North America

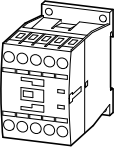
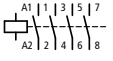
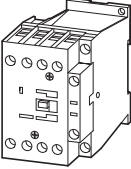

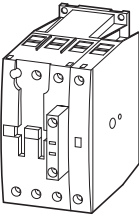

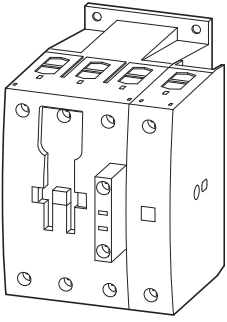



1)
Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No. E29096
UL CCN NLDX
CSA File No. 012528
CSA Class No. 3211-04
NA Certification UL Listed, CSA certified

2)
NA Certification Request filed for UL and CSA

Rated operational current open			Conventional thermal current $I_{th} = I_e$ AC-1 at 50 °C	Circuit symbol	For use with
AC-1					
40 °C	55 °C	70 °C	Open		
A	A	A	$I_{th} = I_e$		

4 pole

	22	21	20	20		DILM32-XHI(C)... DILA-XHI(V)(C)...
	32	30	28	32		DILM32-XHI(C)... DILA-XHI(V)(C)...
	32	30	28	32		
	45	41	39	45		
	45	41	39	45		
	63	60	54	63		DILM150-XHI(A)(V)... or DILM1000-XHI11-SA ¹⁾ or DILM1000-XHI(V)11-SI ¹⁾
	80	76	69	80		
	125	116	108	125		DILM150-XHI(A)(V)... DILM1000-XHI(V)... ¹⁾
	160	150	138	160		
	200	188	172	200		

Notes

¹⁾ DILM1000-XHI... can only be fitted on the left of DILMP.

Contacts to EN 50012.

For DC operated contactors DILMP20 the following applies:

- Integrated varistor suppressor circuit.

For DC operated contactors DILMP32 - DILMP200 the following applies:

- Integrated suppressor circuit in actuating electronics.

For AC operated contactors DILMP125 - DILMP200 the following applies:

- Integrated suppressor circuit in actuating electronics.

For DILMP32-01 and DILMP45-01 the following applies:

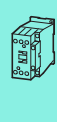
- With mirror contact.

AC operation			DC operation			Std. pack	Notes
Part no. Article no.	Price See price list	Std. pack	Part no. Article no.	Price See price list	Std. pack		
DILMP20(230V50HZ,240V60HZ) 276970		1 off 	DILMP20(24VDC) 276985		1 off 	<p>Accessories</p> <p>1 Auxiliary contact module → 5/38</p> <p>2 Suppressor → 5/54</p> <p>Further actuating voltages → 5/78</p> <p>Accessories → 5/56</p>	
DILMP32-01(230V50HZ,240V60HZ) 118911			DILMP32-01(RDC24) 118913				
DILMP32-10(230V50HZ,240V60HZ) 109797			DILMP32-10(RDC24) 109811				
DILMP45-01(230V50HZ,240V60HZ) 118914			DILMP45-10(RDC24) 109840				
DILMP45-10(230V50HZ,240V60HZ) 109826							
DILMP63(230V50HZ,240V60HZ) 109855			DILMP63(RDC24) 109869				
DILMP80(230V50HZ,240V60HZ) 109884			DILMP80(RDC24) 109898				
DILMP125(RAC240) 109905			DILMP125(RDC24) 109910				
DILMP160(RAC240) 109915			DILMP160(RDC24) 109920				
DILMP200(RAC240) 109925			DILMP200(RDC24) 109930				

Information relevant for export to North America



Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
 UL File No. E29096
 UL CCN NLDX
 CSA File No. 012528
 CSA Class No. 2411-03, 3211-04
 NA Certification UL Listed, CSA certified
 See also → Page 5/85



Terminal type	Pole	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration	Circuit symbol	For use with	Part no.	Price See price list	Std. pack		
Auxiliary contact modules										
With interlocked opposing contacts, except ...XHI(C)V										
Top mounting auxiliary contacts										
	Screw terminals	2 pole	16	1 N/O	1 NC		DILM(C)7-10... DILM(C)9-10... DILM(C)12-10... DILM(C)15-10... DILM(C)17-10... DILM(C)25-10... DILM(C)32-10... DILM38-...10 DILMP20... DILMP32-10... DILMP45-10... DILL...	DILM32-XHI11 277376	5 off 	
				-	2 NC					DILM32-XHI02 277375
	Screw terminals	4 pole	16	2 N/O	2 NC		DILM(C)7-10... DILM(C)9-10... DILM(C)12-10... DILM(C)15-10... DILM(C)17-10... DILM(C)25-10... DILM(C)32-10... DILM38-...10 DILMP20... DILMP32-10... DILMP45-10... DILL...	DILM32-XHI22 277377		
				3 N/O	1 NC					DILM32-XHI31 106112
	Spring-loaded terminals	2 pole	16	1 N/O	1 NC		DILM(C)7-10... DILM(C)9-10... DILM(C)12-10... DILM(C)15-10... DILM(C)17-10... DILM(C)25-10... DILM(C)32-10... DILM38-...10 DILMP20... DILMP32-10... DILMP45-10... DILL...	DILM32-XHIC11 277751		
				-	2 NC					DILM32-XHIC02 277750
	Spring-loaded terminals	4 pole	16	2 N/O	2 NC		DILM(C)7-10... DILM(C)9-10... DILM(C)12-10... DILM(C)15-10... DILM(C)17-10... DILM(C)25-10... DILM(C)32-10... DILM38-...10 DILMP20... DILMP32-10... DILMP45-10... DILL...	DILM32-XHIC22 277752		
	Screw terminals	2 pole	16	2 N/O	-		DILM(C)7... DILM(C)9... DILM(C)12... DILM(C)15... DILM(C)17... DILM(C)25... DILM38... DILMP20... DILMP32... DILMP45... DILL...	DILA-XHI20 276422		
				1 N/O	1 NC					DILA-XHI11 276421
				-	2 NC					DILA-XHI02 276420
				1 S _F	1 Ö _S					DILA-XHIV11 276423
				4 N/O	-					DILA-XHI40 276428
				3 N/O	1 NC					DILA-XHI31 276427
				2 N/O	2 NC					DILA-XHI22 276426
	Screw terminals	4 pole	16	1 N/O	3 NC		DILM(C)7... DILM(C)9... DILM(C)12... DILM(C)15... DILM(C)17... DILM(C)25... DILM38... DILMP20... DILMP32... DILMP45... DILL...	DILA-XHI13 276425		
				-	4 NC					DILA-XHI04 276424
				1 N/O	1 NC					DILA-XHIV22 276429
				1 S _F	1 Ö _S					

Notes

















- Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F
- Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules, also for the integrated auxiliary contacts of the DILM 7 - DILM32

Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified


HPL05039EN


























Terminal type	Pole	Conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration	Circuit symbol	For use with	Part no.	Price See price list	Std. pack	
Auxiliary contact modules									
With interlocked opposing contacts, except ...XHI(C)V									
Top mounting auxiliary contacts									
	2 pole	16	2 N/O	—		DILM(C)7... DILM(C)9... DILM(C)12... DILM(C)15... DILM(C)17... DILM(C)25... DILM(C)32... DILM38... DILMP20... DILMP32... DILMP45... DILL...	DILA-XHIC20 276528	5 off 	
			1 N/O	1 NC					DILA-XHIC11 276527
			—	2 NC					DILA-XHIC02 276526
			1 S _F	1 \bar{O}_S					DILA-XHICV11 276529
	2 pole	16	2 N/O	2 NC		DILM(C)7... DILM(C)9... DILM(C)12... DILM(C)15... DILM(C)17... DILM(C)25... DILM(C)32...	DILA-XHIR22¹⁾ 139580		
		16	1 N/O	1 NC			DILA-XHIR11 110140		
	4 pole	16	4 N/O	—		DILM(C)7... DILM(C)9... DILM(C)12... DILM(C)15... DILM(C)17... DILM(C)25... DILM(C)32...	DILA-XHIC40 276534		
			3 N/O	1 NC			DILA-XHIC31 276533		
			2 N/O	2 NC			DILA-XHIC22 276532		
			1 N/O	3 NC			DILA-XHIC13 276531		
			—	4 NC			DILA-XHIC04 276530		
			1 N/O 1 S _F	1 NC 1 \bar{O}_S			DILA-XHICV22 276535		

Notes

- Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F
 - Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules, also for the integrated auxiliary contacts of the DILM 7 - DILM32
- ¹⁾ 1 N/C + 1 N/O above microswitch for electronic applications

Information relevant for export to North America

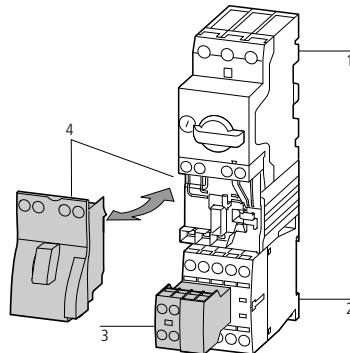
	Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
	UL File No.	E29184
	UL CCN	NKCR
	CSA File No.	012528
	CSA Class No.	3211-03
	NA Certification	UL Listed, CSA certified
	¹⁾ NA Certification	Request filed for UL and CSA

Connection type	Pole	conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration N/O = normally open contact SF = N/O early make NC = normally closed contact ÖS = NC late-break	Circuit symbol	For use with	Part no. Article no.	Price See price list	Std. pack	Notes			
Auxiliary contact modules												
With interlocked opposing contacts												
Top mounting auxiliary contacts												
	Screw terminals	2 pole	16	2 N/O	—		DILM40... DILM50... DILM65... DILM72... DILM80... DILM95... DILM115... DILM150... DILM170...	DILM150-XHI20 277945	5 off  	Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F		
				1 N/O	1 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHI11 277946				
				1 N/O	1 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHIA11 283463				
				—	2 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHI02 277947				
				—	—		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHI40 277948				
	Screw terminals	4 pole	16	4 N/O	—		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHI31 277949				
				3 N/O	1 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHI22 277950				
				2 N/O	2 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHIA22 283464				
				2 N/O	2 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHI13 277951				
				1 N/O	3 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHI04 277952				
				—	4 NC		DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150... DILM150...	DILM150-XHIV22 277953				
				1 N/O	1 NC							
				1 SF	1 ÖS							
	Screw terminals	2 pole	16	2 N/O	—		DILM7... DILM9... DILM12... DILM15... DILL...	DILA-XHIT20 101042	5 off  	Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact modules Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F		
				1 N/O	1 NC			DILA-XHIT11 101043				
				—	2 NC			DILA-XHIT02 101041				
	Screw terminals	4 pole	16	2 N/O	2 NC			DILA-XHIT22 101044				

Notes

¹⁾ Suitable for the combination with electrical wiringlinks in tool-less plug connection usable with:
DILM12-XSL
DILM12-XRL
DILM12-XS1
PKZM0-XDM12
PKZM0-XRM12
PKZM0-XSM12

- 1 PKZM0
- 2 DILM7 - DILM15
- 3 DILA-XHIT
- 4 PKZM0-XDM12



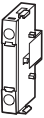

















Information relevant for export to North America



Product Standards IEC/EN 60947-4-1;
UL 508; CSA-C22.2
No. 14-05; CE marking
UL File No. E29184
UL CCN NKCR
CSA File No. 012528
CSA Class No. 3211-03
NA Certification UL Listed,
CSA certified

HPL05041EN

DILA, DILM

Connection type	Pole	conventional thermal current $I_{th} = I_e$ AC-1 at 60 °C Open $I_{th} = I_e$ A	Contact configuration N/O = normally open contact SF = N/O early make NC = normally closed contact ÖS = NC late-break	Circuit symbol	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	
Side-mounting auxiliary contacts										
	Screw terminals	1 pole	10	1 N/O	—		DILM(C)7... DILM(C)9... DILM(C)12... DILM(C)15... DILMP20... DILA(C)...	DILA-XHI10-S 115948	1 off 	1)
			—	1 NC			DILA-XHI01-S 115949			
	Spring-loaded terminals	1 pole	1 N/O	—			DILA-XHIC10-S 115950			
			—	1 NC			DILA-XHIC01-S 115951			
	Screw terminals	2 pole	1 N/O	1 NC		DILM17... DILM25... DILM32... DILM38...	DILM32-XHI11-S 101371		Can only be left on the contactor. Cannot be combined with mechanical interlock	
Side-mounting auxiliary contacts										
	Screw terminals	2 pole	10	1 N/O	1 NC		DILM250 - DILH2600	DILM820-XHI11-SI 208281	1 off 	1)
			10	1 N/O	1 NC			DILM820-XHI11-SA 208282		
			10	1 SF	1 ÖS			DILM820-XHI11V-SI 208283		
	Screw terminals	2 pole	10	1 N/O	1 NC		DILM40 - DILM225A DILMP63 - DILMP200	DILM1000-XHI11-SI 278425		
			10	1 SF	1 ÖS			DILM1000-XHIV11-SI 278426		
			10	1 N/O	1 NC			DILM1000-XHI11-SA 278427		

Notes

- 1)
- Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact module, also for the integrated auxiliary contacts of the DILM7 – DILM32 (not NO early-make and NC late-break)
 - Auxiliary NC usable as mirror contact according to IEC/EN 60947-4-1, Annex F (no NC late-breaks)
 - No auxiliary contact is possible between 2 contactors with mechanical interlock.

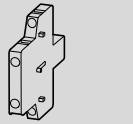
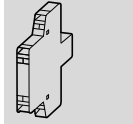
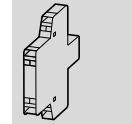
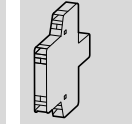
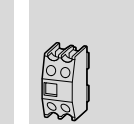
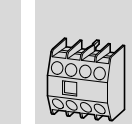
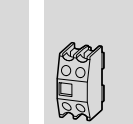
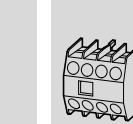
Information relevant for export to North America



2)

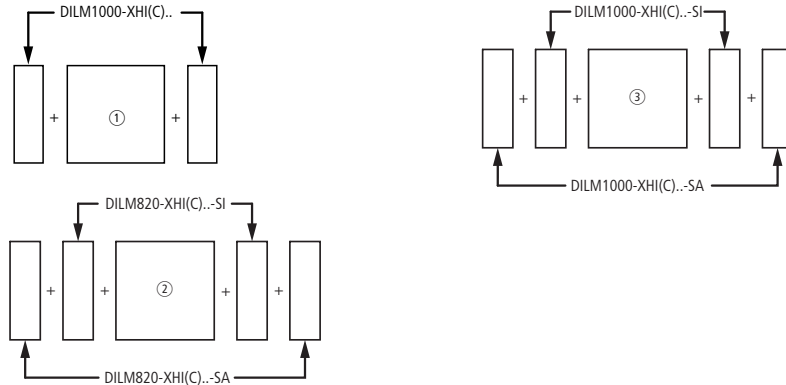
Product Standards IEC/EN 60947-4-1;
 UL 508; CSA-C22.2 No. 14-05;
 CE marking
 UL File No.E29184
 UL CCNNKCR
 CSA File No.012528
 CSA Class No.3211-03, 3211-04
 NA Certification UL Listed,
 CSA certified

Engineering

								
DILM40	2 x	–	–	–	–	–	1 x	–
... DILM72	–	–	2 x	–	1 x	–	–	–
	1 x	–	–	–	–	–	–	1 x
	–	–	1 x	–	–	1 x	–	–
DILM80	2 x	–	2 x	–	–	–	–	–
... DILM170	2 x	–	–	–	–	–	–	1 x
	2 x	–	–	–	–	–	1 x	–
	–	–	2 x	–	–	1 x	–	–
	–	–	2 x	–	1 x	–	–	–
DILM185A	2 x	–	2 x	–	–	–	–	–
DILM222A	2 x	–	–	–	–	–	–	–
DILM250 DILM1600	–	2 x	–	2 x	–	–	–	–
DILH1400 ... DILH2600	–	2 x	–	2 x	–	–	–	–

Notes

Side mounting auxiliary contacts

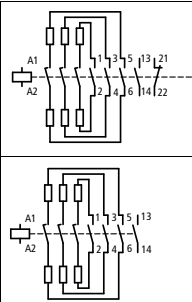
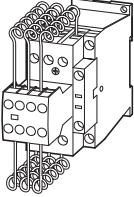
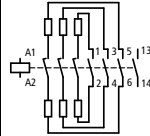





- ① DILM40 – DILM72
- ② DILM250 – DILH2600
- ③ DILM80-DILM225A

- Interlocked opposing contacts according to IEC/EN 60947-5-1 Annex L, inside the auxiliary contact module (not N/O early close and N/C late open)
- Auxiliary contacts can be used as mirror contacts according to IEC/EN 60947-4-1, Annex F (not N/C late open)
- No auxiliary contact is possible between two contactors with mechanical interlock.
- 2 auxiliary contacts DILM820-XHI11-SI are already built into the contactors DILM250 to DILH2600/22.
- 2 DILM1000-XHI11-SI auxiliary contacts are already installed in DILM185A and DILH225A contactors.

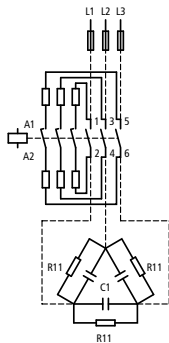
HPL05043EN

Ordering

	Circuit symbol	Part no. Article no.	Price See price list	Std. pack																										
Three-phase capacitors 50 – 60 Hz Open <table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">230 V</td> <td style="border-right: 1px solid black; padding: 2px 10px;">400 V</td> <td style="border-right: 1px solid black; padding: 2px 10px;">525 V</td> <td style="padding: 2px 10px;">690 V</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">kvar</td> <td style="border-right: 1px solid black; padding: 2px 10px;">kvar</td> <td style="border-right: 1px solid black; padding: 2px 10px;">kvar</td> <td style="padding: 2px 10px;">kvar</td> </tr> </table>	230 V	400 V	525 V	690 V	kvar	kvar	kvar	kvar																						
230 V	400 V	525 V	690 V																											
kvar	kvar	kvar	kvar																											
With series resistors Basic Units 		<table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">7.5</td> <td style="border-right: 1px solid black; padding: 2px 10px;">12.5</td> <td style="border-right: 1px solid black; padding: 2px 10px;">16.7</td> <td style="padding: 2px 10px;">20</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">11</td> <td style="border-right: 1px solid black; padding: 2px 10px;">20</td> <td style="border-right: 1px solid black; padding: 2px 10px;">25</td> <td style="padding: 2px 10px;">33.3</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">15</td> <td style="border-right: 1px solid black; padding: 2px 10px;">25</td> <td style="border-right: 1px solid black; padding: 2px 10px;">33.3</td> <td style="padding: 2px 10px;">40</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">20</td> <td style="border-right: 1px solid black; padding: 2px 10px;">33.3</td> <td style="border-right: 1px solid black; padding: 2px 10px;">40</td> <td style="padding: 2px 10px;">55</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">25</td> <td style="border-right: 1px solid black; padding: 2px 10px;">50</td> <td style="border-right: 1px solid black; padding: 2px 10px;">65</td> <td style="padding: 2px 10px;">85</td> </tr> </table>	7.5	12.5	16.7	20	11	20	25	33.3	15	25	33.3	40	20	33.3	40	55	25	50	65	85	<table style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">DILK12-11(230V50HZ,240V60HZ) 293988</td> <td rowspan="5" style="vertical-align: middle; text-align: center;"> 1 Off  </td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">DILK20-11(230V50HZ,240V60HZ) 294010</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">DILK25-11(230V50HZ,240V60HZ) 294032</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">DILK33-10(230V50HZ,240V60HZ) 294054</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 10px;">DILK50-10(230V50HZ,240V60HZ) 294076</td> </tr> </table>	DILK12-11(230V50HZ,240V60HZ) 293988	1 Off 	DILK20-11(230V50HZ,240V60HZ) 294010	DILK25-11(230V50HZ,240V60HZ) 294032	DILK33-10(230V50HZ,240V60HZ) 294054	DILK50-10(230V50HZ,240V60HZ) 294076	
7.5	12.5	16.7	20																											
11	20	25	33.3																											
15	25	33.3	40																											
20	33.3	40	55																											
25	50	65	85																											
DILK12-11(230V50HZ,240V60HZ) 293988	1 Off 																													
DILK20-11(230V50HZ,240V60HZ) 294010																														
DILK25-11(230V50HZ,240V60HZ) 294032																														
DILK33-10(230V50HZ,240V60HZ) 294054																														
DILK50-10(230V50HZ,240V60HZ) 294076																														

Notes

Weld-resistant for capacitors with inrush current peaks up to $180 \times I_N$
 With group compensation multi-stage capacitor banks are connected to the mains as required. This can cause, transient currents of up to $180 \times I_e$ to flow between the capacitors.
 The capacitors are pre-charged via the early-make auxiliary contacts and the fitted wire resistors, thereby reducing the inrush current. The main contacts then close after a time lag and carry the continuous current.
 The contactors for capacitors are weld-resistant with inrush current peaks up to $180 \times I_e$ due to their special contacts.
 DILK... cannot be combined with other auxiliary contacts.
 For the switching of reactive-power compensation equipment please see Engineering notes on power factor correction → page 5/35.



Accessories	Page
Enclosures totally insulated	
Accessories	→ 5/56
Further actuating voltages	→ 5/80

Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified
See also	Further approvals → page 5/70

Engineering

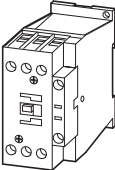










Part no.	Page	Switching power			
		230 V	400 V 420 V 440 V	525 V	690 V
		kvar	kvar	kvar	kvar
Individual compensation, open version					
DILM7-...(...)	→ 5/18	1.5	3	3.5	5
DILM9-...(...)	→ 5/18	2	4	4.5	6
DILM12-...(...)	→ 5/18	2.5	4.5	5.5	7
DILM15-...(...)	→ 5/18	2.5	4.5	5.5	7
DILM17-...(...)	→ 5/18	6.5	12	14.5	19
DILM25-...(...)	→ 5/18	7	13.5	16	21
DILM32-...(...)	→ 5/18	7.5	14.5	17	22.5
DILM40(...)	→ 5/20	11	20.5	24.5	32
DILM50(...)	→ 5/20	11.5	22	26	34.5
DILM65(...)	→ 5/20	12.5	23.5	28	37
DILM80(...)	→ 5/20	16	30.5	36.5	48
DILM95(...)	→ 5/20	18	34	41	54
DILM115(...)	→ 5/20	24	46	54.5	72
DILM150(...)	→ 5/20	28	53	63.5	83.5
DILM185A(...)	→ 5/32	87	150	190	150
DILM300A(...)	→ 5/32	115	200	265	200
DILM580(...)	→ 5/32	175	300	400	300
Group compensation, with choke, open version					
DILM7-...(...)	→ 5/18	4	7	7.5	12
DILM9-...(...)	→ 5/18	5	8	10	14
DILM12-...(...)	→ 5/18	5.5	10	12	16
DILM15-...(...)	→ 5/18	5.5	10	12	16
DILM17-...(...)	→ 5/18	7.5	18	20	28
DILM25-...(...)	→ 5/18	10	20	23	30
DILM32-...(...)	→ 5/18	12.5	25	25	32
DILM40(...)	→ 5/20	15	30	30	40
DILM50(...)	→ 5/20	20	40	40	48
DILM65(...)	→ 5/20	25	50	50	57
DILM80(...)	→ 5/20	30	60	70	90
DILM95(...)	→ 5/20	35	70	80	104
DILM115(...)	→ 5/20	50	95	100	125
DILM150(...)	→ 5/20	55	115	115	152
DILM185A(...)	→ 5/32	80	150	200	260
DILM225A(...)	→ 5/32	100	175	230	300
DILM250(...)	→ 5/32	110	190	260	340
DILM300A(...)	→ 5/32	130	225	290	390
DILM400(...)	→ 5/32	160	280	370	480
DILM500(...)	→ 5/32	220	390	500	680
Group compensation, without choke, open version					
DILK12-...(...)	→ 5/43	7.5	12.5	16.7	20
DILK20-...(...)	→ 5/43	11	20	25	33.3
DILK25-...(...)	→ 5/43	15	25	33.3	40
DILK33-...(...)	→ 5/43	20	33.3	40	55
DILK50-...(...)	→ 5/43	25	50	65	85
DILM185A(...)	→ 5/32	66	115	145	115
DILM300A(...)	→ 5/32	85	150	195	150
DILM580(...)	→ 5/32	145	250	333	250

Notes

Use of the contactors DILM without series resistor for group compensation


When using the contactors for group compensation in a system without chokes each capacitor must have a minimum induction of approx. 6 µH to limit the peak inrush current. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately Ø 140 mm. The conductor cross section must correspond to the rated operational current.

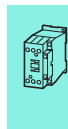
Ordering

Rated operational current		Conventional thermal current		Circuit symbol	Part no. Article no.	Price See price list	Std. pack	
AC-5a operation		AC-5b operation						Open
230 V	400 V	230 V	400 V	$I_{th} = I_e$				
I_e	I_e	I_e	I_e	A				
A	A	A	A					
Illumination contactors DILL								
	12	12	14	14	24		DILL12(230V50HZ,240V60HZ) 104402	1 Off 
	12	12	14	14	24		DILL12(24V50HZ) 104401	
	12	12	14	14	24		DILL12(400V50HZ,440V60HZ) 104403	
	18	18	21	21	35		DILL18(230V50HZ,240V60HZ) 104405	
	18	18	21	21	35		DILL18(24V50HZ) 104404	
	18	18	21	21	35		DILL18(400V50HZ,440V60HZ) 104406	
	20	20	27	27	40		DILL20(230V50HZ,240V60HZ) 104408	
	20	20	27	27	40		DILL20(24V50HZ) 104407	
	20	20	27	27	40		DILL20(400V50HZ,440V60HZ) 104409	

Notes DILL do not have an integrated auxiliary contact. They can be combined with DILM32-XHI... and DILA-XHI... auxiliary contacts. Switchgear for illumination systems → page 5/46

Information relevant for export to North America

 Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
 UL File No. E29096
 UL CCN NLDX
 CSA File No. 012528
 CSA Class No. 3211-04
 NA Certification UL Listed, CSA certified



Engineering

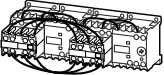
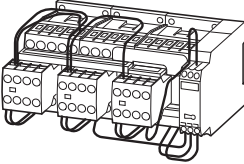
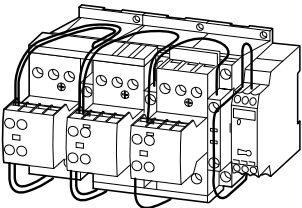
	DIL	L12	L18	L20	M7	M9	M12	M17	M25	M32	M40	M50
Permissible compensation capacitance	C_{\max} [mF]	470	470	470	47	80	100	220	330	470	470	500
Filament bulbs	I_e [A]	14	21	27	6	7.5	10	14	21	27	33	42
Mercury blended lamps	I_e [A]	12	16	23	5	6.5	8.5	12	16	23	30	38
Fluorescent lamps, conventional reactor – starter – connection	I_e [A]	20	26	35	9	10	15	20	26	35	41	45
Fluorescent lamps, duo circuit (series compensated)	I_e [A]	20	26	35	5.5	8	13	15	22.5	29	36	47
Electronic upstream devices	I_e [A]	12	18	20	5	6.5	8.5	12	17.5	22.5	28	35
High-pressure mercury vapour lamps	I_e [A]	12	18	20	3.5	6	10	12	17.5	20	25	30
Metal-halide lamps	I_e [A]	12	18	20	3.5	6	10	12	17.5	20	25	30
High-pressure sodium lamps	I_e [A]	12	18	20	3.5	6	10	12	17.5	20	25	30
Low-pressure sodium lamps	I_e [A]	7.5	10	12	3	4	6	7.5	10	12	15	22

	DIL	M65	M80	M95	M115	M150	M185A	M225A	M250	M300A	M400	M500
Permissible compensation capacitance	C_{\max} [mF]	500	550	620	830	970	2055	2300	2600	3000	3250	3500
Filament bulbs	I_e [A]	55	67	79	95	125	153	187	208	249	332	415
Mercury blended lamps	I_e [A]	45	65	67	80	110	123	150	167	200	266	332
Fluorescent lamps, conventional reactor – starter – connection	I_e [A]	55	95	100	125	145	207	237	263	300	375	525
Fluorescent lamps, duo circuit (series compensated)	I_e [A]	59	71	95	100	138	186	213	236	270	338	473
Electronic upstream devices	I_e [A]	45.5	56	66.5	80.5	105	130	158	175	210	280	350
High-pressure mercury vapour lamps	I_e [A]	36	55	60	80	95	138	158	175	200	250	350
Metal-halide lamps	I_e [A]	36	55	60	80	95	138	158	175	200	250	350
High-pressure sodium lamps	I_e [A]	36	55	60	80	95	138	158	175	200	250	350
Low-pressure sodium lamps	I_e [A]	25	35	40	50	70	100	111	123	140	175	245

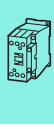
In compensated lamps, the sum of the capacitances must not exceed the contactors' max. permissible capacitor load (C_{\max})!
The values in the table are for each individual contactor contact.



Ordering

	Rated operational current AC-3	Max. rated operational power for three-phase motors, 50 - 60 Hz AC-3				Max. change-over time ^s	Part no. Article no.	Price See price list	Std. pack
		400 V I _e A	230 V P kW	400 V P kW	500 V P kW				
Star-delta combinations SDAINL									
Operating frequency: maximum 30 starts per hour									
	12	4	5.5	5.5	–	< 30	SDAINLEM(230V50HZ) 051840		1 Off
	12	3	5.5	5.5	5.5	< 20	SDAINLM12(230V50HZ) 278286		
	12	3	5.5	5.5	5.5	< 20	SDAINLM12(400V50HZ) 101380		
	12	3	5.5	5.5	5.5	< 20	SDAINLM12(24VDC) 100416		
	16	4	7.5	7.5	7.5	< 20	SDAINLM16(230V50HZ) 278311		
	16	4	7.5	7.5	7.5	< 20	SDAINLM16(400V50HZ) 101381		
	16	4	7.5	7.5	7.5	< 20	SDAINLM16(24VDC) 100417		
	22	5.5	11	11	11	< 20	SDAINLM22(230V50HZ) 278336		
	22	5.5	11	11	11	< 20	SDAINLM22(400V50HZ) 101382		
	22	5.5	11	11	11	< 20	SDAINLM22(24VDC) 100418		
	30	7.5	15	18.5	18.5	< 20	SDAINLM30(230V50HZ) 278361		
	30	7.5	15	18.5	18.5	< 20	SDAINLM30(400V50HZ) 101383		
	30	7.5	15	18.5	18.5	< 20	SDAINLM30(RDC24) 100419		
	45	11	22	30	22	< 20	SDAINLM45(230V50HZ) 278386		
	45	11	22	30	22	< 20	SDAINLM45(400V50HZ) 101384		
	45	11	22	30	22	< 20	SDAINLM45(RDC24) 100420		
	55	15	30	37	30	< 20	SDAINLM55(230V50HZ) 278411		
	55	15	30	37	30	< 20	SDAINLM55(400V50HZ) 101385		
	55	15	30	37	30	< 20	SDAINLM55(RDC24) 100421		
	70	18.5	37	45	37	< 20	SDAINLM70(230V50HZ) 239895		
	70	18.5	37	45	37	< 20	SDAINLM70(400V50HZ) 101386		
	90	22	45	55	45	< 20	SDAINLM90(230V50HZ) 239937		
	115	30	55	75	55	< 20	SDAINLM115(230V50HZ) 239963		
	140	37	75	90	90	< 20	SDAINLM140(230V50HZ) 240009		
	165	45	90	110	132	< 20	SDAINLM165(230V50HZ) 240035		
	200	55	110	132	160	< 20	SDAINLM200(230V50HZ) 101010		
	260	75	132	160	160	< 20	SDAINLM260(230V50HZ) 101031		

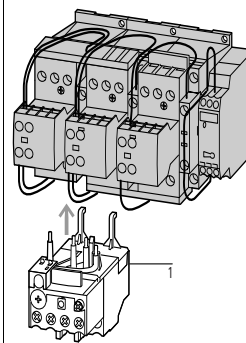
Individual components of the combination				Spare auxiliary contacts			Notes
Mains contactor Q11	Delta contactor Q15	Star contactor Q13	Timing relays K1	Q11	Q13	Q15	
Part no.	Part no.	Part no.	Part no.				
DILEM-10 + 22DILEM	DILEM-01	DILEM-10 + 02DILEM	DILET		—	—	Main circuit: Depending on the type of coordination required (i.e. Type "1" or Type "2") it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.
DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				
DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				The following applies for SDAINLM 140 – SDAINLM 260: • On the mounting plate.
DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				Circuit diagrams, Star-delta combinations → page 5/50
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				Accessories 1 Overload relay Accessories
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				Page → 6/8 → 5/56
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51				
DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51				
DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51				
DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51				
DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51				
DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51				
DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51				
DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	ETR4-51				
DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	ETR4-51				
DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	ETR4-51				
DILM40 + DILM150-XHI31	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51		—	—	
DILM40 + DILM150-XHI31	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51		—	—	
DILM50 + DILM150-XHI31	DILM50 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51		—	—	
DILM65 + DILM150-XHI31	DILM65 + DILM150-XHI11	DILM40 + DILM150-XHI11	ETR4-51		—	—	
DILM80 + DILM150-XHI31	DILM80 + DILM150-XHI11	DILM50 + DILM150-XHI11	ETR4-51		—	—	
DILM95 + DILM150-XHI31	DILM95 + DILM150-XHI11	DILM65 + DILM150-XHI11	ETR4-51		—	—	
DILM115 + DILM150-XHI31	DILM115 + DILM150-XHI11	DILM80 + DILM150-XHI11	ETR4-51		—	—	
DILM150 + DILM150-XHI31	DILM150 + DILM150-XHI11	DILM95 + DILM150-XHI11	ETR4-51		—	—	



Main circuit:
Depending on the type of coordination required (i.e. Type "1" or Type "2") it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.

The following applies for SDAINLM 140 – SDAINLM 260:
• On the mounting plate.

Circuit diagrams, Star-delta combinations → page 5/50



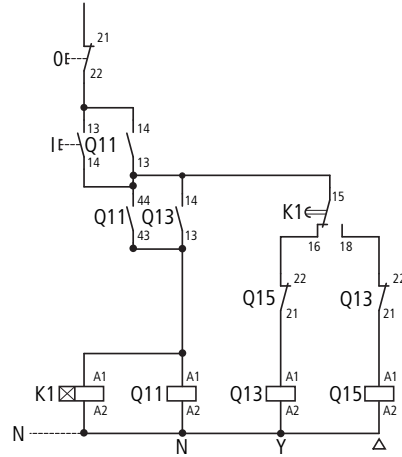
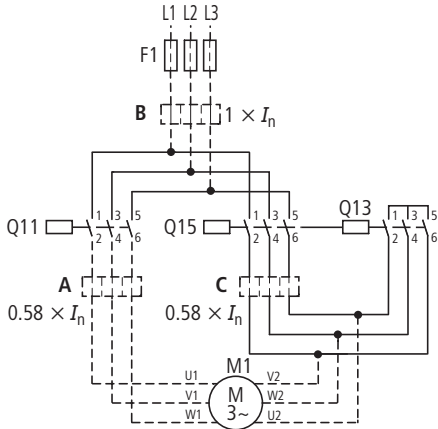
Accessories
1 Overload relay
Accessories

Page
→ 6/8
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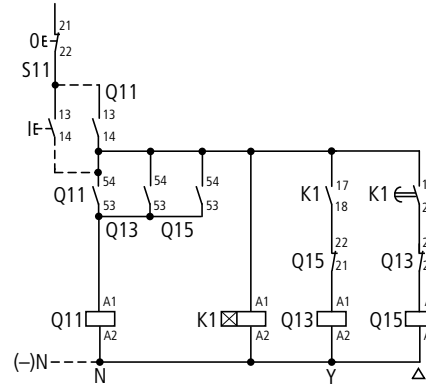
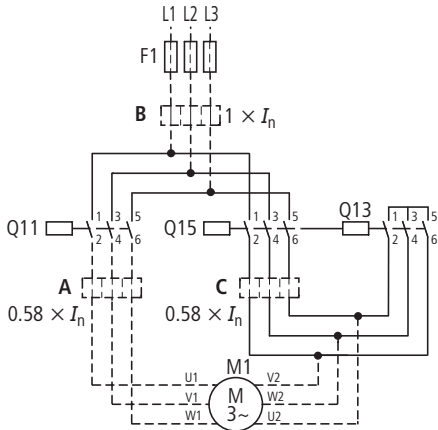
Engineering

Circuit diagrams, Star-delta combinations

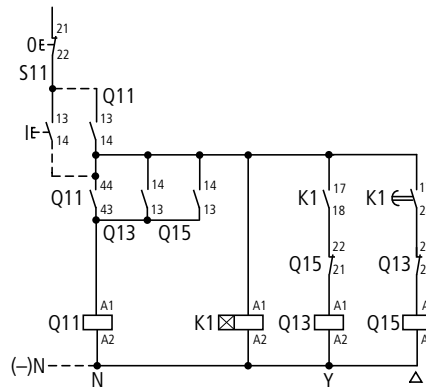
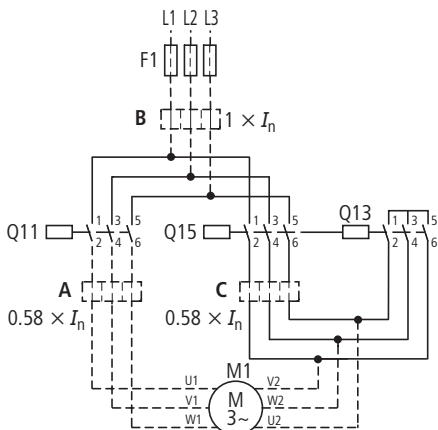
SDAINLEM



SDAINLM12...SDAINLM55



SDAINLM70...SDAINLM260



Overload relay settings

A: $I_N \times 0.58$
Motor protected in Y and Δ - positions

B: $I_N \times 1$
Only partial motor protection in Y position

C: $I_N \times 0.58$
Motor not protected in Y position

Timing relay set to approx. 10 s

Main circuit:

Depending on the type of coordination required (i.e. Type "1" or Type "2") it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.

Starting

F 15 s

15 – 40 s

> 40 s

Components for self-assembly of star-delta combinations

Maximum operational rating of AC motors 50 - 60 Hz

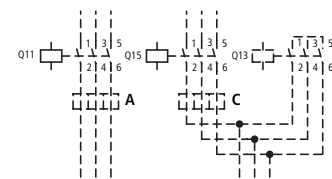
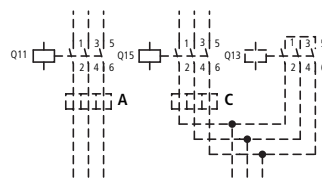
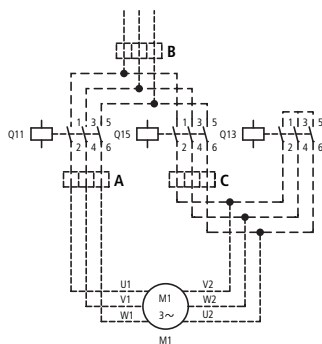
AC-3					Changeover time ¹⁾			Individual components of the combination				Spare auxiliary contacts			
230 V	400 V	500 V	690 V	1000 V	up to 12 s	up to 20 s	up to 30 s	Coil to EN 50005 Switching element to EN 50005 and EN 50012	Mains contactor Q11	Delta contactor Q15	Star contactor Q13	Timing relay K1	Q11	Q15	Q13
kW	kW	kW	kW	kW				Part no. DIL	Part no. DIL	Part no. DIL	Part no.				
90	160	200	250	132	●	●	●	M185A/22	M185A/22	M115/22	ETR4-51				
110	200	250	315	160	●	●	—	M225A/22	M225A/22	M150/22	ETR4-51				
132	250	315	400	200	●	●	●	M250/22	M250/22	M185A/22	ETR4-51				
160	300	355	450	200	●	●	●	M300A/22	M300A/22	M185A/22	ETR4-51				
200	355	450	560	220	●	●	—	M400/22	M400/22	M250/22	ETR4-51				
250	450	560	600	220	●	●	●	M500/22	M500/22	M300A/22	ETR4-51				
300	560	710	900	355	●	●	●	M580/22	M580/22	M400/22	ETR4-51				
350	630	750	950	355	●	●	●	M650/22	M650/22	M400/22	ETR4-51				
400	710	900	1200	1400	●	●	●	M750/22	M750/22	M580/22	ETR4-51				
450	800	950	1300	1400	●	●	●	M820/22	M820/22	M580/22	ETR4-51				
560	1000	1200	1700	1700	●	●	—	M1000/22	M1000/22	M650/22	ETR4-51				

Notes

¹⁾ Longer changeover times please enquire

Components for self-assembly

Notes



Overload relay settings

Timing relay set to approx. 10 s

I_N

Starting

Main circuit:

Depending on the coordination type required (i.e. Type "1" or Type "2") it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.

A x 0.58
Motor protection in Y and Δ positions

≤ 15 s

B x 1
In Y position only limited motor protection

15 – 40 s

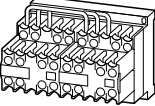

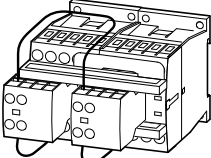
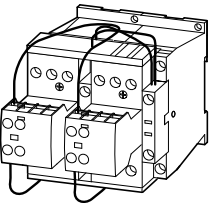
Control circuit:

If the combinations are to be used within the scope of IEC/EN 60 204 Part 1, VDE 0113 Part 1, then Point 9.1.1 regarding the supply of control circuits, must be observed.

C x 0.58
Motor not protected in Y position

> 40 s

Ordering

	Rated operational current AC-3	Max. motor rating for three-phase motors 50 - 60 Hz						Part no.	Price See price list	Std. pack
		AC-3			AC-4					
		220 V 230 V	380 V 400 V	660 V 690 V	220 V 230 V	380 V 400 V	660 V 690 V			
	I_e A	P kW	P kW	P kW	P kW	P kW	P kW			
DIUL reversing combinations										
AC operation										
	9	2.2	4	4	1.5	3	3	DIULEM/21/MV(230V50HZ)¹⁾ 051849	1 Off 	
	9	2.2	4	4	1.5	3	3	DIULEM/21/MV-G(24VDC)²⁾ 214655		
	7	2.2	3	3.5	1	2.2	2.9	DIULM7/21(230V50HZ)²⁾ 278061		
	7	2.2	3	3.5	1	2.2	2.9	DIULM7/21(24VDC)²⁾ 107021		
	9	2.5	4	4.5	1.5	2.5	3.6	DIULM9/21(230V50HZ)²⁾ 278086		
	9	2.5	4	4.5	1.5	2.5	3.6	DIULM9/21(24VDC)²⁾ 107022		
	12	3.5	5.5	6.5	2	3	4.4	DIULM12/21(230V50HZ)²⁾ 278111		
	12	3.5	5.5	6.5	2	3	4.4	DIULM12/21(24VDC)²⁾ 107023		
	18	5	7.5	11	2.5	4.5	6.5	DIULM17/21(230V50HZ)²⁾ 278136		
	18	5	7.5	11	2.5	4.5	6.5	DIULM17/21(RDC24)²⁾ 107024		
	25	7.5	11	14	3.5	6	8.5	DIULM25/21(230V50HZ)²⁾ 278161		
	25	7.5	11	14	3.5	6	8.5	DIULM25/21(RDC24)²⁾ 107025		
	32	10	15	17	4	7	10	DIULM32/21(230V50HZ)²⁾ 278186		
	32	10	15	17	4	7	10	DIULM32/21(RDC24)²⁾ 107026		
	40	12.5	18.5	23	5	9	12	DIULM40/11(230V50HZ)²⁾ 278211		
	50	15.5	22	30	6	10	14	DIULM50/11(230V50HZ)²⁾ 278236		
	65	20	30	35	7	12	17	DIULM65/11(230V50HZ)²⁾ 278261		

Information relevant for export to North America



1)

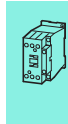
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	3211-04
NA Certification	UL Listed, CSA certified

Information relevant for export to North America



2)

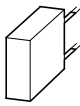
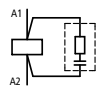

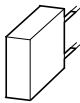
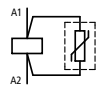

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	012528
CSA Class No.	2411-03, 3211-04
NA Certification	UL Listed, CSA certified



Individual components of the combination		Spare auxiliary contacts			Circuit diagram	Notes
Contactor Q11	Contactor Q12	Q11	Q12	Mechanical interlock		
Part no.	Part no.					
DILEM-10 + 11DILEM	DILEM-10 + 11DILEM			+		
DILEM-10-G + 11DILEM	DILEM-10-G + 11DILEM			+		
DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20			+		<p>Accessories</p> <p>1 Overload relay</p> <p>Accessories</p> <p>Reversing contactors</p> <p>DIULM7/21 to DIULM65/11 with mechanical interlock</p>
DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20			+		
DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20			+		
DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20			+		
DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20			+		
DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20			+		
DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20			+		
DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20			+		
DILM25-01 + DILA-XHI20	DILM25-01 + DILA-XHI20			+		
DILM25-01 + DILA-XHI20	DILM25-01 + DILA-XHI20			+		
DILM32-01 + DILA-XHI20	DILM32-01 + DILA-XHI20			+		
DILM32-01 + DILA-XHI20	DILM32-01 + DILA-XHI20			+		
DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	-	-	+		
DILM50 + DILM150-XHI11	DILM50 + DILM150-XHI11	-	-	+		
DILM65 + DILM150-XHI11	DILM65 + DILM150-XHI11	-	-	+		

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Ordering

Voltage U_s V	For use with	Circuit symbol	Part no. Article no.	Price See price list	Std. pack	Notes	
Suppressor circuits							
RC suppressors							
	24 - 48 AC		DILM12-XSPR48 281199 DILM12-XSPR240 281200 DILM12-XSPR500 281201		10 Off 	For AC operated contactors 50 - 60 Hz. DC operated contactors and DILM115 and DILM150 have an integrated suppressor. Note drop-out delay.	
	110 - 240 AC						
	240 - 500 AC						
	24 - 48 AC	DILM17 - DILM32 DILK12 - DILK25 DILL... DILMP32 - DILMP45	DILM32-XSPR48 281202 DILM32-XSPR240 281203 DILM32-XSPR500 281204				
	110 - 240 AC						
	240 - 500 AC						
	24 - 48 AC	DILM40 - DILM95 DILK33 - DILK50 DILMP63 - DILMP200	DILM95-XSPR48 281205 DILM95-XSPR240 281206 DILM95-XSPR500 281207				
	110 - 240 AC						
	240 - 500 AC						
Varistor suppressors							
	24 - 48 AC		DILM12-XSPV48 281208 DILM12-XSPV130 281209 DILM12-XSPV240 281210 DILM12-XSPV500 281211		10 Off 		For AC operated contactors 50 - 60 Hz. DC operated contactors and DILM115 and DILM150 have an integrated suppressor. Note drop-out delay.
	48 - 130 AC						
	130 - 240 AC						
	240 - 500 AC	DILM17 - DILM32 DILK12 - DILK25 DILL... DILMP32 - DILMP45	DILM32-XSPV48 281212 DILM32-XSPV130 281213 DILM32-XSPV240 281214 DILM32-XSPV500 281215				
	24 - 48 AC						
	48 - 130 AC						
	130 - 240 AC	DILM40 - DILM95 DILK33 - DILK50 DILMP63 - DILMP200	DILM95-XSPV48 281216 DILM95-XSPV130 281217 DILM95-XSPV240 281218 DILM95-XSPV500 281219				
	240 - 500 AC						
	24 - 48 AC						
	48 - 130 AC						
	130 - 240 AC						
	240 - 500 AC						

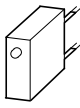
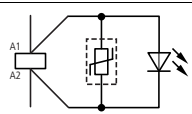

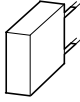
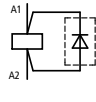

Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	227038
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified

HPL05055EN



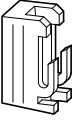


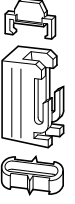





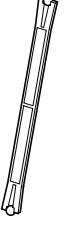
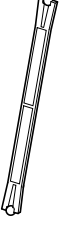
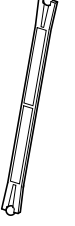
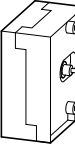
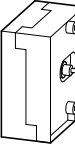


DILM...-XSP...

Voltage U_s V	For use with	Circuit symbol	Part no. Article no.	Price See price list	Std. pack	Notes
Varistor suppressors with integrated LED						
 24 - 48 AC 130 - 240 AC	DILM7 - DILM15 DILMP20 DILA		DILM12-XSPVL48 281220		10 Off 	For AC operated contactors 50 - 60 Hz. DC operated contactors and DILM115 and DILM150 have an integrated suppressor. Note drop-out delay.
	24 - 48 AC 130 - 240 AC		DILM17 - DILM32 DILK12 - DILK25 DILL... DILMP32 - DILMP45			
24 - 48 AC 130 - 240 AC	DILM40 - DILM95 DILK33 - DILK50 DILMP63 - DILMP200		DILM95-XSPVL48 281224			
			DILM32-XSPVL240 281223			
			DILM95-XSPVL48 281225			
			DILM95-XSPVL240 281225			
Diode suppressor						
 12 - 250 DC	DILM7 - DILM15 DILMP20 DILA		DILM12-XSPD 101672		10 Off 	Additional for integrated suppressor with DC operated contactors. Prevention of negative switch-off voltage when the contactor is used together with a safety PLC.

Information relevant for export to North America


















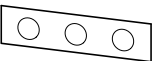



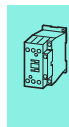
Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29096
UL CCN	NLDX
CSA File No.	227038
CSA Class No.	3211-07
NA Certification	UL Listed, CSA certified


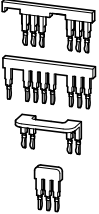

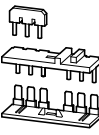



For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America  
Mechanical interlocks					
For mechanically linking contactors in combinations 0 mm distance between contactors.					
	DILM7 - DILM72 DILA	DILM32-XVB 281227	50 Off  	-	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E36332 UL CCN NLRV CSA File No. 012528 CSA Class No. 3211-05 NA Certification UL Recognized, CSA certified
	DILM80 - DILM170	DILM150-XVB 281226	10 Off  	-	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29184 UL CCN NKCR CSA File No. 012528 CSA Class No. 3211-03 NA Certification UL Listed, CSA certified
Mechanical interlocks					
	DILM7 - DILM15 DILMP20 DILA	DILM12-XMV 281196	1 Off  	For two contactors with AC or DC operation arranged vertically or horizontally. Distance between contactors 0 mm, including contactor connector Mechanical lifespan 2.5 x 10 ⁶ operations. DILM 150-XMV including mounting plate for contactors. Additional auxiliary contact modules possible. → 5/38	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29096 UL CCN NLDX CSA File No. 012528 CSA Class No. 2411-03 NA Certification UL Listed, CSA certified
	DILM17 - DILM38	DILM32-XMV 281197			Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29096 UL CCN NLDX CSA File No. 012528 CSA Class No. 2411-03, 3211-04 NA Certification UL Listed, CSA certified
	DILM40 - DILM72	DILM65-XMV 281198			Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29096 UL CCN NLDX CSA File No. 012528 CSA Class No. 2411-03, 3211-04 NA Certification UL Listed, CSA certified
	DILM80 - DILM170	DILM150-XMV 240081			Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29096 UL CCN NLDX CSA File No. 012528 CSA Class No. 2411-03 NA Certification UL Listed, CSA certified
	DILM185A, DILM225A, DILM250, DILM300A, DILM400, DILM500, DILM570	DILM500-XMV 208289			For contactors with the same or different magnet systems mounted horizontally or vertically, mechanical lifespan 5 x 10 ⁶ operations. No auxiliary contact permitted between mechanical interlock and contactor. Combination only with consecutive installation sizes or DILM185A - DILM570.
	DILM580, DILM650, DILM750, DILM820 DILM1000	DILM820-XMV 208288	For contactors with the same or different magnet systems mounted horizontally or vertically, mechanical lifespan 5 x 10 ⁶ operations. No auxiliary contact permitted between mechanical interlock and contactor. DILM820-XMV consists of interlock element and mounting plate.	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking UL File No. E29184 UL CCN NKCR CSA File No. 012528 CSA Class No. 3211-04 NA Certification UL Listed, CSA certified	
Set of spare parts for mechanical interlock					
Ball for mechanical interlock, incl. contactor connector.					
-	DILM80 - DILM170	DILM150-XMVE 107020	1 Off  	-	UL/CSA certification not required

DILM...-XP1, DILM...-XS1

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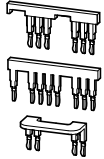

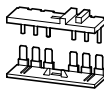
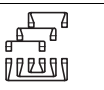

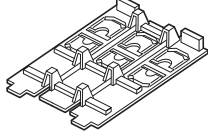




For use with	Circuit symbol	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Paralleling links for main contacts						
Consisting of 2 paralleling links						
	DILM7 - DILM15		DILM12-XP1 281193	5 Off 	4th pole can be broken off AC-1 current carrying capacity of the open contactor increases by a factor of 2.5 Protected against accidental contact in accordance with VDE 0106 Part 100 A cover is included with DILM185-XP1 for protection against accidental contact. Connection cross section for DILM.-XP1 Technical data	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29096 NLDX 012528 3211-03 UL Listed, CSA certified UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	DILM17 - DILM32		DILM32-XP1 281194			
	DILM40 - DILM72		DILM65-XP1 281195	1 Off 		
	DILM80 - DILM170		DILM150-XP1 284769			
	DILM185A		DILM185-XP1 208292	1 Off		
Star-point bridges						
	DILM7 - DILM15		DILM12-XS1 281190	20 Off 	• Designed as tool-less plug connection • Use as DILA-XHIT... contactor auxiliary contact → 5/40	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 3211-05 UL Listed, CSA certified UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	DILM17 - DILM32		DILM32-XS1 281191			
	DILM40 - DILM72		DILM65-XS1 281192	10 Off 		UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	DILM80 - DILM170		DILM150-XS1 284768	5 Off 		Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 3211-03 UL Listed, CSA certified UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	DILM185A - DILM400		DILM400-XS1 208291	1 Off 	A cover is included for protection against accidental contact.	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 3211-04 UL Listed UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	DILM500		DILM500-XS1 208290		A cover is included for protection against accidental contact.	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29096 NLDX UL Listed UL File No. UL CCN NA Certification

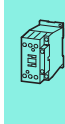














For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America 
Star-delta wiring kit					
Main current wiring for star-delta combination Including star-point bridge					
	DILM7/9/12/15 mains contactors DILM7/9/12/15 delta contactors DILM7/9/12/15 star contactors	DILM12-XSL 283130	1 Off 	<ul style="list-style-type: none"> Designed for tool-less plug connection Use as DILA-XHIT... contactor auxiliary contact → 5/40 The following control cables are integrated in addition to electrical interlock: <ul style="list-style-type: none"> Q13: A1 - Q15: 21 Q13: 21 - Q15: A1 Q13: A2 - Q15: A2 	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking 012528 3211-05 CSA certified CSA File No. CSA Class No. NA Certification
	DILM17/25/32 mains contactors DILM17/25/32 delta contactors DILM17/25/32 star contactors	DILM32-XSL 283131		Consists of the following connection bridges: <ul style="list-style-type: none"> Mains - delta contactors Delta - star contactors Star-point bridge 	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 3211-04 UL Listed, CSA certified UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	DILM40/50/65 mains contactors DILM40/50/65 delta contactors DILM40/50/65 star contactors	DILM65-XSL 101058			
	DILM 80/95 mains contactors DILM80/95 delta contactors DILM50/65 star contactors	DILM95-XSL 101486	1 Off		-
	DILM 115/150 mains contactors DILM115/150 delta contactors DILM80/95/115 star contactors	DILM150-XSL 101487	1 Off 		Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 NLRV 012528 2411-03, 3211-04 UL Listed, CSA certified UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	DILM 185/225 mains contactors DILM185/225 delta contactors DILM115/150 star contactors	DILM225-XSL 101488	1 Off		-

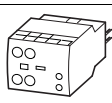
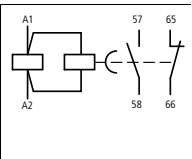

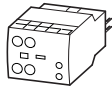
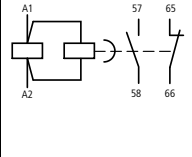

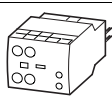
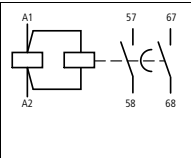

DILM...-XRL, DILM...XIP2X

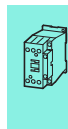
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For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America 
Reversing starter wiring kits					
Main current wiring for reversing combinations					
	DILM7 DILM9 DILM12	DILM12-XRL 283108	1 Off 	<ul style="list-style-type: none"> Designed for tool-less plug connection As auxiliary contact DILA-XHIT...use → 5/40 The following control cables are integrated in addition to electrical interlock: <ul style="list-style-type: none"> Q11: A1 - Q12: 21 Q11: 21 - Q12: A1 Q11: A2 - Q12: A2 	Product Standards IEC/EN60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. NLRV UL CCN 012528 CSA File No. 3211-05 CSA Class No. UL Listed, CSA certified NA Certification
	DILM17 DILM25 DILM32	DILM32-XRL 283109	-	-	Product Standards IEC/EN60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. NLRV UL CCN 012528 CSA File No. 3211-04 CSA Class No. UL Listed, CSA certified NA Certification
	DILM40 DILM50 DILM65	DILM65-XRL 101057	-	-	Product Standards IEC/EN60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. NLRV UL CCN 012528 CSA File No. 2411-03, 3211-04 CSA Class No. UL Listed, CSA certified NA Certification
	DILM80 DILM95 DILM115 DILM150	DILM150-XRL 101681	-	-	Product Standards IEC/EN60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. NLRV UL CCN 012528 CSA File No. 2411-03, 3211-04 CSA Class No. UL Listed, CSA certified NA Certification
IP2X cover set					
	DILM17 DILM25 DILM32 DILM38 DILMP32 DILMP45	DILM32-XIP2X 118855	1 Off 	Each cover set consists of two three-pole and two single-pole covers.	UL/CSA certification not required
	DILM40 DILM50 DILM65 DILM72 DILMP63 DILMP80	DILM65-XIP2X 106491	8 Off 	2 covers are required per phase The cover set consists of 8 covers	UL/CSA certification not required
	DILM80 DILM95 DILM115 DILM150 DILM170 DILMP125 DILMP160 DILMP200 ZB150	DILM150-XIP2X 106492	-	-	UL/CSA certification not required



For use with	Part no.	Price See price list	Std. pack	Notes	Information relevant for export to North America  
Three-phase commoning links					
Protected against accidental contact, short-circuit proof, $U_e = 690\text{ V}$, $I_u = 35\text{ A}$ Can be extended by rotating by mounting					
	DILM7 DILM9 DILM12 DILM15	DILM12-XDSB0/3 240084	5 Off  	Suitable for 3 contactors. Length 112 mm	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. UL CCN CSA File No. CSA Class No. NA Certification NLRV 012528 2411-03 UL Listed, CSA certified
	DILM7 DILM9 DILM12 DILM15	DILM12-XDSB0/4 240085		Suitable for 4 contactors. Length 157 mm	
	DILM7 DILM9 DILM12 DILM15	DILM12-XDSB0/5 240086		Suitable for 5 contactors. Length 202 mm	
Incoming connection block					
–	DILM7 DILM9 DILM12 DILM15	DILM12-XEK 240083	5 Off  	For three-phase commoning link, protected against accidental contact, $U_e = 690\text{ V}$, $I_u = 35\text{ A}$. Terminal capacities: Stranded 2.5...16 mm ² Flexible with ferrule 2.5...16 mm ² AWG14...8	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. UL CCN CSA File No. CSA Class No. NA Certification NLRV 012528 2411-03 UL Listed, CSA certified
Adapter plate					
Enables clipping on of switches on to DIN rails					
	DILM80 DILM95 DILM115 DILM150 DILM170	NZM2-XC75 260215	1 Off  	For top-hat rail 75 mm	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E140305 UL File No. UL CCN CSA File No. CSA Class No. NA Certification DIHS 022086 1437-01 UL Listed, CSA certified

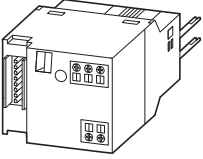


For use with	Circuit symbol	Part no. Article no.	Price See price list	Std. pack	Notes
Electronic timer modules					
On-delayed Cannot be combined with top mounting auxiliary contacts Incl. suppressor circuits					
 24 V AC/DC 100 ... 130 V AC 200 ... 240 V AC	DILM7 - DILM32 DILMP20 DILMP32-DILMP45 DILA		DILM32-XTEE11(RA24) 101440	1 Off 	Time range can be selected 0.05 s...1 s 0.5 s...10 s 5 s...100 s
			DILM32-XTEE11(RAC130) 101441		
			DILM32-XTEE11(RAC240) 101442		
Off-delayed, auxiliary voltage-free Cannot be combined with top mounting auxiliary contacts Incl. suppressor circuits					
 24 V AC/DC 100 ... 130 V AC 200 ... 240 V AC	DILM7 - DILM32 DILMP20 DILMP32-DILMP45 DILA		DILM32-XTED11-1(RA24) 105210	1 Off 	Time range 0.05 s...1 s
			DILM32-XTED11-10(RA24) 104943		Time range 0.5 s...10 s
			DILM32-XTED11-100(RA24) 104946		Time range 5 s...100 s
			DILM32-XTED11-1(RAC130) 105211		Time range 0.05 s...1 s
			DILM32-XTED11-10(RAC130) 104944		Time range 0.5 s...10 s
			DILM32-XTED11-100(RAC130) 104947		Time range 5 s...100 s
			DILM32-XTED11-1(RAC240) 105212		Time range 0.05 s...1 s
			DILM32-XTED11-10(RAC240) 104945		Time range 0.5 s...10 s
			DILM32-XTED11-100(RAC240) 104948		Time range 5 s...100 s
			For star-delta applications Cannot be combined with top mounting auxiliary contacts Incl. suppressor circuits		
 24 V AC/DC 100 ... 130 V AC 200 ... 240 V AC	DILM7 - DILM32 DILMP20 DILMP32-DILMP45 DILA		DILM32-XTEY20(RA24) 101446	1 Off 	Changeover time 1...30 s 50 ms changeover delay Sample circuit → Page 5/96
			DILM32-XTEY20(RAC130) 101447		
			DILM32-XTEY20(RAC240) 101448		

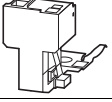

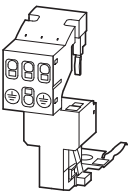





Information relevant for export to North America




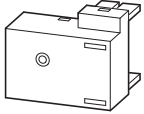

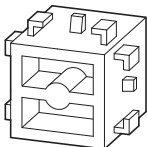

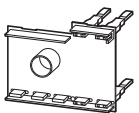
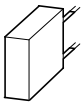

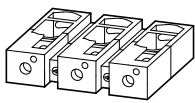

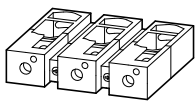

Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	3211-03
NA Certification	UL Listed, CSA certified

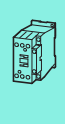
	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
SWD contactor modules					
SmartWire-Darwin module for installation on contactors. One module per contactor					
	Two digital inputs for potential-free contacts. 1 electrical interlock for the surface mounting of reversing starters. Messages: Contactor switch status, status of the digital inputs 1 and 2. Commands: Contactor actuation	DILM(C)7... - DILM(C)32 DILM38 DILA	DIL-SWD-32-001¹⁾ 118560	5 Off 	<ul style="list-style-type: none"> Take into account the max. current consumption of the contactor coils per SmartWire-Darwin line. A2 terminals must not be bridged. Wiring sets DILM 12-XRL and PKZM0-XRM12 cannot be used. Connection terminals for electrical interlocking are not suitable for safety technology.
	Two digital inputs for potential-free contacts. 1 electrical interlock for the surface mounting of reversing starters. 1-0-A switch for manual or automatic operation. Messages: contactor switching position, status of the digital inputs 1 and 2, 1-0-A switch position. Commands: Contactor actuation	DILM(C)7... - DILM(C)32 DILM38 DILA	DIL-SWD-32-002¹⁾ 118561	5 Off 	

	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Wiring set for motor feeder plug					
	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	DILM12-XMCE²⁾ 121764		5 Off 	35x7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: PE 0.75 – 4 mm ²
	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	DILM12-XMCP/E²⁾ 121769		1 Off 	35x7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: L1, L2, L3, PE 0.75 – 2.5 mm ²
	PKZM0/PKE + DILM(C)7 PKZM0/PKE + DILM(C)9 PKZM0/PKE + DILM(C)12 PKZM0/PKE + DILM(C)15 MSC-D(E)-...-M7... MSC-D(E)-...-M9... MSC-D(E)-...-M15...	DILM12-XMCP/T²⁾ 121770		1 Off 	For connection of: L1, L2, L3, PE 0.75 – 2.5 mm ²

Information relevant for export to North America


- 1) NA Certification Request filed for UL and CSA
 2) Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
 NA Certification Request filed for UL and CSA

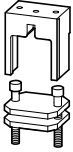
For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America 	
Motor suppressor module						
Can be used at 380...575 V 50/60 Hz.						
	DILM7 - DILM15	DILM12-XMSM 109399	4 Off 	<ul style="list-style-type: none"> • Tool-less version using tool-less plug connection • RC suppressor • Ambient temperature -25...+60 °C, open. • Insulated material, difficult to ignite according to UL 94. • Weight = 0.05 kg. • UL/CSA approval applied for 	Product Standards UL File No. UL CCN NA Certification	IEC/EN 60947-4-1; UL 508; CE marking E300273 NMTR2 UL Recognized
Test block						
Suitable for switching on contactor off-load						
	DILM7 - DILM38 DILA	DILM32-XMAN 110955	1 Off 	-	UL/CSA certification not required	
Printed board contact						
For the adaption of a control circuit on a printed-circuit board						
	DILM7 - DILM15 DILA	DILM12-XPBC 109400	4 Off	-	-	
Load resistor						
For DC contactors in order to increase power consumption						
	DILM17 DILM25 DILM32 DILM38 DILMP32 DILMP45	DILM32-XSPLW24 112419	1 Off 	Installed in a suppressor circuit enclosure. Required when using special PLC outputs for actuation, e.g.: Beckhoff safety controllers.	Product Standards CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; CSA-C22.2 No. 14-05; CE marking 225135 3211-07 CSA certified
Extension terminals						
With control circuit terminal						
Consisting of three flat ribbon terminals						
	DILM80 DILM95 DILM115 DILM150 DILM170	DILM150-XZK 104486	10 Off 	Can be fitted on every main terminal of the contactor. Connection options: maximum 2 x 4 mm ² solid maximum 2 x 2.5 mm ² flexible with ferrule	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29184 NKCR 012528 2411-03, 2411-04 UL Listed, CSA certified
Cable terminal block						
With control circuit terminal						
Consisting of three flat ribbon terminals						
	DILM250 DILM300A DILM400	DILM400-XKU-S 208293	1 Off 	Connection options: round conductors, flexible and stranded, ribbon cables.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29184 NKCR 012528 3211-04 UL Listed, CSA certified



For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
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Flat strip conductor terminal kit

With control cable connection



DILM580
DILM650
DILM750
DILM820

DILM820-XKB-S
208295

1 Off

Connection options:
ribbon cables



Conductor material	Cross-section X number of cores mm ²	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
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
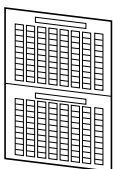

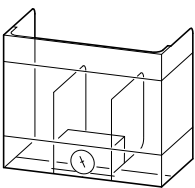

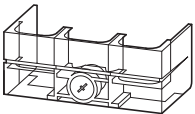

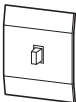


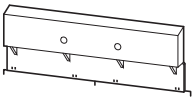

Connection terminal sets for North America

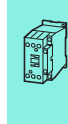
Consist of three individual terminals

Copper, aluminum	2 x (AWG4 ... MCM500)	DILM500/22	DILM500-XK-CNA 232192		1 Off 	Including cover With control cable connec- tion	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29184 NKCR 012528 3211-04 UL Listed, CSA certified
Copper, aluminum	4 x (AWG2 ... MCM500)	DILM580/22 DILM650/22 DILM750/22 DILM820/22	DILM820-XK-CNA 232194				

HPL05065EN

DILM...-XHB, DILM...-XAB

Description	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America 
Sealable shrouds						
Transparent 	DILM32-XTE...	DILM32-XTEPLH 101449		1 Off	-	-
Device labelling, label sheet						
7.5 x 17 mm Colour: yellow HKS 3 (≈RAL 1018) 	Labelling with laser printer, plotter, film plotter, copier	XGKE-GE 207517		25 Off 	1 off = 1 sheet 240 labels per sheet 1 sheet = DIN A4, Can be split into two DIN A5 sheets	UL/CSA certification not required
Covers						
Terminal cover 	DILM185A DILM225A DILM250 DILM300A DILM400 DILM500 DILM580 DILM650 DILM750 DILM820, DILM1000	DILM225A-XHB 139560 DILM400-XHB 208287 DILM500-XHB 208286 DILM650-XHB 208285 DILM820-XHB 208284		1 Off 	To provide terminals with protection against accidental contact vertical from the front	UL/CSA certification not required
Shroud for star-point bridge 	DILM400-XS1	DILM400-XHBS1 101687		1 Off 	Can be combined with star-delta wiring kits DILM250-XSL and DILM400-XSL.	UL/CSA certification not required
Auxiliary contact seat cover  	DILM7 - DILM38 DILMP32 DILMP45 DILA DILL DILM40 - DILM170 DILMP63 - DILMP200	DILM32-XAB 129538 DILM150-XAB 121712		10 Off 	For preventing manual actuation. Cannot be combined with additional surface mounting accessories.	UL/CSA certification not required
Suppressor circuits for vacuum contactors (on load side) 	DILM580 DILM650 DILM750 DILM820 DILM1000 DILH2000 DILH2200 DILH2600	DILM1000-XSM 125947 DILH2600-XSM 125946		1 Off 	For damping the cutout overvoltage when switching off inductive loads.	NA Certification Request filed for UL and CSA



Rated operational current			Actuating voltage	Actuating current	Circuit symbol	For use with	Part no.	Price	Std. pack	Information relevant for export to North America
AC-15		DC						See price list		
230 V	400 V	220 V								
I_e	I_e	I_e	U_s	I						
A	A	A	V DC	mA						

Amplifier module for separate mounting

Input with integrated suppressor circuit for overvoltage limitation

	2	2	0.03	24	25		...DILM DIMLP... DILL... DILK...	ETS4-VS3 083094	1 Off 	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E29184 UL File No. UL CCN CSA File No. CSA Class No. NA Certification UL Listed, CSA certified
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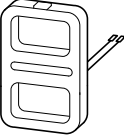

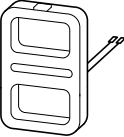
Notes Contactor coils with rated operational current > 2 A must be actuated via the DILER-G mini contactor relay.
Rated operational current DC:
Making and breaking conditions DC-13, time L/R 300ms

For use with	DC voltage	Prices	AC voltage	Price	Std. pack	Notes
	Part no. Article no.	See price list	Part no. Article no.	See price list		
	DILM17 DILM25 DILM32 DILM38	DILM32-XSP(RDC24) ¹⁾ 281155	DILM32-XSP(230V50HZ,240V60HZ) 281141		1 Off 	For additional actuating voltages → Page 5/79
	DILM40 DILM50 DILM65 DILM72	DILM65-XSP(RDC24) ¹⁾ 281185	DILM65-XSP(230V50HZ,240V60HZ) 281171			
	DILM80 DILM95	DILM95-XSP(RDC24) ¹⁾ 230080	DILM95-XSP(230V50HZ,240V60HZ) 230062			
	DILM115 DILM150 DILM170	DILM150-XSP(RDC24) ¹⁾ 230115	DILM150-XSP(RAC240) ¹⁾ 230112			
	DILM185A DILM225A	DILM225A-XSP(RDC24) ¹⁾ 139568	DILM225A-XSP(RAC240) ¹⁾ 139565			

Notes ¹⁾ Incl. electronic module

Information relevant for export to North America

Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No. E29096
UL CCN NLDX
CSA File No. 012528
CSA Class No. 2411-03, 3211-04
NA Certification UL Listed, CSA certified

For use with	DC voltage		AC voltage		Std. pack	Notes
	Part no. Article no.	Price See price list	Part no. Article no.	Price See price list		
Electronic modules including coils						
	DILM250 DILM300A	DILM250-XSP/E(RA250) ¹⁾ 208252	DILM250-XSP/E(RA250) ¹⁾ 208252		1 Off 	For additional actuating voltages → Page 5/81
	DILM400 DILM500	DILM500-XSP/E(RA250) ¹⁾ 208256	DILM500-XSP/E(RA250) ¹⁾ 208256			
	DILM580 DILM650 DILM750 DILM820 DILM1000	DILM1000-XSP/E(RA250) ¹⁾ 289145	DILM1000-XSP/E(RA250) ¹⁾ 289145			
	DILH1400	–	DILH1400-XSP/E(RAW250) ²⁾ 289161			
	DILM250-S DILM300A-S	–	DILM250-S-XSP/E(220-240V50/60HZ) ²⁾ 274202			
	DILM400-S DILM500-S	–	DILM500-S-XSP/E(220-240V50/60HZ) ²⁾ 274205			

1)

2)

Information relevant for export to North America

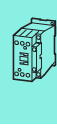


Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05;
CE marking
UL File No. E29096
UL CCN NLDX
CSA File No. 1017510
CSA Class No. 3211-04
NA Certification UL Listed, CSA certified

Information relevant for export to North America

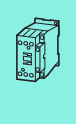


Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05;
CE marking
UL File No. E29096
UL CCN NLDX
CSA File No. 012528
CSA Class No. 3211-04
NA Certification UL Listed, CSA certified



CMD

Description, ordering



General

For safety-related off switching to safety category 3 and 4 according to EN 954-1, at present two contactors must be used in series. Especially with larger contactors this is an expensive solution.

Application

This is where the CMD can be used. The function of the CMD is to monitor the main contacts of a contactor against welding. For this the control voltage of the contactor is compared with the state of the main contacts which is reliably monitored using a mirror contact (IEC EN 60947-4-1 Annex F). If the coil is de-energized and the contactor does not drop out the CMD trips the upstream circuit-breaker/motor protective circuit breaker/switch-disconnector via a shunt release.

Safety

The CMD has a safety-compliant design so that in safety combinations with a circuit-breaker/motor protective circuit breaker/switch disconnector the reliable switch off in the case of a "welded contactor" can be guaranteed. In this application it replaces the series connection of a second contactor. As a component it conforms to safety category 3 according to EN 954-1 and EN ISO 13849.

Mounting

The CMD can be combined with the following Eaton components:

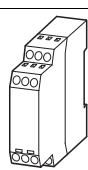
- Contactors:
 - DILEM
 - DILM7 to DILM150
 - DILM185(-S) to DILM500(-S):
 - DILM580 to DILM1600
 - DILH1400 ... DILH2000
 - SE-1A-PKZ2 and S-PKZ2
- Motor-protective circuit-breakers/ circuit-breakers:
 - PKZ2 + U-PKZ2(18VDC)
 - NZM1 + NZM1-XUVL
 - NZM2 + NZM2/3-XUV
 - NZM3 + NZM2/3-XUV
 - NZM4 + NZM4-XUV
 - N1 + NZM1-XUVL
 - N2 + NZM2/3-XUV
 - N3 + NZM2/3-XUV
 - N4 + NZM4-XUV

For the wiring of the CMD the auxiliary N/C contact, mirror contact must be according to IEC/EN 60947-4-1 and the auxiliary N/O contact must be interlocked and opposing according to IEC/EN 60947-5-1. Also the auxiliary N/C contact for the feedback circuit must have a mirror contact function according to IEC/EN 60947-4-1.

Auxiliary contact requirements per contactor:

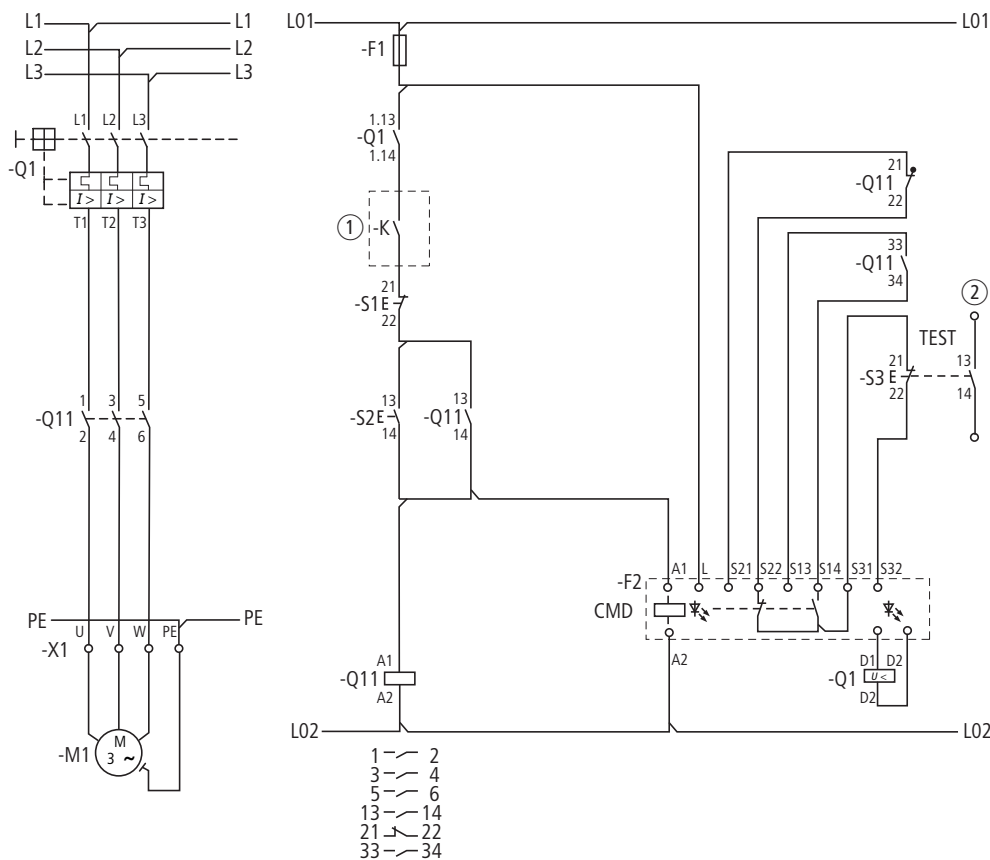
	CMD	Self maintaining	Feedback circuit	Electrical interlock
DOL starter	1 N/O + 1 N/C	1S	1 B	
Reversing starter	1 N/O + 1 N/C	1S	1 B	1 B

Ordering

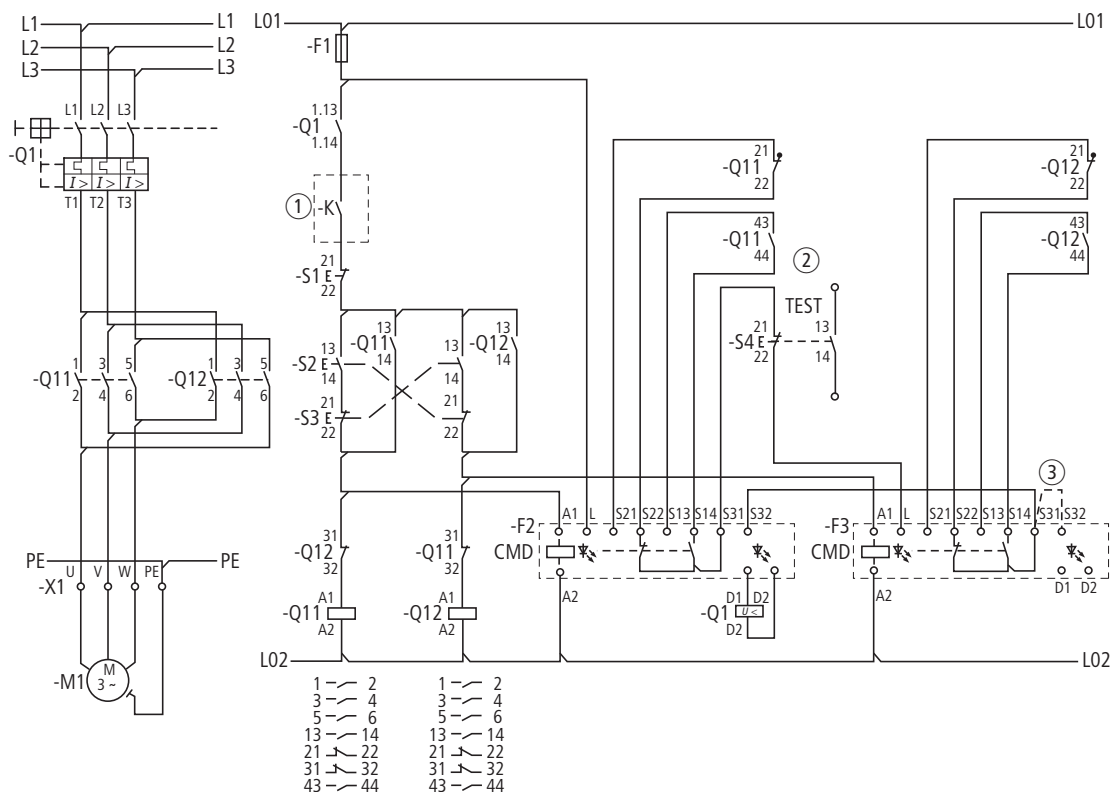
	Part no. Article no.	Price See Price List	Std. pack
CMD contactor monitoring device			
	CMD(24VDC) 106170		1 Off
	CMD(220-240VAC) 106172		1 Off

Engineering

DOL starter



Reversing starter



- ① Switching by safety relay of safety PLC
- ② Signal contact to PLC evaluation
- ③ CMD (24VDC)

Ordering

AC	DILER-40(...)	DILER-31(...)	DILER-22(...)	DILEEM-10(...)	DILEEM-01(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list
24V 50Hz	010094	010251	010344	051604	051629
48V 50Hz	010190	010044	010201	051603	051628
240V 50Hz	010478	010300	010138	051602	051627
115V 60Hz	010270	010204	010211	051598	051624
42V 50Hz, 48V 60Hz	–	–	–	051612	051637
110V 50Hz, 120V 60Hz	051756	051765	051774	051611	051636
190V 50Hz, 220V 60Hz	051757	051766	051775	051610	051635
220V 50Hz, 240V 60Hz	051758	051767	051776	051609	051634
230V 50Hz, 240V 60Hz	051759	051768	051777	051608	051633
380V 50Hz, 440V 60Hz	051760	051769	051778	051607	051632
400V 50Hz, 440V 60Hz	051761	051770	051779	051606	051631
415V 50Hz, 480V 60Hz	051762	051771	051780	051605	051630
24V 50/60Hz	021924	021594	021704	051596	051621
42V 50/60Hz	033459	029869	029433	051595	051620
110V 50/60Hz	021961	021624	021871	051592	051618
230V 50/60Hz	052725	052509	052508	056674	058771
DC	DILER-40-G(...)	DILER-31-G(...)	DILER-22-G(...)	DILEEM-10-G(...)	DILEEM-01-G(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list
12V DC	079711	079761	080728	051644	051649
24V DC	010223	010157	010042	051643	051650
48V DC	010255	010205	010346	051642	051648
110V DC	010287	010253	010043	051640	051646
220V DC	010303	010269	010091	051639	051645

Notes

¹⁾ To obtain the article number for ordering, read under selected part number and actuating voltage from the table.
Devices with dual-voltage coils are to be ordered under a single article number.

AC	DILEM-10(...)	DILEM-01(...)	DILEM12-10(...)	DILEM12-01(...)	DILEM4(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list
24V 50Hz	010005	010086	127067	127083	014754
48V 50Hz	010020	010294	–	–	–
240V 50Hz	010032	010151	–	–	014305
115V 60Hz	010024	010470	–	–	–
42V 50Hz, 48V 60Hz	051782	051791	–	–	–
110V 50Hz, 120V 60Hz	051783	051792	127072	127088	051801
190V 50Hz, 220V 60Hz	051784	051793	–	–	–
220V 50Hz, 240V 60Hz	051785	051794	–	–	051803
230V 50Hz, 240V 60Hz	051786	051795	–	–	051804
380V 50Hz, 440V 60Hz	051787	051796	–	–	–
400V 50Hz, 440V 60Hz	051788	051797	–	–	051806
415V 50Hz, 480V 60Hz	051789	–	–	–	–
24V 50/60Hz	021417	020402	127079	127095	022044
42V 50/60Hz	032174	033233	–	–	–
110V 50/60Hz	021455	020436	127081	127097	–
230V 50/60Hz	052302	051114	127082	127098	052506
DC	DILEM-10-G(...)	DILEM-01-G(...)	DILEM12-10-G(...)	DILEM12-01-G(...)	DILEM4-G(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list
12V DC	079594	079642	–	–	079680
24V DC	010213	010343	127132	127137	012701
48V DC	010245	010496	–	–	–
110V DC	010309	010136	–	–	–
220V DC	010325	010168	–	–	–

Notes

¹⁾ To obtain the article number for ordering, read under selected part number and actuating voltage from the table. Devices with **dual-voltage coils** are to be ordered under a **single** article number.



AC	With screw terminals			With Spring-loaded terminals		
	DILA-40(...)	DILA-31(...)	DILA-22(...)	DILAC-40(...)	DILAC-31(...)	DILAC-22(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list
24V 50Hz	276316	276351	276386	276431	276463	276495
240V 50Hz	276318	276353	276388	–	–	–
110V 50Hz 120V 60Hz	276326	276361	276396	276438	276470	276502
190V 50Hz 220V 60Hz	276327	276362	276397	–	–	–
220V 50Hz 240V 60Hz	276328	276363	276398	–	–	–
230V 50Hz 240V 60Hz	276329	276364	276399	276441	276473	276505
380V 50Hz 440V 60Hz	276330	276365	276400	–	–	–
400V 50Hz 440V 60Hz	276331	276366	276401	–	–	–
24V 50Hz/60Hz	276333	276368	276403	276445	276477	276509
42V 50Hz/60Hz	276334	276369	276404	–	–	–
110V 50Hz/60Hz	276335	276370	276405	–	–	–
220V 50Hz/60Hz	276336	276371	276406	–	–	–
230V 50Hz/60Hz	276337	276372	276407	276449	276481	276513
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz(12-500V)³⁾	276341	276376	276411	276453	276485	276517
...V 60Hz(12-600V)³⁾	276342	276377	276412	276454	276486	276518
DC	With screw terminals			With Spring-loaded terminals		
	DILA-40(...)	DILA-31(...)	DILA-22(...)	DILAC-40(...)	DILAC-31(...)	DILAC-22(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	276344	276379	276414	276456	276488	276520
48V DC	276345	276380	276415	–	–	–
110V DC	276347	276382	276417	276459	276491	276523
220V DC	276348	276383	276418	276460	276492	276524
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list
...V DC(12-250V)³⁾	276349	276384	276419	276461	276493	276525

Notes

¹⁾ The article number is a combination of part no. and operating voltage devices with dual-voltage coils can be ordered under a single article no.

²⁾ With non-standard voltages the required actuating voltage from the defined range (...-...V) must be stated.

³⁾ Minimum order quantity 10 units

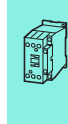
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DILM

AC	DILM7-10 (...)	DILM7-01 (...)	DILM9-10 (...)	DILM9-01 (...)	DILM12-10 (...)	DILM12-01 (...)	DILM15-10 (...)	DILM15-01 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V 50Hz	276537	276572	276677	276712	276817	276852	290045	290080
240V 50Hz	276539	276574	276679	276714	276819	276854	–	–
42V 50Hz 48V 60Hz	276546	–	276686	–	276826	–	–	–
110V 50Hz 120V 60Hz	276547	276582	276687	276722	276827	276862	290055	290090
190V 50Hz 220V 60Hz	276548	276583	276688	276723	276828	276863	–	–
220V 50Hz 240V 60Hz	276549	276584	276689	276724	276829	276864	–	–
230V 50Hz 240V 60Hz	276550	276585	276690	276725	276830	276865	290058	290093
380V 50Hz 440V 60Hz	276551	276586	276691	276726	276831	276866	–	–
400V 50Hz 440V 60Hz	276552	276587	276692	276727	276832	276867	–	–
415V 50Hz 480V 60Hz	276553	–	276693	–	276833	–	–	–
24V 50Hz/60Hz	276554	276589	276694	276729	276834	276869	290062	290097
42V 50Hz/60Hz	276555	276590	276695	276730	276835	276870	–	–
110V 50Hz/60Hz	276556	276591	276696	276731	276836	276871	–	–
220V 50Hz/60Hz	276557	276592	276697	276732	276837	276872	–	–
230V 50Hz/60Hz	276558	276593	276698	276733	276838	276873	290066	290101
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz (12 – 600V)³⁾	276562	276597	276702	276737	276842	276877	290070	290105
...V 60Hz (12 – 600V)³⁾	276563	276598	276703	276738	276843	276878	290071	290106
DC	DILM7-10 (...)	DILM7-01 (...)	DILM9-10 (...)	DILM9-01 (...)	DILM12-10 (...)	DILM12-01 (...)	DILM15-10 (...)	DILM15-01 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	276565	276600	276705	276740	276845	276880	290073	290108
48V DC	276566	276601	276706	276741	276846	276881	–	–
110V DC	276568	276603	276708	276743	276848	276883	–	–
220V DC	276569	276604	276709	276744	276849	276884	–	–
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V DC (12-250V)³⁾	276570	276605	276710	276745	276850	276885	290078	290113

Notes

- ¹⁾ To obtain the article number for ordering, read under selected part number and actuating voltage from the table. devices with dual-voltage coils can be ordered under a single article no.
- ²⁾ With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
- ³⁾ Minimum order quantity 10 units



AC	DILM17-10 (...)	DILM17-01 (...)	DILM25-10 (...)	DILM25-01 (...)	DILM32-10 (...)	DILM32-01 (...)	DILM38-10(...)	DILM38-01(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V 50Hz	276991	277023	277119	277151	277247	277279	112378	112446
240V 50Hz	276993	–	277121	–	277249	–	112420	–
42V 50Hz 48V 60Hz	277000	–	277128	–	277256	–	112424	–
110V 50Hz 120V 60Hz	277001	277033	277129	277161	277257	277289	112425	112454
190V 50Hz 220V 60Hz	277002	–	277130	–	277258	–	112426	–
220V 50Hz 240V 60Hz	277003	–	277131	–	277259	–	112427	–
230V 50Hz 240V 60Hz	277004	277036	277132	277164	277260	277292	112428	112457
380V 50Hz 440V 60Hz	277005	–	277133	–	277261	–	112429	–
400V 50Hz 440V 60Hz	277006	277038	277134	277166	277262	277294	112430	112459
415V 50Hz 480V 60Hz	277007	–	277135	–	277263	–	112431	–
24V 50Hz/60Hz	277008	277040	277136	277168	277264	277296	112432	112461
42V 50Hz/60Hz	277009	–	277137	–	277265	–	112433	–
110V 50Hz/60Hz	277010	277042	277138	277170	277266	277298	112434	112463
220V 50Hz/60Hz	277011	277043	277139	277171	277267	277299	112435	112464
230V 50Hz/60Hz	277012	277044	277140	277172	277268	277300	112436	112465
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz (24 – 600V)	277016 ⁷⁾	277048 ⁷⁾	277144 ⁷⁾	277176 ⁷⁾	277272 ⁷⁾	277304 ⁸⁾	112440 ⁷⁾	112468 ⁷⁾
...V 60Hz (24 – 600V)	277017 ⁷⁾	277049 ⁷⁾	277145 ⁷⁾	277177 ⁷⁾	277273 ⁷⁾	277305 ⁸⁾	112441 ⁷⁾	112469 ⁷⁾
DC	DILM17-10(...)	DILM17-01(...)	DILM25-10(...)	DILM25-01(...)	DILM32-10(...)	DILM32-01(...)	DILM38-10(...)	DILM38-01(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RDC 24 ³⁾	277018	277050	277146	277178	277274	277306	112442	112470
RDC 60 ⁴⁾	277019	277051	277147	277179	277275	277307	112443	112471
RDC 130 ⁵⁾	277020	277052	277148	277180	277276	277308	112444	112472
RDC 240 ⁶⁾	277021	277053	277149	277181	277277	277309	112445	112473

Notes

- ¹⁾ To obtain the article number for ordering, read under selected part number and actuating voltage from the table. devices with dual-voltage coils can be ordered under a single article no.
- ²⁾ With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.
- ³⁾ 24 – 27 V DC
- ⁴⁾ 48 – 60 V DC
- ⁵⁾ 110 – 130 V DC
- ⁶⁾ 200 – 240 V DC
- ⁷⁾ Minimum order quantity 10 units
- ⁸⁾ Minimum order quantity 5 units

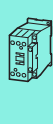
DILM

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AC	DILM40(...)	DILM50(...)	DILM65(...)	DILM72(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list
24V 50Hz	277753	277817	277881	–
240V 50Hz	277755	277819	277883	109183
42V 50Hz 48V 60Hz	277762	277826	277890	–
110V 50Hz 120V 60Hz	277763	277827	277891	109191
190V 50Hz 220V 60Hz	277764	277828	277892	–
220V 50Hz 240V 60Hz	277765	277829	277893	–
230V 50Hz 240V 60Hz	277766	277830	277894	107670
380V 50Hz 440V 60Hz	277767	277831	277895	–
400V 50Hz 440V 60Hz	277768	277832	277896	109195
415V 50Hz 480V 60Hz	277769	277833	277897	–
24V 50Hz/60Hz	277770	277834	277898	109197
42V 50Hz/60Hz	277771	277835	277899	–
110V 50Hz/60Hz	277772	277836	277900	109199
220V 50Hz/60Hz	277773	277837	277901	109200
230V 50Hz/60Hz	277774	277838	277902	109201
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list
...V 50Hz (24 – 600V)	277778 ⁸⁾	277842 ⁸⁾	277906 ⁸⁾	109205 ⁷⁾
...V 60Hz (24 – 600V)	277779 ⁸⁾	277843 ⁸⁾	277907 ⁸⁾	109206 ⁷⁾
DC	DILM40(...)	DILM50(...)	DILM65(...)	DILM72(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list
RDC 24 ³⁾	277780	277844	277908	107671
RDC 60 ⁴⁾	277781	277845	277909	–
RDC 130 ⁵⁾	277782	277846	277910	–
RDC 240 ⁶⁾	277783	277847	277911	109209

Notes

- ¹⁾ To obtain the article number for ordering, read under selected part number and actuating voltage from the table.
devices with dual-voltage coils can be ordered under a single article no.
- ²⁾ With non-standard voltages the required actuating voltage from the defined range (...-...V) must be stated.
- ³⁾ 24 – 27 V DC
- ⁴⁾ 48 – 60 V DC
- ⁵⁾ 110 – 130 V DC
- ⁶⁾ 200 – 240 V DC
- ⁷⁾ Minimum order quantity 10 units



AC	DILM80 (...)	DILM95 (...)	AC	DILM115 (...)	DILM150 (...)	DILM170 (...)	DILM185A/ 22(...)	DILM225A/ 22(...)						
	Article no. ¹⁾	Article no. ¹⁾		Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾						
Standard voltages	See price list	See price list	Standard voltages	See price list	See price list	See price list	See price list	See price list						
24 V 50 Hz	235904	239467	RAC 24⁷⁾	239545	239585	107010	139534	139544						
240V 50Hz	235910	239469	RAC 48⁸⁾	239546	239586	107011	139535	139545						
42V 50Hz 48V 60Hz	239394	239476	RAC 120⁹⁾	239547	239587	107012	139536	139546						
110V 50Hz 120V 60Hz	239399	239477	RAC 240¹⁰⁾	239548	239588	107013	139537	139547						
190V 50Hz 220V 60Hz	239400	239478	RAC 440¹¹⁾	239549	239589	107014	139538	139548						
220V 50Hz 240V 60Hz	239401	239479	RAC 500¹²⁾	239550	239590	107015	139539	139549						
230V 50Hz 240V 60Hz	239402	239480	DC	DILM115 (...)	DILM150 (...)	DILM170 (...)	DILM185A/ 22(...)	DILM225A/ 22(...)						
380V 50Hz 440V 60Hz	239403	239481							Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	
400V 50Hz 440V 60Hz	239404	239482							See price list	See price list	See price list	See price list	See price list	
415V 50Hz 480V 60Hz	239405	239483							RDC 24³⁾	239555	239591	107016	139540	139550
24V 50Hz/60Hz	239406	239484							RDC 60⁴⁾	239560	239592	107017	139541	139551
42V 50Hz/60Hz	239407	239485							RDC 130⁵⁾	239567	239593	107018	139542	139552
110V 50Hz/60Hz	239408	239486							RDC 240⁶⁾	239572	239594	107019	139543	139553
220V 50Hz/60Hz	239409	239487							Notes	¹⁾ The article no. results from combining the part no. and the actuating voltage. Devices with dual-voltage coils must be ordered under a single article no. ²⁾ With non-standard voltages the required actuating voltage from the defined range (...-...V) must be stated. ³⁾ 24 - 27 V DC ⁴⁾ 48 - 60 V DC ⁵⁾ 110 - 130 V DC ⁶⁾ 200 - 240 V DC ⁷⁾ 24 V 50/60 Hz ⁸⁾ 42 - 48 V 50/60 Hz ⁹⁾ 100 - 120 V 50/60 Hz ¹⁰⁾ 190 - 240 V 50/60 Hz ¹¹⁾ 380 - 440 V 50/60 Hz ¹²⁾ 480 - 500 V 50/60 Hz ¹³⁾ Minimum order quantity 5 units				
230V 50Hz/60Hz	239410	239488												
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list												
...V 50Hz (24 - 600V) ¹³⁾	239414	239504												
...V 60Hz (24 - 600V) ¹³⁾	239415	239509												
DC	DILM80 (...)	DILM95 (...)												
	Article no. ¹⁾	Article no. ¹⁾												
Standard voltages	See price list	See price list												
RDC 24³⁾	239416	239510												
RDC 60⁴⁾	239417	239511												
RDC 130⁵⁾	239418	239512												
RDC 240⁶⁾	239419	239513												

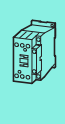
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AC	DILMC7-10 (...)	DILMC7-01 (...)	DILMC9-10 (...)	DILMC9-01 (...)	DILMC12-10 (...)	DILMC12-01 (...)	DILMC15-10 (...)	DILMC15-01 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24 V 50 Hz	277379	277411	277443	277475	277507	277539	293938	293933
110V 50Hz 120V 60Hz	277386	277418	277450	277482	277514	277546	293908	293943
230V 50Hz 240V 60Hz	277389	277421	277453	277485	277517	277549	293911	293946
24V 50Hz/60Hz	277393	277425	277457	277489	277521	277553	293915	293950
230V 50Hz/60Hz	277397	277429	277461	277493	277525	277557	293919	293954
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...V 50Hz (12 – 600V)⁶⁾	277401	277433	277465	277497	277529	277561	293923	293958
...V 60Hz (12 – 600V)⁶⁾	277402	277434	277466	277498	277530	277562	293924	293959
DC	DILMC7-10 (...)	DILMC7-01 (...)	DILMC9-10 (...)	DILMC9-01 (...)	DILMC12-10 (...)	DILMC12-01 (...)	DILMC15-10 (...)	DILMC15-01 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	277404	277436	277468	277500	277532	277564	293926	293961
110V DC	277407	277439	277471	277503	277535	277567	293929	293964
220V DC	277408	277440	277472	277504	277536	277568	293930	293965
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
...VDC (12 – 250V)⁶⁾	277409	277441	277473	277505	277537	277569	293931	293966
AC	DILMC17-10 (...)	DILMC17-01 (...)	DILMC25-10 (...)	DILMC25-01 (...)	DILMC32-10 (...)	DILMC32-01 (...)		
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	
24 V 50 Hz	277570	277600	277630	277660	277690	277720		
110V 50Hz 120V 60Hz	277578	277608	277638	277668	277698	277728		
230V 50Hz 240V 60Hz	277581	277611	277641	277671	277701	277731		
24V 50Hz/60Hz	277585	277615	277645	277675	277705	277735		
220V 50Hz/60Hz	277588	277618	277648	277678	277708	277738		
230V 50Hz/60Hz	277589	277619	277649	277679	277709	277739		
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	
...V 50Hz (24 – 600V)⁶⁾	277593	277623	277653	277683	277713	277743		
...V 60Hz (24 – 600V)⁶⁾	277594	277624	277654	277684	277714	277744		
DC	DILMC17-10 (...)	DILMC17-01 (...)	DILMC25-10 (...)	DILMC25-01 (...)	DILMC32-10 (...)	DILMC32-01 (...)		
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	
RDC 24³⁾	277595	277625	277655	277685	277715	277745		
RDC 130⁴⁾	277597	277627	277657	277687	277717	277747		
RDC 240⁵⁾	277598	277628	277658	277688	277718	277748		

Notes

- ¹⁾ The article no. results from combining the part no. and the actuating voltage.
Devices with dual-voltage coils must be ordered under a single article no.
- ²⁾ With non-standard voltages the required actuating voltage from the defined range (...-...V) must be stated.
- ³⁾ 24 - 27 V DC
- ⁴⁾ 110 - 130 V DC
- ⁵⁾ 200 - 240 V DC
- ⁶⁾ Minimum order quantity 10 units



AC	DILMP20 (...)	DILMP32- 10	DILMP32- 01	DILMP45- 10	DILMP45- 01	DILMP63 (...)	DILMP80 (...)	DILMP125 (...)	DILMP160 (...)	DILMP200 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
240V 50Hz	–	109798	–	109827	–	109856	109885	–	–	–
110V 50Hz 120V 60Hz	276967	109790	118912	109819	118915	109848	109877	–	–	–
230 V 50Hz 240V 60Hz	276970	109797	118911	109826	118914	109855	109884	–	–	–
24V 50/60Hz	276974	109799	–	109828	–	109857	109886	–	–	–
230V 50/60Hz	276978	109796	–	109825	–	109883	109883	–	–	–
AC	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RAC 24⁴⁾	–	–	–	–	–	–	–	109904	109914	109924
RAC 120⁵⁾	–	–	–	–	–	–	–	109903	109913	109923
RAC 240⁶⁾	–	–	–	–	–	–	–	109905	109915	109925
AC	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Non-standard voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
... V 50Hz (12 – 600V)³⁾	276982	109787	109787	109816	109816	109845	109874	–	–	–
... V 60Hz (12 – 600V)³⁾	276983	109788	109788	109817	109817	109846	109875	–	–	–
DC	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
24V DC	276985	–	–	–	–	–	–	–	–	–
RDC 24⁷⁾	–	109811	118913	109840	118916	109869	109898	109910	109920	109930
DC	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Non-standard voltages ²⁾	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
... V DC (12 – 250V)³⁾	276990	–	–	–	–	–	–	–	–	–

Notes

¹⁾ The article number is a combination of part no. and actuating voltage

²⁾ For non-standard voltages, state the actuating voltage selected from the range (...–...V) shown.

³⁾ Minimum order quantity: 10 units

⁴⁾ 24 V 50/60 Hz

⁵⁾ 100 – 120 V 50/60 Hz

⁶⁾ 190 – 240 V 50/60 Hz

⁷⁾ 24 – 27 V DC

DILM...XSP...

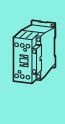
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AC	DILM32-XSP (...)	DILM65-XSP (...)	DILM95- XSP
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list
24V 50Hz	281130	281160	229984
240V 50Hz	281132	281162	229986
24V 60Hz	281134	281164	229988
115V 60Hz	281136	281166	229990
42V 50Hz 48V 60Hz	281137	281167	229994
110V 50Hz 120V 60Hz	281138	281168	230058
190V 50Hz 220V 60Hz	281139	281169	230059
220V 50Hz 240V 60Hz	281140	281170	230061
230V 50Hz 240V 60Hz	281141	281171	230062
380V 50Hz 440V 60Hz	281142	281172	230063
400V 50Hz 440V 60Hz	281143	281173	230064
415V 50Hz 480V 60Hz	281144	281174	230065
24V 50Hz/60Hz	281145	281175	230066
42V 50Hz/60Hz	281146	281176	230067
110V 50Hz/60Hz	281147	281177	230068
220V 50Hz/60Hz	281148	281178	230073
230V 50Hz/60Hz	281149	281179	230074
Special voltages other than the already shown normal-voltages ²⁾	See price list	See price list	See price list
...V 50Hz (24 – 600V)	281153 ¹³⁾	281183 ¹⁴⁾	230078 ¹⁴⁾
...V 60Hz (24 – 600V)	281154 ¹³⁾	281184 ¹⁴⁾	230079 ¹⁴⁾
DC	DILM32-XSP (...)	DILM65-XSP (...)	DILM95- XSP
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list
RDC 24³⁾	281155	281185	230080
RDC 60⁴⁾	281156	281186	230081
RDC 130⁵⁾	281157	281187	230082
RDC 240⁶⁾	281158	281188	230107

AC	DILM150-XSP (...)	DILM225A-XSP (...)
	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list
RAC 24⁷⁾	230109	139562
RAC 48⁸⁾	230110	139563
RAC 120⁹⁾	230111	139564
RAC 240¹⁰⁾	230112	139565
RAC 440¹¹⁾	230113	139566
RAC 500¹²⁾	230114	139567
DC	DILM150-XSP (...)	DILM225A-XSP (...)
	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list
RDC 24³⁾	230115	139568
RDC 60⁴⁾	230116	139569
RDC 130⁵⁾	230117	139570
RDC 240⁶⁾	230122	139571

Notes

- 1) To obtain the article number for ordering, read under selected part number and actuating voltage from the table.
Devices with dual-voltage coils are to be ordered under a single article number.
- 2) With non-standard voltages the required actuating voltage from the defined range (...-...V) must be stated.
- 3) 24 – 27 V DC
- 4) 48 – 60 V DC
- 5) 110 – 130 V DC
- 6) 200 – 240 V DC
- 7) 24 V 50/60 Hz
- 8) 42 – 48 V 50/60 Hz
- 9) 100 – 120 V 50/60 Hz
- 10) 190 – 240 V 50/60 Hz
- 11) 380 – 440 V 50/60 Hz
- 12) 480 – 500 V 50/60 Hz
- 13) Minimum order quantity 10 units
- 14) Minimum order quantity 5 units



AC	DILK12-11 (...)	DILK20-11 (...)	DILK25-11 (...)	DILK33-10 (...)	DILK50-10 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list
110V 50Hz, 120V 60Hz	293985	294007	294029	294051	294073
190V 50Hz, 220V 60Hz	293986	294008	294030	294052	294074
230V 50Hz, 240V 60Hz	293988	294010	294032	294054	294076
400V 50Hz, 440V 60Hz	293990	294012	294034	294056	294078
Special voltages other than the already shown normal voltages ²⁾	See price list	See price list	See price list		
...V 50Hz (24 – 600V) ³⁾	293997	294019	294041	–	–
...V 60Hz (24 – 600V) ³⁾	293998	294020	294042	–	–

Notes

¹⁾ The article no. results from combining the part no. and the actuating voltage.

Devices with dual-voltage coils must be ordered under a single article no.

²⁾ With non-standard voltages the required actuating voltage from the defined range (...–...V) must be stated.

³⁾ Minimum order quantity 10 units

Contactors up to 150 A with electronic actuation

AC	DILMF8-10 (...)	DILMF8-01 (...)	DILMF11-10 (...)	DILMF11-01 (...)	DILMF14-10 (...)	DILMF14-01 (...)	DILMF17-10 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RAC 24 ¹⁾	104410	104414	104418	104422	104426	104430	104434
RAC 48 ³⁾	104411	104415	104419	104423	104427	104431	104435
RAC 120 ⁴⁾	104412	104416	104420	104424	104428	104432	104436
RAC 240 ⁵⁾	104413	104417	104421	104425	104429	104433	104437
AC	DILMF17-01 (...)	DILMF25-10 (...)	DILMF25-01 (...)	DILMF32-10 (...)	DILMF32-01 (...)	DILMF40 (...)	DILMF50 (...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltages	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RAC 24 ²⁾	104438	104442	104446	104450	104454	104458	104462
RAC 48 ³⁾	104439	104443	104447	104451	104455	104459	104463
RAC 120 ⁴⁾	104440	104444	104448	104452	104456	104460	104464
RAC 240 ⁵⁾	104441	104445	104449	104453	104457	104461	104465
AC	DILMF65 (...)	DILMF80 (...)	DILMF95 (...)	DILMF115 (...)	DILMF150 (...)		
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾		
Standard voltages	See price list	See price list	See price list	See price list	See price list		
RAC 24 ²⁾	104466	104470	104474	104478	104482		
RAC 48 ³⁾	104467	104471	104475	104479	104483		
RAC 120 ⁴⁾	104468	104472	104476	104480	104484		
RAC 240 ⁵⁾	104469	104473	104477	104481	104485		

Notes

¹⁾ The article no. results from combining the part no. and the actuating voltage.

²⁾ 24 - 24 V

³⁾ 42 - 48

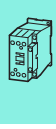
⁴⁾ 100 - 120

⁵⁾ 190 - 240

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DILM

Complete comfort devices	DILM250 /22(...)	DILM300A /22(...)	DILM400 /22(...)	DILM500 /22(...)	DILM580 /22(...)	DILM650 /22(...)	DILM750 /22(...)	DILM820 /22(...)	DILM1000 /22(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Voltage variants	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list	See price list
RDC 48 ²⁾	208199	139554	208207	208211	–	–	–	–	–
RA 110 ³⁾	208200	139555	208208	208212	208215	208218	208221	208224	–
RA 250 ⁴⁾	208201	139556	208209	208213	208216	208219	208222	208225	267214
RAC 500 ^{5) 6)}	208202	139557	208210	208214	208217	208220	208223	208226	–



Complete units Standard	DILM250 -S/22(...)	DILM300A -S/22(...)	DILM400 -S/22(...)	DILM500 -S/22(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Voltage variants	See price list	See price list	See price list	See price list
110-120V 50/60Hz	274189	139558	274195	274198
220-240V 50/60Hz	274190	139559	274196	274199

Electronic module, incl. coil, for comfort model	DILM250-XSP/E(...)	DILM500-XSP/E(...)	DILM1000-XSP/E(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Voltage variants	See price list	See price list	See price list
RDC 48 ²⁾	208250	208254	–
RA 110 ³⁾	208251	208255	289146
RA 250 ⁴⁾	208252	208256	289145
RAC 500 ^{5) 6)}	208253	208257	289147

Electronic module, incl. coil, for standard model	DILM250-S-XSP/E(...)	DILM500-S-XSP/E(...)
	Article no. ¹⁾	Article no. ¹⁾
Voltage variants	See price list	See price list
110-120V 50/60Hz	274201	274204
220-240V 50/60Hz	274202	274205

Notes

- ¹⁾ The article no. results from combining the part no. and the voltage variant.
- ²⁾ 24 – 48 V DC
- ³⁾ 48 – 110 V 40 – 60 Hz/48 – 110 V DC
- ⁴⁾ 110 – 250 V 40 – 60 Hz/110 – 250 V DC
- ⁵⁾ 250 – 500 V 40 – 60 Hz
- ⁶⁾ DC on request

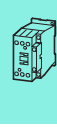
Engineering

The diagrams show the closing and opening travel of the contacts at no load.

	N/O	x1		x2	
DILE AC	N/O	1.9	2.8		
	NC	0.95	2.8		
...DILE	N/O	1.9	2.8		
	NC	0.9	2.8		
...DDILE	NO early-make	1.06	2.9		
	Late-break N/C contact	1.86	2.9		
	N/O	1.9	2.8		
	NC	0.9	2.8		
DILE DC	N/O	1.9	2.85		
	NC	0.95	2.85		
DILE...	N/O	1.9	2.8		
	NC	0.9	2.8		
...DDILE	NO early-make	1.06	2.9		
	Late-break N/C contact	1.86	2.9		
	N/O	1.9	2.8		
	NC	0.9	2.8		
DILA-AC	N/O	3.3	4.5		
	NC	1.0	4.5		
DILA-XHI	N/O	3.2	4.5		
	NC	1.6	4.5		
DILA-XHIV	NO early-make	2.0	4.5		
	Late-break N/C contact	2.8	4.5		
	N/O	3.2	4.5		
	NC	1.6	4.5		
DILA-DC	N/O	2.1	2.9		
	NC	0.7	2.9		
DILA-XHI	N/O	2.3	2.9		
	NC	0.7	2.9		
DILA-XHIV	NO early-make	1.1	2.9		
	Late-break N/C contact	1.9	2.9		
	N/O	2.3	2.9		
	NC	0.7	2.9		
DILM7/9 AC	N/O	3.3	4.5		
	NC	1.0	4.5		
DILM32-XHI, DILA-XHI	N/O	3.2	4.5		
	NC	1.6	4.5		
DILA-XHIV	NO early-make	2.0	4.5		
	Late-break N/C contact	2.8	4.5		
	N/O	3.2	4.5		
	NC	1.6	4.5		
DILM7/9 DC	N/O	2.1	2.9		
	NC	0.7	2.9		
DILM32-XHI, DILA-XHI	N/O	2.3	2.9		
	NC	0.7	2.9		
DILA-XHIV	NO early-make	1.1	2.9		
	Late-break N/C contact	1.9	2.9		
	N/O	2.3	2.9		
	NC	0.7	2.9		
DILM12/15/P20 AC	N/O	3.3	4.5		
	NC	1.0	4.5		
DILM32-XHI, DILA-XHI	N/O	3.2	4.5		
	NC	1.6	4.5		
DILA-XHIV	NO early-make	2.0	4.5		
	Late-break N/C contact	2.8	4.5		
	N/O	3.2	4.5		
	NC	1.6	4.5		
DILM12/15/P20 DC	N/O	3.3	4.4		
	NC	1.0	4.4		
DILM32-XHI, DILA-XHI	N/O	3.2	4.4		
	NC	1.6	4.4		

The diagrams show the closing and opening travel of the contacts at no load.

	N/O	x1		x2	
DILA-XHIV	NO early-make	2.0	4.4		
	Late-break N/C contact	2.8	4.4		
	N/O	3.2	4.4		
	NC	1.6	4.4		
DILM17/25/32/P32/P45	N/O	4.0	6.0		
	Auxiliary N/C	1.8	6.0		
	Auxiliary N/O	3.2	6.0		
DILM32-XHI, DILA-XHI	N/O	3.2	6.0		
	NC	1.6	6.0		
DILA-XHIV	NO early-make	2.0	6.0		
	Late-break N/C contact	2.8	6.0		
	N/O	3.2	6.0		
	NC	1.6	6.0		
DILM40/50/65/P63/P80	N/O	5.1	7.5		
DILM150-XHI	N/O	5.7	7.5		
	NC	3.9	7.5		
DILM150-XHIV	NO early-make	3.8	7.5		
	Late-break N/C contact	5.4	7.5		
	N/O	5.7	7.5		
	NC	3.9	7.5		
DILM1000-XHI	N/O	5.5	7.5		
	NC	3.6	7.5		
DILM1000-XHIV	NO early-make	4.1	7.5		
	Late-break N/C contact	5.0	7.5		
DILM80/95/115/150/170/P125/P160/P200	N/O	8.0	11		
DILM150-XHI	N/O	9.2	11		
	NC	7.4	11		
DILM150-XHIV	NO early-make	7.3	11		
	Late-break N/C contact	8.9	11		
	N/O	9.2	11		
	NC	7.4	11		
DILM1000-XHI	N/O	9.0	11		
	NC	7.1	11		
DILM1000-XHIV	NO early-make	7.6	11		
	Late-break N/C contact	8.5	11		
DILM185A/225A	N/O	10.0	13.0		
DILM1000-XHI	N/O	10.0	13.0		
	NC	8.1	13.0		
DILM1000-XHIV	NO early-make	8.4	13.0		
	Late-break N/C contact	9.5	13.0		
DILM250/300A	N/O	10.1	13.1		
DILM820-XHI	N/O	10.3	13.1		
	NC	8.4	13.1		
DILM820-XHIV	NO early-make	8.7	13.1		
	Late-break N/C contact	9.8	13.1		
DILM400/500/570	N/O	8.9	13.1		
DILM820-XHI	N/O	10.3	13.1		
	NC	8.4	13.1		
DILM820-XHIV	NO early-make	8.7	13.1		
	Late-break N/C contact	9.8	13.1		
DILM580/650/750/820	N/O	2.0	4.1		
DILM820-XHI	N/O	7.4	10.5		
	NC	5.5	10.5		
DILM820-XHIV	NO early-make	6.0	10.5		
	Late-break N/C contact	6.8	10.5		
DILM1000/1600, DILH1400/2000/2200/2600	N/O	2.0	4.1		
DILM820-XHI	N/O	7.4	10.5		
	NC	5.5	10.5		
DILM820-XHIV	NO early-make	6.0	10.5		
	Late-break N/C contact	6.8	10.5		



Components	Contactor selection				
	With top mounting auxiliary contacts	With side mounting auxiliary contacts	With overload relay	With parallel connector	Insulated enclosures
Part no.					
DILE...(-G)(-C)	—	—	—	—	CI-K1-95-TS
DILE...(-G)(-C)	•	—	—	—	CI-K2-145-TS
DILE...(-G)	•	—	•	—	CI-K2-145-AD
DILE...(-G)	—	—	—	•	CI-K2-100-TS
DILE...(-G)	•	—	—	•	CI-K2-145-TS
DILM7 to DILM15	•	—	—	—	CI-K2-145-TS
DILM7 to DILM15	•	—	•	—	CI-K3-160-TS
DILM17 to DILM32	—	—	—	—	CI-K2-145-TS
DILM17 to DILM32	•	—	•	—	CI23E-150
DILM40 to DILM65	—	•	—	—	CI-K3-160-TS
DILM40 to DILM65	•	•	•	—	CI43E-150
DILM80 to DILM170	•	•	—	—	CI43E-200
DILM80 to DILM170	•	•	•	—	CI44E-200
DILM185A	—	•	—	—	CI48-250
DILM225A	—	•	—	—	CI48-250
DILM250	—	•	—	—	CI48-250
DILM300A	—	•	—	—	CI48-250
DILM400	—	•	—	—	CI48-250
DILM500	—	•	—	—	CI48-250
DILM580	—	•	—	—	CI48-250
DILM650	—	•	—	—	CI48-250
DILM750	—	•	—	—	CI48-250
DILM820	—	•	—	—	CI48-250
DIULE...	•	—	—	—	CI-K3-125-TS
DIULE...	•	—	•	—	CI-K3-125-TS
DIULM7 to DIULM12	•	—	—	—	CI-K4-160-TS
DIULM17 to DIULM32	•	—	—	—	CI23E-150
DIULM40 to DIULM65	•	—	—	—	CI43E-200
SDAINLEM...	•	—	—	—	CI-K5-125-TS CI-K5-125-M
SDAINLM12 to SDAINLM22	•	—	—	—	CI-K5-160-TS
SDAINLM30 to SDAINLM65	•	—	—	—	CI23E-150
SDAINLM70 to SDAINLM115	•	—	—	—	CI43E-200

Notes

CI-K small enclosure	→ Chapter 20	Insulated PE, N or PEN terminal for enclosure CI-K	→ Chapter 20
Terminal for CI-K enclosure	→ Chapter 20		
CI enclosure	→ Chapter 20		



Rating data for approved types



Maximum alternating current-motor rating
Single-phase

GENERAL USE

Maximum motor-rated current
I_{th}
Open/enclosed

Contactors

NEMA size

Single-phase		3-phase				A	Part no.	
115 V 120 V HP	230 V 240 V HP	200 V 208 V HP	230 V 240 V HP	460 V 480 V HP	575 V 600 V HP			
1/2	1 1/2	2	3	5	5	15/13.5	DILEM(4)	00
1/4	1	1 1/2	2	3	5	20	DILM7-...(...)	00
1/2	1 1/2	3	3	5	7 1/2	20	DILM9-...(...)	00
1	2	3	3	10	10	20	DILM12-...(...)	0
1	3		5	10	10	20	DILM15-...(...)	0
2	3	5	7 1/2	10	15	35	DILM17-...(...)	0
2	5	7 1/2	7 1/2	15	20	35	DILM25-...(...)	1
3	5	10	10	20	25	40	DILM32-...(...), DILM38-...(...)	1
3	7 1/2	10	15	30	40	55	DILM40(...)	2
3	10	15	20	40	50	65	DILM50(...)	2
5	15	20	25	40	60	80	DILM65(...), DILM70(...)	2
7 1/2	15	25	30	60	75	125	DILM80(...)	3
7 1/2	15	25	40	75	100	125	DILM95(...)	3
10	25	40	50	100	125	160	DILM115(...)	4
15	30	40	60	125	125	160	DILM150(...), DILM170(...)	4
-	-	50	60	125	150	225	DILM185(...)	4
-	-	60	75	150	200	250	DILM225(...)	4
-	-	75	100	200	250	350	DILM250(...)	5
-	-	100	125	250	300	350	DILM300(...)	5
-	-	125	150	300	400	450	DILM400(...)	5
-	-	150	200	400	500	550	DILM500(...)	6
-	-	200	200	400	600	630	DILM580(...)	6
-	-	200	250	500	600	700	DILM650(...)	6
-	-	250	300	600	700	800	DILM750(...)	6
-	-	290	350	700	860	850	DILM820(...)	6
-	-	350	400	800	1000	1000	DILM1000(...)	7
-	-	560	640	1200	1300	1600	DILM1600(...)	8

Further approvals → 5/85

- Elevator control
- Refrigeration control
- Resistance air heating
- Incandescent lamps
- Electrical discharge lamps
- Capacitive switching

**Approved rating data
UL - File No. E29184
for auxiliary contacts**



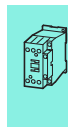
Part no.	Pilot Duty		General Use			
	AC	DC	AC V	A	DC V	A
DIL(E)EM-10(-01) DILER-40(31)(22) ...(D)DILE	A600	P300	600	10	250	0.5
DILM7-10(-01) To DILM32-10(-01) DILA...	A600	P300	600	15	250	1
DILA-XHI... DILM32-XHI...	A600	P300	600	15	250	1
DILM...-XHI11-SI DILM...-XHI11-SA DILM...-XHI11V-SI	A600	P600	600	10	-	-

Special purpose rating



	DIL	M7	M9	M12	M15	M17	M25 MP32 MP45	M32	M40 MP63	M50 MP80	M65 M72	M80 MP125	M95 MP160	M115	M150 M170 MP200
Electrical discharge lamps (ballast)															
480V 60Hz 3phase, 277V 60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	85	100	136	160
600V 60Hz 3phase, 347V 60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	85	100	136	160
Incandescent lamps (Tungsten)															
480V 60Hz 3phase, 277V 60Hz 1phase	A	8	11	14	14	23	32	40	55	74	88	85	100	136	160
600V 60Hz 3phase, 347V 60Hz 1phase	A	8	11	14	14	23	32	40	55	74	88	85	100	136	160
Resistance air heating															
480V/60Hz 3phase, 277V/60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	94	110	136	160
600V/60Hz 3phase, 347V/60Hz 1phase	A	12	18	20	20	27	35	40	63	79	88	94	110	136	160
Refrigeration control (CSA only)															
LRA 480V 60Hz 3phase	A	60	60	60	60	240	240	240	270	270	270	540	540	540	540
LRA 600V 60Hz 3phase	A	60	60	60	60	180	180	180	270	270	270	420	420	540	540
480V 60Hz 3phase	A	6	7.5	10	10	23	32	40	26	36	45	63	70	84	90
600V 60Hz 3phase	A	6	7.5	10	10	17	24	30	26	36	45	63	70	84	90
Elevator control															
200V 60Hz 3phase	HP (A)	¾ (3.7)	2 (7.8)	2 (7.8)	2 (7.8)	3 (11)	3 (11)	7½ (25.3)	7½ (25.3)	10 (32.2)	10 (32.2)	20 (62.1)	20 (62.1)	30 (92)	30 (92)
240V 60Hz 3phase	HP (A)	1½ (6.0)	2 (6.8)	2 (6.8)	3 (9.6)	3 (9.6)	5 (15.2)	7½ (22)	10 (28)	15 (42)	15 (42)	25 (68)	30 (80)	40 (104)	40 (104)
480V 60Hz 3phase	HP (A)	2 (3.4)	3 (4.8)	7½ (11)	7½ (11)	7½ (11)	10 (14)	20 (27)	25 (34)	30 (40)	30 (40)	50 (65)	60 (77)	75 (96)	75 (96)
600V 60Hz 3phase	HP (A)	3 (3.9)	5 (6.1)	7½ (9.6)	7½ (9.6)	10 (11)	15 (17)	20 (22)	30 (32)	40 (41)	40 (41)	60 (62)	75 (77)	100 (99)	100 (99)

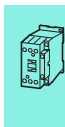
	DIL	K12	K20	K25	K33	K50
Capacitor Switching						
240V 60Hz 3phase	A	18	28	36	48	72
480V 60Hz 3phase	A	18	28	36	48	72
600V 60Hz 3phase	A	14.4	28	38.4	48	72
240V 60Hz 3phase	kvar	7.5	12	15	20	30
480V 60Hz 3phase	kvar	15	20	30	40	60
600V 60Hz 3phase	kvar	15	30	40	50	75



UL/CSA Short circuit current rating

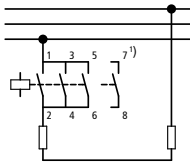
DILM**Short circuit current rating (SCCR)**

Contactor	Basic Rating			480 V High Fault				600 V High Fault			
	kA	Max. fuse A	Max. CB A	kA	Max. fuse A	kA	Max. CB A	kA	Max. fuse A	kA	Max. CB A
DILM7-...(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM9-...(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM12-...(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM15-...(…)	5	45	60	100	20 Class J	-	Fuse only	30	25	-	Fuse only
DILM17-...(…)	5	125	125	100	70 Class J	10	50	10	125	10	50
DILM25-...(…)	5	125	125	100	100 Class J	10	50	10	125	10	50
DILM32-...(…)	5	125	125	100	125 Class J	10	50	10	125	10	50
DILM38-...(…)	5	125	125	100	125 Class J	10	50	10	125	10	50
DILM40(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM50(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM65(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM72(…)	10	250	250	100	150 Class J	65	100	30	250	30	250
DILM80(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM95(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM115(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM150(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM170(…)	10	600	600	100	300 Class J	65	250	30	300	30	350
DILM185(…)	18	700	600	-	CB only	65	250	-	-	-	-
DILM225(…)	18	700	600	-	CB only	65	250	-	-	-	-
DILM250(…)	18	700	600	-	CB only	65	250	-	-	-	-
DILM300(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM400(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM500(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM570(…)	30	800	600	-	CB only	42	600	30	800	30	600
DILM580(…)	30	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM650(…)	30	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM750(…)	42	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM820(…)	42	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM1000(…)	85	2000	1200	85	2000	85	1200	85	2000	85	1200
DILM1600(…)	85	2000	-	85	2000	-	-	85	2000	85	-



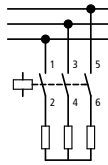
Rating data

Single-phase rating AC-1



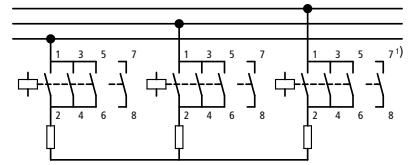
Voltage in V			Max. upstream fuse gG/gL	Rated operational current $I_e = I_{th}$ or I_{the}
220	380	660		
230	400	690		
240	440			
kW	kW	kW	A	A

Three-phase rating AC-1



Voltage in V			Max. upstream fuse gG/gL	Rated operational current $I_e = I_{th}$ or I_{the}
220	380	660		
230	400	690		
240	440			
kW	kW	kW	A	A

Three-phase rating AC-1



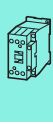
Voltage in V			Max. upstream fuse gG/gL	Rated operational current $I_e = I_{th}$ or I_{the}
220	380	660		
230	400	690		
240	440			
kW	kW	kW	A	A

Open version

10	18	31	50	50	7	13	20	20	20	18	31	54	50	50
10	18	31	50	50	7	13	20	20	20	18	31	54	50	50
12	21	37	63	60	-	-	-	-	-	21	37	65	63	60
10	18	31	-	50	7	13	22	-	20	18	31	54	-	50
13	22	38	-	60	-	-	-	-	-	22	38	65	-	60
18	32	55	-	88	13	22	38	-	35	32	55	95	-	88
21	36	63	-	100	14	25	43	-	40	36	63	109	-	100
26	45	78	-	125	18	31	54	-	50	45	78	136	-	125
34	59	102	-	163	24	41	71	-	65	59	102	176	-	163
42	72	125	-	200	29	50	87	-	80	72	125	217	-	200
47	81	141	-	225	33	56	98	-	90	81	141	244	-	225
57	99	172	-	275	40	69	119	-	110	100	172	299	-	275
68	117	204	-	325	47	81	141	-	130	118	203	353	-	325
84	144	251	-	400	58	100	174	-	160	145	250	434	-	400
101	175	317	-	460	70	120	220	-	185	175	302	549	-	460
144	248	431	800	688	100	172	299	315	275	262	453	786	-	688
165	284	494	800	788	114	197	342	315	315	300	519	900	-	788
172	297	516	1000	825	120	206	357	400	330	333	576	1000	-	875
183	316	548	1000	875	126	219	380	400	350	381	658	1143	-	1000
261	451	784	1250	1250	181	313	543	500	500	476	825	1429	-	1250
366	632	1097	-	1750	253	438	760	800	700	667	1152	2000	-	1750
418	722	1254	-	2000	290	500	869	800	800	762	1316	2286	-	2000
444	767	1332	-	2125	308	531	923	1000	850	810	1400	2429	-	2125
470	812	1411	-	2250	326	563	977	1000	900	857	1480	2572	-	2250
523	903	1568	-	2500	362	625	1086	1000	1000	953	1646	2858	-	2500
732	1264	2195	-	3500	507	875	1520	-	1400	1334	2300	4000	-	3500
1045	1805	3135	-	5000	724	1251	2172	-	2000	1905	3290	5716	-	5000
1150	1985	3449	-	5500	796	1376	2389	-	2200	2095	3619	6288	-	5500
1358	2346	4075	-	6500	941	1626	2827	-	2600	2476	4277	7430	-	6500

Notes

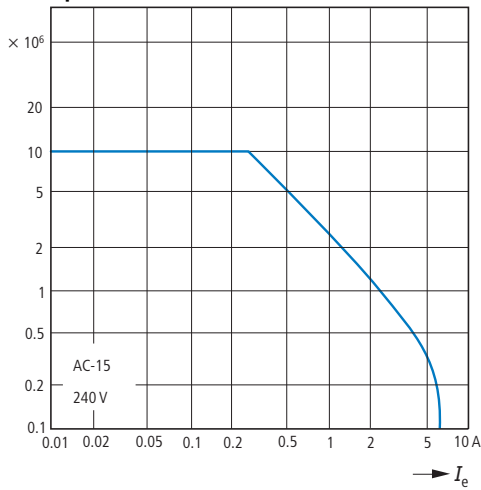
¹⁾ Contact 7 – 8 only with DILEM4(-G), DILMP20...



Part no.	Ordering data	Required accessories: Paralleling links	Notes										
AC operated	Page	Part no.											
DILEM-10(...)	→ 5/4	P1DILEM	<table border="0"> <thead> <tr> <th>Accessories</th> <th>Page</th> </tr> </thead> <tbody> <tr> <td>Auxiliary contact modules</td> <td>→ 5/6 → 5/38</td> </tr> <tr> <td>Set of paralleling links</td> <td>→ 5/57</td> </tr> <tr> <td>Enclosure</td> <td>→ 5/67</td> </tr> <tr> <td>Accessories</td> <td>→ 5/56</td> </tr> </tbody> </table>	Accessories	Page	Auxiliary contact modules	→ 5/6 → 5/38	Set of paralleling links	→ 5/57	Enclosure	→ 5/67	Accessories	→ 5/56
Accessories	Page												
Auxiliary contact modules	→ 5/6 → 5/38												
Set of paralleling links	→ 5/57												
Enclosure	→ 5/67												
Accessories	→ 5/56												
DILEM-01(...)	→ 5/4	P1DILEM											
DILEM4(...)	→ 5/4	P1DILEM											
DILM7-...(...)	→ 5/18	DILM12-XP1											
DILMP20(...)	→ 5/36	DILM12-XP1											
DILM17-...(...)	→ 5/18	DILM32-XP1											
DILM25-...(...)	→ 5/18	DILM32-XP1											
DILM40(...)	→ 5/20	DILM65-XP1											
DILM50(...)	→ 5/20	DILM65-XP1											
DILM65(...)	→ 5/20	DILM65-XP1											
DILM80(...)	→ 5/20	DILM150-XP1											
DILM95(...)	→ 5/20	DILM150-XP1											
DILM115(...)	→ 5/20	DILM150-XP1											
DILM150(...)	→ 5/20	DILM150-XP1											
DILM170(...)	→ 5/20	DILM150-KP1											
DILM185A(...)	→ 5/32	DILM185-XP1											
DILM225A(...)	→ 5/32	DILM185-XP1											
DILM250(...)	→ 5/32	–											
DILM300A(...)	→ 5/32	–											
DILM400(...)	→ 5/32	–											
DILM500(...)	→ 5/32	–											
DILM580(...)	→ 5/32	–											
DILM650(...)	→ 5/32	–											
DILM750(...)	→ 5/32	–											
DILM820(...)	→ 5/32	–											
DILH1400(...)	→ 5/34	–											
DILH2000(...)	→ 5/34	–											
DILH2200(...)	→ 5/34	–											
DILH2600(...)	→ 5/34	–											

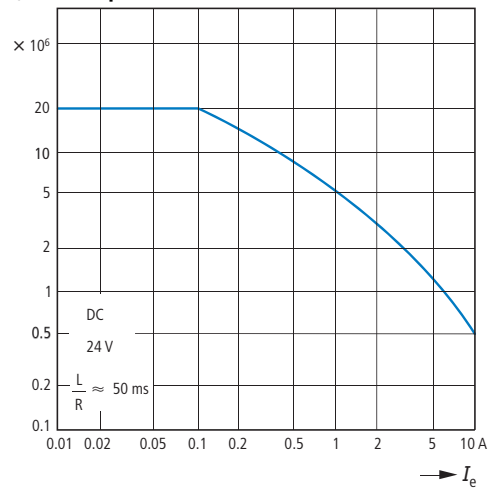
DILA (AC-15)

Component lifespan (operations)
 I_e = Rated operational current



DILA DC¹⁾

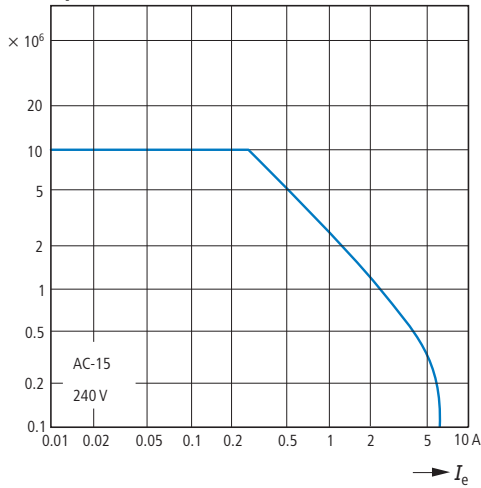
Component lifespan (operations)
 I_e = Rated operational current



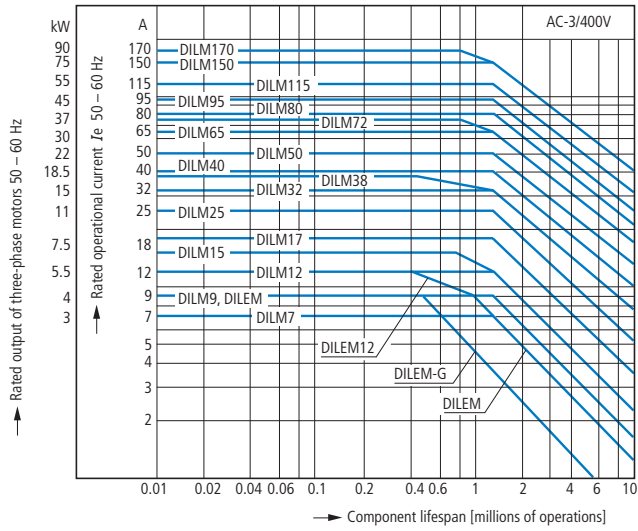
¹⁾ Three contacts in series

DILER (AC-15)

Component lifespan (operations)
 I_e = Rated operational current



Normal switching duty



Normal AC induction motor

Operating characteristics

Make: from stop

Break: during run

Electrical characteristics:

Make: up to 6 X rated motor current

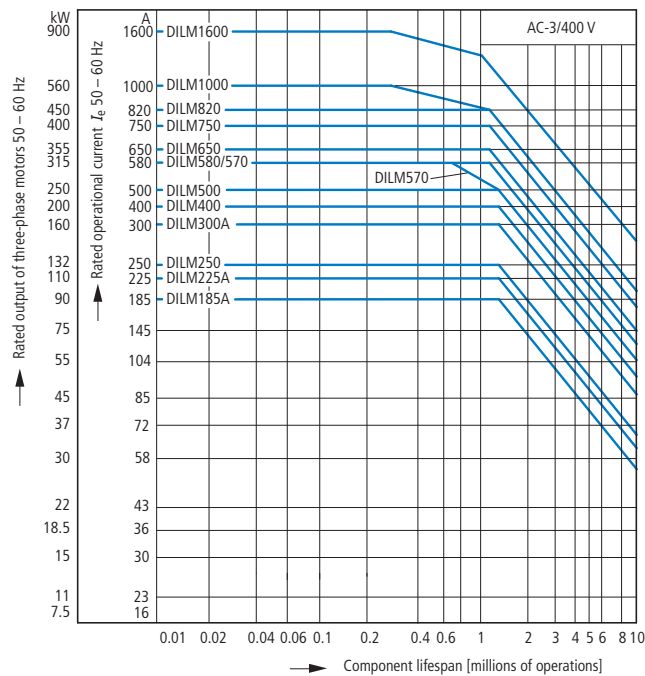
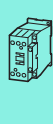
Break: 1 X rated motor current

Utilization category

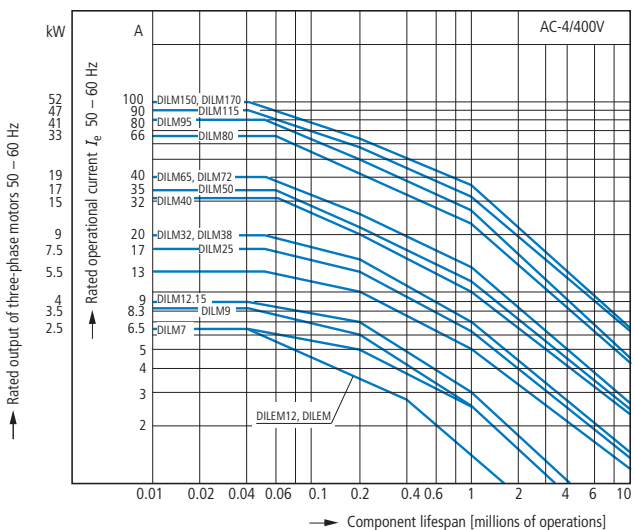
100 % AC-3

Typical applications:

- | | | |
|--|-----------------|-----------------------|
| Compressors | Lifts | Mixers |
| Pumps | Escalators | Agitators |
| Fan | Conveyor belts | Centrifuges |
| Hinged flaps | Bucket-elevator | Air conditioning sys- |
| General drives for manufacturing and processing machines | | |



Extreme switching duty



Normal AC induction motor

Operating characteristics

Inching, plugging, reversing

Electrical characteristics:

Make: up to 6 X rated motor current

Break: 6 X rated motor current

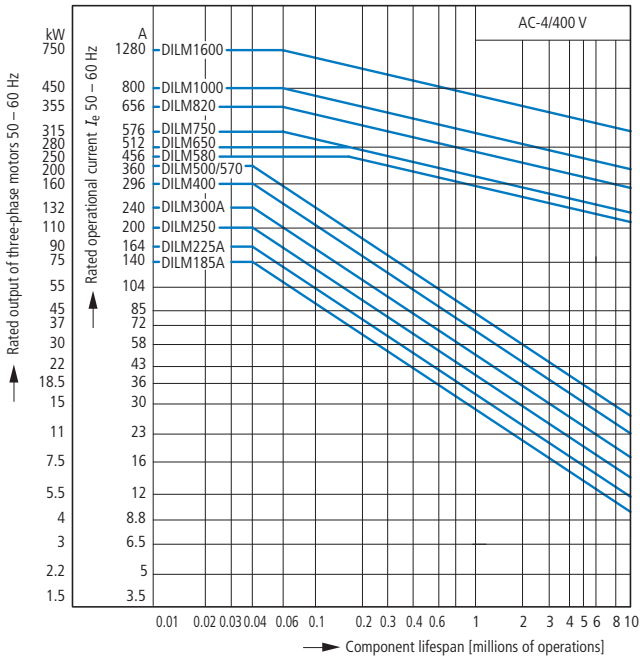
Utilization category

100 % AC-4

Typical applications:

- | | | |
|---|--------------|-------------|
| Printing machines | Wire-drawing | Centrifuges |
| Special drives on manufacturing and processing machines | | |

Extreme switching duty



Normal AC induction motor

Operating characteristics

Inching, plugging, reversing

Electrical characteristics:

Make: up to 6 X rated motor current

Break: 6 X rated motor current

Utilization category

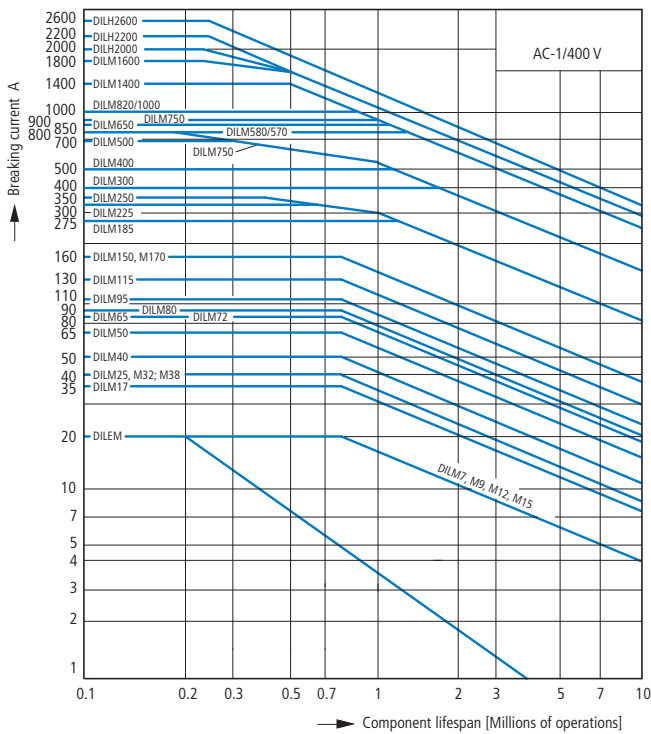
100 % AC-4

Typical applications:

Printing machines Wire-drawing machines Centrifuges

Special drives on manufacturing and processing machines

Switching conditions for 3 pole, non-motor loads



Operating characteristics

Non inductive and slightly inductive loads

Electrical characteristics:

Make: 1 X rated operational current

Break: 1 X rated operational current

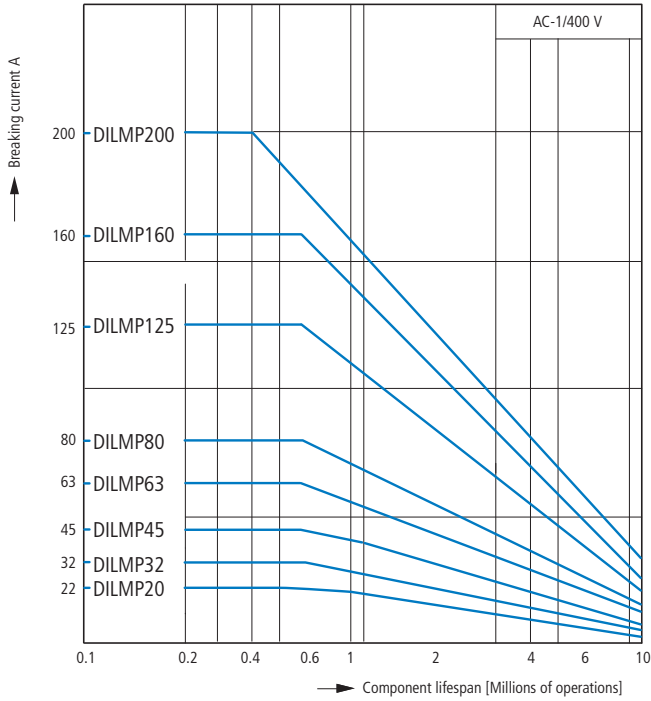
Utilization category

100 % AC-1

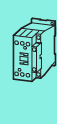
Typical applications:

Electric heat

Switching conditions for 4 pole, non-motor loads

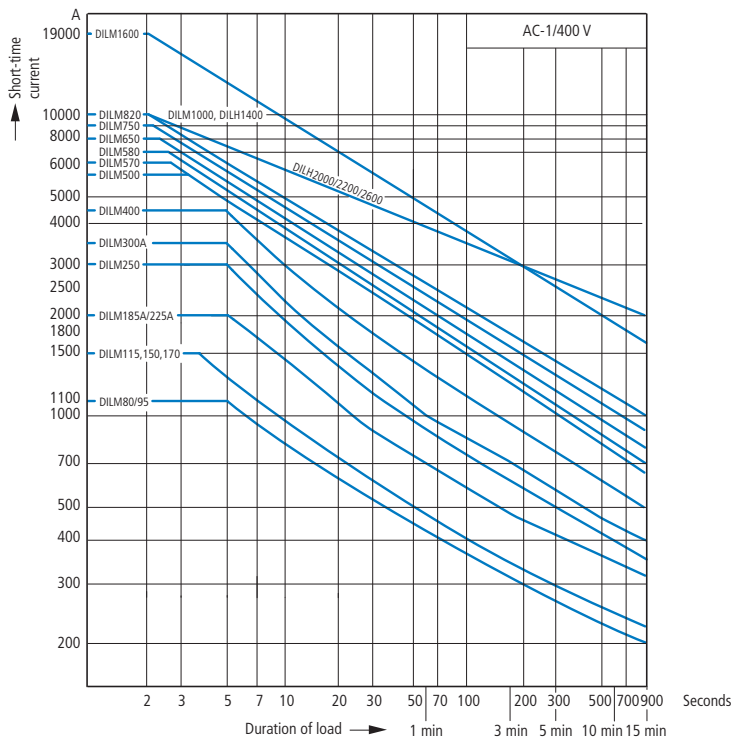
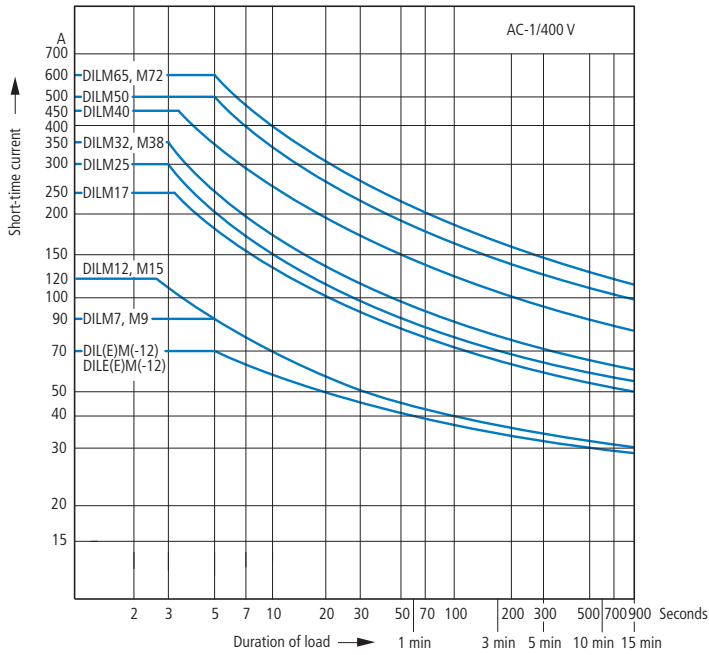


- Operating characteristics
 - Non inductive and slightly inductive loads
- Electrical characteristics:
 - Make: 1 X rated operational current
 - Break: 1 X rated operational current
- Utilization category
 - 100 % AC-1
- Typical applications:
 - Electric heat



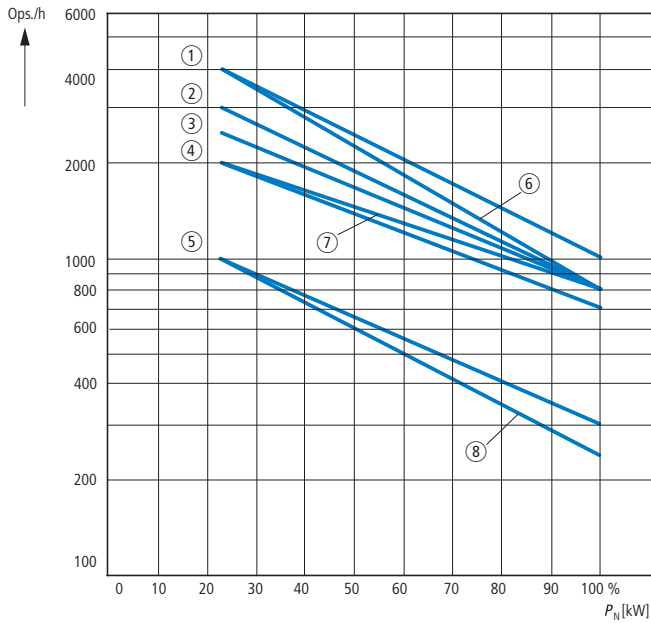
Short-time loading 3 pole

Time interval between two loads: 15 minutes

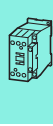


Determination of the maximum operating frequency dependent on the rating and utilization category (recommended values) for 400 V

P_N = max. rated motor output (kW) of respective contactor according to → Page 5/18 and → Page 5/4
S/h = max. operation per hour

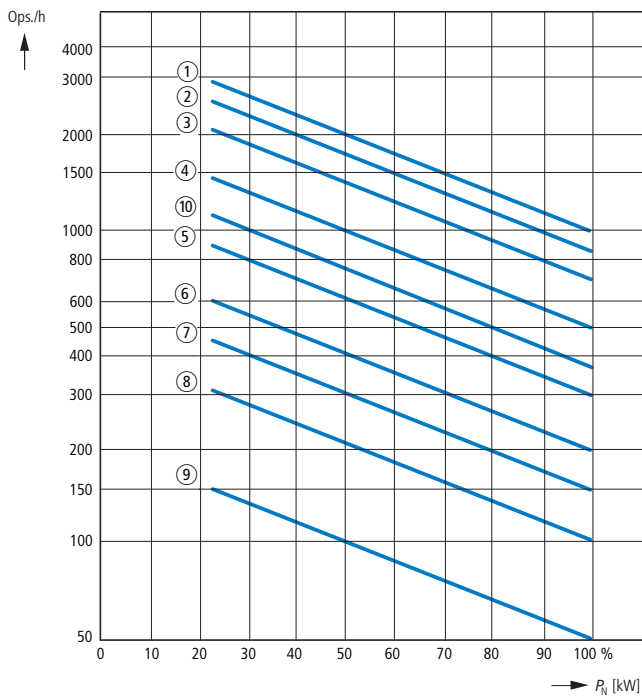


Part no.	Characteristic AC-1	AC-3	AC-2 AC-4
DILE(E)M(-12)	7	6	8
DILM7, 9, 12, 15	3	1	5
DILM17, 25, 32, 38	3	2	5
DILM40, 50, 65, 72	3	2	5
DILM80, 95, 115, 150, 170	3	4	5



Determination of the maximum operating frequency dependent on the rating and utilization category (recommended values)

P_N = max. rated motor output (kW) of respective contactor according to → Page 5/30 and → Page 5/34
S/h = max. operation per hour



Part no.	Characteristic AC-1	AC-3	AC-4
DILM185A	2	1	8
DILM225A	2	1	8
DILM250	2	1	8
DILM300A	3	2	9
DILM400	3	2	9
DILM500	3	2	9
DILM580	3	4	7
DILM650	3	4	7
DILM750	3	4	7
DILM820	3	4	7
DILM1000	3	4	7
DILM1600	10	10	7
DILH1400	10	—	—
DILH2000	10	—	—
DILH2200	10	—	—
DILH2600	10	—	—

DC current switching

----- when necessary
conductor to be
supplied by customer

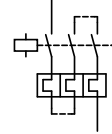
DILEEM ... DILM700

Without overload relay
≤ 60 V DC

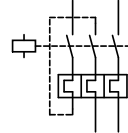
> 60 V DC

With overload relay
> 60 V DC

1 pole

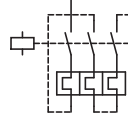
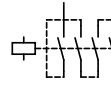


2 pole

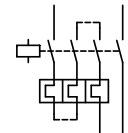


**DILEM4
DILMP...**

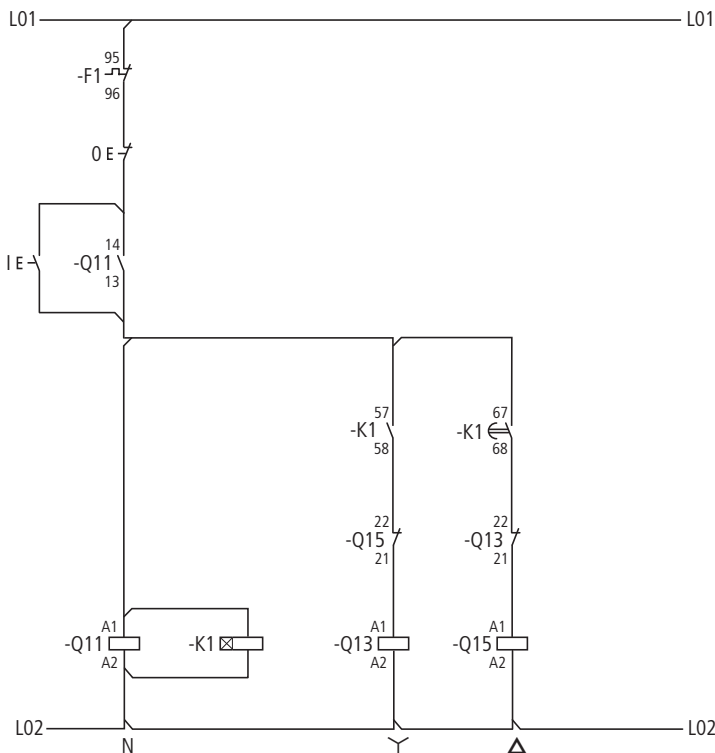
1 pole



2 pole

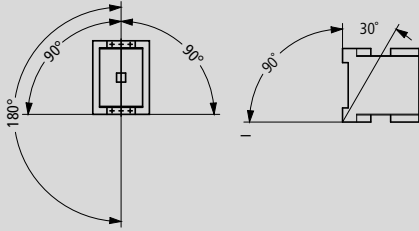


Wiring, star-delta combination with DILM32-XTEY20



DILER, DILA

Technical data

			DILA	DILA...XHI	DILER	DILE...	
General							
Standards			IEC/EN 60947, VDE 0660, UL, CSA				
Lifespan, mechanical							
AC operated	Operations	x 10 ⁶	20	10	10	10	
DC operated	Operations	x 10 ⁶	20	10	20	20	
Maximum operating frequency							
Maximum operating frequency	Operations/h		9000	9000	9000	9000	
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...50	-25...50	
Enclosed		°C	-25...40	-25...40	-25...40	-25...40	
Ambient temperature for storage		°C	-40 - 80	-40 - 80			
Mounting position						Any, except vertically with terminals A1/A2 below	
Mechanical shock resistance (IEC/EN 60068-2-27)							
Half-sinusoidal shock 10 ms							
Basic devices with auxiliary contact module							
	N/O	g	7	7	10	10	
	NC	g	5	5	8	8	
Protection type			IP20	IP20	IP20	IP20	
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof				
Weight							
AC operated		kg	0.23	0.05	0.17	–	
DC operated		kg	0.28	0.05	0.2	–	
Terminal capacity							
Screw terminals							
Solid		mm ²	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	
Flexible with ferrule		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	
Solid or stranded		AWG	18 - 14	18 - 14	18 - 14	18 - 14	
Terminal screw			M3.5	M3.5	M3.5	M3.5	
Pozidriv screwdriver		Size	2	2	2	2	
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	
Max. tightening torque		Nm	1.2	1.2	1.2	1.2	
Spring-loaded terminals							
Solid		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	
Flexible with ferrule		mm ²	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	1 x (1 - 2.5) 2 x (1 - 2.5)	
Flexible without ferrule DIN 46228		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	–	–	
Solid or stranded		AWG	18 - 14	18 - 14	1 x (16 - 14) 2 x (16 - 14)	1 x (16 - 14) 2 x (16 - 14)	
Flat-blade screwdriver		mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	



DILER, DILA

			DILA	DILA...XHI	DILER	DILE...
Contacts						
Interlocked opposing contacts to EN 60947-4-1, Annex L, including auxiliary contact module			Yes	Yes	Yes	Yes
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000
Overtoltage category/degree of pollution			III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	690	690	690	690
Rated operating voltage	U_e	V AC	690	500	600	600
Safe isolation according to EN 61140						
Between coil and auxiliary contacts		V AC	400	400	300	300
Between the auxiliary contacts		V AC	400	400	300	300
Rated operational current						
AC-15						
220/240 V	I_e	A	4	4	6	4
380/415 V	I_e	A	4	4	3	2
500 V	I_e	A	1.5	1.5	1.5	1.5
DC ¹⁾						
L/R ≤ 15 ms						
Contacts in series:						
1	24 V	A	10	10	2.5	2.5
1	60 V	A	6	6	–	–
2	60 V	A	10	10	2.5	2.5
1	110 V	A	3	3	–	–
3	110 V	A	6	6	1.5	1.5
1	220 V	A	1	1	–	–
3	220 V	A	5	5	0.5	0.5
L/R ≤ 50 ms						
Contacts in series:						
3	24 V	A	4	2.5	–	–
3	60 V	A	4	1	–	–
3	110 V	A	2	0.5	–	–
3	220 V	A	1	0.25	–	–
DC-13 (6xP)						
Contacts in series:						
3	24 V	A	2.5	2.5	–	–
3	60 V	A	1	1	–	–
3	110 V	A	0.5	0.5	–	–
3	220 V	A	0.25	0.25	–	–
Control circuit reliability (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)	Fault probability	λ	<10 ⁻⁹ , < one failure in 100 million operations			
Conventional thermal current	I_{th}	A	16	16	10	10
Short-circuit strength without welding						
Maximum overcurrent protection device						
220/240 V		PKZM 0	4	–	4	4
380/415 V		PKZM 0	4	–	4	4
Short-circuit protection rating maximum fuse ²⁾						
500 V		A gG/ gL	10	10	6	6
500 V		A fast	–	–	10	10
Current heat loss at load of I_{th}						
AC operated		W	0.3	0.3	0.2	0.2
DC operated		W	0.3	0.3	0.3	0.3

Notes

¹⁾ Switch-on and switch-off conditions based on DC-13, time constant as specified

²⁾ See characteristic curve "Fuses" for time/current characteristics (please enquire)

DILER, DILA

			DILA	DILA...XHI	DILER	DILE...
Magnet systems						
Voltage tolerance						
AC operated						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	Pick-up	x U _c	0.8...1.1	–	0.8...1.1	–
Dual-frequency coil 50/60 Hz	Pick-up	x U _c	0.8...1.1	–	0.85...1.1	–
DC operated ¹⁾						
Starting voltage	Pick-up	x U _c	0.8...1.1	–	0.85...1.3	–
At 24 V: without auxiliary contact module (40 °C)	Pick-up	x U _c	0.7 - 1.3	–	0.7 - 1.3	–
Power consumption						
50 Hz	Pick-up	VA	24	–	25	–
50 Hz	Sealing	VA	3.4	–	4.6	–
50 Hz	Sealing	W	1.2	–	1.3	–
60 Hz	Pick-up	VA	30	–	25	–
60 Hz	Sealing	VA	4.4	–	4.6	–
60 Hz	Sealing	W	1.4	–	1.3	–
50/60 Hz	Pick-up	VA	27 25	–	30 29	–
50/60 Hz	Sealing	VA	4.2 3.3	–	5.4 3.9	–
50/60 Hz	Sealing	W	1.4 1.2	–	1.6 1.1	–
DC operated	Pick-up = sealing	W	3	–	2.6	–
Duty factor		% DF	100	–	100	–
Changeover times at 100 % U _c (recommended values)						
AC operated closing delay		ms	15 - 21	–	14 - 21	–
AC operated normally open contact opening delay		ms	9 - 18	–	8 - 18	–
AC operated with auxiliary contact module, max. closing delay		ms	–	–	45	45
DC operated closing delay		ms	31	–	26 - 35	–
DC operated normally open contact opening delay		ms	12	–	15 - 25	–
DC operated with auxiliary contact module, max. closing delay		ms	–	–	70	70

Notes

¹⁾ Smoothed DC, three-phase bridge rectifier or smoothed two-phase bridge rectifier



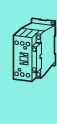
			ETS4-VS3	DILM32-XTE	CMD(24VDC) CMD(220-240VAC)
General					
Standards			IEC/EN 60947, VDE 0660, UL, CSA	DIN EN 61812, IEC/EN 60947, VDE 0660, UL, CSA	IEC/EN 60947 UL CSA
Lifespan, mechanical					
AC operated	c (contacts)	x 10 ⁶	–	3	10
DC operated	c (contacts)	x 10 ⁶	30	3	3
Maximum operating frequency					
DC operated	c (contacts)	x 10 ⁶	72000	–	9000
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30		
Ambient temperature					
Storage		°C	–	-40 - 80	-40 - 80
Open		°C	-25 - 60	-25 - 60	-25 - 50
Enclosed		°C	-25 - 45	-25 - 40	–
Mounting position			Any	As required, except suspended	Any
Mechanical shock resistance (IEC/EN 60068-2-27)					
Half-sinusoidal shock 20 ms					
N/O		g	10	–	–
Half-sinusoidal shock 10 ms					
N/O		g	–	6	4
NC		g	–	6	4
Protection type			IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof		
Weight		kg	0.09	0.08	0.1
Terminal capacity					
Solid		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5) ¹⁾	1 x (0.75 - 2.5) 2 x (0.75 - 1.5)	1 x (0.75...2.5) 2 x (0.75...1.5)
Flexible with ferrule		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 1.5) ¹⁾	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)	1 x (0.75...1.5) 2 x (0.75...1.5)
Solid or stranded		AWG	16 - 14	18 - 14	18...14
Terminal screw			M3.5	M3.5	M3.5
Pozidriv screwdriver		Size	2	2	2
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Max. tightening torque		Nm	1.2	1.2	1.2

Notes¹⁾ Use equal cross-sections only

			ETS4-VS3	DILM32-XTE	CMD(24VDC)	CMD(220-240VAC)
Contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	8000	4000
Overtoltage category/degree of pollution			III/2	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	440	600	100	250
Rated operating voltage	U_e	V	440 AC	400 AC	24 DC	250 AC
Rated operational current						
AC-15						
220/240 V	I_e	A	2	3	–	–
380/415 V	I_e	A	2	–	–	–
DC-13 ¹⁾						
DC-13 L/R ≤ 15 ms						
Contacts in series:						
1	24 V	A	2.6	1	–	–
1	60 V	A	1	0.2	–	–
1	110 V	A	0.6	0.2	–	–
1	220 V	A	0.2	0.1	–	–
DC-13 L/R ≤ 50 ms						
Contacts in series:						
1	24 V	A	2	1	–	–
1	60 V	A	0.6	0.2	–	–
1	110 V	A	0.08	0.2	–	–
1	220 V	A	0.08	0.1	–	–
DC-13 L/R ≤ 300 ms						
Contacts in series:						
1	24 V	A	0.6	1	–	–
1	60 V	A	0.2	0.2	–	–
1	110 V	A	0.08	0.2	–	–
1	220 V	A	0.03	0.1	–	–
Safe isolation according to EN 61140						
Between coil and auxiliary contacts		V AC	–	250	–	–
Between the auxiliary contacts		V AC	–	250	–	–
Control circuit reliability (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)	Fault probability	λ	<10 ⁻⁸ , < one failure in 100 million operations	–	–	–
Conventional thermal current	I_{th}	A	6	4	–	–
Component lifespan						
AC-15						
230 V, $I_e = 0.1$ A	Switch operations	x 10 ⁶	7	–	–	–
230 V, $I_e = 1.2$ A	Switch operations	x 10 ⁶	1	–	–	–
Short-circuit rating without welding						
Short-circuit protection rating maximum fuse ²⁾						
500 V		A gG/gL	–	4	2	2
500 V		A fast	4	–	–	–

Notes

- ¹⁾ Switch-on and switch-off conditions based on DC-13, time constant as specified
- ²⁾ See transparent overlay "Fuses" for time/current characteristics (please enquire)




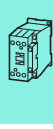
				ETS4-VS3	DILM32-XTE	CMD(24VDC) CMD(220-240VAC)
Magnet systems						
Voltage tolerance						
Starting voltage						
AC operated						
	Pick-up	$x U_c$	–	0.85 - 1.1	0.85 - 1.1	
DC operated ¹⁾						
	Pick-up	$x U_c$	0.85 - 1.2	0.7 - 1.2	0.85 - 1.1	
Power consumption						
AC operated						
	Sealing	VA	–	2	4	
AC operated						
	Sealing	W	–	1.8	4	
DC operated						
	Pick-up = sealing	W	0.6	–	4	
Duty factor						
		% DF	100	100	100	
Changeover times at 100 % U_c (recommended values)						
DC operated closing delay						
		ms	7	–	–	
DC operated opening delay						
		ms	3	–	–	
Maximum operating frequency						
Max. operating frequency						
		Ops/h	–	3600	–	
6 A/250 V						
		Ops/h	–	360	–	
Minimum on duration						
On-delayed						
		ms	–	< 50	–	
Off-delayed						
		ms	–	< 200	–	
Repetition accuracy (with constant parameters)						
	Deviation	%	–	< 5	–	
Recovery time (after 100% time delay)						
		ms	–	70	–	
Contact changeover time						
DILM32-XTEE11/DILM32-XTED11						
	t_u	ms	–	10	–	
DILM32-XTEY20						
	t_u	ms	–	50	–	
CMD						
	t_u	ms	–	–	100 ± 20%	

Notes

¹⁾ Smoothed DC, three-phase bridge rectifier or smoothed two-phase bridge rectifier

DILEEM, DILEM

			DILEEM DILEM DILEM12	DILEEM-G DILEM-G DILEM12-G	DILEM4	DILEM4-G
General						
Standards			IEC/EN 60947, VDE 0660, CSA, UL			
Lifespan, mechanical; Coil 50/60 Hz	at 50 Hz		7	–	7	–
Lifespan, mechanical	c (contacts)	x 10 ⁶	10	20	20	–
Maximum operating frequency						
Mechanical		Ops/h	9000			
Electrical (Contactor without overload relay)			→ Characteristic curves Page 5/95			
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25 - 50			
Enclosed		°C	-25 - 40			
Mounting position			Any, except for vertically with terminals A1/A2 below			
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 10 ms						
Basic device without auxiliary contact module						
Main circuit normally open contact		g	10			
Auxiliary contacts NC/Normally open contact		g	10/8	10/8	–	–
Basic devices with auxiliary contact module						
Main circuit normally open contact		g	10			
Auxiliary contacts Normally open contact/NC		g	20/20			
Protection type			IP20			
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Weight		kg	0.2	0.17	0.2	0.17
Terminal capacity: main and auxiliary contacts						
Solid		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)			
Flexible with ferrule		mm ²	1 x (0.75 - 1.5) 2 x (0.75 - 1.5)			
Solid or stranded		AWG	18 - 14			
Terminal screw			M3.5			
Pozidriv screwdriver		Size	2			
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6			
Max. tightening torque		Nm	1.2			
Terminal capacity springloaded terminals main and control circuits						
Solid		mm ²	1 x (1 - 2.5) 2 x (1 - 2.5)			
Flexible with ferrule		mm ²	1 x (1 - 2.5) 2 x (1 - 2.5)			
Flat-blade screwdriver		mm	0.6 x 3.5			

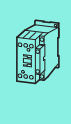


DILEEM, DILEM

				DILEEM DILEEM-G	DILEM DILEM-G	DILEM4	DILEM4-G	DILEM12 DILEM12-G	
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 operating voltage	U_e	V AC		690	690	690	690	690	
Safe isolation according to EN 61140									
	Between coil and contacts	V AC		300	300	300	300	300	
	Between the contacts	V AC		300	300	300	300	300	
Making capacity of up to 440 V (cos ϕ as specified in IEC/EN 60947)									
Breaking capacity	220/230 V	A		90	90	90	90	96	
	380/400 V	A		90	90	90	90	96	
	500 V	A		64	64	64	64	72	
	660/690 V	A		42	42	42	42	42	
Devices lifespan	AC-1			→ Engineering Page 5/92					
	AC-3			→ Engineering Page 5/91					
	AC-4			→ Engineering Page 5/91					
Short-circuit protection rating maximum fuse									
	Type "2" coordination 500 V	gL/gG	A	10	10	10	10	20	
	Type "1" coordination 500 V	gL/gG	A	20	20	20	20	35	
AC voltage									
AC-1 operation									
Conventional thermal current 3 pole 50 - 60 Hz									
Open	at 40 °C	I_{th}	A	22	22	22	22	22	
				20	20	20	20	20	
				19	19	19	19	19	
Enclosed ¹⁾	at 50 °C	I_{th}	A	19	19	19	19	19	
				16	16	16	16	16	
				16	16	16	16	16	
Enclosed ¹⁾	at 55 °C	I_{th}	A	16	16	16	16	16	
				16	16	16	16	16	
				16	16	16	16	16	
Conventional thermal current, 1-pole									
Open ¹⁾		I_{th}	A	50	50	60	60	50	
				40	40	50	50	40	
Enclosed ¹⁾		I_{th}	A	40	40	50	50	40	
				40	40	50	50	40	
AC-3 operation									
Rated operational current AC-3 open, 50 - 60 Hz, 3-pole ¹⁾	220/230 V	I_e	A	6.6	9	9	9	12	
	240 V	I_e	A	6.6	9	9	9	12	
	380/400 V	I_e	A	6.6	9	9	9	12	
	415 V	I_e	A	6.6	9	9	9	12	
	440 V	I_e	A	6.6	9	9	9	10.5	
	500 V	I_e	A	5	6.4	6.4	6.4	9	
Motor rating	660/690 V	I_e	A	3.5	4.8	4.8	4.8	5.2	
	220/230 V	P	kW	1.5	2.2	2.2	2.2	3.5	
	240 V	P	kW	1.8	2.5	2.5	2.5	3	
	380/400 V	P	kW	3	4	4	4	5.5	
	415 V	P	kW	3.1	4.3	4.3	4.3	5.5	
	440 V	P	kW	3.3	4.6	4.6	4.6	5.5	
500 V	500 V	P	kW	3	4	4	4	5.5	
	660/690 V	P	kW	3	4	4	4	4	
	AC-4 operation								
	Rated operational current AC-4 open, 50 - 60 Hz, 3-pole ¹⁾	220/230 V	I_e	A	5	6.6	6.6	6.6	6.6
		240 V	I_e	A	5	6.6	6.6	6.6	6.6
		380/400 V	I_e	A	5	6.6	6.6	6.6	6.6
415 V		I_e	A	5	6.6	6.6	6.6	6.6	
440 V		I_e	A	5	6.6	6.6	6.6	6.6	
500 V		I_e	A	3.7	5	5	5	5	
660/690 V	660/690 V	I_e	A	2.9	3.4	3.4	3.4	3.4	
	220/230 V	P	kW	1.1	1.5	1.5	1.5	1.5	
	240 V	P	kW	1.3	1.8	1.8	1.8	1.8	
	380/400 V	P	kW	2.2	3	3	3	3	
	415 V	P	kW	2.3	3.1	3.1	3.1	3.1	
	440 V	P	kW	2.4	3.3	3.3	3.3	3.3	
500 V	500 V	P	kW	2.2	3	3	3	2.2	
	660/690 V	P	kW	2.2	3	3	3	2.2	

Notes

¹⁾ At maximum permissible ambient air temperature

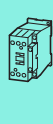


DILEEM, DILEM

				DILEEM	DILEEM-G	DILEM	DILEM-G	DILEM4	DILEM4-G	DILEM12	DILEM12-G
DC voltage											
Operations				→ Engineering Page 5/96							
Rated operational current open											
DC-1	12 V	I_e	A	20	20	20	20	20	20	20	20
	24 V	I_e	A	20	20	20	20	20	20	20	20
	60 V	I_e	A	20	20	20	20	20	20	20	20
	110 V	I_e	A	20	20	20	20	20	20	20	20
	220 V	I_e	A	20	20	20	20	20	20	20	20
DC-3	12 V	I_e	A	6	6	8	8	8	8	8	8
	24 V	I_e	A	6	6	8	8	8	8	6	8
	60 V	I_e	A	3	3	4	4	4	4	4	4
	110 V	I_e	A	2	2	3	3	3	3	3	3
	220 V	I_e	A	–	–	–	–	1	1	–	–
DC-5	12 V	I_e	A	1.8	1.8	2.5	2.5	2.5	2.5	2.5	2.5
	24 V	I_e	A	1.8	1.8	2.5	2.5	2.5	2.5	2.5	2.5
	60 V	I_e	A	1.8	1.8	2.5	2.5	2.5	2.5	2.5	2.5
	110 V	I_e	A	1.8	1.8	1.5	1.5	2.5	2.5	1.5	1.5
	220 V	I_e	A	0.2	0.2	0.3	0.3	1	1	0.3	0.3
Current heat loss (3-pole or 4-pole)											
At I_{th}			W	2	3.5	2	3.5	2.7	4.7	2	3.5
At I_e to AC-3/400 V			W	0.5	0.7	0.5	0.7	–	–	0.5	0.7
Magnet systems											
Voltage tolerance											
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz			Pick-up $x U_c$	0.8 - 1.1	–	0.8 - 1.1	–	0.8 - 1.1	–	0.8 - 1.1	–
Dual-frequency coil 50/60 Hz			Pick-up $x U_c$	0.8 - 1.1	–	0.85 - 1.1	–	0.85 - 1.1	–	0.8 - 1.1	–
DC operated			Pick-up $x U_c$	–	0.8 - 1.1	–	0.8 - 1.1	–	0.85 - 1.1	–	0.8 - 1.1
Power consumption											
AC operation	Single-voltage coil, 50 Hz, and dual-voltage coil, 50 Hz, 60 Hz	Pick-up	VA	25	–	25	–	25	–	25	–
		Pick-up	W	22	–	22	–	22	–	22	–
		Sealing	VA	4.6	–	4.6	–	4.6	–	4.6	–
		Sealing	W	1.3	–	1.3	–	1.3	–	1.3	–
	Dual-frequency coil 50/60 Hz at 50 Hz	Pick-up	VA	30	–	30	–	30	–	30	–
		Pick-up	W	26	–	26	–	26	–	26	–
		Sealing	VA	5.4	–	5.4	–	5.4	–	5.4	–
		Sealing	W	1.6	–	1.6	–	1.6	–	1.6	–
	Dual-frequency coil 50/60 Hz at 60 Hz	Pick-up	VA	29	–	29	–	29	–	29	–
		Pick-up	W	24	–	24	–	24	–	24	–
		Sealing	VA	3.9	–	3.9	–	3.9	–	3.9	–
		Sealing	W	1.1	–	1.1	–	1.1	–	1.1	–
	Single-voltage coil, 50 Hz, and dual-voltage coil, 50 Hz, 60 Hz	Pick-up	VA	25	–	25	–	25	–	25	–
		Dual-frequency coil 50/60 Hz at 50 Hz	Pick-up	VA	30	–	30	–	30	–	30
Dual-frequency coil 50/60 Hz at 60 Hz		Pick-up	VA	29	–	29	–	29	–	29	–
DC operation ¹⁾	Power consumption pick-up = sealing	VA/W	–	2.6	–	2.6	–	2.6	–	2.6	
Duty factor			% DF	100	100	100	100	100	100	100	100
Switching times at 100 % U_c											
N/O	Closing delay min.	ms	14	26	14	26	14	26	14	26	26
	Closing delay max.	ms	21	35	21	35	21	35	21	35	35
	Opening delay min.	ms	8	15	8	15	8	15	8	15	15
	Opening delay max.	ms	18	25	18	25	18	25	18	25	25
	Closing delay with top mounting auxiliary contact	ms	Max. 45	Max. 70	Max. 45	Max. 70	Max. 45	Max. 70	Max. 45	Max. 70	Max. 70
Reversing contactors	Changeover time at 110 % U_c										
	Changeover time min.	ms	16	40	16	40	16	40	16	40	40
	Changeover time max.	ms	21	50	21	50	21	50	21	50	50
Arcing time at 690 V AC			ms	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12	Max. 12
Coil	Lifespan, mechanical; Coil 50/60 Hz	c (contacts) $x 10^6$	7	–	7	–	7	–	7	–	–

Notes

¹⁾ Smoothed DC or three-phase bridge rectifier

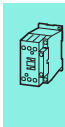


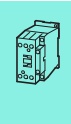
DILEEM, DILEM

				DILE(E)M(-12)...	...DILEM
Auxiliary contact					
Interlocked opposing contacts to EN 60947-5-1 Annex L, including auxiliary contact module				Yes	Yes
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	
Overvoltage category/pollution degree			III/3	III/3	
Rated insulation voltage	U_i	V AC	690	690	
Rated operating voltage	U_e	V AC	600	600	
Safe isolation according to EN 61140					
Between coil and auxiliary contacts		V AC	300	300	
Between the auxiliary contacts		V AC	300	300	
Rated operational current					
AC-15					
	220/240 V	I_e	A	6	4
	380/415 V	I_e	A	3	2
	500 V	I_e	A	1.5	1.5
DC					
L/R ≤ 15 ms					
Contacts in series:					
	1	24 V	A	2.5	2.5
	2	60 V	A	2.5	2.5
	3	100 V	A	1.5	1.5
	3	220 V	A	0.5	0.5
Conventional thermal current				I_{th}	A
Control circuit reliability (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)				Fault probability	λ
				<10 ⁻⁸ , < one failure in 100 million operations	
Component lifespan at $U_e = 240$ V					
AC-15		c (contacts)	x 10 ⁶	0.2	0.2
DC ¹⁾					
L/R = 50 ms: 2 contacts in series at $I_e = 0.5$ A		c (contacts)	x 10 ⁶	0.15	0.15
Short-circuit rating without welding					
Maximum overcurrent protective device				PKZM0-4	PKZM0-4
Short-circuit protection rating maximum fuse					
500 V			A gG/gL	6	6
500 V			A fast	10	10
Current heat loss at load of I_{th}					
Per contact			W	0.2	0.2

Notes

¹⁾ Switch-on and switch-off conditions based on DC-13, time constant as specified

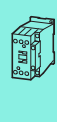




				DILM7	DILM9	DILM12	DILM15	DILM17	DILM25
General									
Standards				IEC/EN 60947, VDE 0660, UL, CSA					
Lifespan, mechanical									
AC operated		c (contacts)	x 10 ⁶	10	10	10	10	10	10
DC operated		c (contacts)	x 10 ⁶	10	10	10	10	10	10
Operating frequency, mechanical									
Mechanical, AC operated		Operations/h		9000	9000	9000	5000	5000	5000
DC operated		Operations/h		9000	9000	9000	5000	5000	5000
Maximum operating frequency									
Electrical (Contactor without overload relay)				→ Characteristic curves Page 5/78					
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	-25...60	-25...60
Enclosed			°C	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40
Storage			°C	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
Mounting position AC- and DC operated									
Mechanical shock resistance (IEC/EN 60068-2-27)									
Half-sinusoidal shock 10 ms									
Main contacts									
		N/O	g	10	10	10	10	10	10
Auxiliary contacts									
		N/O	g	7	7	7	7	7	7
		NC	g	5	5	5	5	5	5
Mechanical shock resistance (IEC/EN 60068-2-27) with table mounting									
Half-sinusoidal shock 10 ms									
Main contacts									
		N/O	g	5.7	5.7	5.7	5.7	6.9	6.9
Auxiliary contacts									
		N/O	g	3.4	3.4	3.4	3.4	5.3	5.3
		NC	g	3.4	3.4	3.4	3.4	3.5	3.5
Protection type				IP20	IP20	IP20	IP20	IP00	IP00
Protection against direct contact when actuated from front (EN 50274)				Finger- and back-of-hand proof					
Weight									
AC operated			kg	0.23	0.23	0.23	0.23	0.42	0.42
DC operated			kg	0.28	0.28	0.28	0.28	0.48	0.48
Terminal type, screw connection									
Terminal capacity of main cable									
Solid			mm ²	1 x (0.75 - 4) 2 x (0.75 - 2.5)				1 x (0.75 - 16) 2 x (0.75 - 10)	
Flexible with ferrule			mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5) ¹⁾				1 x (0.75 - 16) 2 x (0.75 - 10)	
Stranded			mm ²	-	-	-	-	1 x 16	1 x 16
Solid or stranded			AWG	18 - 10	18 - 10	18 - 10	18 - 10	18 - 6	18 - 6
Flat conductor		Number of layers x width x thickness	mm	-	-	-	-	-	-
Terminal capacity of control circuit cable									
Solid			mm ²	1 x (0.75 - 4) 2 x (0.75 - 2.5)				1 x (0.75 - 4) 2 x (0.75 - 4)	
Flexible with ferrule			mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded			AWG	18 - 10	18 - 10	18 - 10	18 - 10	18 - 14	18 - 14

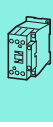
Notes

¹⁾ Also without ferrule.



DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
IEC/EN 60947, VDE 0660, UL, CSA										
10	10	10	10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10	10	10	10
5000	5000	5000	5000	5000	5000	3600	3600	3600	3600	3000
5000	5000	5000	5000	5000	5000	3600	3600	3600	3600	3000
→ Characteristic curves Page 5/78										
Damp heat, constant, to IEC 60068-2-78										
Damp heat, cyclic, to IEC 60068-2-30										
-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60
-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40
-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
10	10	10	10	10	10	10	10	10	10	10
7	7	7	7	7	7	7	7	7	7	7
5	5	5	5	5	5	5	5	5	5	5
6.9	6.9	10	10	10	10	10	10	10	10	10
5.3	5.3	7	7	7	7	7	7	7	7	7
3.5	3.5	5	5	5	5	5	5	5	5	5
IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00
Finger- and back-of-hand proof										
0.42	0.42	0.9	0.9	0.9	0.9	2	2	2	2	2
0.48	0.48	1.1	1.1	1.1	1.1	2.1	2.1	2.1	2.1	2.1
1 x (0.75 - 16) 2 x (0.75 - 10)		1 x (0.75 - 16) 2 x (0.75 - 16)		-		-		-		-
1 x (0.75 - 16) 2 x (0.75 - 10)		1 x (0.75 - 35) 2 x (0.75 - 25)		1 x (10 - 95) 2 x (10 - 70)		-		-		-
1 x 16	1 x 16	1 x (16 - 50) 2 x (16 - 35)		1 x (16 - 95) 2 x (16 - 70)		-		-		-
18 - 6	18 - 6	12 - 2	12 - 2	12 - 2	12 - 2	8...3/0	8...3/0	8...3/0	8...3/0	8...3/0
-	-	2 x (6 x 9 x 0.8)		2 x (6 x 16 x 0.8)		-		-		-
1 x (0.75 - 4) 2 x (0.75 - 4)										
1 x (0.75 - 2.5) 2 x (0.75 - 2.5)										
18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14

				DILM7	DILM9	DILM12	DILM15	DILM17	DILM25
General									
Main cable connection screw/bolt				M3.5	M3.5	M3.5	M3.5	M5	M5
Tightening torque		Nm		1.2	1.2	1.2	1.2	3.2	3.2
Control circuit cable connection screw/bolt				M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm		1.2	1.2	1.2	1.2	1.2	1.2
Tools									
Main conductors									
Pozidriv screwdriver		Size		2	2	2	2	2	2
Internal hexagon	SW	mm		–	–	–	–	–	–
Flat-blade screwdriver		mm		0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Auxiliary conductors									
Pozidriv screwdriver		Size		2	2	2	2	2	2
Flat-blade screwdriver		mm		0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Terminal type spring-cage terminal									
Terminal capacity of main cable									
Solid		mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–
Flexible		mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–
Flexible with ferrule		mm ²		1 x (0.75 - 1.5) 2 x (0.75 - 1.5)				–	–
Flexible without ferrule		mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–
Solid or stranded		AWG		18 - 14	18 - 14	18 - 14	18 - 14	–	–
Terminal capacity of control circuit cable									
Solid		mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–
Flexible		mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–
Flexible with ferrule		mm ²		1 x (0.75 - 1.5) 2 x (0.75 - 1.5)				–	–
Flexible without ferrule		mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)				–	–
Solid or stranded		AWG		18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14
Tools									
Strip length		mm		10	10	10	10	10	10
Screwdriver blade width		mm		3.5	3.5	3.5	3.5	3.5	3.5
Main contacts									
Rated impulse withstand voltage	U_{imp}	V AC		8000	8000	8000	8000	8000	8000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC		690	690	690	690	690	690
Rated operating voltage	U_e	V AC		690	690	690	690	690	690
Safe isolation according to EN 61140									
Between coil and contacts		V AC		400	400	400	400	440	440
Between the contacts		V AC		400	400	400	400	440	440
Making capacity (cos ϕ to IEC/EN 60947)	To 690 V	A		112	112	144	155	238	350
Breaking capacity									
230 V		A		70	90	120	124	170	250
380/400 V		A		70	90	120	124	170	250
500 V		A		50	70	100	100	170	250
660/690 V		A		40	50	70	70	120	150
Short-circuit rating									
Short-circuit protection rating maximum fuse									
Type "2" coordination									
400 V	gG/gL 500 V	A		20	20	20	20	35	35
690 V	gG/gL 690 V	A		16	16	20	20	35	35
Type "1" coordination									
400 V	gG/gL 500 V	A		35	35	35	63	63	100
690 V	gG/gL 690 V	A		20	20	25	50	50	50

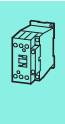


DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
M5	M5	M6	M6	M6	M6	M10	M10	M10	M10	M10
3.2	3.2	3.3	3.3	3.3	3.3	14	14	14	14	14
M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
2	2	2	2	2	2	–	–	–	–	–
–	–	–	–	–	–	5	5	5	5	5
0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	–	–	–	–	–
2	2	2	2	2	2	2	2	2	2	2
0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–
1 x (0.75 - 2.5) 2 x (0.75 - 2.5)										
1 x (0.75 - 2.5) 2 x (0.75 - 2.5)										
1 x (0.75 - 1.5) 2 x (0.75 - 1.5)										
–	–	–	–	–	–	–	–	–	–	–
18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14	18 - 14
10	10	10	10	10	10	10	10	10	10	10
3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
690	690	690	690	690	690	690	690	690	690	690
690	690	690	690	690	690	690	690	690	690	690
440	440	440	440	440	440	690	690	690	690	690
440	440	440	440	440	440	690	690	690	690	690
384	384	560	700	910	910	1120	1330	1610	2100	2100
320	320	400	500	650	650	800	950	1150	1500	1500
320	320	400	500	650	650	800	950	1150	1500	1500
320	320	400	500	650	650	800	950	1150	1500	1500
180	180	250	320	370	370	650	800	1100	1200	1320
63	63	63	80	125	125	160	160	250	250	250
35	35	50	63	80	80	160	160	250	250	250
125	125	125	160	250	250	250	250	250	250	250
63	63	80	80	100	100	200	200	250	250	250

					DILM7	DILM9	DILM12	DILM15	DILM17	DILM25	
AC voltage											
AC-1 operation											
Conventional free air thermal current 3 pole 50 - 60 Hz	Open	at 40 °C	I_{th}	A	22	22	22	22	40	45	
		at 50 °C	I_{th}	A	21	21	21	21	38	43	
		at 55 °C	I_{th}	A	21	21	21	21	37	42	
		at 60 °C	I_{th}	A	20	20	20	20	35	40	
	Enclosed			I_{th}	A	18	18	18	18	32	36
		Open		I_{th}	A	50	50	50	50	88	100
			Enclosed		I_{th}	A	45	45	45	45	80
		AC-3 operation									
Rated operational current AC -3 open, 50 - 60 Hz, 3 pole	220/230 V		I_e	A	7	9	12	15.5	18	25	
	240 V		I_e	A	7	9	12	15.5	18	25	
	380/400 V		I_e	A	7	9	12	15.5	18	25	
	415 V		I_e	A	7	9	12	15.5	18	25	
	440 V		I_e	A	7	9	12	15.5	18	25	
	500 V		I_e	A	5	7	10	12.5	18	25	
	660/690 V		I_e	A	4	5	7	9	12	15	
Rated operational power	220/230 V	P	kW	2.2	2.5	3.5	4	5	7.5		
	240 V	P	kW	2.2	3	4	4.6	5.5	8.5		
	380/400 V	P	kW	3	4	5.5	7.5	7.5	11		
	415 V	P	kW	4	5.5	7	8	10	14.5		
	440 V	P	kW	4.5	5.5	7.5	8.4	10.5	15.5		
	500 V	P	kW	3.5	4.5	7	7.5	12	17.5		
	660/690 V	P	kW	3.5	4.5	6.5	7	11	14		
AC-4 operation											
Rated operational current AC-4 open, 50 - 60 Hz, 3 pole	220/230 V		I_e	A	5	6	7	7	10	13	
	240 V		I_e	A	5	6	7	7	10	13	
	380/400 V		I_e	A	5	6	7	7	10	13	
	415 V		I_e	A	5	6	7	7	10	13	
	440 V		I_e	A	5	6	7	7	10	13	
	500 V		I_e	A	4.5	5	6	6	10	13	
	660/690 V		I_e	A	4	4.5	5	5	8	10	
Rated operational power	220/230 V	P	kW	1	1.5	2	2	2.5	3.5		
	240 V	P	kW	1.5	1.6	2.2	2.2	3	4		
	380/400 V	P	kW	2.2	2.5	3	3	4.5	6		
	415 V	P	kW	2.3	2.8	3.4	3.4	5	6.5		
	440 V	P	kW	2.4	3	3.6	3.6	5.5	7		
	500 V	P	kW	2.5	2.8	3.5	3.5	6	8		
	660/690 V	P	kW	2.9	3.6	4.4	4.4	6.5	8.5		
DC voltage											
Operations					→ Switching of DC current Page 5/96						
Rated operational current I_e open											
DC-1 operation	60 V		I_e	A	20	20	20	20	35	40	
	110 V		I_e	A	20	20	20	20	35	40	
	220 V		I_e	A	15	15	15	15	35	40	
	440 V		I_e	A	1	1.3	1.3	1.3	2.9	2.9	
DC-3 operation	60 V		I_e	A	20	20	20	20	35	35	
	110 V		I_e	A	20	20	20	20	35	35	
	220 V		I_e	A	1.5	1.5	1.5	1.5	10	10	
	440 V		I_e	A	0.2	0.2	0.2	0.2	0.6	0.6	
DC-5 operation	60 V		I_e	A	20	20	20	20	35	35	
	110 V		I_e	A	20	20	20	20	35	35	
	220 V		I_e	A	1.5	1.5	1.5	1.5	10	10	
	440 V		I_e	A	0.2	0.2	0.2	0.2	0.6	0.6	

DILM7 ... DILM170

DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
45	45	60	80	98	98	110	130	160	190	225
43	43	57	71	88	88	98	125	142	180	200
42	42	55	68	83	83	94	115	135	170	190
40	40	50	65	80	80	90	110	130	160	185
36	36	45	58	72	72	80	100	115	144	166
100	100	125	162	200	200	225	275	325	400	460
90	90	112	145	180	180	200	250	285	360	415
32	38	40	50	65	72	80	95	115	150	170
32	38	40	50	65	72	80	95	115	150	170
32	38	40	50	65	72	80	95	115	150	170
32	38	40	50	65	72	80	95	115	150	170
32	38	40	50	65	72	80	95	115	150	170
18	22.5	25	32	37	37	65	80	93	100	150
10	11	12.5	15.5	20	22	25	30	37	48	52
11	12	13.5	17	22	25	27.5	32	40	52	57
15	18.5	18.5	22	30	37	37	45	55	75	90
19	20	24	30	39	41	48	57	70	91	100
20	21	25	32	41	44	51	60	75	95	105
23	24	28	36	47	50	58	70	85	110	120
17	21	23	30	35	35	63	75	90	96	140
15	15	18	21	25	25	40	50	55	65	65
15	15	18	21	25	25	40	50	55	65	65
15	15	18	21	25	25	40	50	55	65	65
15	15	18	21	25	25	40	50	55	65	65
15	15	18	21	25	25	40	50	55	65	65
12	12	14	17	20	20	27	37	45	50	50
4	4	5	6	7	7	12	16	17	20	20
4.5	4.5	5.5	6.5	7.5	7.5	13	17	19	22	22
7	7	9	10	12	12	20	26	28	33	33
7.5	7.5	9.5	11	13	13	24	30	33	39	39
8	8	10	12	14	14	25	32	35	41	41
9	9	11	13	16	16	29	36	40	47	47
10	10	12	14	17	17	26	35	43	48	48
40	40	50	60	72	72	110	110	160	160	160
40	40	50	50	72	72	110	110	160	160	160
40	40	45	45	65	65	70	70	90	90	90
2.9	2.9	2.9	2.9	2.9	2.9	4.5	4.5	4.5	4.5	4.5
40	40	50	60	72	72	110	110	160	160	160
40	40	50	50	72	72	110	110	160	160	160
25	25	25	25	35	35	35	35	40	40	40
0.6	0.6	0.6	0.6	0.6	0.6	1	1	1	1	1
40	40	50	60	72	72	110	110	160	160	160
40	40	50	50	72	72	110	110	160	160	160
10	10	25	25	35	35	35	35	40	40	40
0.6	0.6	0.6	0.6	0.6	0.6	1	1	1	1	1



			DILM7	DILM9	DILM12	DILM15	DILM17	DILM25
Current heat loss (3 pole)								
Current heat loss at I_{th}		W	3	3	3	3	7.3	9.6
Current heat loss at I_e to AC-3/400 V		W	0.37	0.6	1.1	1.8	1.9	3.8
Impedance per pole		mΩ	2.5	2.5	2.5	2.5	2	2
Magnet systems								
Voltage tolerance								
AC operated	Pick-up	$x U_c$	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1
AC operated	Drop-out	$x U_c$	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6
DC operated ³⁾	Pick-up	$x U_c$	0.8 - 1.1	0.8 - 1.1 ¹⁾	0.8 - 1.1 ¹⁾	0.8 - 1.1 ¹⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾
DC operated ³⁾	Drop-out	$x U_c$	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6
Power consumption of the coil in a cold state and $1.0 \times U_c$								
50 Hz	Pick-up	VA	24	24	24	24	52	52
50 Hz	Sealing	VA	3.4	3.4	3.4	3.4	7.1	7.1
50 Hz	Sealing	W	1.2	1.2	1.2	1.2	2.1	2.1
60 Hz	Pick-up	VA	30	30	30	30	67	67
60 Hz	Sealing	VA	4.4	4.4	4.4	4.4	8.7	8.7
60 Hz	Sealing	W	1.4	1.4	1.4	1.4	2.6	2.6
50/60 Hz	Pick-up	VA	27 25	27 25	27 25	27 25	62 58	62 58
50/60 Hz	Sealing	VA	4.2 3.3	4.2 3.3	4.2 3.3	4.2 3.3	9.1 6.5	9.1 6.5
50/60 Hz	Sealing	W	1.4 1.2	1.4 1.2	1.4 1.2	1.4 1.2	2.5 2	2.5 2
DC operated	Pick-up	W	3	3	4.5	4.5	12	12
DC operated	Sealing	W	3	3	4.5	4.5	0.5	0.5
Duty factor		% DF	100	100	100	100	100	100
Changeover times at 100 % U_c (recommended values)								
Main contacts								
AC operated	Closing delay	ms	15...21	15...21	15...21	15...21	16...22	16...22
	Opening delay	ms	9...18	9...18	9...18	9...18	8...14	8...14
DC operated	Closing delay	ms	31	31	31	31	47	47
	Opening delay	ms	12	12	12	12	30	30
Arcing time			ms	10	10	10	10	10
Permissible residual current when A1 - A2 are actuated from the electronic system (with 0 signal)			mA	-	-	-	-	-
Lifespan, mechanical; Coil 50/60 Hz			At 50 Hz	Mechanical lifespan at 50 Hz approx. 30% lower than under → Technical data general				
Electromagnetic compatibility (EMC)								
Emitted interference				To EN 60947-1				
Interference immunity				To EN 60947-1				

Notes

¹⁾ At 24 V DC: 0.7 – 1.3 without auxiliary contact module and at ambient temperature + 40 °C

²⁾ RDC 24 (U_{min} 24 V DC/ U_{max} 27 V DC)

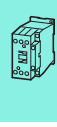
RDC 60 (U_{min} 48 V DC/ U_{max} 60 V DC)

RDC 130 (U_{min} 110 V DC/ U_{max} 130 V DC)

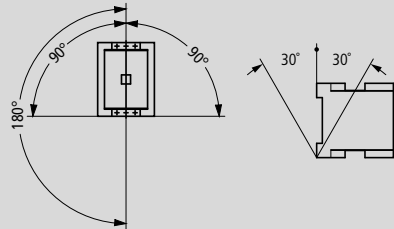
RDC 240 (U_{min} 200 V DC/ U_{max} 240 V DC)

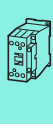
Example: $U_c = 0.7 \times U_{min} - 1.2 \times U_{max}$ / $U_c = 0.7 \times 24 \text{ V} - 1.2 \times 27 \text{ V DC}$

³⁾ At least: smoothed two-phase bridge rectifier or three-phase rectifier



DILM32	DILM38	DILM40	DILM50	DILM65	DILM72	DILM80	DILM95	DILM115	DILM150	DILM170
12.1	12.1	11.3	19	28.8	28.8	12.2	18.2	20.3	30.7	41.1
6.1	6.1	7.2	11.3	19	23	9.6	13.5	15.9	27	34.7
2	2	1.5	1.5	1.5	1.5	0.5	0.5	0.4	0.4	0.4
0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15
0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.25 - 0.6	0.25 - 0.6	0.25 - 0.6
0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾	0.7 - 1.2 ²⁾
0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6	0.15 - 0.6
52	52	149	149	149	149	310	310	180	180	180
7.1	7.1	16	16	16	16	26	26	3.1	3.1	3.1
2.1	2.1	4.3	4.3	4.3	4.3	5.8	5.8	2.1	2.1	2.1
67	67	178	178	178	178	345	345	170	170	170
8.7	8.7	19	19	19	19	30	30	3.1	3.1	3.1
2.6	2.6	5.3	5.3	5.3	5.3	7.1	7.1	2.1	2.1	2.1
62	62	168	168	168	168	372	372	170	170	170
58	58	154	154	154	154	328	328	170	170	170
9.1	9.1	22	22	22	22	37.1	37.1	3.1	3.1	3.1
6.5	6.5	14	14	14	14	22.6	22.6	3.1	3.1	3.1
2.5	2.5	5.3	5.3	5.3	5.3	7.5	7.5	2.1	2.1	2.1
2	2	4.3	4.3	4.3	4.3	6.1	6.1	2.1	2.1	2.1
12	12	24	24	24	24	90	90	149	149	149
0.5	0.5	0.5	0.5	0.5	0.5	1.3	1.3	2.1	2.1	2.1
100	100	100	100	100	100	100	100	100	100	100
16...22	16...22	12...18	12...18	12...18	12...18	14...20	14...20	28...33	28...33	28...33
8...14	8...14	8...13	8...13	8...13	8...13	9...14	9...14	35...41	35...41	35...41
47	47	54	54	54	54	45	45	35	35	35
30	30	24	24	24	24	34	34	30	30	30
10	10	10	10	10	10	15	15	15	15	15
—	—	—	—	—	—	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Mechanical lifespan at 50 Hz approx. 30% lower than under → Technical data general										
To EN 60947-1										
To EN 60947-1										

			Contactors						
			DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570
General									
Standards			IEC/EN 60947, VDE 0660, UL, CSA						
Lifespan, mechanical									
AC operated	c (contacts)	x 10 ⁶	10	10	10	10	7	7	7
DC operated	c (contacts)	x 10 ⁶	10	10	10	10	7	7	7
Operating frequency, mechanical									
AC operated	Operations/h		3000	3000	3000	3000	2000	2000	2000
DC operated	Operations/h		3000	3000	3000	3000	2000	2000	2000
Maximum operating frequency									
Electrical (Contactor without overload relay)			→ Engineering Page 5/95						
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	-25...60	-25...60	-25...60
Enclosed		°C	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40
Storage		°C	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
Mounting position: AC and DC-actuated									
Mechanical shock resistance (IEC/EN 60068-2-27)									
Half-sinusoidal shock 10 ms									
Main contacts									
N/O		g	10	10	10	10	10	10	10
Auxiliary contacts									
N/O		g	10	10	10	10	10	10	10
NC		g	8	8	8	8	8	8	8
Protection type			IP00	IP00	IP00	IP00	IP00	IP00	IP00
Protection against direct contact when actuated from front (EN 90274)			Finger- and back-of-hand proof with cover or terminal block						
Weight									
Weight		kg	3.2	3.2	6.5	6.5	8	8	8
Terminal capacity of main cable									
Flexible with cable lug		mm ²	50 - 185	50 - 185	50 - 240	50 - 240	50 - 240	50 - 240	50 - 240
Stranded with cable lug		mm ²	50 - 185	70 - 185	70 - 240	70 - 240	70 - 240	70 - 240	70 - 240
Solid or stranded		AWG	1/0 - 350 MCM	2/0 - 250 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM
Busbar	Width	mm	32	32	25	25	25	30	30
Main cable connection screw/bolt			M10	M10	M10	M10	M10	M10	M10
Tightening torque		Nm	24	24	24	24	24	24	24
Terminal capacity of control circuit cable									
Solid		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)						
Flexible with ferrule		mm ²	1 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)	2 x (18 - 12)
Control circuit cable connection screw/bolt			M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Tools									
Main conductors									
Wrench		mm	16	16	16	16	16	16	16
Auxiliary conductors									
Pozidriv screwdriver		Size	2	2	2	2	2	2	2



DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
IEC/EN 60947, VDE 0660, UL, CSA									
5	5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5	5
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
→ Engineering Page 5/95									
Damp heat, constant, to IEC 60068-2-78									
Damp heat, cyclic, to IEC 60068-2-30									
-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60	-25...60
-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40	-25...40
-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80	-40 - 80
10	10	10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10	10	10
8	8	8	8	8	8	8	8	8	8
IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00	IP00
Finger- and back-of-hand proof with cover or terminal block									
15	15	15	15	15	32	15	32	32	32
50 - 240	50 - 240	50 - 240	50 - 240	50 - 240	—	—	—	—	—
70 - 240	70 - 240	70 - 240	70 - 240	70 - 240	—	—	—	—	—
2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	2/0 - 500 MCM	—	—	—	—	—
50	50	60	60	60	100	80	100	100	100
M10	M10	M12	M12	M12	M12	M12	M12	M12	M12
24	24	35	35	35	35	35	35	35	35
1 x (0.75 - 2.5)									
2 x (0.75 - 2.5)									
1 x (0.75 - 2.5)									
2 x (0.75 - 2.5)									
2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18...12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)	2 x (18 - 12)
M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
16	16	18	18	18	18	18	18	18	18
2	2	2	2	2	2	2	2	2	2

			Contactors						
			DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570
Main contacts									
Rated impulse withstand voltage	U_{imp}	V AC	8000	8000	8000	8000	8000	8000	8000
Overvoltage category/pollution degree			III/3	III/3	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage	U_i	V AC	1000	1000	1000	1000	1000	1000	1000
Rated operating voltage	U_e	V AC	1000	1000	1000	1000	1000	1000	1000
Safe isolation according to EN 61140									
Between coil and contacts		V AC	500	500	500	500	500	500	500
Between the contacts		V AC	500	500	500	500	500	500	500
Making capacity ($\cos \varphi$ to IEC/EN 60947)		A	2700	2700	3000	3600	5500	5500	6000
Breaking capacity									
220/230 V		A	2250	2250	2500	3000	5000	5000	5800
380/400 V		A	2250	2250	2500	3000	5000	5000	5800
500 V		A	2250	2250	2500	3000	5000	5000	5800
660/690 V		A	2250	2250	2500	3000	5000	5000	5800
1000 V		A	760	760	760	950	950	950	950
Component lifespan			→ Page 5/91						
Short-circuit rating									
Short-circuit protection rating maximum fuse									
Type "2" coordination									
400 V	gG/gL 500 V	A	250	250	315	315	500	500	500
690 V	gG/gL 690 V	A	250	250	315	315	500	500	500
1000 V	gG/gL 1000 V	A	160	160	160	160	200	200	200
Type "1" coordination									
400 V	gG/gL 500 V	A	400	400	400	400	630	630	800
690 V	gG/gL 690 V	A	315	315	400	400	630	630	630
1000 V	gG/gL 1000 V	A	200	200	200	200	250	250	250
AC voltage									
AC-1 operation									
Conventional thermal current 3 pole 50 - 60 Hz									
Open									
at 40 °C	I_{th}	A	337	356	400	430	612	857	920
at 50 °C	I_{th}	A	301	310	360	385	548	767	821
at 55 °C	I_{th}	A	287	295	340	365	522	731	783
at 60 °C	I_{th}	A	275	285	330	350	500	700	750
Enclosed ¹⁾	I_{th}	A	245	275	300	315	450	650	–
Conventional thermal current, 1-pole									
Open ¹⁾	I_{th}	A	685	707	825	875	1250	1750	1875
Enclosed ¹⁾	I_{th}	A	625	636	742	785	1125	1600	–
AC-3 operation									
Rated operational current AC -3 open, 50 – 60 Hz, 3 pole									
220/230 V	I_e	A	185	225	250	300	400	500	580
240 V	I_e	A	185	225	250	300	400	500	580
380/400 V	I_e	A	185	225	250	300	400	500	580
415 V	I_e	A	185	225	250	300	400	500	580
440 V	I_e	A	185	225	250	300	400	500	580
500 V	I_e	A	185	225	250	300	400	500	500
660/690 V	I_e	A	150	160	250	210	360	360	360
1000 V	I_e	A	76	76	76	95	95	95	95
Rated operational power									
220/230 V	P	kW	55	70	75	90	125	155	185
240 V	P	kW	62	75	85	100	132	170	200
380/400 V	P	kW	90	110	132	160	200	250	315
415 V	P	kW	110	132	148	180	240	300	348
440 V	P	kW	115	138	132	185	200	250	370
500 V	P	kW	132	160	180	215	290	360	360
660/690 V	P	kW	140	150	240	195	344	344	344
1000 V	P	kW	108	108	108	132	132	132	132

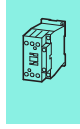
Notes¹⁾ At maximum permissible ambient air temperature²⁾ To 690 V

DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
500	500	500	500	500	500	500	500	500	500
500	500	500	500	500	500	500	500	500	500
7800	7800	9840	9840	9840	19000	9840	9840	9840	9840
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
6500	6500	8200	8200	8200	16000	8200	8200	8200	8200
4350	4350	5800	5800	5800	5800	5800	5800	5800	5800
→ Page 5/91									
630	630	630	630	630	-	-	-	-	-
630	630	630	630	630	-	-	-	-	-
500	500	630	630	630	-	-	-	-	-
1000	1000	1200	1200	1200	-	-	-	-	-
1000	1000	1200	1200	1200	-	-	-	-	-
630	630	800	800	800	-	-	-	-	-
980	1041	1102	1225	1225	2200 ²⁾	1714 ²⁾	2450 ²⁾	2700 ²⁾	3185 ²⁾
876	931	986	1095	1095	1970 ²⁾	1533 ²⁾	2190 ²⁾	2400 ²⁾	2847 ²⁾
836	888	940	1044	1044	1880 ²⁾	1462 ²⁾	2089 ²⁾	2300 ²⁾	2716 ²⁾
800	850	900	1000	1000	1800 ²⁾	1400 ²⁾	2000 ²⁾	2200 ²⁾	2600 ²⁾
-	-	-	-	-	-	-	-	-	-
2000	2125	2250	2500	2500	4500	3500	5000	5500	6500 ²⁾
-	-	-	-	-	-	-	-	-	-
580	650	750	820	1000	1600	-	-	-	-
580	650	750	820	1000	1600	-	-	-	-
580	650	750	820	1000	1600	-	-	-	-
580	650	750	820	1000	1600	-	-	-	-
580	650	750	820	1000	1600	-	-	-	-
580	650	750	820	1000	1600	-	-	-	-
580	650	750	820	1000	1600	-	-	-	-
435	435	580	580	750	1200	-	-	-	-
185	205	240	260	315	500	-	-	-	-
200	225	260	285	340	550	-	-	-	-
315	355	400	450	560	900	-	-	-	-
348	390	455	500	610	930	-	-	-	-
370	420	480	450	650	1000	-	-	-	-
420	470	550	600	730	1180	-	-	-	-
560	630	720	750	1000	1600	-	-	-	-
600	600	800	800	1100	1770	-	-	-	-



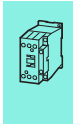
			Contactors						
			DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570
AC voltage									
AC-4 operation									
Rated operational current AC -4 open, 50 – 60 Hz, 3 pole									
220/230 V	I_e	A	136	164	200	240	296	360	360
240 V	I_e	A	136	164	200	240	296	360	360
380/400 V	I_e	A	136	164	200	240	296	360	360
415 V	I_e	A	136	164	200	240	296	360	360
440 V	I_e	A	136	164	200	240	296	360	360
500 V	I_e	A	136	164	200	240	296	360	360
660/690 V	I_e	A	110	120	200	170	296	296	296
1000 V	I_e	A	55	55	76	76	95	95	95
Rated operational power									
220/230 V	P	kW	41	51	62	75	92	112	112
240 V	P	kW	45	54	68	82	101	122	122
380/400 V	P	kW	75	90	110	132	160	200	200
415 V	P	kW	80	96	117	142	176	216	216
440 V	P	kW	85	102	125	150	186	229	229
500 V	P	kW	96	116	143	172	214	260	260
660/690 V	P	kW	102	110	189	160	283	344	344
1000 V	P	kW	77	77	108	109	132	132	132
Capacitor operation									
Individual compensation rated operational current I_e of alternating current capacitor									
Open									
To 525 V		A	220	220	220	307	307	307	307
690 V		A	133	133	133	177	177	177	177
Max. peak inrush current									
		$x I_e$	30	30	30	30	30	30	30
Component lifespan									
		c (contacts) $x 10^6$	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Max. operating frequency									
		Ops/h	200	200	200	200	200	200	200
DC voltage									
Operations			→ Engineering Page 5/96						
Rated operational current I_e open									
DC-1 operation									
60 V	I_e	A	300	300	300	400	400	400	400
110 V	I_e	A	300	300	300	400	400	400	400
220 V	I_e	A	300	300	300	400	400	400	400
440 V	I_e	A	11	11	11	11	11	11	11
DC-3 operation									
60 V	I_e	A	300	300	300	400	400	400	400
110 V	I_e	A	300	300	300	400	400	400	400
220 V	I_e	A	300	300	300	400	400	400	400
DC-5 operation									
60 V	I_e	A	300	300	300	400	400	400	400
110 V	I_e	A	300	300	300	400	400	400	400
220 V	I_e	A	300	300	300	400	400	400	400
Current heat loss (3 pole)									
Current heat loss at I_{th}									
		W	34	45	55	37	58	113	130
Current heat loss at I_e to AC-3/400 V									
		W	16	23	28	21	37	58	78

DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
456	512	576	656	800	1280	-	-	-	-
456	512	576	656	800	1280	-	-	-	-
456	512	576	656	800	1280	-	-	-	-
456	512	576	656	800	1280	-	-	-	-
456	512	576	656	800	1280	-	-	-	-
456	512	576	656	800	1280	-	-	-	-
456	512	576	656	800	1280	-	-	-	-
348	348	464	464	700	1120	-	-	-	-
143	161	181	209	260	430	-	-	-	-
156	176	200	228	280	450	-	-	-	-
250	280	315	355	450	750	-	-	-	-
274	307	346	394	490	770	-	-	-	-
290	326	367	418	520	830	-	-	-	-
330	370	417	474	590	940	-	-	-	-
440	494	556	633	780	1300	-	-	-	-
509	509	678	678	1000	1650	-	-	-	-
463	463	463	463	463	-	-	-	-	-
265	265	265	265	265	-	-	-	-	-
30	30	30	30	30	-	-	-	-	-
0.1	0.1	0.1	0.1	0.1	-	-	-	-	-
200	200	200	200	200	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
61	69	78	96	96	155	188	192	232	250
32	41	54	65	96	123	-	-	-	-



				Contactors						
				DILM185A	DILM225A	DILM250	DILM300A	DILM400	DILM500	DILM570
Magnet systems										
Voltage tolerance ¹⁾	AC operated	Pick-up	$x U_c$	0.8 - 1.15	0.8 - 1.15					
	AC operated	Drop-out	$x U_c$	0.25 - 0.6	0.25 - 0.6					
	DC operated	Pick-up	$x U_c$	0.7 - 1.2	0.7 - 1.2					
	DC operated	Drop-out	$x U_c$	0.15 - 0.6	0.15 - 0.6					
Power consumption of the coil in a cold state and $1.0 \times U_c$	50/60 Hz	Pick-up	VA	210	210	–	–	–	–	–
	50/60 Hz	Sealing	VA	2.6	2.6	–	–	–	–	–
	50/60 Hz	Sealing	W	2.6	2.6	–	–	–	–	–
	DC operated	Pick-up	W	180	180	–	–	–	–	–
	DC operated	Sealing	W	2.1	2.1	–	–	–	–	–
Voltage tolerance	Comfort series DILM...	Pick-up	$x U_c$	–	–	$0.7 \times U_{c \min} - 1.15 \times U_{c \max}$				
	Standard range DILM...-S	Pick-up	$x U_c$	–	–	$0.85 \times U_{c \min} - 1.1 \times U_{c \max}$				
	Comfort series DILM...	Drop-out	$x U_c$	–	–	$0.2 \times U_{c \min} - 0.6 \times U_{c \min}$				
	Standard range DILM...-S	Drop-out	$x U_c$	–	–	$0.2 \times U_{c \min} - 0.4 \times U_{c \min}$				
Power consumption of the coil in a cold state and $1.0 \times U_c$	Comfort series DILM...	Pick-up	VA	–	–	380 ²⁾	380 ²⁾	450 ²⁾	450 ²⁾	450 ²⁾
	Comfort series DILM...	Pick-up	W	–	–	250	250	350	350	350
	Comfort series DILM...	Sealing	VA	–	–	4.3	4.3	4.3	4.3	4.3
	Comfort series DILM...	Sealing	W	–	–	3.3	3.3	3.3	3.3	3.3
	Standard range DILM...-S	Pick-up	VA	–	–	360 ⁴⁾	360 ⁴⁾	715 ⁴⁾	715 ⁴⁾	715 ⁴⁾
	Standard range DILM...-S	Pick-up	W	–	–	325	625	645	645	645
	Standard range DILM...-S	Sealing	VA	–	–	4.3	4.3	4.3	4.3	4.3
	Standard range DILM...-S	Sealing	W	–	–	3.3	3.3	3.3	3.3	3.3
Duty factor		% DF	–	–	100	100	100	100	100	100
Changeover time at 100 % U_c (recommended values), main circuit										
Comfort series DILM...	Closing delay		ms	–	–	< 100	< 80	< 80	< 80	< 80
	Opening delay		ms	–	–	< 110	< 110	< 110	< 110	< 110
Standard range DILM...-S	Closing delay		ms	< 60	< 60	< 55	< 55	< 55	< 55	< 55
	Opening delay		ms	< 40	< 40	< 40	< 40	< 50	< 50	< 50
Behavior in limit range and transition area, hold state										
Voltage interruption	$(0 - 0.2 \times U_{c \min}) \leq 10 \text{ ms}$			–	–	Targeted bridging during this time				
	$(0 - 0.2 \times U_{c \min}) > 10 \text{ ms}$					Drop-out of the contactor				
Voltage drops	$(0.2 - 0.6 \times U_{c \min}) \leq 12 \text{ ms}$					Targeted bridging during this time				
	$(0.2 - 0.6 \times U_{c \min}) > 12 \text{ ms}$					Drop-out of the contactor				
	$(0.6 - 0.7 \times U_{c \min})$					Contactor remains switched on				
Excess voltage	$(1.15 - 1.3 \times U_{c \max})$					Contactor remains switched on				
	$(> 1.3 \times U_{c \max}) \leq 3 \text{ s}$					Contactor remains switched on				
	$(> 1.3 \times U_{c \max}) > 3 \text{ s}$					Drop-out of the contactor				
Pick-up phase	$(0 - 0.7 \times U_{c \min})$					Contactor does not switch on				
	$(0.7 \times U_{c \min} - 1.15 \times U_{c \max})$					Contactor switches on safely				
	$(> 1.15 \times U_{c \max})$					Contactor switches on safely				
Permissible transitional contact resistance (of external control unit when A11 is actuated)			mΩ	–	–	≤ 500	≤ 500	≤ 500	≤ 500	–
Permissible residual current (when A11 is actuated from the electronic system in the event of a 0 signal)			mA	–	–	≤ 1	≤ 1	≤ 1	≤ 1	–
PLC signal level (A3 - A4) to IEC/EN 61131-2 (part no. 2)										
High			V	15	15	15	15	15	15	–
Low			V	5	5	5	5	5	5	–
Electromagnetic compatibility (EMC)										
Electromagnetic compatibility				This product is designed for operation in industrial environments (environment 2). The use in residential environments (environment 1) could cause electrical interference so that addition suppression must be planned.						
Notes										
				1) $U_{c \min}$, $U_{c \max}$,						
				2) Control transformer with $u_k \leq 0.6$						
				3) Control transformer with $u_k \leq 0.7$						
				4) $u_k \leq 10 \%$						

Comfort devices and standard devices greater than 170 A
DILM185...DILM1600, DILH

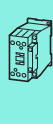


DILM580	DILM650	DILM750	DILM820	DILM1000	DILM1600	DILH1400	DILH2000	DILH2200	DILH2600
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
0.7 x U _{c min} - 1.15 x U _{c max}									
0.85 x U _{c min} - 1.1 x U _{c max}									
0.2 x U _{c min} - 0.6 x U _{c min}									
0.2 x U _{c min} - 0.4 x U _{c min}									
800 ³⁾	800 ³⁾	800 ³⁾	800 ³⁾	800 ³⁾	1600 ³⁾	800 ³⁾	1600 ³⁾	1600 ³⁾	-
700	700	700	700	700	1400	700	1400	1400	-
7.5	7.5	7.5	7.5	7.5	15	7.5	15	15	-
6.5	6.5	6.5	6.5	6.5	13	6.5	13	13	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
100	100	100	100	100	100	100	100	100	100
< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	< 70	-
< 110	< 110	< 110	< 110	< 110	< 40	< 40	< 40	< 40	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
Targeted bridging during this time									
Drop-out of the contactor									
Targeted bridging during this time									
Drop-out of the contactor									
Contactor remains switched on									
Contactor remains switched on									
Contactor remains switched on									
Drop-out of the contactor									
Contactor does not switch on									
Contactor switches on safely									
Contactor switches on safely									
≅ 500	≅ 500	≅ 500	≅ 500	≅ 500	≅ 500	≅ 500	≅ 500	≅ 500	≅ 500
≅ 1	≅ 1	≅ 1	≅ 1	≅ 1	≅ 1	≅ 1	≅ 1	≅ 1	≅ 1
15	15	15	15	15	15	15	15	15	15
5	5	5	5	5	5	5	5	5	5
This product is designed for operation in industrial environments (environment 2). The use in residential environments (environment 1) could cause electrical interference so that addition suppression must be planned.									

			DILMP20	DILMP32 DILMP45	DILMP63 DILMP80	DILMP125 DILMP160 DILMP200
General						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Lifespan, mechanical						
AC operated	c (contacts)	x 10 ⁶	10			
DC operated	c (contacts)	x 10 ⁶	10			
Operating frequency, mechanical						
Mechanical, AC operated	Operations/h		5000		3600	
DC operated	Operations/h		5000		3600	
Maximum operating frequency			600			
Electrical (Contactor without overload relay)			600			
Climatic proofing			Damp heat, constant, to IEC 60068-2-3 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25...60			
Enclosed		°C	-25...40			
Storage		°C	-40 - 80			
Mounting position AC- and DC operated						
Mechanical shock resistance (IEC/EN 60068-2-27)						
Half-sinusoidal shock 10 ms						
Main contacts						
N/O		g	10			
Auxiliary contacts						
N/O		g	7			
NC		g	5			
Protection type			IP20	IP00		
With accessories			–	IP20		
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Terminal type, screw connection						
Terminal capacity of main cable						
Solid		mm ²	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 16) 2 x (0.75 - 10)	1 x (2.5 - 16) 2 x (2.5 - 16)	–
Flexible with ferrule		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 16) 2 x (0.75 - 10)	1 x (2.5 - 35) 2 x (2.5 - 25)	1 x (10 - 95) 2 x (10 - 70)
Stranded		mm ²	–	1 x 16	1 x (16 - 50) 2 x (16 - 35)	1 x (16 - 120) 2 x (16 - 95)
Solid or stranded		AWG	18 - 14	18 - 6	12 - 2	8 - 250MCM
Flat conductor	Number of layers x width x thickness	mm	–	–	2 x (6 x 9 x 0.8)	2 x (6 x 16 x 0.8)
Terminal capacity of control circuit cable						
Solid		mm ²	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 4) 2 x (0.75 - 2.5)	1 x (0.75 - 4) 2 x (0.75 - 4)	1 x (0.75 - 4) 2 x (0.75 - 4)
Flexible with ferrule		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded		AWG	18 - 14	18 - 14	18 - 14	18 - 14
Main cable connection screw/bolt			M3.5	M5	M6	M10
Tightening torque		Nm	1.2	3	3.3	14
Control circuit cable connection screw/bolt			M3.5	M3.5	M3.5	M3.5
Tightening torque		Nm	1.2	1.2	1.2	1.2
Tools						
Main conductors						
Pozidriv screwdriver		Size	2	2	2	–
Internal hexagon	SW	mm	–	–	–	5
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	–
Auxiliary conductors						
Pozidriv screwdriver		Size	2	2	2	2
Flat-blade screwdriver		mm	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6

DILMP20 ... DILMP200

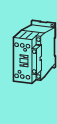
				DILMP20	DILMP32 DILMP45		DILMP63 DILMP80	DILMP125 DILMP160 DILMP200				
Main contacts												
Rated impulse withstand voltage	U_{imp}	V AC		8000								
Overvoltage category/pollution degree				III/3								
Rated insulation voltage	U_i	V AC		690								
Rated operating voltage	U_e	V AC		690								
Safe isolation according to EN 61140												
Between coil and contacts			V AC	400	440							
Between the contacts			V AC	400	440							
Making capacity (cos ϕ to IEC/EN 60947)	To 690 V	A		144	238	350	560	700	1120	1330	1800	
Breaking capacity												
220/230 V		A		120	180	250	400	500	800	950	1150	
380/400 V		A		120	180	250	400	500	800	950	1150	
500 V		A		100	180	250	400	500	800	950	1150	
660/690 V		A		70	120	144	250	296	650	750	800	
Short-circuit rating												
Short-circuit protection rating maximum fuse												
Type "2" coordination												
400 V			gG/gL 500 V	A	20	35	35	63	80	160	160	250
690 V			gG/gL 690 V	A	20	35	35	50	63	160	160	200
Type "1" coordination												
400 V			gG/gL 500 V	A	35	63	100	125	160	250	250	250
690 V			gG/gL 690 V	A	25	50	50	80	80	200	200	200
AC voltage												
AC-1 operation												
Conventional thermal current 3 pole 50 - 60 Hz												
Open												
at 40 °C			I_{th}	A	22	32	45	63	80	125	160	200
at 50 °C			I_{th}	A	21	30	41	60	76	116	150	188
at 60 °C			I_{th}	A	20	28	39	54	69	108	138	172
Enclosed												
			I_{th}	A	18	27	36	50	64	100	128	160
Conventional thermal current, 1 pole												
Open												
			I_{th}	A	60	84	117	162	207	325	415	516
Enclosed												
			I_{th}	A	54	76	105	146	186	292	373	464
Rated operational power												
220/230 V	P	kW		8	12	16	23	29	45	58	72	
240 V	P	kW		9	13	18	25	32	49	63	79	
380/400 V	P	kW		14	20	28	39	50	78	100	125	
415 V	P	kW		15	22	31	43	55	85	109	137	
440 V	P	kW		16	23	33	46	58	90	116	145	
500 V	P	kW		18	26	37	52	66	103	132	165	
690 V	P	kW		24	35	49	68	87	136	174	217	
AC-3 operation												
Rated operational current AC -3 open, 50 – 60 Hz, 3 pole												
220/230 V	I_e	A		12	18	25	40	50	80	95	115	
240 V	I_e	A		12	18	25	40	50	80	95	115	
380/400 V	I_e	A		12	18	25	40	50	80	95	115	
415 V	I_e	A		12	18	25	40	50	80	95	115	
440 V	I_e	A		12	18	25	40	50	80	95	115	
500 V	I_e	A		10	18	25	40	50	80	95	115	
660/690 V	I_e	A		7	12	15	25	32	65	80	93	
Rated operational power												
220/230 V	P	kW		3.5	5	7.5	12.5	15.5	25	30	37	
240 V	P	kW		4	5.5	8.5	13.5	17	27.5	33	40	
380/400 V	P	kW		5.5	7.5	11	18.5	22	37	45	55	
415 V	P	kW		7	10	14.5	24	30	48	57	70	
440 V	P	kW		7.5	10.5	15.5	25	32	51	60	75	
500 V	P	kW		7	12	17.5	28	36	58	70	85	
660/690 V	P	kW		6.5	11	14	23	30	63	75	90	



				DILMP20	DILMP32 DILMP45		DILMP63 DILMP80		DILMP125 DILMP160 DILMP200		
DC voltage											
Rated operational current I_e open											
DC-1 operation											
60 V	I_e	A		22	32	45	63	80	125	160	200
110 V	I_e	A		22	32	45	63	80	125	160	200
220 V	I_e	A		6	32	45	63	80	125	160	200
440 V	I_e	A		1.3	3	3	5	5	10	10	10
DC-3 operation											
60 V	I_e	A		20	32	45	63	80	125	160	200
110 V	I_e	A		20	32	45	63	80	125	160	200
220 V	I_e	A		1.5	32	45	63	80	125	160	200
440 V	I_e	A		0.2	6	6	8	8	9	9	9
DC-5 operation											
60 V	I_e	A		20	32	45	63	80	125	160	200
110 V	I_e	A		20	25	32	50	80	125	160	200
220 V	I_e	A		1.5	15	22	38	70	100	125	150
440 V	I_e	A		0.2	4	4	8	8	8	8	8
Current heat loss (3 pole)											
Current heat loss at I_{th}				4.7	8.2	12	16	23	29	46	60
Impedance per pole				2.5	2	1.5	1	0.7	0.6	0.6	0.5
Magnet systems											
Voltage tolerance											
AC operated 50 Hz	Pick-up	$x U_c$		0.8 - 1.1	0.8 - 1.1		0.8 - 1.1		0.8 - 1.1		
AC operated 50/60 Hz		$x U_c$		0.8 - 1.1	0.85 - 1.1		0.85 - 1.1		0.8 - 1.1		
AC operated	Drop-out	$x U_c$		0.4 - 0.6	0.4 - 0.6		0.4 - 0.6		0.4 - 0.6		
DC operated ¹⁾	Pick-up	$x U_c$		0.8 - 1.1	0.7 - 1.2		0.7 - 1.2		0.7 - 1.2		
DC operated ¹⁾	Drop-out	$x U_c$		0.2 - 0.6	0.2 - 0.6		0.2 - 0.6		0.2 - 0.6		
Power consumption of the coil in a cold state and $1.0 \times U_c$											
AC operated 50/60 Hz	Pick-up	VA		24	50		150		180		
AC operated 50/60 Hz	Pick-up	W		19	40		95		150		
AC operated 50/60 Hz	Sealing	VA		4	8		16		3.1		
AC operated 50/60 Hz	Sealing	W		1.2	2.4		4		2.1		
DC operated ¹⁾	Pick-up	W		4.5	12		24		149		
DC operated ¹⁾	Sealing	W		4.5	0.5		0.5		2.1		
Duty factor				100	100		100		100		
Changeover times at 100 % U_c (recommended values)											
Main contacts											
AC operated											
	Closing delay	ms		15...21	16...22		12...18		28...33		
	Opening delay	ms		9...18	8...14		8...13		35...41		
DC operated ¹⁾											
	Closing delay	ms		31	47		54		35		
	Opening delay	ms		12	30		24		30		
Arcing time				10	10		10		15		
Permissible residual current when A1 - A2 are actuated from the electronic system (with 0 signal)				≤ 1	≤ 1		≤ 1		≤ 1		

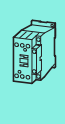
Notes

¹⁾ At least double-pulse bridge rectifier



			DILK12	DILK20	DILK25	DILK33	DILK50
General							
Standards			IEC/EN 60947, VDE 0660				
Ambient temperature							
Open		°C	-25...60	-25...60	-25...60	-25...60	-25...60
Enclosed		°C	-25...40	-25...40	-25...40	-25...40	-25...40
Mounting position							
Protection type			IP00	IP00	IP00	IP00	IP00
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof				
Weight basic device							
AC operated		kg	0.55	0.55	0.55	1	1
Terminal capacity of main cable							
Solid		mm ²	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (2.5 - 16)	1 x (2.5 - 16)
Flexible with ferrule		mm ²	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (0.75 - 16)	1 x (2.5 - 35)	1 x (2.5 - 35)
Stranded		mm ²	1 x 16	1 x 16	1 x 16	1 x (16 - 50)	1 x (16 - 50)
Solid or stranded		AWG	18 - 16	18 - 6	18 - 6	12 - 2	12 - 2
Flat conductor	Number of layers x width x thickness	mm	-	-	-	1 x (6 x 9 x 0.8)	1 x (6 x 9 x 0.8)
Group compensation							
60 Hz							
230 V		kvar	7.5	11	15	20	25
400 V		kvar	12.5	20	25	33.3	50
525 V		kvar	16.7	25	33.3	40	65
690 V		kvar	20	33.3	40	55	85
50/60 Hz							
Open							
230 V	I_e	A	18	29	38	50	72
400 V	I_e	A	18	29	38	50	72
525 V	I_e	A	18	29	38	50	72
690 V	I_e	A	18	29	38	50	72
Enclosed							
230 V	I_e	A	16	26	34	45	65
400 V	I_e	A	16	26	34	45	65
525 V	I_e	A	16	26	34	45	65
690 V	I_e	A	16	26	34	45	65
Making capacity (i-peak value) without damping			$x I_e$				
			180	180	180	180	180
Component lifespan	c (contacts)	$x 10^6$	0.15	0.15	0.15	0.15	0.15
Maximum operating frequency		Ops/h	120	120	120	120	120

			DILK12	DILK20	DILK25	DILK33	DILK50
Magnet systems							
Voltage tolerance							
AC operated	Pick-up	$x U_c$	0.8 - 1.1	0.8 - 1.1	0.8 - 1.1	0.8 - 1.15	0.8 - 1.15
AC operated	Drop-out	$x U_c$	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6
Power consumption of the coil in a cold state and $1.0 \times U_c$							
50 Hz	Pick-up	VA	58	58	58	45	45
50 Hz	Sealing	VA	7.6	7.6	7.6	1.5	1.5
50 Hz	Sealing	W	2.3	2.3	2.3	1.5	1.5
60 Hz	Pick-up	VA	71	71	71	45	45
60 Hz	Sealing	VA	9.3	9.3	9.3	1.5	1.5
60 Hz	Sealing	W	2.8	2.8	2.8	1.5	1.5
50/60 Hz	Pick-up	VA	65 59	65 59	65 59	45 45	45 45
50/60 Hz	Sealing	VA	9.6 7	9.6 7	9.6 7	1.5 1.5	1.5 1.5
50/60 Hz	Sealing	W	2.7 2.2	2.7 2.2	2.7 2.2	1.5 1.5	1.5 1.5
Duty factor		% DF	100	100	100	100	100
Changeover times at 100 % U_c (recommended values)							
Main contacts							
AC operated							
	Closing delay	ms	16...22	16...22	16...22	50	50
	Opening delay	ms	8...14	8...14	8...14	40	40
Arcing time		ms	10	10	10	10	10
Electromagnetic compatibility (EMC)							
Emitted interference			To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1
Interference immunity			To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1	To EN 60947-1
Further technical data							
As per contactor	DIL		M17	M25	M32	M50	M65

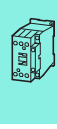


				DILL12	DILL18	DILL20	
General							
Standards				IEC/EN 60947, VDE 0660, UL, CSA			
Lifespan, mechanical							
AC operated	c (contacts)	x 10 ⁶		1	1	1	
Operating frequency, mechanical							
Mechanical, AC operated	Operations/h			60	60	60	
Maximum operating frequency							
Electrical	Operations/h			60	60	60	
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	
	Enclosed	°C		-25...40	-25...40	-25...40	
	Storage	°C		-40 - 80	-40 - 80	-40 - 80	
Mounting position							
Mechanical shock resistance (IEC/EN 60068-2-27)							
Half-sinusoidal shock 10 ms				6.9	6.9	6.9	
Protection type				IP00	IP00	IP00	
Weight							
AC operated		kg		0.42	0.42	0.42	
Main contacts							
Rated impulse withstand voltage	U _{imp}	V AC		8000	8000	8000	
Overvoltage category/pollution degree				III/3	III/3	III/3	
Rated insulation voltage	U _i	V AC		690	690	690	
Rated operating voltage	U _e	V AC		690	690	690	
Making capacity		A		238	350	550	
Breaking capacity	380/400 V	A		170	250	320	
Lifespan, electrical	c (contacts)			10000	10000	10000	
Short-circuit protection rating maximum fuse							
400 V	gG/gL 500 V	A		63	100	125	
AC voltage							
AC-1 operation							
Conventional thermal current							
	at 40 °C	I _{th}	A	27	40	45	
	at 60 °C	I _{th}	A	24	35	40	
230 V		I _e	A	12	18	20	
400 V		I _e	A	12	18	20	
AC-1 operation							
220/230 V		I _e	A	14	21	27	
400 V		I _e	A	14	21	27	
Electric lamps							
Filament bulbs							
		A		14	21	27	
Mercury blended lamps							
		A		12	16	23	
Fluorescent lamp load							
Conventional reactor starter connection							
		A		20	26	35	
Duo circuit							
		A		20	26	35	
Electronic upstream devices							
		A		12	18	20	
High-pressure mercury vapour lamps							
		A		12	18	20	
Metal-halide lamps							
		A		12	18	20	
High-pressure sodium lamps							
		A		12	18	20	
Low-pressure sodium lamps							
		A		7.5	10	12	
Maximum permissible compensation capacitance							
		µF		470	470	470	
Further technical data							
As per contactor				DIL	M17	M25	M32

				DILMF8	DILMF11	DILMF14	DILMF17
General							
Mounting position							
AC voltage							
AC-3 operation							
Rated operational current AC -3 open, 50 – 60 Hz, 3 pole	220/230 V	I_e	A	7	9	12	18
	240 V	I_e	A	7	9	12	18
	380/400 V	I_e	A	7	9	12	18
	415 V	I_e	A	7	9	12	18
	440 V	I_e	A	7	9	12	18
	500 V	I_e	A	5	7	10	18
	660/690 V	I_e	A	4	5	7	12
Rated operational power	220/230 V	P	kW	2.2	2.5	3.5	5
	240 V	P	kW	2.2	3	4	5.5
	380/400 V	P	kW	3	4	5.5	7.5
	415 V	P	kW	4	5.5	7	10
	440 V	P	kW	4.5	5.5	7.5	10.5
	500 V	P	kW	3.5	4.5	7	12
	660/690 V	P	kW	3.5	4.5	6.5	11
AC-4 operation							
Rated operational current AC-4 open, 50 - 60 Hz, 3 pole	220/230 V	I_e	A	5	6	7	10
	240 V	I_e	A	5	6	7	10
	380/400 V	I_e	A	5	6	7	10
	415 V	I_e	A	5	6	7	10
	440 V	I_e	A	5	6	7	10
	500 V	I_e	A	4.5	5	6	10
	660/690 V	I_e	A	4	4.5	5	8
Rated operational power	220/230 V	P	kW	1	1.5	2	2.5
	240 V	P	kW	1.5	1.6	2.2	3
	380/400 V	P	kW	2.2	2.5	3	4.5
	415 V	P	kW	2.3	2.8	3.4	5
	440 V	P	kW	2.4	3	3.6	5.5
	500 V	P	kW	2.5	2.8	3.5	6
	660/690 V	P	kW	2.9	3.6	4.4	6.5
Current heat loss (3 pole)							
Current heat loss at I_{th}			W	2.4	2.4	2.4	7.3
Current heat loss at I_e to AC-3/400 V			W	0.3	0.6	1	1.9
Magnet systems							
Voltage tolerance	AC operated	Pick-up	$x U_c$	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15
	AC operated	Drop-out	$x U_c$	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5
Power consumption of the coil in a cold state and $1.0 \times U_c$	Electronic actuation	Pick-up	VA	14	14	14	14
	Electronic actuation	Sealing	VA	0.7	0.7	0.7	0.7
	Electronic actuation	Sealing	W	0.7	0.7	0.7	0.7
Duty factor			% DF	100	100	100	100
Switching times	Closing delay		ms	40	40	40	40
	Opening delay		ms	45	45	45	45
suitable according to				SEMI F47	SEMI F47	SEMI F47	SEMI F47
Electromagnetic compatibility (EMC)							
Emitted interference				To EN 60947-1			
Interference immunity				To EN 60947-1			
Further technical data							
As per contactor			DIL	M7	M9	M12	M17
Terminal type							
As per contactor			DIL	M17	M17	M17	M17

DILMF

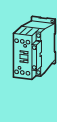
DILMF25	DILMF32	DILMF40	DILMF50	DILMF65	DILMF80	DILMF95	DILMF115	DILMF150
25	32	40	50	65	80	95	115	150
25	32	40	50	65	80	95	115	150
25	32	40	50	65	80	95	115	150
25	32	40	50	65	80	95	115	150
25	32	40	50	65	80	95	115	150
25	32	40	50	65	80	95	115	150
15	18	25	32	37	65	80	93	100
7.5	10	12.5	15.5	20	25	30	37	48
8.5	11	13.5	17	22	27.5	4	40	52
11	15	18.5	22	30	37	45	55	75
14.5	19	24	30	39	48	57	70	91
15.5	20	25	32	41	51	60	75	95
17.5	23	28	36	47	58	70	85	110
14	17	23	30	35	63	75	90	96
13	15	18	21	25	40	50	55	65
13	15	18	21	25	40	50	55	65
13	15	18	21	25	40	50	55	65
13	15	18	21	25	40	50	55	65
13	15	18	21	25	40	50	55	65
13	15	18	21	25	40	50	55	65
10	12	14	17	20	27	37	45	50
3.5	4	5	6	7	12	16	17	20
4	4.5	5.5	6.5	7.5	13	17	19	22
6	7	9	10	12	20	26	28	33
6.5	7.5	9.5	11	13	24	30	33	39
7	8	10	12	14	25	32	35	41
8	9	11	13	16	29	36	40	47
8.5	10	12	14	17	26	35	43	48
9.6	12.1	11.3	19	28.8	14.6	21.8	30.4	46.1
3.8	6.1	7.2	11.3	19	11.5	16.2	23.8	40.5
0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15	0.8 - 1.15
0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5	0.2 - 0.5
14	14	45	45	45	75	75	180	180
0.7	0.7	1.5	1.5	1.5	2	2	3.1	3.1
0.7	0.7	1.5	1.5	1.5	2	2	2.1	2.1
100	100	100	100	100	100	100	100	100
40	40	50	50	50	55	55	40	40
45	45	45	45	45	40	40	40	40
SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47	SEMI F47
To EN 60947-1								
To EN 60947-1								
M25	M32	M40	M50	M65	M80	M95	M115	M150
M25	M32	M40	M50	M65	M80	M95	M115	M150



			DILM7-... - DILM38-...	DILA- XHI(C)...(-S)	DILM32- XHI(C)...(-S)	DILM150- XHI...	DILM1000-XHI... DILM820-XHI...	
Auxiliary contact								
Interlocked opposing contacts within an auxiliary contact module (to IEC 60947-5-1 Annex L) ¹⁾			-	Yes	Yes	Yes	Yes	
Normally closed (not late-normally closed) suitable as a mirror contact (to IEC/EN 60947-4-1, Annex F)			DILM7 - DILM38	DILM7 - DILM38	DILM7 - DILM38	DILM40 - DILM170	DILM40 - DILM225A DILM250 - DILM1000	
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 operating voltage	U_e	V AC	500	500	500	500	500	
Safe isolation according to EN 61140								
Between coil and auxiliary contacts		V AC	400	400	400	440	440	
Between the auxiliary contacts		V AC	400	400	400	440	440	
Rated operational current								
AC-15								
230 V	I_e	A	4	4	4	4	4	
380/415 V	I_e	A	4	4	4	4	4	
500 V	I_e	A	1.5	–	1.5	1.5	1.5	
DC L/R ≤ 15 ms ²⁾								
24 V	I_e	A	10	10	10	10	10	
60 V	I_e	A	6	6	6	6	6	
110 V	I_e	A	3	3	3	3	3	
220 V	I_e	A	1	1	1	1	1	
DC-13 (6xP)								
Contacts in series:								
3	24 V	A	2.5	2.5	2.5	–	–	
3	60 V	A	1	1	1	–	–	
3	110 V	A	0.5	0.5	0.5	–	–	
3	220 V	A	0.25	0.25	0.25	–	–	
Conventional thermal current			I_{th}	A	10	16	16	10
Control circuit reliability (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)			Fault probability					λ
			< 10 ⁻⁸ , < 1 one failure in 100 million operations					
Component lifespan								
at $U_e = 230$ V, AC-15, 3 A		c (contacts)	x 10 ⁶	1.3	1.3	1.3	1.3	1.3
Short-circuit rating without welding								
Max. fuse		A gG/gL	10	10	10	16	16	

Notes¹⁾ Not with DIL...-XHIV and DIL...-XHICV.²⁾ Switch-on and switch-off conditions based on DC-13, time constant as specified.

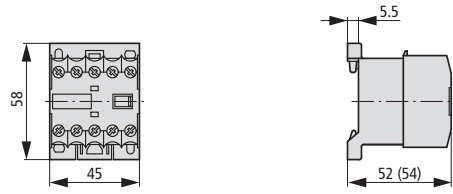
			P1DILEM DILM12-XP1	DILM32-XP1	DILM65-XP1	DILM150-XP1	DILM185-XP1
Parallel connector							
Terminal capacity							
Solid		mm ²	1 - 16	16	16	–	–
Flexible with ferrule		mm ²	1 x (0.5 - 25) 2 x (0.5 - 16)	1 x (16 - 35)	1 x (16 - 120)	–	–
Stranded		mm ²	1 x (0.5 - 25) 2 x (0.5 - 16)	1 x (16 - 50)	1 x (16 - 120)	1 x (35 - 300) 2 x (35 - 120)	–
Flat conductor	Number of layers x width x thickness	mm	6 x 9 x 0.8	–	–	2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)
Tightening torque							
Terminal capacity of control circuit cable							
Solid		mm ²	–	–	–	–	1 x (0.75 - 4) 2 x (0.75 - 4)
Flexible with ferrule		mm ²	–	–	–	–	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Tools							
Pozidriv screwdriver		Size	2	2	–	–	–
Internal hexagon	SW	mm	–	–	5	6	5
Conventional thermal current							
3 pole	I _{th}	A	50	100	180	400	700
4 pole	I _{th}	A	60	–	–	–	–



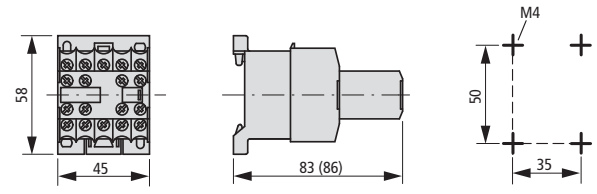
Dimensions

Mini contactor relays

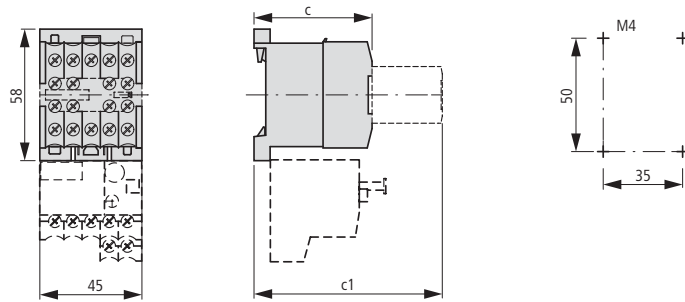
DILER...(-C)
DILER...-G(-C)



DILER...(-C) + ...DILE(-C)
DILER...-G(-C) + ...DILE(-C)



DILEEM..., DILEM...(-C), DILEM-12...
DILEEM...-G, DILEM...-G(-C), DILEM-12...-G



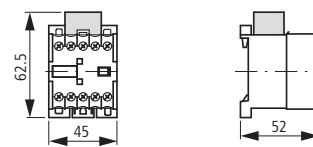
Part no.	c	c1
DILE(E)M...(-G)	52	83
DILE(E)M...-G(-C)	54	86

DILER... + HDILE
DILER...-G + HDILE

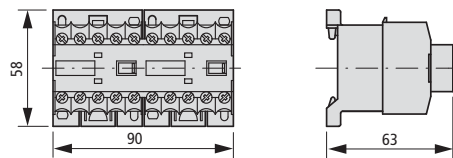


Suppressor circuit

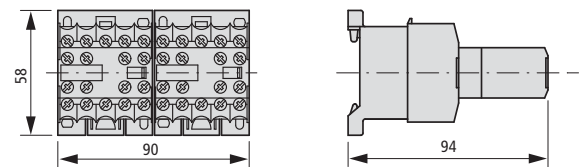
RCDILE...
VGDILE



2DILE... + MVDILE
2DILE...-G + MVDILE

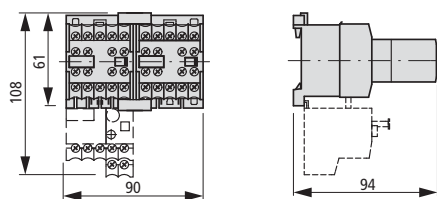


2DILE... + MVDILE + ...DILE
2DILE...-G + MVDILE + ...DILE



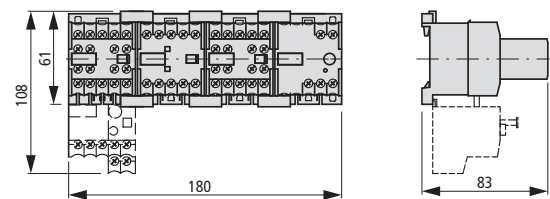
Reversing contactors

DIULEM

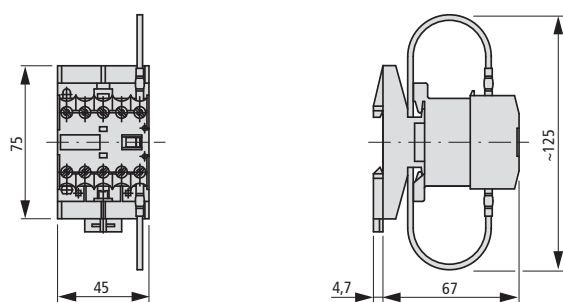


Star-delta contactors

SDAINLEM

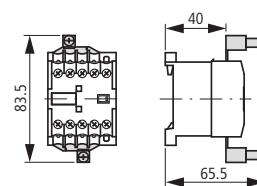


DILER... + TDDILE24



Parallel connector

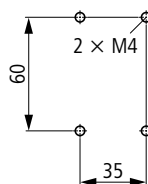
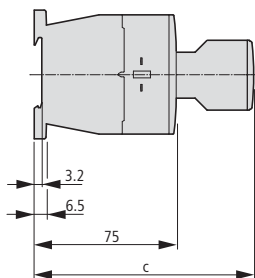
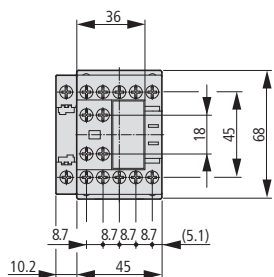
P1DILEM



Contactor with auxiliary contact module

DILM7...DILM15

DILA...

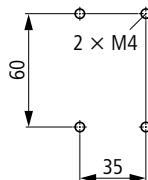
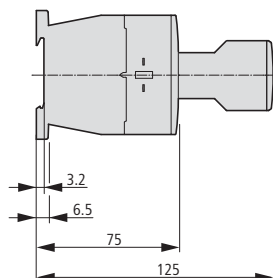
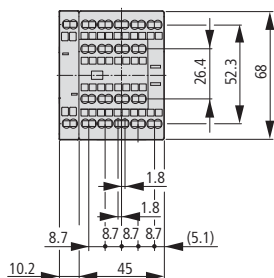


Part no.	c
DILM32-XHI	117
DILA-XHI	117
DILA-XHI...T	125

DILM7...DILM15

DILAC...

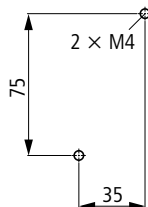
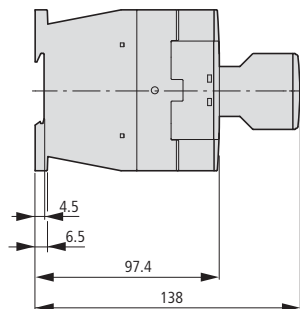
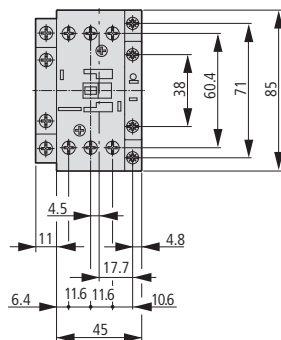
DILA-XHIC...



DILM17...DILM38

DILMC17...DILMC32

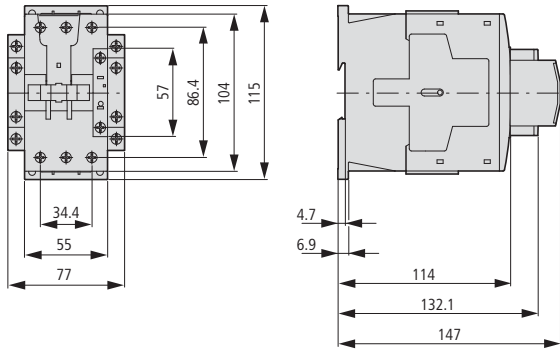
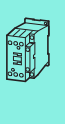
DILMF8...DILMF32



Clearance at side to grounded parts: 6 mm

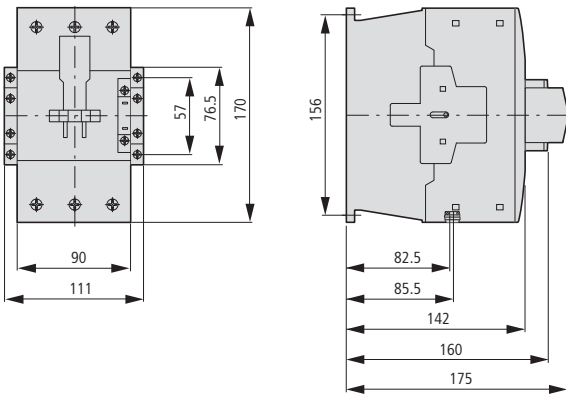
Contactors

DILM40...DILM72
 DILMC40...DILMC65
 DILMF40...DILMF65



Clearance at side to grounded parts: 6 mm

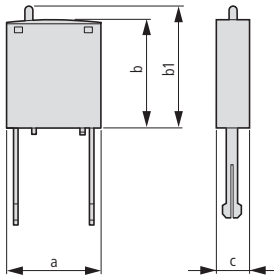
DILM80...DILM170
 DILMC80...DILMC150
 DILMF80...DILMF150



Clearance at side to grounded parts: 10 mm

Suppressor circuits

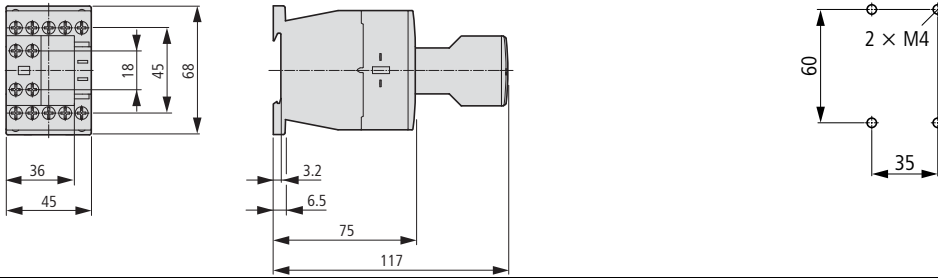
DILM...XSP...



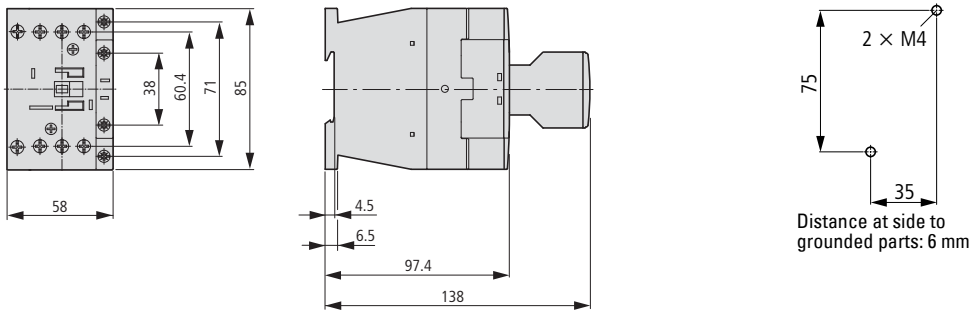
Part no.	a	b	b1	c
DILM12-XSP...	25	28	≈32	9
DILM32-XSP...	25	28	≈32	9
DILM95-XSP...	25	28	≈32	9

Contactor with auxiliary contact module

DILMP20

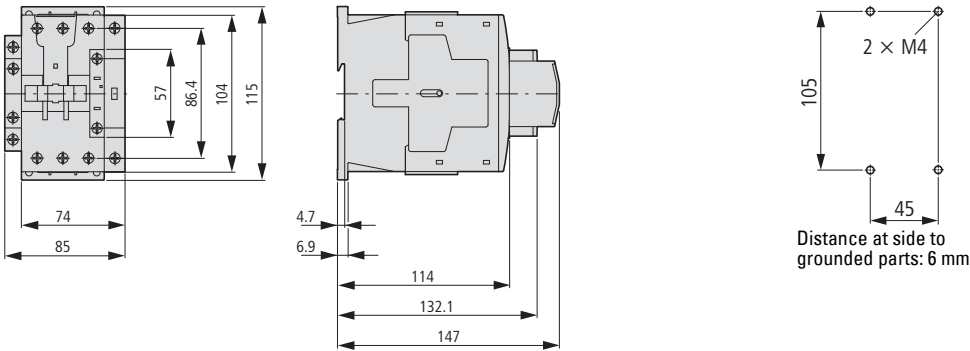


DILMP32 DILMP45

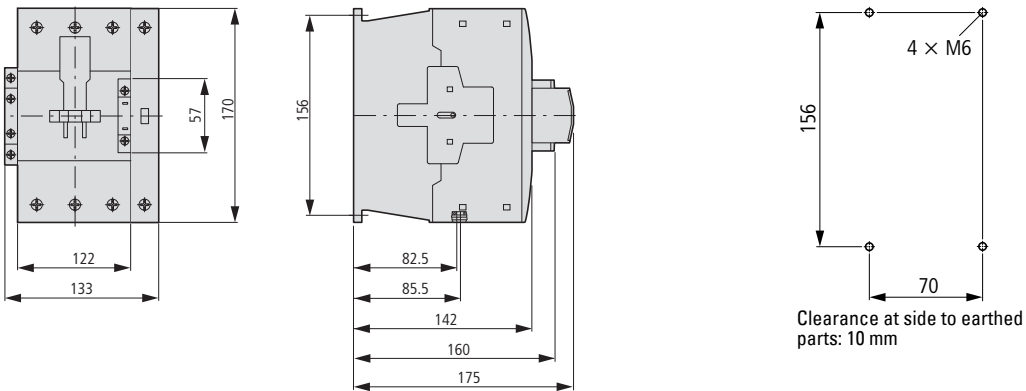


Contactors

DILMP63 DILMP80

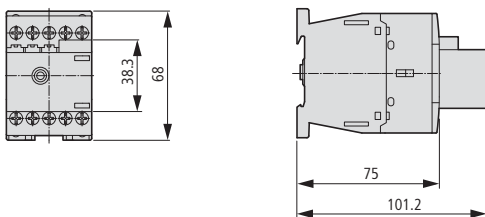


DILMP125 DILMP160 DILMP200



Motor suppressor module

DILM12-XMSM



5/138 Contactors

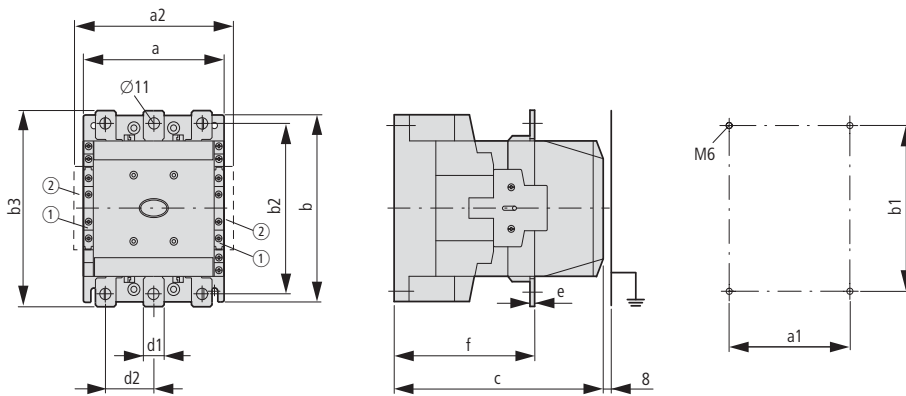
Complete units for currents greater than 170 A

...DILM

Complete units

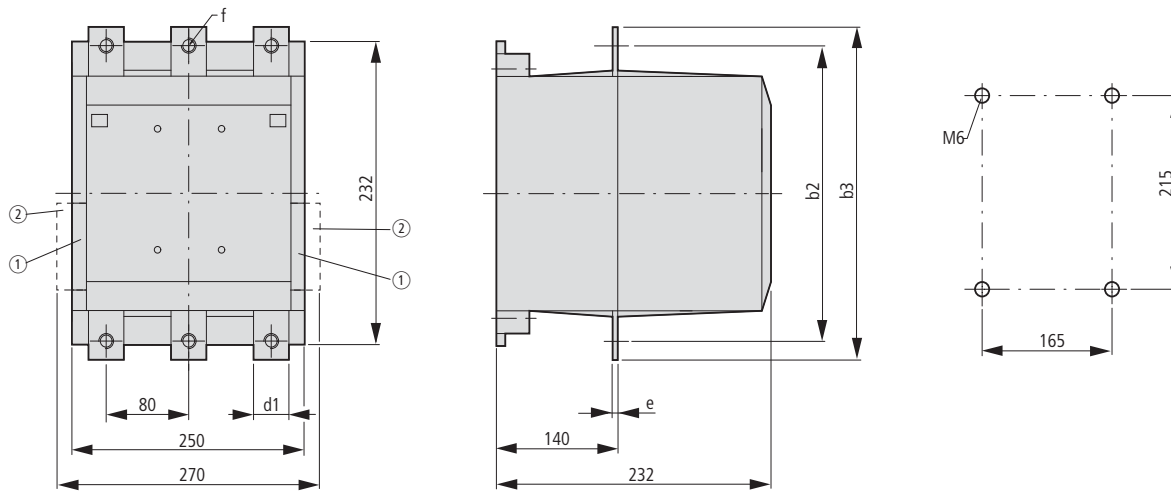
DILM185A...DILM500
DILM250-S...DILM570-S

① DILM1000-XHI...-SI
② DILM1000-XHI11-SA



Part no.	a	a1	a2	b	b1	b2	b3	d1	d2	e	c	f
DILM185A	140	120	160	180	160	165	190	20	41	5	158	83
DILM225A	140	120	160	180	160	165	190	20	41	5	158	83
DILM250	140	120	160	180	160	164	189	25	48	5	208	140
DILM300A	140	120	160	180	160	164	189	25	48	5	208	140
DILM400	160	130	180	200	180	184	209	25	48	6	216	140
DILM500	160	130	180	200	180	189	219	38	57	6	216	140
DILM570	160	130	180	200	180	189	219	38	57	6	216	140

DILM580...DILM1000

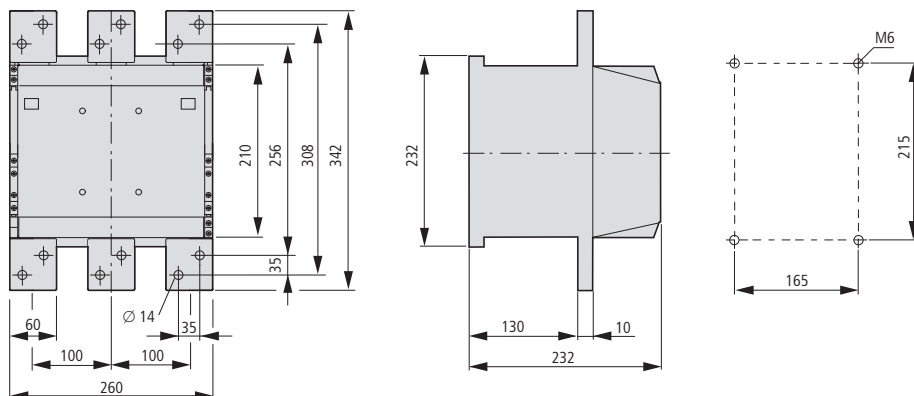


① DILM820-XHI...-SI
② DILM820-XHI11-SA

Part no.	b2	b3	d1	e	f
DILM580	256	296	45	6	13.5
DILM650	256	296	45	6	13.5
DILM750	256	296	45	6	13.5
DILM820	256	296	45	6	13.5
DILM1000	256	296	45	10	13.5

AC-1 contactors greater than 1000 A

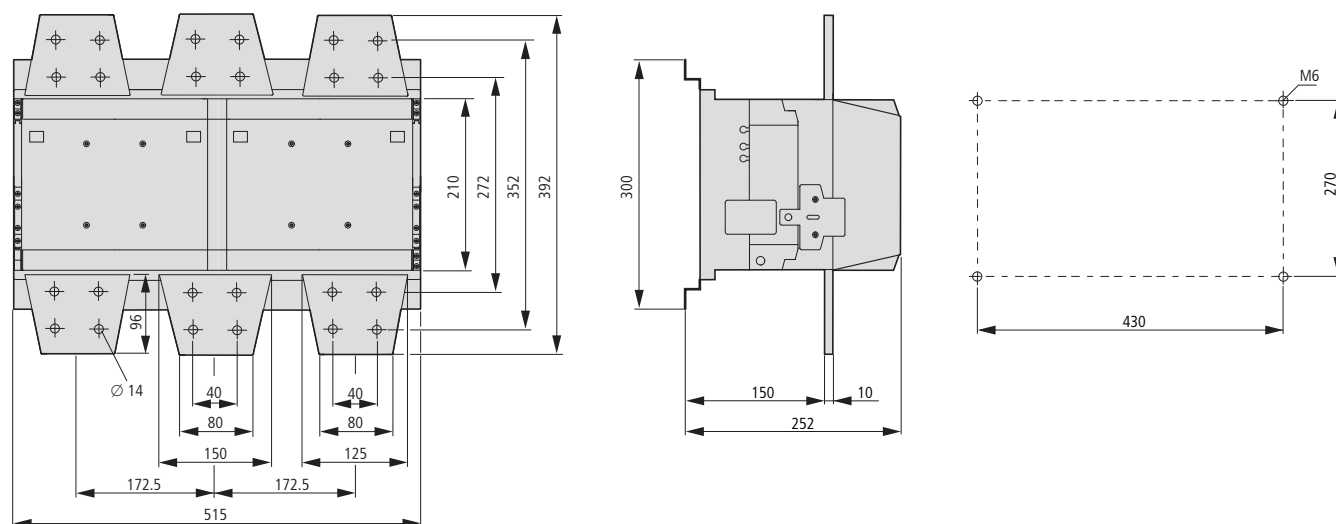
DILH1400



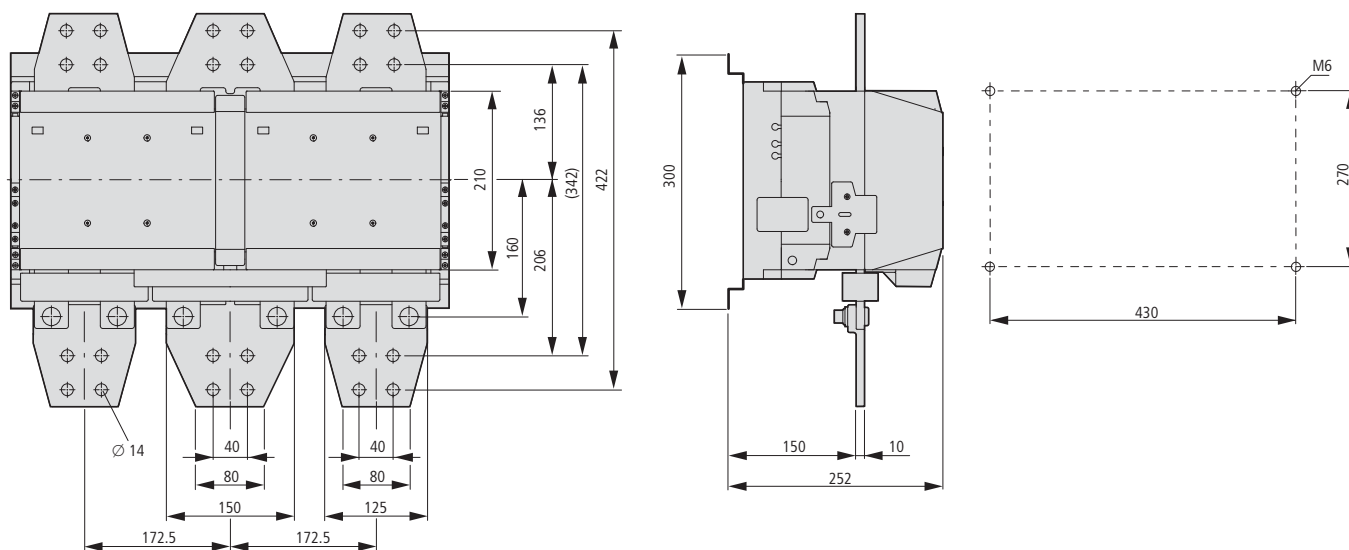
DILM1600

DILH2000

DILH2200

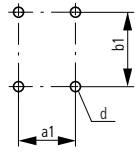
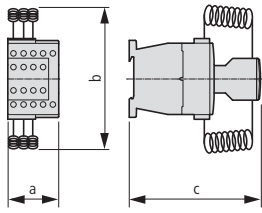


DILH2600



Contactor for capacitors

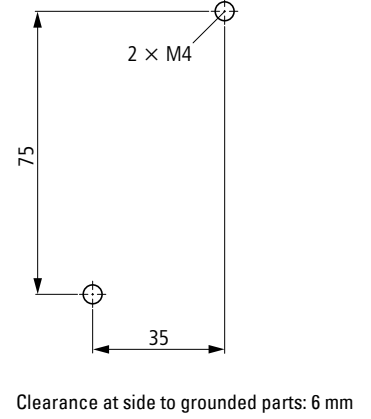
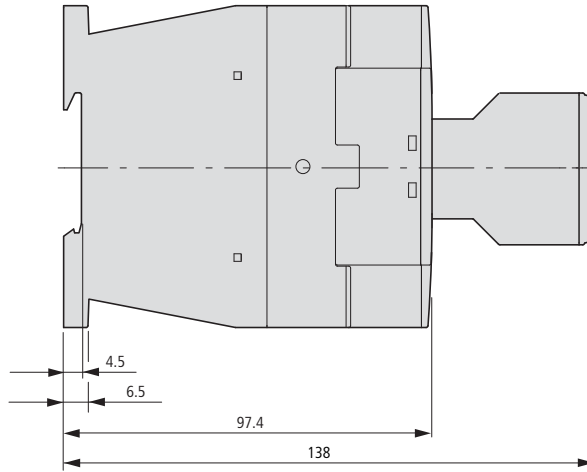
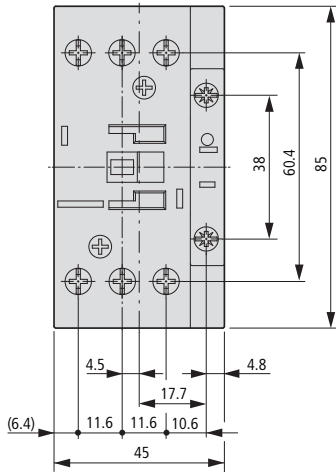
DILK...



Part no.	a	b	c	a1	b1	d
DILK12	45	135	138	35	75	2 x M4
DILK20	45	135	138	35	75	2 x M4
DILK25	45	135	138	35	75	2 x M4
DILK33	55	190	147	45	105	2 x M4
DILK50	55	190	147	45	105	2 x M4

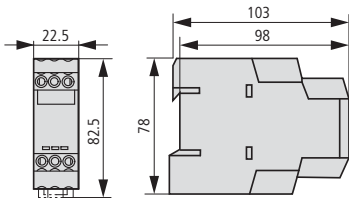
Illumination contactors

DILL...



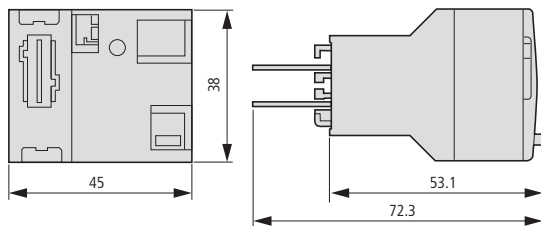
Contactor monitoring devices

CMD(...)



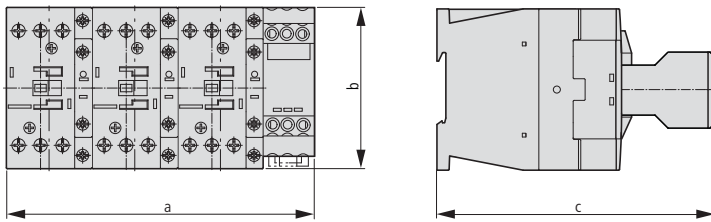
SWD contactor modules

DIL-SWD-32-...



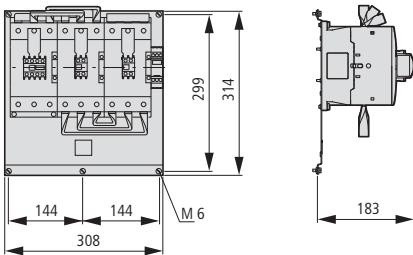
Star-delta contactors

SDAINLM12...SDAINLM115



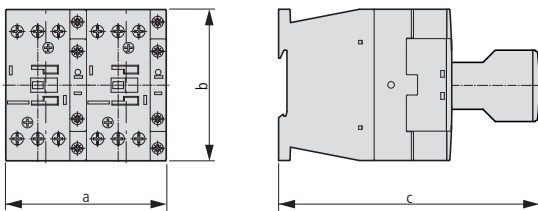
Part no.	a	b	c
SDAINLM12...22	158	68	117
SDAINLM30...55	158	85	138
SDAINLM70...115	188	115	147

SDAINLM140...SDAINLM260



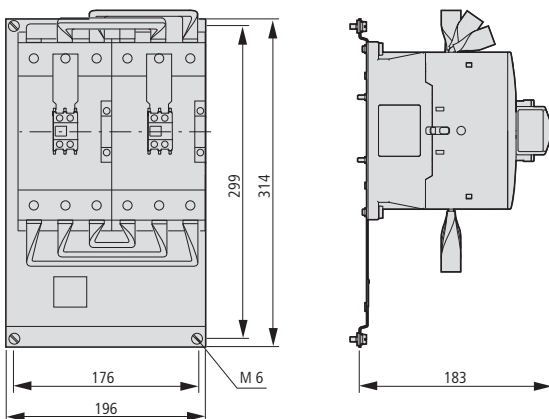
Reversing contactors

DIULM7...DIULM65



Part no.	a	b	c
DIULM7/21...12/21	90	68	117
DIULM17/21...32/21	90	85	138
DIULM40/11...65/11	110	115	147

DIULM80...DIULM150



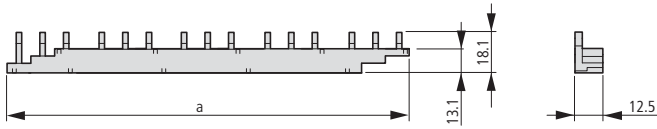
5/142 Contactors

Accessories

DILM...XDSB..., ETS4-VS3, DILM...XTE, DILM12-XMC...

Three-phase commoning links

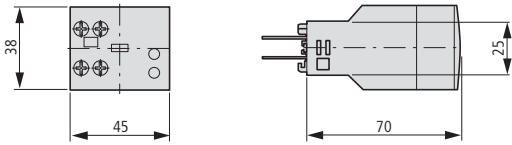
DILM12-XDSB...



Part no.	a
DILM12-XDSB0/3	112
DILM12-XDSB0/4	157
DILM12-XDSB0/5	202

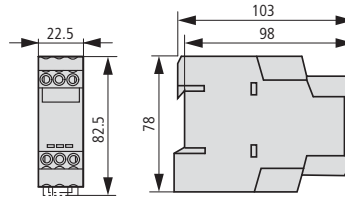
Electronic timer modules

DILM...XTE



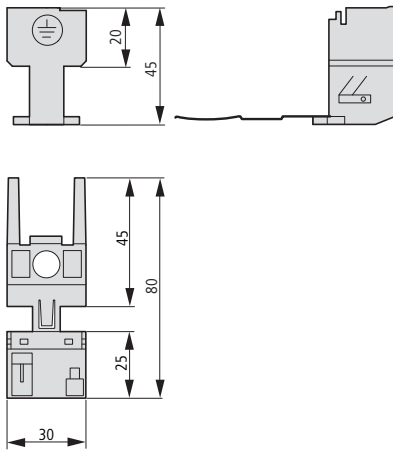
Amplifier module

ETS4-VS3

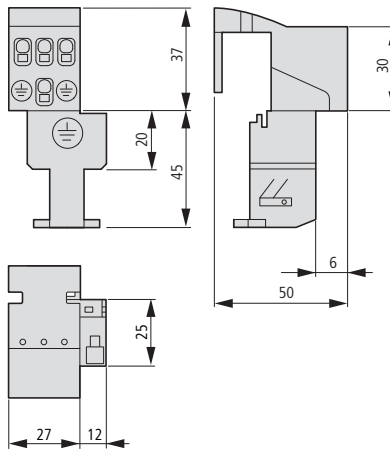


Wiring set for motor feeder plug

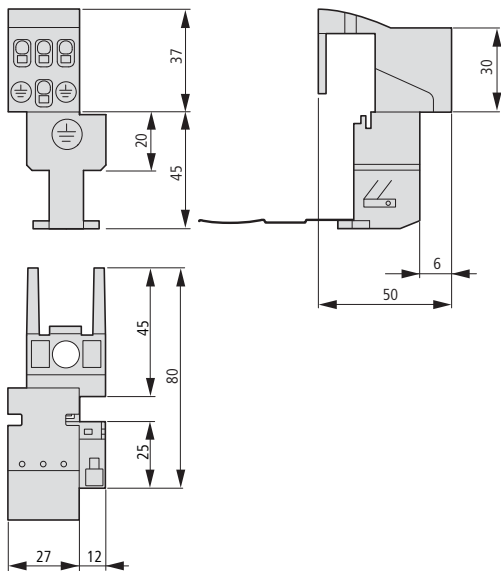
DILM12-XMCE



DILM12-XMCP/T



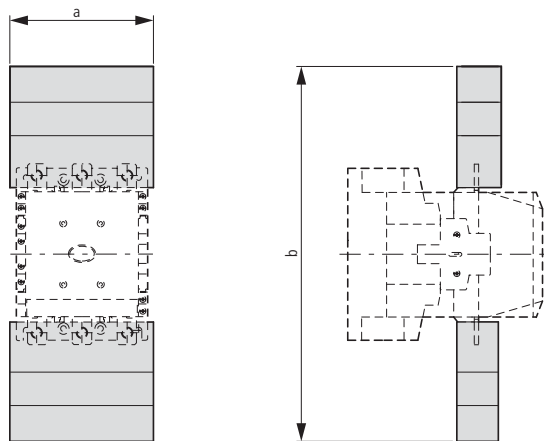
DILM12-XMCP/E



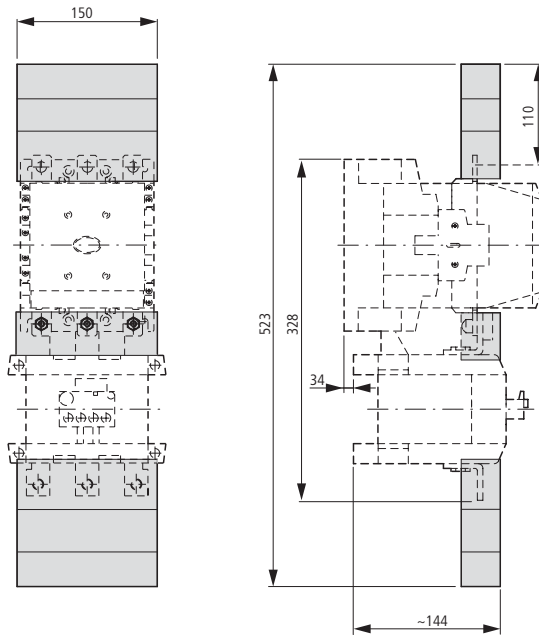
...DILM

Contactors with terminal shrouds

DILM250...DILM1000 + DILM...-XHB

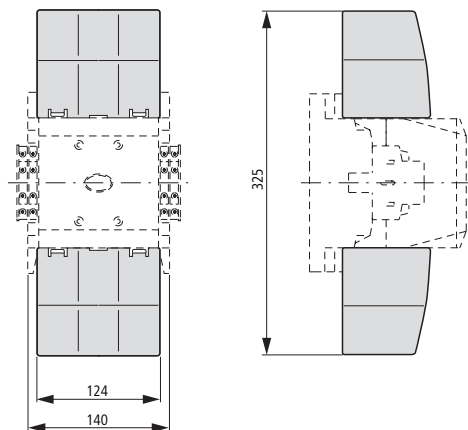


DILM250 + Z5-.../FF250



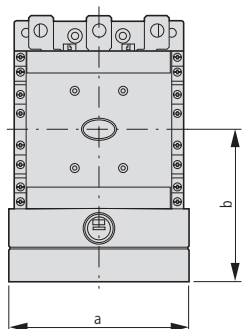
for part no.	a	b
DILM250, DILM300A	150	384
DILM400	150	404
DILM500	174	426
DILM580...1000	236	506

DILM185A...DILM225A + DILM225A-XHB



Contactor with star-point bridge and terminal shroud

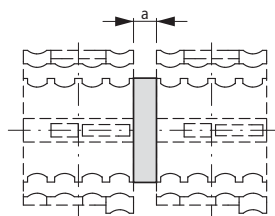
DILM...XS1



for part no.	a	b
DILM185...250	150	127
DILM300...400	150	137
DILM500	176	146

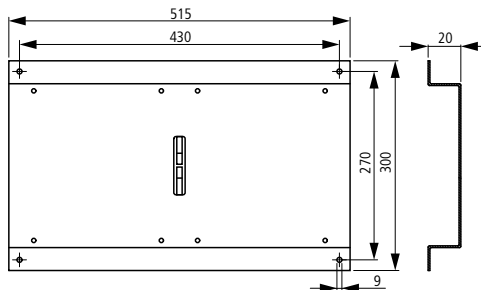
Mechanical interlock

DILM500-XMV



for part no.	a
DILM185...500	15

DILM820-XMV





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

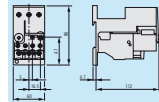
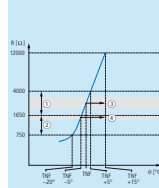


Description	
ZEV electronic overload relay	6/19

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

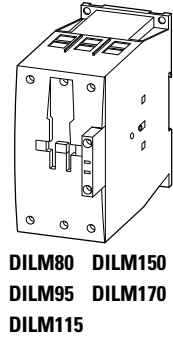
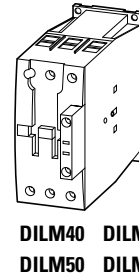
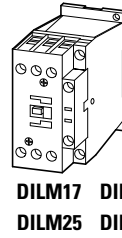
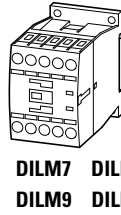
Technical data	
Bimetal relay for mini-contactor relays	6/30
Bimetal relays up to 150A	6/30
Overload relays greater than 150 A	6/31
Overload relays	6/31
ZEB electronic overload relay	6/33
ZEV electronic overload relay	6/34
EMT6 thermistor overload relay for machine protection	6/36

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)

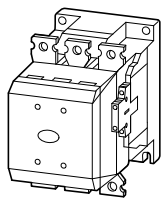


Overload relays

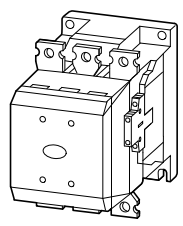
ZE 0.1-12					
ZB12 0.1-16					
ZB32 0.1-38					
ZB65 6-75					
ZB150 35-175					
Z5-.../FF225A 70-250					
Z5-.../FF250 50-300					

Current transformer-operated overload relay

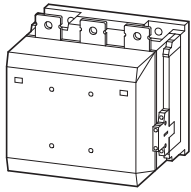
ZW7-...
42-630



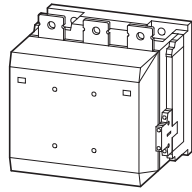
DILM185A
DILM225A



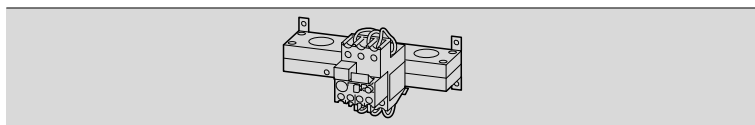
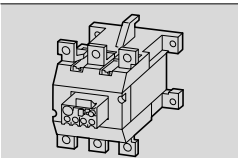
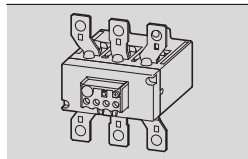
DILM250
DILM300



DILM400 DILM500
DILM500



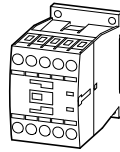
DILM650



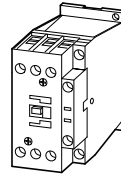
Setting ranges (A)
(note max. current of the contactor)



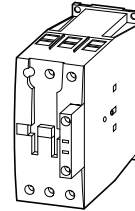
DILEM



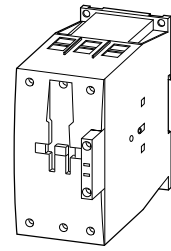
**DILM7 DILM12
DILM9 DILM15**



**DILM17 DILM32
DILM25 DILM38**



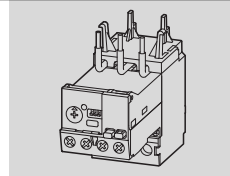
**DILM40 DILM65
DILM50 DILM72**



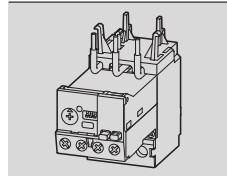
**DILM80 DILM150
DILM95 DILM170
DILM115**

Electronic overload relays

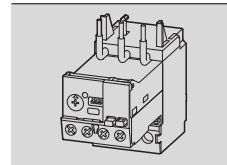
ZEB12
0.33-20



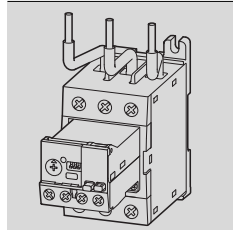
ZEB32
0.33-45



ZEB65
9-100

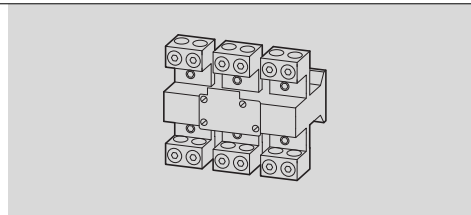


ZEB150
20-100

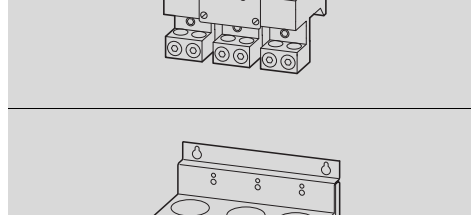


ZEB32-5-(GF)/KK combined with

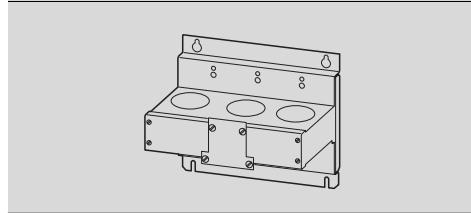
ZEB-XCT300
60-300



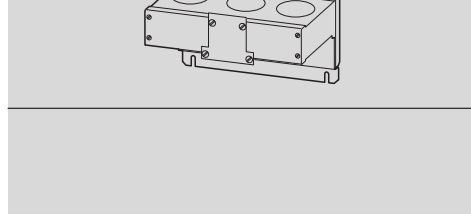
ZEB-XCT600
120-600



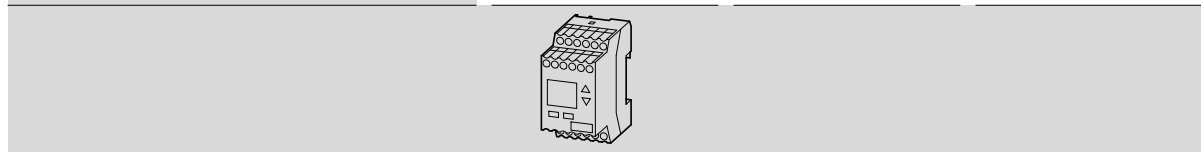
ZEB-XCT1000
200-1000



ZEB-XCT1500
300-1500

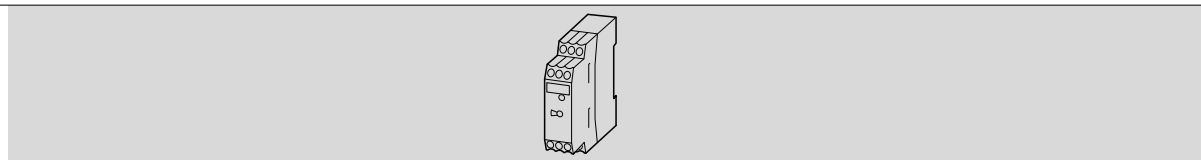


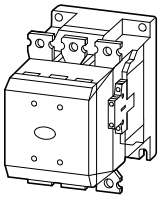
ZEV
1-820



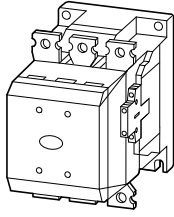
Thermistor overload relay for machine protection

EMT6((DB)K)

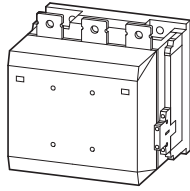




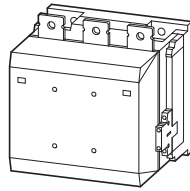
DILM185A
DILM225A



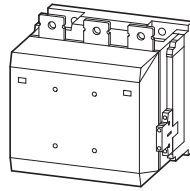
DILM250
DILM300



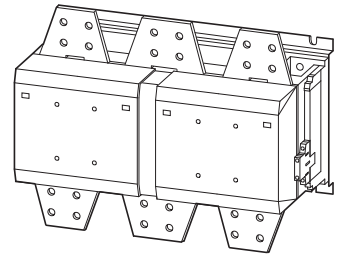
DILM400 DILM500
DILM580 DILM650



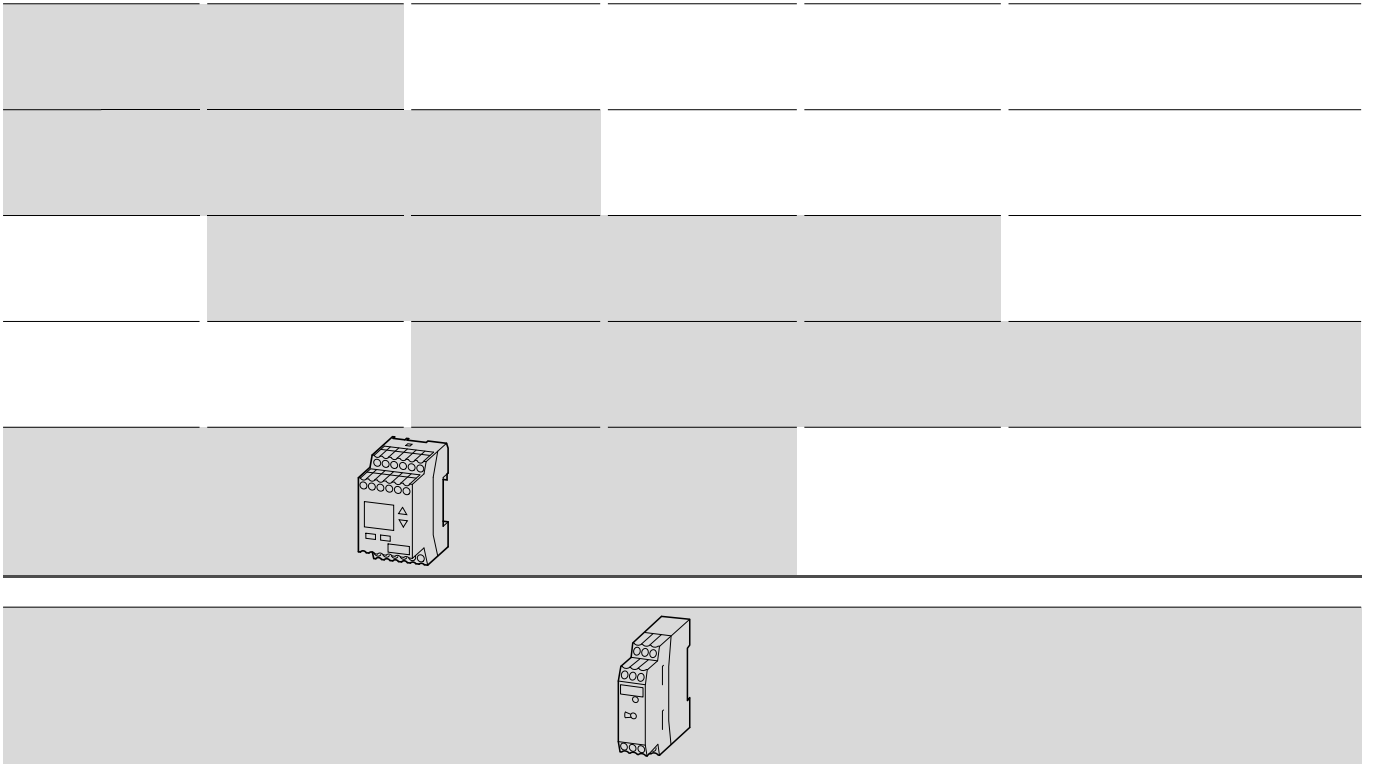
DILM750 DILM820



DILM1000



DILM1600

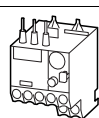


Ordering

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

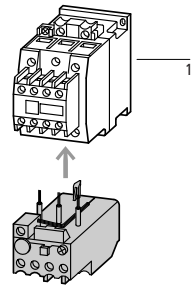
Information relevant for export to North America



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.
ZE-0.24 014285			
ZE-0.4 014300			Suitable for protection of EEx e motors
ZE-0.6 014333			 II (2) GD PTB 01 ATEX 3331
ZE-1.0 014376			Observe manual AWB2300-1425D/GB.
ZE-1.6 014432			
ZE-2.4 014479			
ZE-4 014518			
ZE-6 014565			
ZE-9 014708			
ZE-12 014752			

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



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



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

	0.1 – 0.16		1 N/O	1 NC	DILM7, DILM9, DILM12, DILM15, DIULM7, DIULM9, DIULM12, SDAINLM12, SDAINLM16, SDAINLM22	-	25	0.5
	0.16 – 0.24						1	
	0.24 – 0.4						2	
	0.4 – 0.6						4	
	0.6 – 1						4	
	1 – 1.6						6	
	1.6 – 2.4						10	
	2.4 – 4						16	
	4 – 6						20	
	6 – 10						50	25
	9 – 12						DS7-34...SX007... DS7-34...SX009... DS7-34...SX012...	
	12 – 16						-	

ZB32 overload relay

	0.1 – 0.16		1 N/O	1 NC	DILM17, DILM25, DILM32, DILM38, DILMF8, DILMF11, DILMF14, DILMF17, DILMF25, DILMF32, DIULM17, DIULM25, DIULM32, SDAINLM30, SDAINLM45, SDAINLM55	-	25	0.5	
	0.16 – 0.24						1		
	0.24 – 0.4						2		
	0.4 – 0.6						4		
	0.6 – 1						4		
	1 – 1.6						6		
	1.6 – 2.4						10		
	2.4 – 4						16		
	4 – 6						20		
	6 – 10						50	25	
	10 – 16						DS7-34...SX016...	63	35
	16 – 24						DS7-34...SX024...	100	35
	24 – 32						DS7-34...SX032...	125	63
32 – 38	-	125	63						



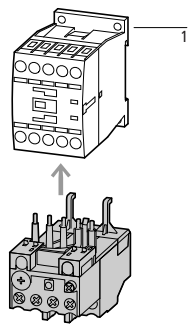


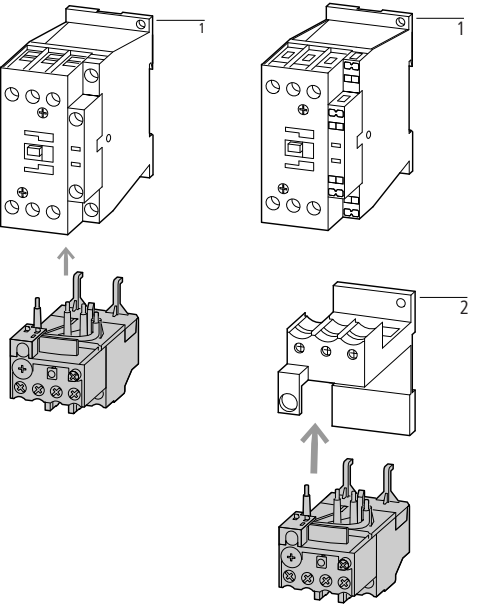
Information relevant for export to North America



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 Suitable for Max. voltage R Rating Degree of Protection See also

UL Listed, CSA certified Branch circuits
 600 V AC
 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		1 Off 	<p>Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor.</p> <p>Suitable for protection of EEx e motors.</p> <p> II (2) GD PTB 04 ATEX 3022</p> <p>Observe manual AWB2300-1527D/GB.</p> <ul style="list-style-type: none"> • Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting 	<p>Fitted directly to the contactor</p>  <p>1 Contactor → Chapter 5 Accessories → Page 6/26 Manual → Page 6/26</p>
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 	<p>Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor.</p> <p>Suitable for protection of EEx e motors.</p> <p> II (2) GD PTB 04 ATEX 3022</p> <p>Observe manual AWB2300-1527D/GB.</p> <ul style="list-style-type: none"> • Phase failure sensitivity to IEC/EN 60947, VDE 0660 Part 102 • Test/off pushbutton • Reset pushbutton manual/auto • Trip-free release • Direct mounting 	<p>Fitted directly to the contactor Separate mounting</p>  <p>1 Contactor → Chapter 5 2 Base → Page 6/26 Manual → Page 6/26</p>



Setting range of
overload
releases

Circuit symbol

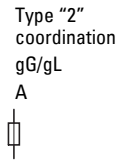
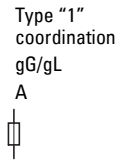
Auxiliary contact

For use with

Short-circuit protection



N/O = normally open contact
NC = normally closed contact



ZB65 overload relay

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

	6 – 10		1 N/O	1 NC	DILM40, DILM50, DILM65, DILM72, DILMF40, DILMF50, DILMF65, DIULM40, DIULM50, DIULM65, SDAINLM70, SDAINLM90, SDAINLM115	50	25
	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

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

	35 – 50		1 N/O	1 NC	DILM80, DILM95, DILM115, DILM150, DILM170 DILMF80, DILMF95, DILMF115, DILMF150, DIULM80, DIULM95, DIULM115, DIULM150, SDAINLM140, SDAINLM165, SDAINLM200, SDAINLM260	160	125
	50 – 70					250	160
	70 – 100					315	200
	95 – 125					315	250
	120 – 150					315	250
	145 – 175					315	250

ZB150 overload relay

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


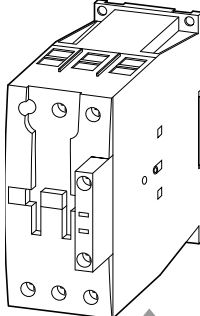
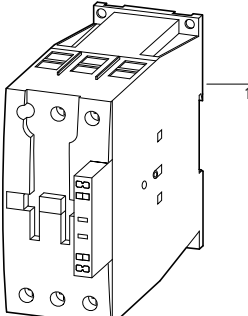
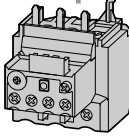
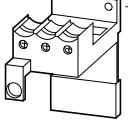


	35 – 50		1 N/O	1 NC	DILM80, DILM95, DILM115, DILM150, DILM170 DILMF80, DILMF95, DILMF115, DILMF150, DIULM80, DIULM95, DIULM115, DIULM150, SDAINLM140, SDAINLM165, SDAINLM200, SDAINLM260	160	125
	50 – 70					250	160
	70 – 100					315	200
	95 – 125					315	250
	120 – 150					315	250
	145 – 175					400	315

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

HPL06011EN

Part no. Article no.	Price See price list	Std. pack	Notes	
ZB65-10 278455 ZB65-16 278456 ZB65-24 278457 ZB65-40 278458 ZB65-57 278459 ZB65-65 278460 ZB65-75 108792		1 Off 	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EExe motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Fitted directly to the contactor</p>  </div> <div style="text-align: center;"> <p>Separate mounting</p>  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;">   </div> <p style="font-size: small;">1 Contactor → Chapter 5 2 Base → Page 6/26 Manual → Page 6/26</p>
ZB150-50 278462 ZB150-70 278463 ZB150-100 278464 ZB150-125 278465 ZB150-150 278466 ZB150-175 107316		1 Off 	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.	
ZB150-50/KK 278468 ZB150-70/KK 278469 ZB150-100/KK 278470 ZB150-125/KK 278471 ZB150-150/KK 278472 ZB150-175/KK 107317		1 Off 	Overload release: tripping class 10 A Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor. Suitable for protection of EEx e motors. Ex II (2) GD PTB 04 ATEX 3022 Observe manual AWB2300-1545D/GB.	



Setting range of of
overload releases

Circuit symbol

Auxiliary
contacts

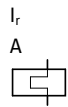
For use with

Short-circuit protection

N/O = normally open
contact
NC = normally closed
contact

Type "1"
coordination
gG/gL

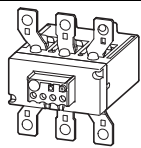
Type "2"
coordination
gG/gL



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

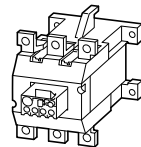
70 – 100

95 – 125

120 – 160

160 – 220

200 – 250



50 – 70

70 – 100

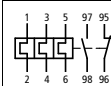
95 – 125

120 – 160

160 – 220

200 – 250

250 – 300



1 N/O

1 NC

DILM185A
DILM225A

250

250

315

315

315

400

400

400

500

400

500

500

160

160

200

200

250

250

250

315

400

315

400

DILM250

250

250

315

315

315

315

400

400

400

400

500

400

400

500

500

160

160

200

200

250

250

250

250

315

400

400

315

400

400

DILM300A

500

500

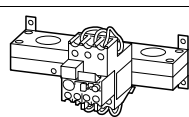
400

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

60 – 90

85 – 125

110 – 160

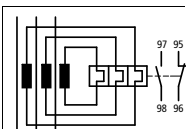
160 – 240

190 – 290

270 – 400

360 – 540

420 – 630



1 N/O

1 NC

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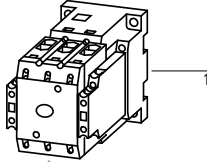

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HPL06013EN

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	Product Standards UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
Z5-100/FF225A 139573			Short-circuit protection: With direct mounting, observe the maximum permissible fuse of the contactor.	NA Certification Request filed for UL and CSA
Z5-125/FF225A 139574			Z5-.../FF225A for protecting EEx electric motors in preparation.	Suitable for Branch circuits
Z5-160/FF225A 139575				Max. Voltage Rating 600 V AC
Z5-220/FF225A 139576			Fitted directly to the contactor	Degree of Protection IEC: IP00, UL/CSA Type: - → Page 6/29
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. E29184
Z5-125/FF250 210072				UL CCN NKCR
Z5-160/FF250 210073				CSA File No. 12528
Z5-220/FF250 210074				CSA Class No. 3211-03
Z5-250/FF250 210075				NA Certification UL Listed, CSA certified
Z5-300/FF250 139578			1 Contactor → Chapter 5 Accessories → Page 6/27	Suitable for Branch circuits
				Max. Voltage Rating 600 V AC
				Degree of Protection IEC: IP00, UL/CSA Type: - → Page 6/29
ZW7-63 000245		1 Off	The main current characteristic values are defined by the main current wiring being used.	Product Standards UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking
ZW7-90 002618			Adjustment for smaller rated motor currents → Page 6/28	UL File No. E29184
ZW7-125 004991				UL CCN NKCR
ZW7-160 007364				CSA File No. 12528
ZW7-240 009737				CSA Class No. 3211-03
ZW7-290 052448				NA Certification UL Listed, CSA certified
ZW7-400 045329				Suitable for Branch circuits
ZW7-540 047702				Max. Voltage Rating 600 V AC
ZW7-630 050075		1 Off		Degree of Protection IEC: IP00, UL/CSA Type: -

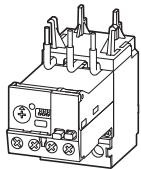


Ground fault detection	Setting range of overload releases	Circuit symbol	Auxiliary contact	For use with
	I_r A		N/O = normally open contact NC = normally closed contact	

ZEB12 electronic overload relay

- Phase-failure sensitivity
- Test/off pushbutton
- Reset button
- Manual/Auto reset selectable
- Protection with heavy starting duty (Class 5-30)

Direct mounting

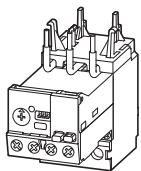


Without	0.33 – 1.65		1 N/O	1 NC	DILM7 DILM9 DILM12 DILM15 DIULM7 DIULM9 DIULM12 SDAINLM12 SDAINLM16 SDAINLM22
Without	1 – 5				
Without	4 – 20				
With	0.33 – 1.65				
With	1 – 5				
With	4 – 20				

ZEB32 electronic overload relay

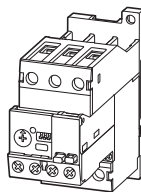
- Phase-failure sensitivity
- Test/off pushbutton
- Reset button
- Manual/Auto reset selectable
- Protection with heavy starting duty (Class 5-30)

Direct mounting



Without	0.33 – 1.65		1 N/O	1 NC	DILM17 DILM25 DILM32 DILM38 DIULM17 DIULM25 DIULM32 SDAINLM30 SDAINLM45 SDAINLM55
Without	1 – 5				
Without	4 – 20				
Without	9 – 45				
With	0.33 – 1.65				
With	1 – 5				
With	4 – 20				
With	9 – 45				



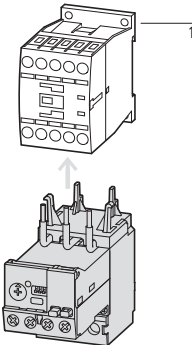


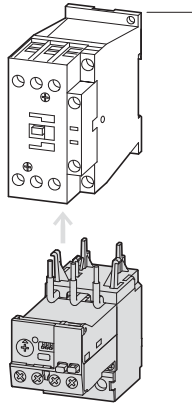


Separate mounting



Without	0.33 – 1.65		1 N/O	1 NC	DILM17 DILM25 DILM32 DILM38 DIULM17 DIULM25 DIULM32 SDAINLM30 SDAINLM45 SDAINLM55
Without	1 – 5				
Without	4 – 20				
Without	9 – 45				
With	0.33 – 1.65				
With	1 – 5				
With	4 – 20				
With	9 – 45				

Information relevant for export to North America

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

Part no. Article no.	Price See price list	Std. pack	Notes	
ZEB12-1,65 136480 ZEB12-5 136481 ZEB12-20 136482 ZEB12-1,65-GF 136483 ZEB12-5-GF 136484 ZEB12-20-GF 136485		1 Off 	Suitable for protection of EEx e motors.  II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
ZEB32-1,65 136486 ZEB32-5 136487 ZEB32-20 136488 ZEB32-45 136489 ZEB32-1,65-GF 136490 ZEB32-5-GF 136491 ZEB32-20-GF 136492 ZEB32-45-GF 136493		1 Off 	Suitable for protection of EEx e motors.  II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
ZEB32-1,65/KK 136494 ZEB32-5/KK 136495 ZEB32-20/KK 136496 ZEB32-45/KK 136497 ZEB32-1,65-GF/KK 136498 ZEB32-5-GF/KK 136499 ZEB32-20-GF/KK 136500 ZEB32-45-GF/KK 136501		1 Off 	Suitable for protection of EEx e motors.  II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor 1 Contactor → Chapter 5 Accessories → Page 6/18



Ground fault detection

Setting range of overload releases

I_r
A



Circuit symbol

Auxiliary contact

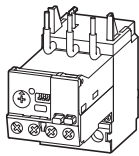
N/O = normally open contact
NC = normally closed contact

For use with

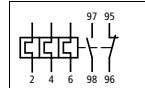
ZEB65 electronic overload relay

- Phase-failure sensitivity
- Test/off pushbutton
- Reset button
- Manual/Auto reset selectable
- Protection with heavy starting duty (Class 5-30)

Direct mounting



Without	9 – 45
With	9 – 45
Without	20 – 100
With	20 – 100



1 N/O

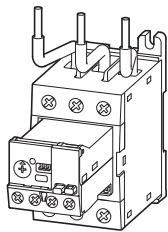
1 NC

- DILM40
- DILM50
- DILM65
- DILM72
- DIULM40
- DIULM50
- DIULM65
- SDAINLM70
- SDAINLM90
- SDAINLM115

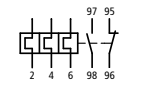
ZEB150 electronic overload relay

- Phase-failure sensitivity
- Test/off pushbutton
- Reset button
- Manual/Auto reset selectable
- Protection with heavy starting duty (Class 5-30)

Direct mounting



Without	20 – 100
With	20 – 100

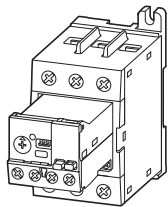


1 N/O

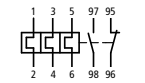
1 NC

- DILM80
- DILM95
- DILM115
- DILM150
- DIULM80
- DIULM95
- DIULM115
- DIULM150
- SDAINLM140
- SDAINLM165
- SDAINLM200
- SDAINLM260

Separate mounting



Without	20 – 100
With	20 – 100





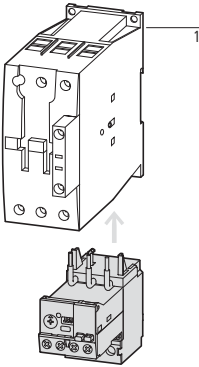


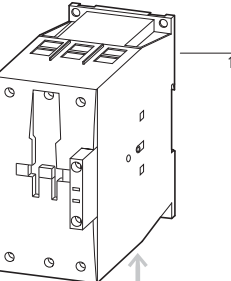


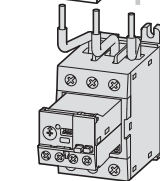
1 N/O

1 NC

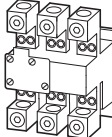


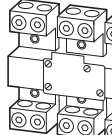
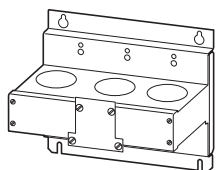





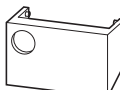
- DILM80
- DILM95
- DILM115
- DILM150
- DIULM80
- DIULM95
- DIULM115
- DIULM150
- SDAINLM140
- SDAINLM165
- SDAINLM200
- SDAINLM260

Information relevant for export to North America

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

Part no. Article no.	Price See price list	Std. pack	Notes	
ZEB65-45 136502 ZEB65-45-GF 136503 ZEB65-100 136504 ZEB65-100-GF 136505		1 Off 	Suitable for protection of EEx e motors.  II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
ZEB150-100 136506 ZEB150-100-GF 136507		1 Off 	Suitable for protection of EEx e motors.  II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18
ZEB150-100/KK 136508 ZEB150-100-GF/KK 136509		1 Off 	Suitable for protection of EEx e motors.  II (2) GD PTB ATEX starting 08/2010 Observe manual AWB2320-1633D/GB. Switchgear and cable dimensioning according to CLASS → Page 6/22	Fitted directly to the contactor  1 Contactor → Chapter 5 Accessories → Page 6/18



	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)

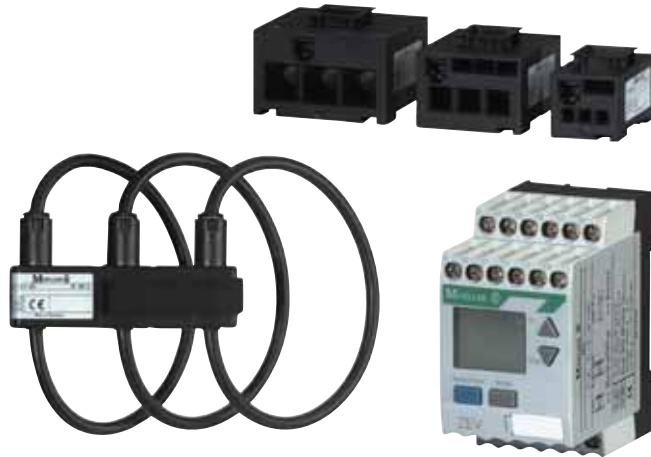
Information relevant for export to North America

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								
<ul style="list-style-type: none"> • 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

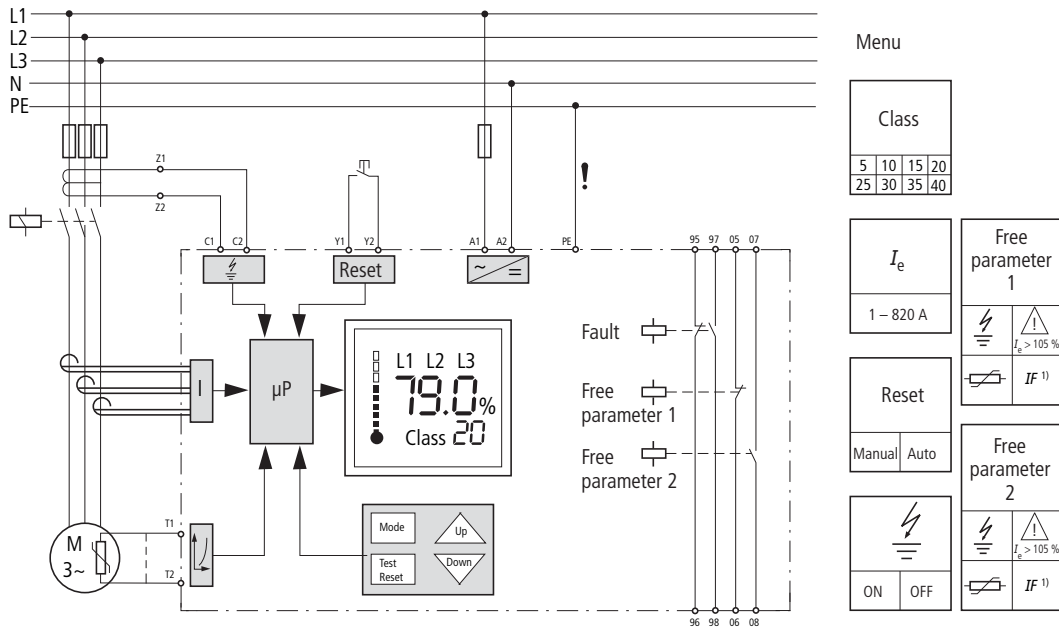
UL/CSA certification not required

6/22 Electronic motor protective relay

Selection aid

ZEV, ZEB

Engineering



¹⁾ IF: Internal fault

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

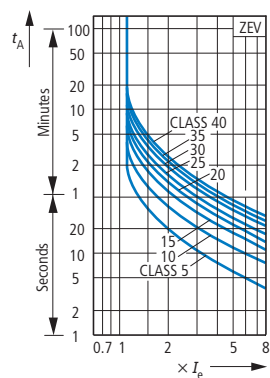
Rated motor currents < 1 A

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.

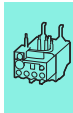
Number of loops n		4	3	2
Rated motor current I_N	A	0.25...0.32	0.33...0.49	0.5...0.99
Set current on the relay I_E between the lowest and highest values	A	1.00...1.28	1.00...1.47	1.00...1.98

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 $\sum R_K \leq 1500 \Omega$

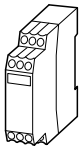




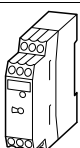
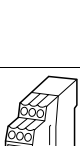





at $R_K \leq 250 \Omega$ per sensor: 6 sensors

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			
 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-DB(230V) ^{1) 2)} 066401			
 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-KDB ²⁾ 269471			
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

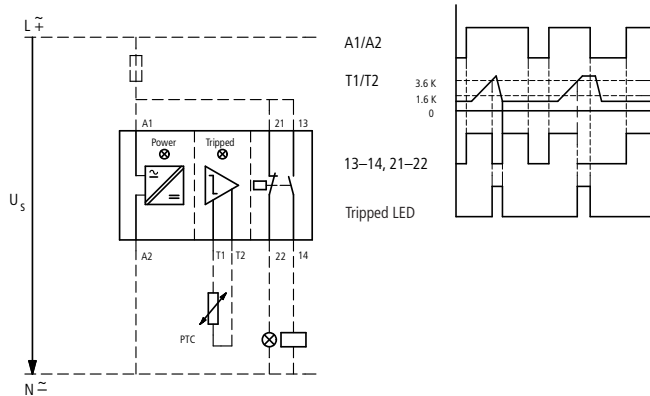


UL/CSA certification not required

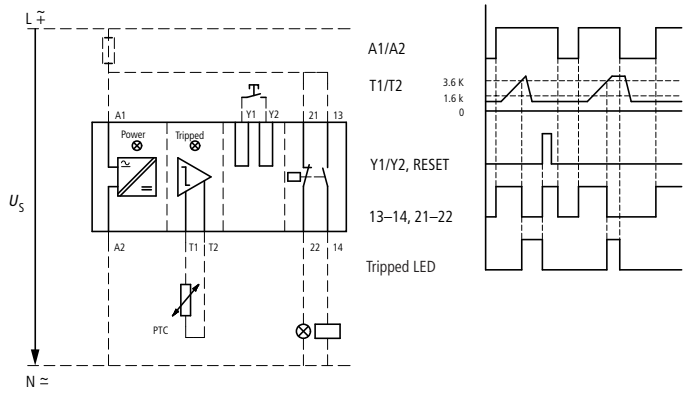
Engineering

Terminal marking according to EN 50005

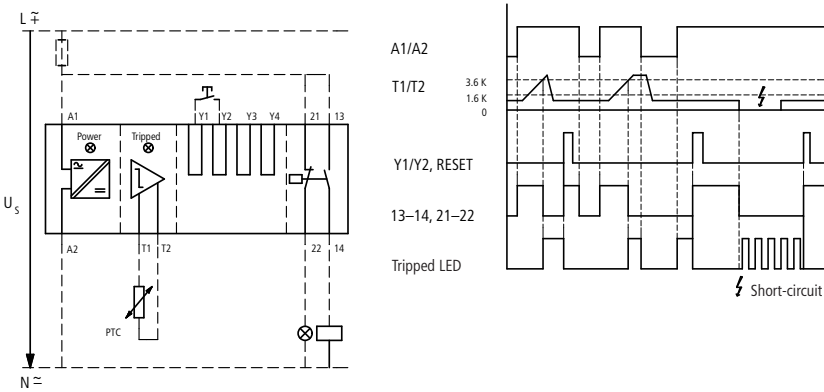
**EMT6(-K), EMT6(-K)DB, EMT6-DBK
Auto**



**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

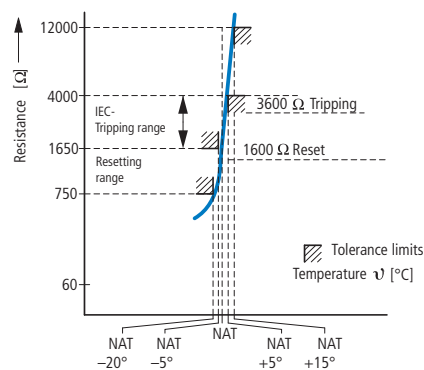
At $R_K \leq 250 \Omega$ per sensor: 6 sensors, at $R_K \leq 100 \Omega$ per sensor: 9 sensors in the winding (provided by user), max. cable length to sensor 250 m (not shielded);
Total PTC thermistor resistance $\sum R_K \leq 1500 \Omega$

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




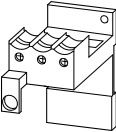














R_{T1-T2}	EMT6... U_{T1-T2} V DC max.	I_{T1-T2} mA max.
T1, T2 short-circuited	-	1.9
4 k Ω	3	0.8
T1-T2 open	5.1	-

Functions that can be disconnected on the EMT6-DBK:

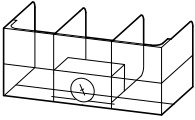
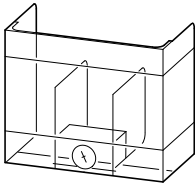
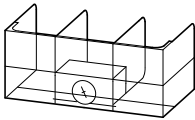
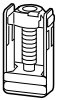
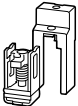
Function	Disconnection by link
Short-circuit monitoring	Y ₁ - Y ₃
Zero-voltage safety	Y ₁ - Y ₄



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.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification Max. Voltage Rating Degree of Protection
	ZB65	ZB65-XEZ 278474	2 off  	For ZB32-38, use BK25/3-PKZ0 additionally.	UL 508; CSA-C22.2 No. 14; IEC/EN 60947-4-1; CE marking E29184 NKCR 12528 3211-03 UL Listed, CSA certified 600 V AC IEC: IP20, UL/CSA Type: -
Pushbuttons					
For enclosed Overload relay Mounting diameter: 22.3 mm					
External reset button, IP65					
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	M22-DZ-B 254833	10 off  	Button plate, blue	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	M22-DZ-B-GB14 254834	10 off  	Button plate, blue RESET	UL 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking E29184 NKCR 012528 3211-03 UL Listed, CSA certified
Off button, IP65					
	ZW7... ZE Z5 ZB12 ZB32 ZB65 ZB150	M22-DZ-X 254835	10 off  	Without button plate, add button plate.	Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification
					UL 508; CSA-C22.2 No. 14; IEC/EN 60947; CE marking E29184 NKCR 012528 3211-03 UL Listed, CSA certified
Button plates					
	M22-DZ-X	M22-XD-R 216423	10 off  	Button plate, red	UL/CSA certification not required
	M22-DZ-X	M22-XD-R-X0 218153		Red button plate with white circle	
	M22-DZ-X	M22-XD-R-GB0 218194		Button plate red STOP	

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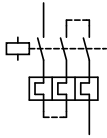
For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Covers				
 <p>Direct mounting Z5.../FF225 to DILM185A DILM225A</p>	Z5/FF225A-XHB-Z 139579		1 off	Fitted directly to the contactor DILM400-XHB DILM185A/225A Z5/FF225A-XHB-Z Z5.../FF225A Z5/FF250-XHB
 <p>Z5.../FF225A Z5.../FF250</p>	Z5/FF250-XHB 215217		1 off	Separate mounting Z5/FF250-XHB Z5.../FF250/FF225A Z5/FF250-XHB Fitted directly to the contactor DILM400-XHB DILM250/300A Z5/FF250-XHB-Z Z5.../FF250 Z5/FF250-XHB Fitted directly to the contactor DILM400-XHB DILM185A/225A Z5/FF225A-XHB-Z Z5.../FF225A Z5/FF250-XHB
 <p>Direct mounting Z5.../FF250 to DILM250 DILM300A</p>	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.



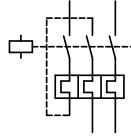
Engineering

Protection of single-phase and DC current motors:

1 pole

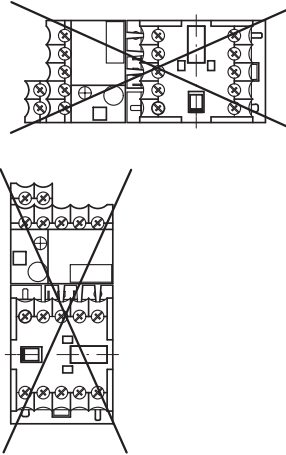


2 pole

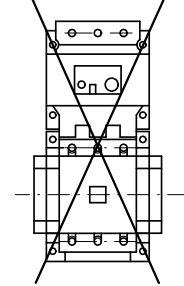


Mounting position:

ZE

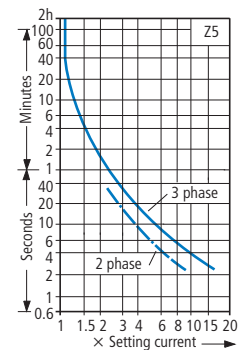
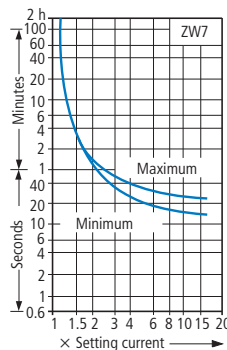
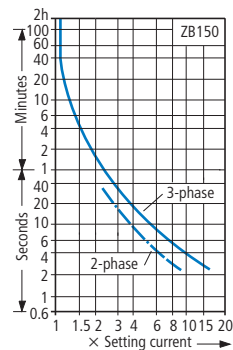
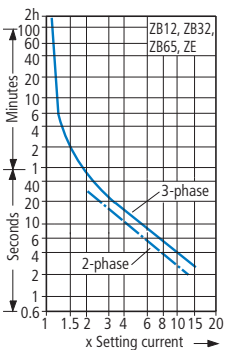


ZB12, ZB32, ZB65, ZB150, Z5



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

Notes

¹⁾ Ambient temperature: Operating range to IEC/EN 60947, PTB: -5°C to +50°C

²⁾ Fixing with box terminals



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

Notes

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

ZEB

			ZEB12, ZEB32	ZEB65-45	ZEB65-100	ZEB150
General						
Standards			IEC/EN 60947, VDE 0660, UL, CSA			
Climatic proofing			Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature						
Open		°C	-25...65	-25...65	-25...65	-25...65
Enclosed		°C	-25...65	-25...40	-25...40	-25...40
Temperature compensation			Continuous	Continuous	Continuous	Continuous
Mounting position			Any	Any	Any	Any
Mechanical shock resistance half-sinusoidal shock, 10 ms to IEC 60068-2-27		g	15	15	15	15
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact when actuated from front (EN 50274)			Finger- and back-of-hand proof			
Main contacts						
Rated impulse withstand voltage	U_{imp}	V AC	6000	6000	6000	6000
Overvoltage category/pollution degree			III / 3	III / 3	III / 3	III / 3
Rated insulation voltage						
AC	U_i	V AC	690	690	690	690
Rated operating voltage	U_e	V AC	690	690	690	690
Safe isolation according to EN 61140						
Between auxiliary contacts and main contacts		V AC	600	600	600	600
Between the main contacts		V AC	600	600	600	600
Overload relay setting range		A	0.3...45	9...45	20...100	20...100
Terminal capacity						
Solid		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 U_i 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⁾
			I_e A	3 ⁶⁾
			I_e A	-
	240 V		I_e A	-
			I_e A	3
			I_e A	3
NC	120 V		I_e A	-
			I_e A	3
			I_e A	3
	240 V		I_e A	-
			I_e A	-
			I_e A	-
DC-13 L/R ≤ 15 ms ²⁾	24 V		I_e A	1
			I_e A	-
			I_e A	-
	60 V		I_e A	-
			I_e A	-
			I_e A	-
110 V		I_e A	-	
		I_e A	-	
		I_e A	-	
220 V		I_e A	-	
		I_e A	-	
		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	\varnothing	mm	6	13	21	110

Notes

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

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



EMT6

				EMT6
General				
Standards				IEC/EN 60947, VDE 0660, EN 55011
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068-2-30
Ambient temperature				
Open		°C		-25...60
Enclosed		°C		-25...45
Storage		°C		-45 - 60
Mounting position				Any
Weight		kg		0.15
Shock resistance half-sinusoidal shock 10 ms to IEC 60068-2-27		g		10
Protection type				IP20
Protection against direct contact when actuated from front (EN 50274)				Finger- and back-of-hand proof
Safe isolation according to EN 61140				
Between the contacts		V AC		250
Between contacts and supply voltage		V AC		250
Auxiliary and control circuits				
Rated impulse withstand voltage	U_{imp}	V AC		6000
Overvoltage category/pollution degree				III/3
Auxiliary and control circuit terminal capacity				
Solid		mm ²		1 x 2.5 2 x (0.5 - 1.5)
Flexible with ferrule		mm ²		1 x 2.5 2 x (0.5 - 1.5)
Solid or stranded		AWG		20 - 14
Terminal screw				M3.5
Tightening torque		Nm		1.2
Tools				
Pozidriv screwdriver		Size		2
Flat-blade screwdriver		mm		1 x 6
Auxiliary circuit				
Rated insulation voltage	U_i	V		400
Rated operational current				
AC-14				
N/O				
415 V		I_e	A	3
NC				
415 V		I_e	A	3
AC-15				
N/O				
240 V		I_e	A	3
415 V		I_e	A	1
NC				
240 V		I_e	A	3
415 V		I_e	A	1
Max. short-circuit protective device				
Fuse		gG/gL	A	6
Control circuit				
Rated insulation voltage	U_i	V		240
Rated operational voltage	U_e	V		240 ¹⁾
Voltage tolerance		x U_e		0.85 - 1.1
Power consumption				
AC		VA		3.5
DC		W		2
Trip at approx.		Ω		≥ 3600
Reset at approx.		Ω		≤ 1600
Notes				
1) EMT6(-DB)230V: $U_e = 230$ V				

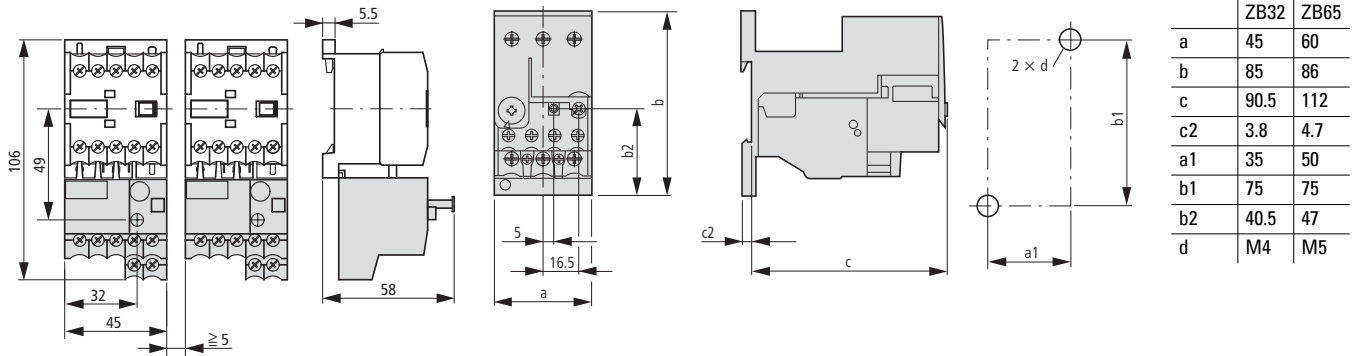
Dimensions

Overload relays
ZE-...

Base

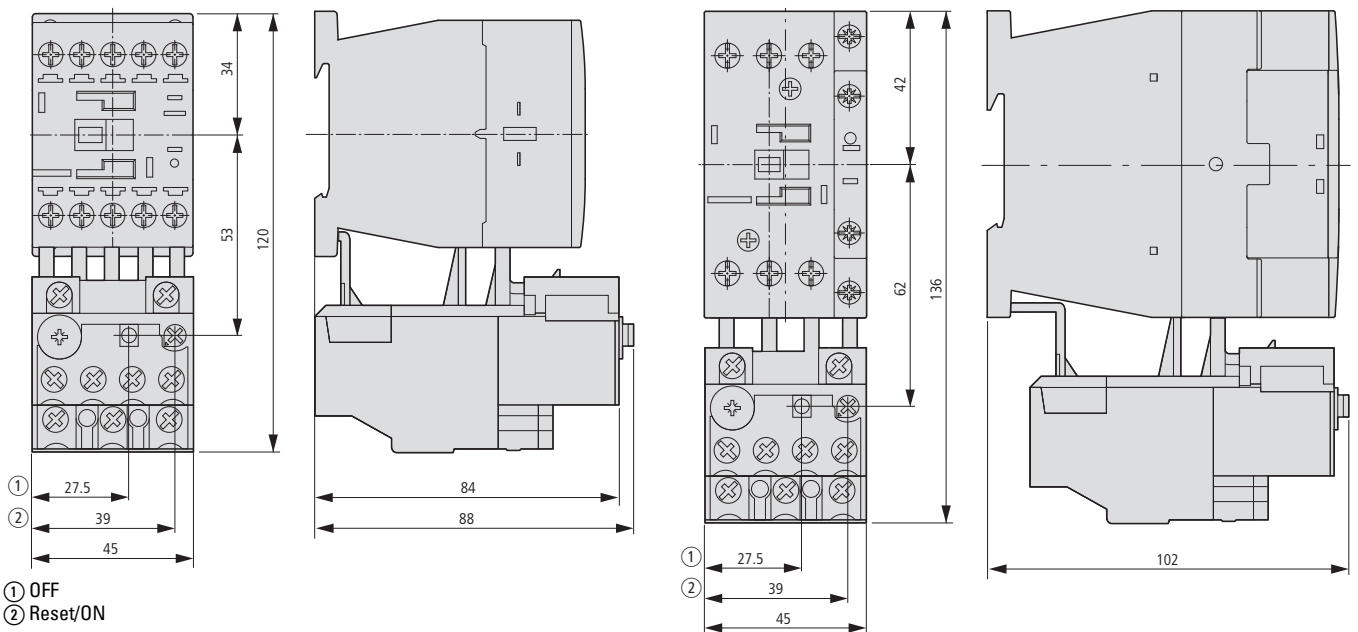
ZB32-XEZ

ZB65-XEZ



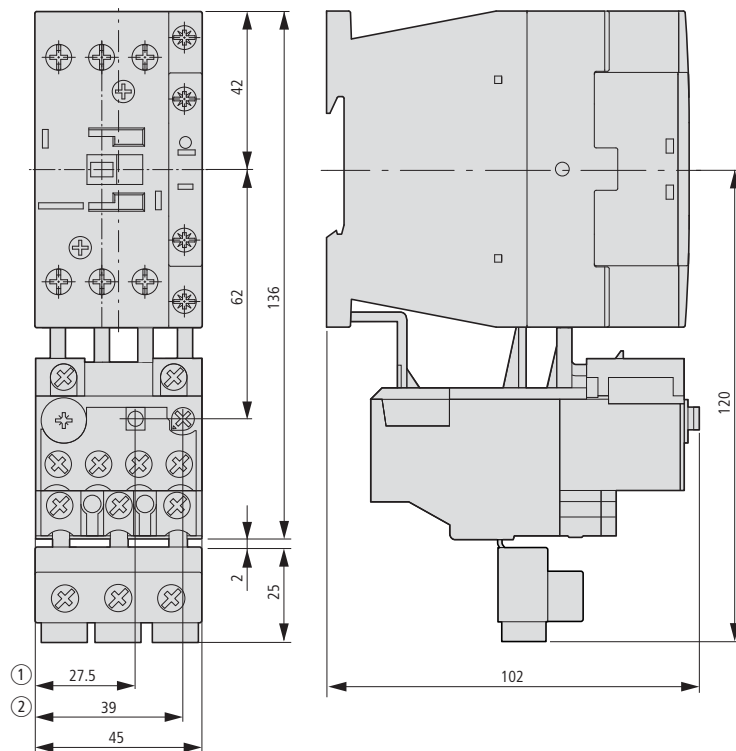
ZB12

ZB32



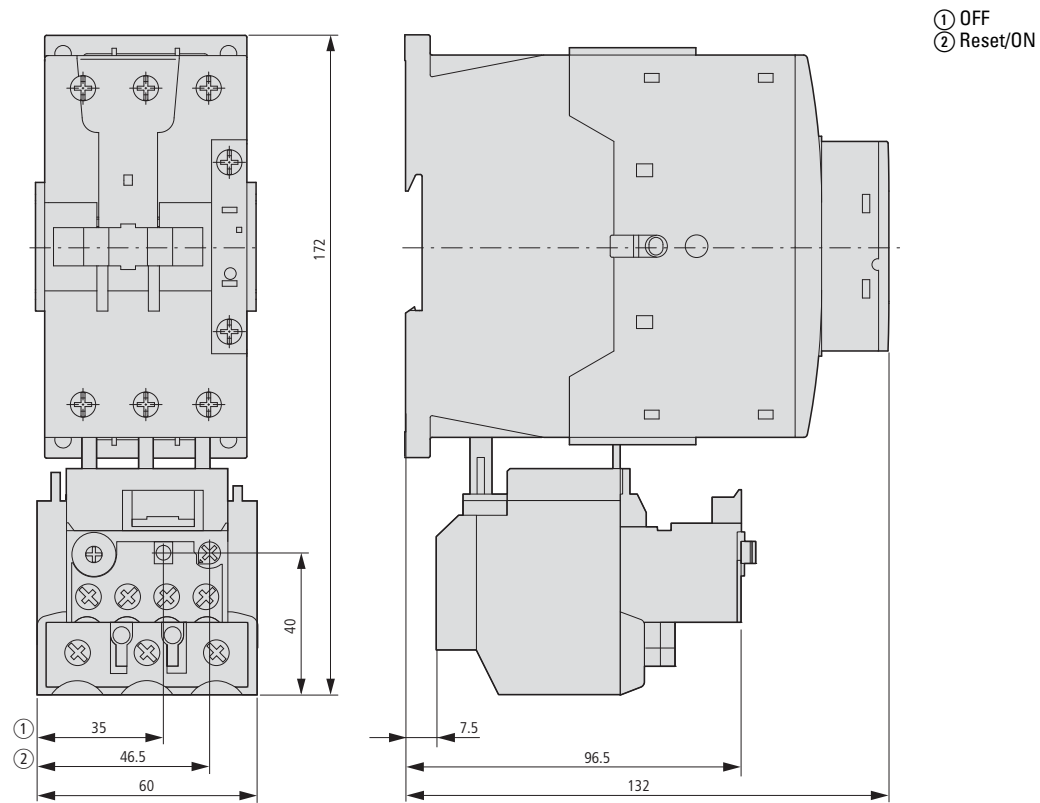
ZB32-38

① OFF
② Reset/ON

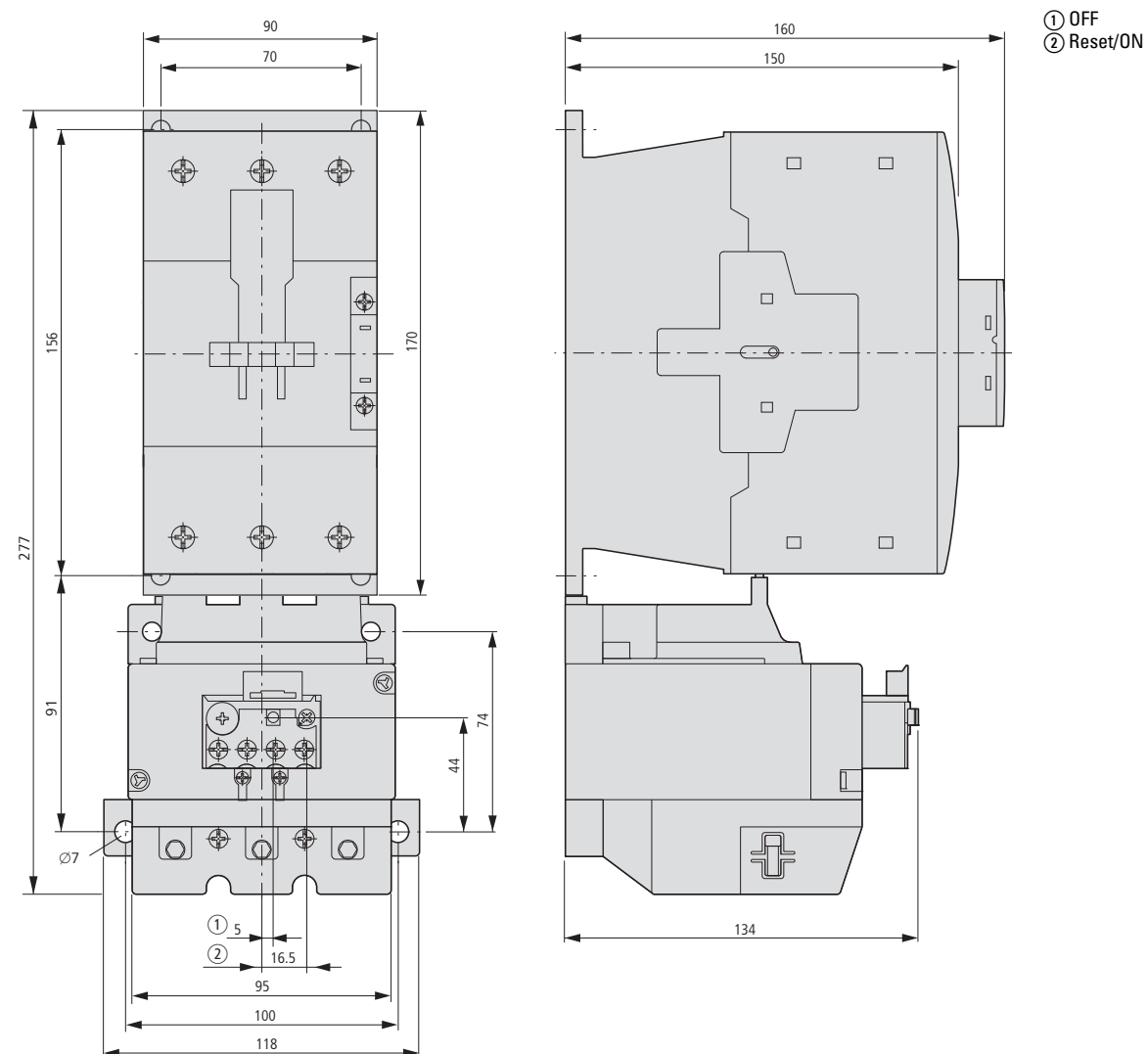


Overload relays

ZB65

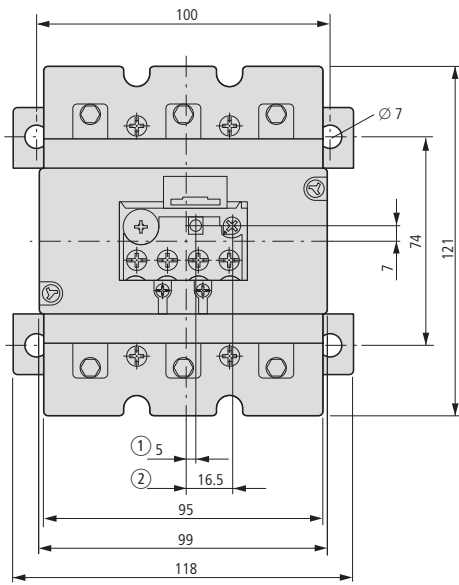


ZB150



Overload relays

ZB150-50/KK

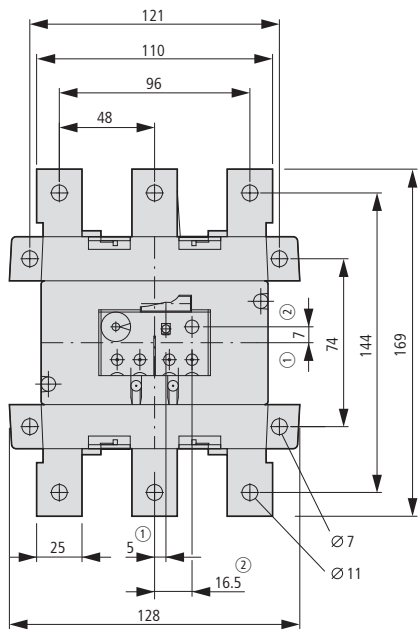


- ① OFF
- ② Reset/ON



Z5 overload relays greater than 150A

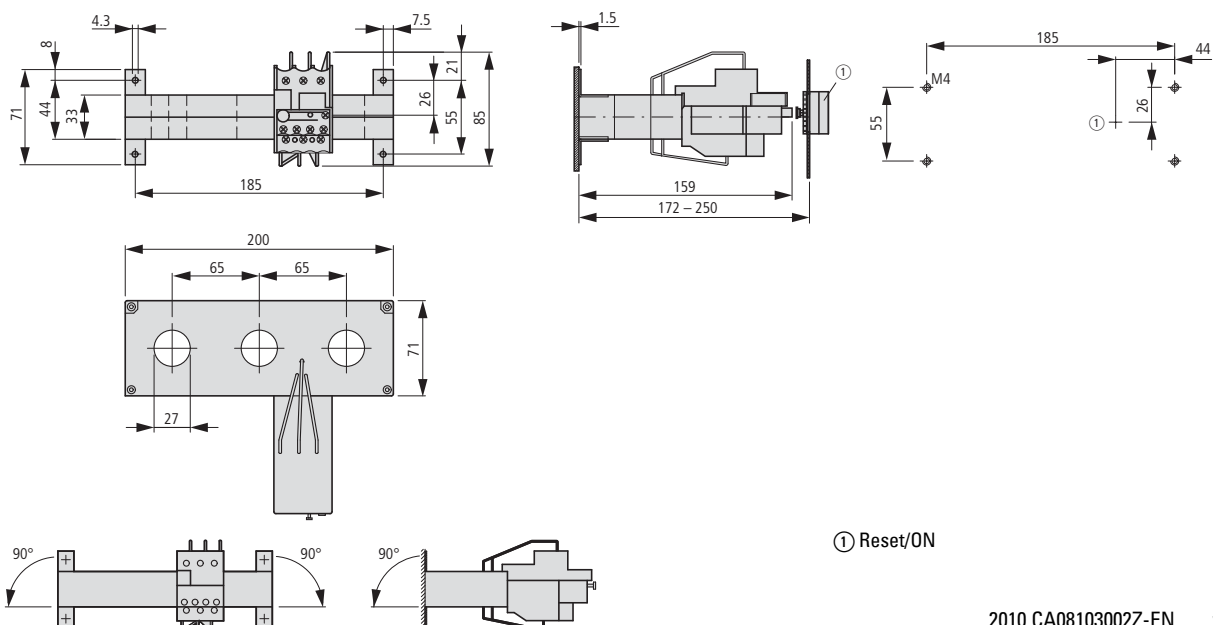
Z5-.../FF250



- ① OFF
- ② Reset/ON

Current transformer-operated overload relays

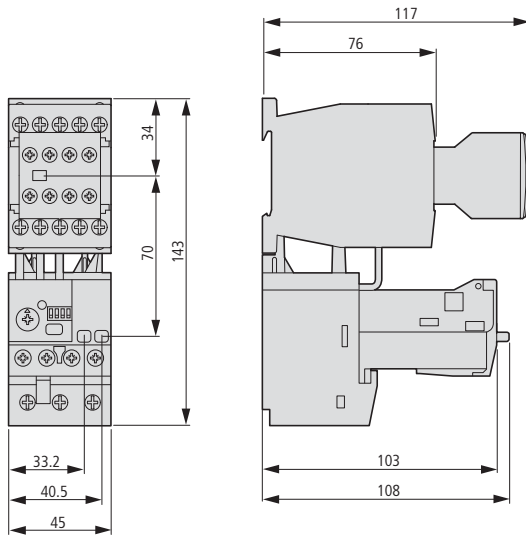
ZW7-...



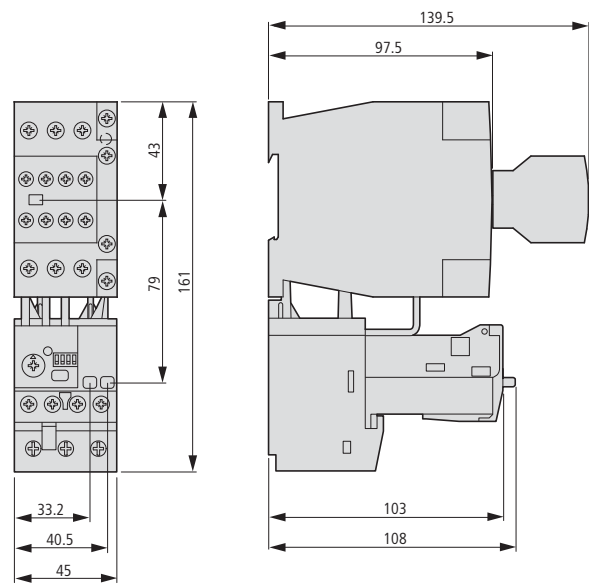
- ① Reset/ON

Electronic overload relays

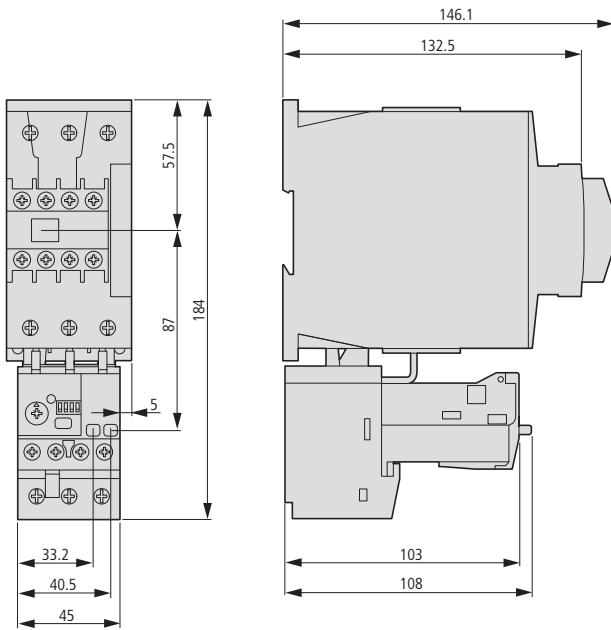
ZEB12



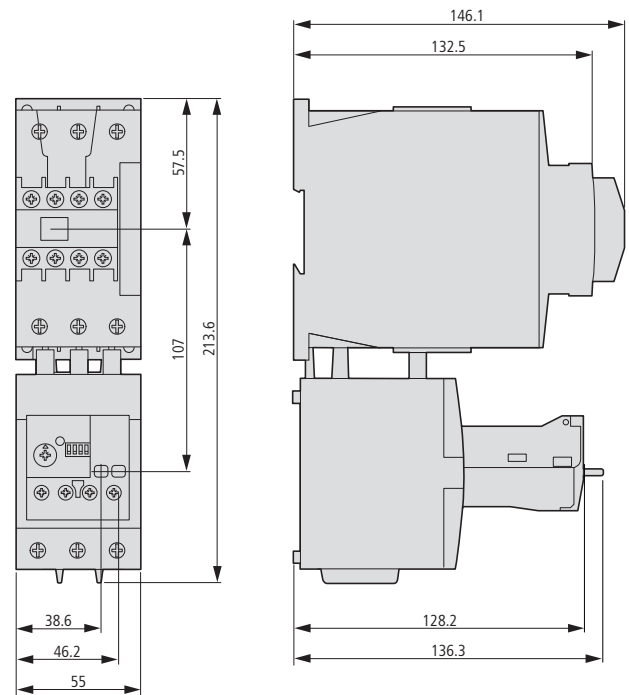
ZEB32



ZEB65-45

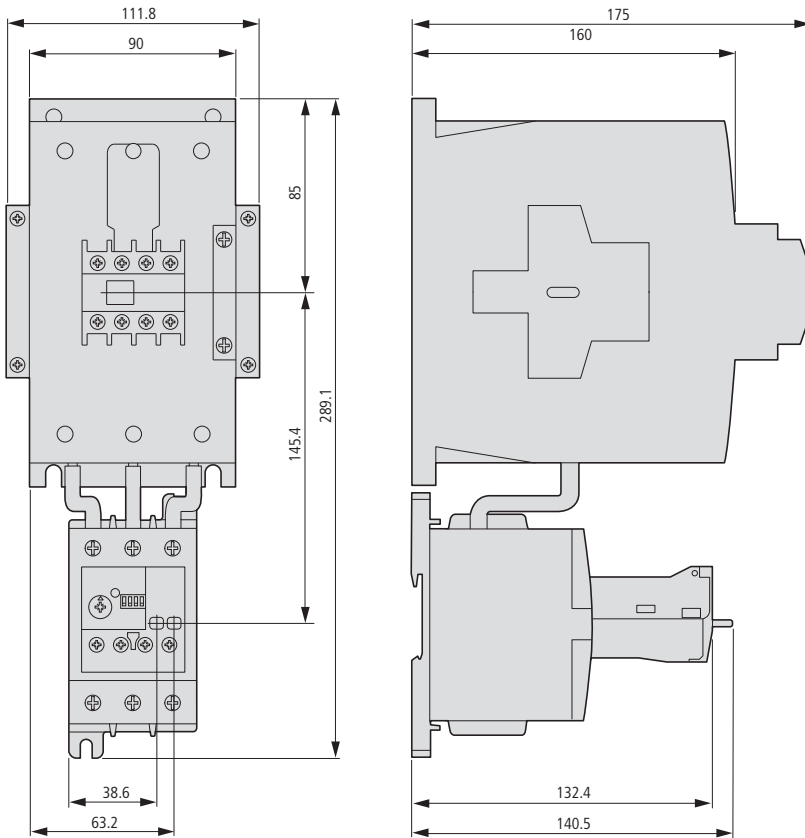


ZEB65-100

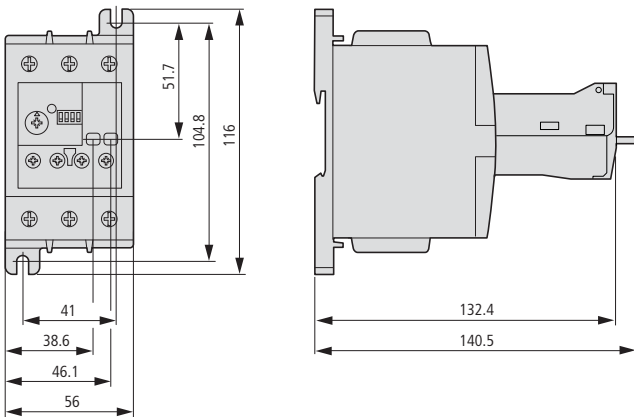


Electronic overload relays

ZEB150-100

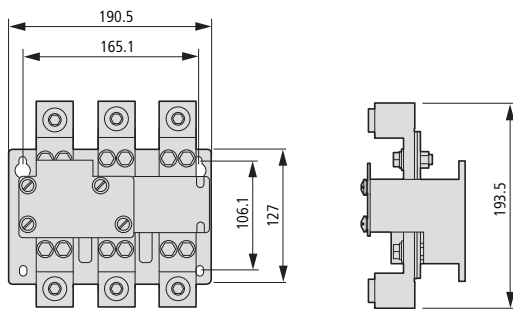


ZEB150-100/KK

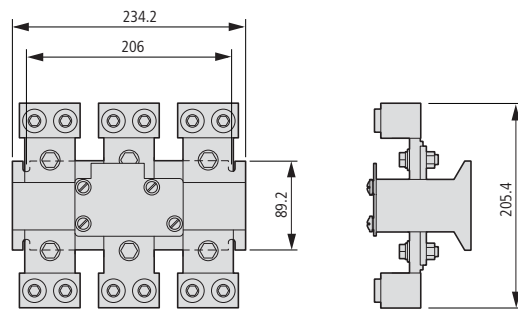


Current sensors

ZEB-XCT300

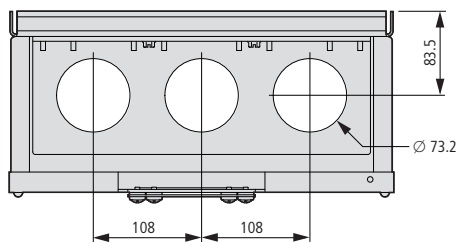
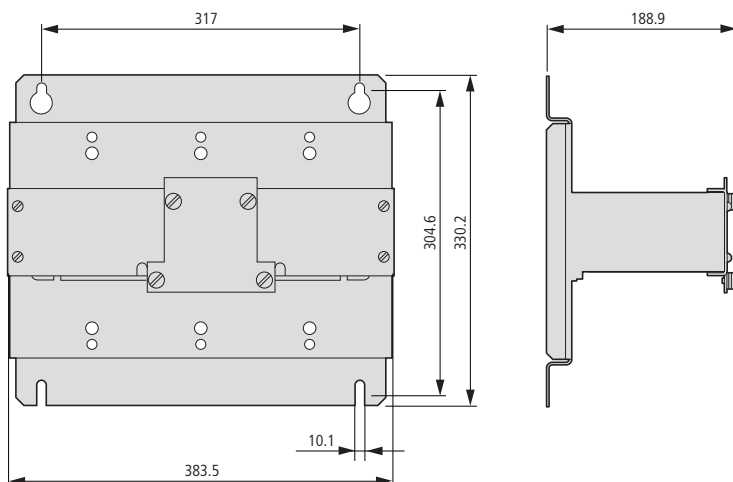


ZEB-XCT600



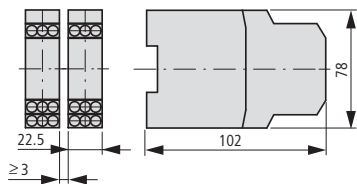
ZEB-XCT1000

ZEB-XCT1500



EMT6 thermistor overload relays for machine protection

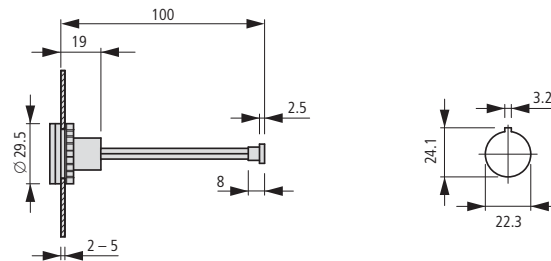
EMT6...



External reset button

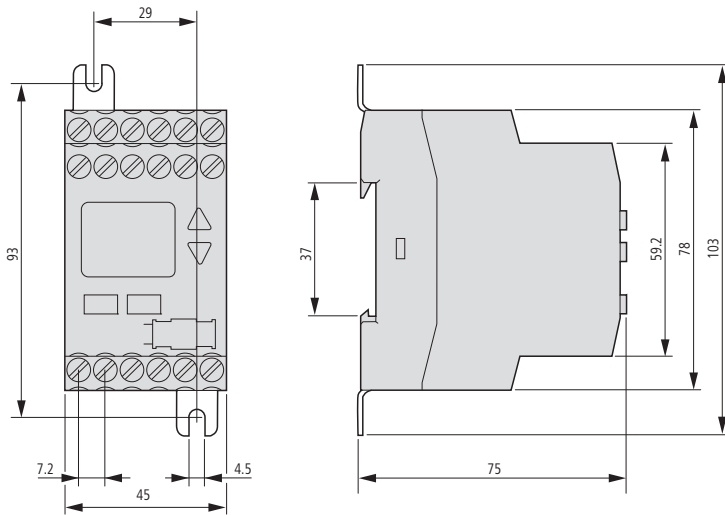
M22-DZ-B

M22-DZ-X



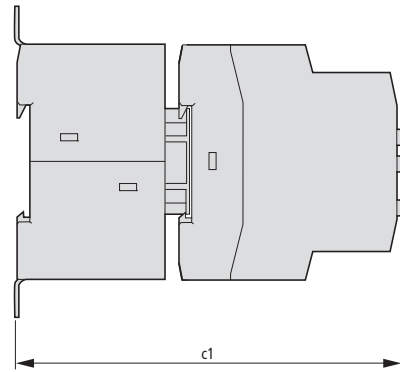
Electronic overload relays

ZEV



Electronic overload relays

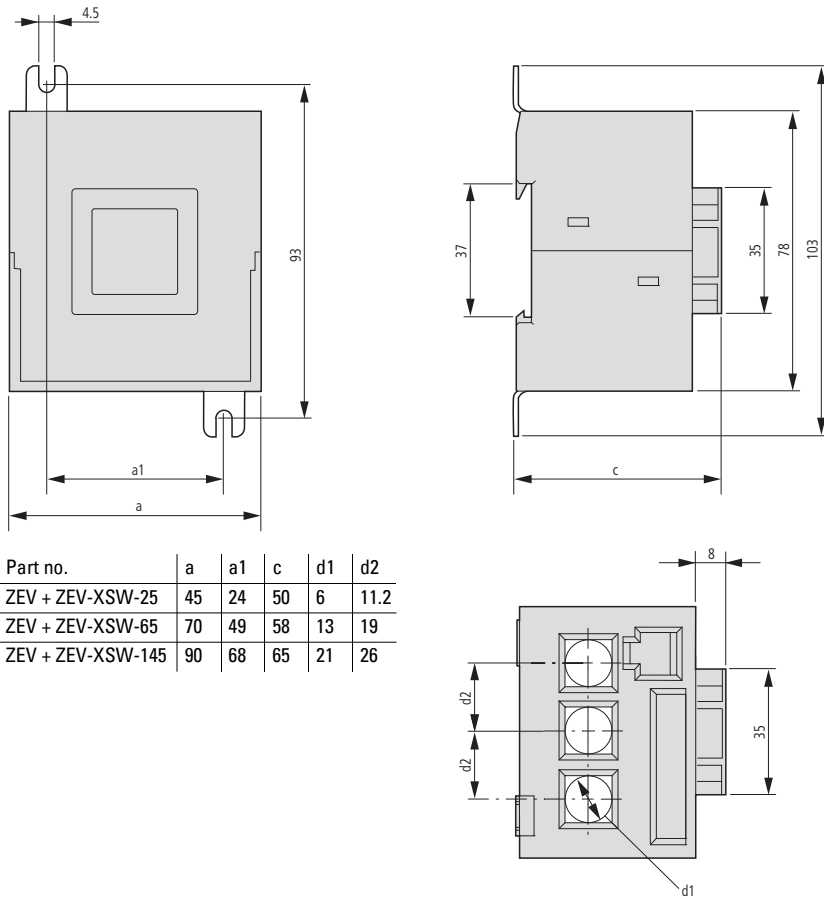
ZEV + ZEV-XSW...



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

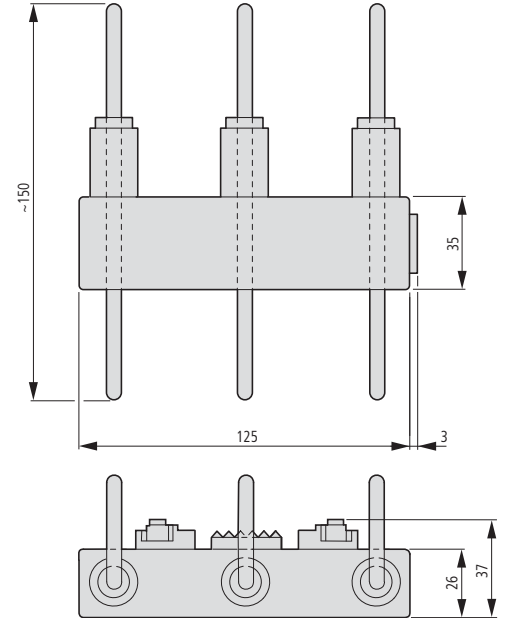
Current sensors

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

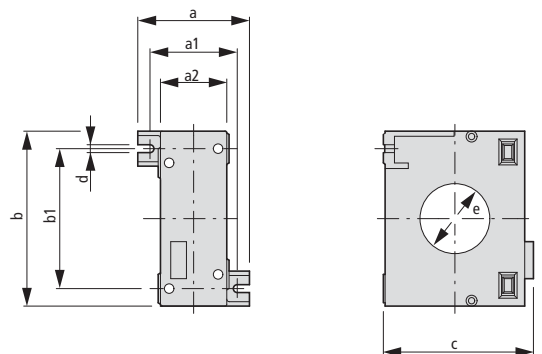
ZEV-XSW-820



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





PKZ and PKE motor-protective circuit-breakers

Machinery and installation downtimes should be kept as short as possible. The PKZ fuseless motor-protective circuit-breakers combine short-circuit and overload protection in one device, allowing fast restart readiness. PKZM01, PKZM0, PKZM4 and PKE have the same accessories. Combines easily with DILM contactors and DS7 soft starters. Connecting PKE to SmartWire-Darwin facilitates high data transparency.



PKZM01 (up to 16) motor-protective circuit-breaker with pushbuttons

Motor-protective circuit-breaker in housing for protection types IP40 and IP65 +++ Integrated EMERGENCY STOP and EMERGENCY OFF pushbuttons reduce wiring.

PKZM0 (up to 32 A) and PKZM4 (up to 65 A) motor-protective circuit-breakers with rotary handle

Short-circuit proof up to at least 50 kA for easy engineering +++ Trip-indicating auxiliary contact enables remote diagnosis +++ High safety through application as main switch or repair and maintenance switch +++ ATEX approval for protection of EEx e motors up to 65 A

PKE (up to 65 A) motor-protective circuit-breakers with electronic wide-range overload protection

High flexibility through plug-in trip block +++ Wide current setting ranges enable only five trip blocks up to 65 A +++ Precise and extremely long-term stable characteristic curves +++ Individual supply through integrated current converter +++ ATEX approval for protection of EEx e motors up to 65 A +++ Adjustable tripping classes

DC string circuit-breakers PKZ-SOL and DC switch-disconnectors P-SOL (up to 63 A) for installations

High string circuit-breaker flexibility due to wide current setting range +++ Enclosed switch-disconnector for external mounting (IP65) +++ Remote shutdown through optional secondary voltage and shunt trip +++ Voltage up to 1000 V DC +++ TÜV certified



Motor-protective circuit-breakers

Motor-protective circuit-breaker PKZM01, PKZM0, PKZM4, PKE

System overview

PKZM01, PKZM0, PKZM4 motor-protective circuit-breakers	7/2
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Ordering

Motor-protective circuit-breakers	7/3
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Auxiliary contacts, shunt releases	7/12

Engineering

Accessories for motor-protective circuit-breakers in enclosures	7/14
	7/15

Ordering

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Busbar adapters	7/22
Wiring sets	7/25
Three-phase commoning links	7/26
Actuating voltages	7/28

Engineering

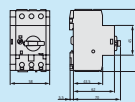
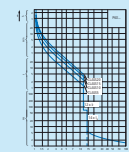
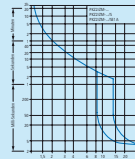
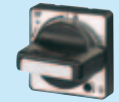
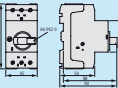
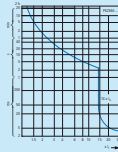
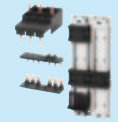
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PKZ2 motor-protective circuit-breaker

System overview

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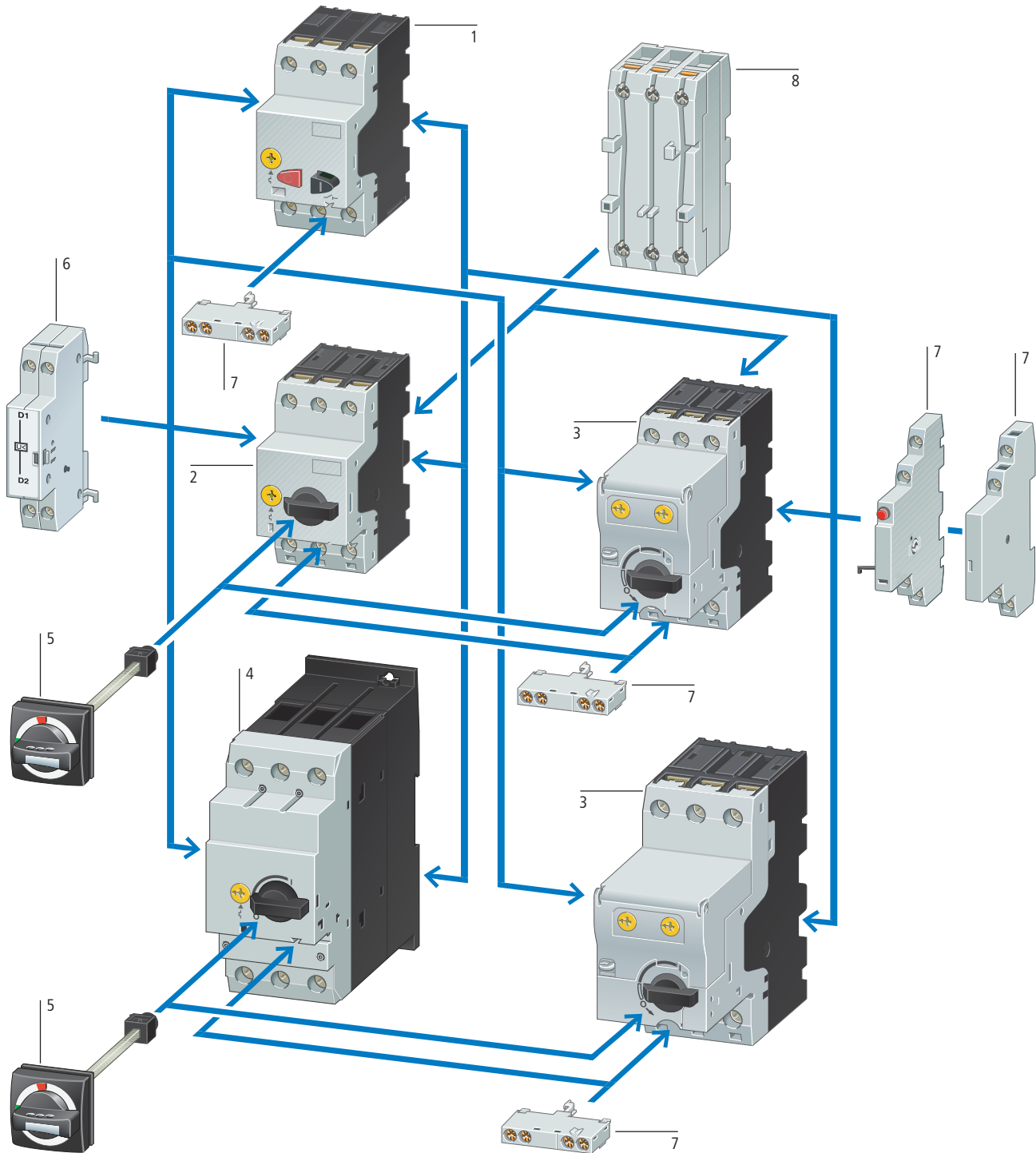
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System overview



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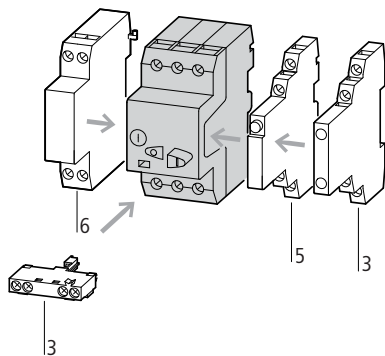
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Ordering

							Screw terminals		Std. pack	Information relevant for export to North America
Max. motor rating AC-3			Rated uninterrupted current	Setting range		Part no. Article no.	Price See price list			
220 V	380 V	440 V		Overload releases	Short-circuit releases					
230 V	400 V		I_u	I_r	I_{rm}	PKZM01-0.16 278475		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking	
240 V	415 V									
P	P	P	A	A	A	PKZM01-0.25 278476			UL File No. E36332	
kW	kW	kW				PKZM01-0.4 278477			UL CCN NLRV	
Motor-protective circuit-breakers, type "1"; and type "2" coordination									CSA File No. 12528	
	-	-	0.16	0.1...0.16	2.2	PKZM01-0.63 278478			CSA Class No. 3211-05	
	-	0.06	0.06	0.16...0.25	3.5	PKZM01-1 278479			NA Certification UL Listed, CSA certified	
	0.06	0.09	0.12	0.25...0.4	5.6	PKZM01-1.6 278480			Suitable for Branch circuit, or suitable for group installations	
	0.09	0.12	0.18	0.4...0.63	8.8	PKZM01-2.5 278481			See also → Page 7/34	
	0.12	0.25	0.25	0.63...1	14	PKZM01-4 278482				
	0.25	0.55	0.55	1...1.6	22	PKZM01-6.3 278483				
	0.37	0.75	1.1	1.6...2.5	35	PKZM01-10 278484				
	0.75	1.5	1.5	2.5...4	56	PKZM01-12 278485				
	1.1	2.2	3	4...6.3	88	PKZM01-16 283390				
	2.2	4	4	6.3...10	140	PKZM01-20 283383				
	3	5.5	5.5	8...12	168	PKZM01-25 288893				
	4	7.5	9	10...16	224					
	5.5	9	11	16...20	280					
	5.5	12.5	12.5	20...25	350					

Notes

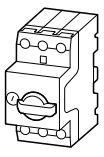
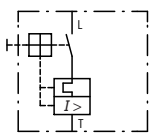
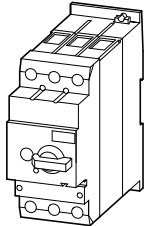
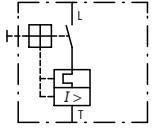
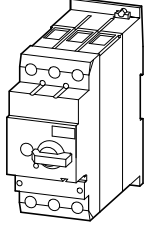


Accessories

- 3 Standard auxiliary contacts → 7/10
 - 5 Trip-indicating auxiliary contact → 7/12
 - 6 Shunt release, undervoltage release → 7/29
- Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height

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Circuit diagrams	Max. motor rating AC-3					Rated uninter-rupted current I_u A	Setting range		Screw terminals Part no. Article no.	Price See price list	Screw terminals on feed side, spring-loaded terminals on output side	
	220 V	380 V	440 V	500 V	660 V		Overload releases I_r A	Short-circuit releases I_{rm} A			Part no. Article no.	Price See price list
	230 V	400 V	415 V		690 V							
	P	P	P	P	P							
	kW	kW	kW	kW	kW							
Motor-protective circuit-breakers, type "1" and type "2" coordination¹⁾												
 	-	-	-	-	0.06	0.16	0.1...0.16	2.2	PKZM0-0.16 072730		PKZM0-0.16-SC 229828	
	-	0.06	0.06	0.06	0.12	0.25	0.16...0.25	3.5	PKZM0-0.25 072731		PKZM0-0.25-SC 229829	
	0.06	0.09	0.12	0.12	0.18	0.4	0.25...0.4	5.6	PKZM0-0.4 072732		PKZM0-0.4-SC 229830	
	0.09	0.12	0.18	0.25	0.25	0.63	0.4...0.63	8.8	PKZM0-0.63 072733		PKZM0-0.63-SC 229831	
	0.12	0.25	0.25	0.37	0.55	1	0.63...1	14	PKZM0-1 072734		PKZM0-1-SC 229832	
	0.25	0.55	0.55	0.75	1.1	1.6	1...1.6	22	PKZM0-1.6 072735		PKZM0-1.6-SC 229833	
	0.37	0.75	1.1	1.1	1.5	2.5	1.6...2.5	35	PKZM0-2.5 072736		PKZM0-2.5-SC 229834	
	0.75	1.5	1.5	2.2	3	4	2.5...4	56	PKZM0-4 072737		PKZM0-4-SC 229835	
	1.1	2.2	3	3	4	6.3	4...6.3	88	PKZM0-6.3 072738		PKZM0-6.3-SC 229836	
	2.2	4	4	4	7.5	10	6.3...10	140	PKZM0-10 072739		PKZM0-10-SC 229837	
	3	5.5	5.5	5.5	11	12	8...12	168	PKZM0-12 278486		PKZM0-12-SC 278487	
	4	7.5	9	9	12.5	16	10...16	224	PKZM0-16 046938		PKZM0-16-SC 229838	
	5.5	9	11	12.5	15	20	16...20	280	PKZM0-20 046988			
	5.5	12.5	12.5	15	22	25	20...25	350	PKZM0-25 046989			
	7.5	15	15	22	30	32	25...32	448	PKZM0-32 278489			
Motor-protective circuit-breakers, type "1" and type "2" coordination¹⁾												
 	4	7.5	9	9	12.5	16	10...16	224	PKZM4-16 222350			
	5.5	12.5	12.5	15	22	25	16...25	350	PKZM4-25 222352			
	7.5	15	17.5	22	22	32	25...32	448	PKZM4-32 222353			
	11	20	22	24	30	40	32...40	560	PKZM4-40 222354			
	14	25	30	30	45	50	40...50	700	PKZM4-50 222355			
	17	30	37	37	55	58	50...58	812	PKZM4-58 222394			
	18.5	34	37	45	55	65	55...65	882	PKZM4-63 222413			
Circuit-breakers²⁾												
For line and cable protection												
	-	-	-	-	-	16	10...16	224	PKZM4-16-CB 132591			
	-	-	-	-	-	25	16...25	350	PKZM4-25-CB 132592			
	-	-	-	-	-	32	25...32	448	PKZM4-32-CB 132593			

Spring-loaded terminals

Part no.
Article no.

Price
See price list

Std. pack

Notes

Information relevant for export to North America



PKZM0-0,16-C
229669

1 off

Accessories

3 Standard auxiliary contacts → 7/10

5 Trip-indicating auxiliary contact → 7/12

6 Shunt release, undervoltage release → 7/29

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Can be snap-fit to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height

PTB 02 ATEX 3151, see manual → 7/21

¹⁾ Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking

UL File No. E36332

UL CCN NLRV

CSA File No. 12528

CSA Class No. 3211-05

NA Certification UL Listed, CSA certified

Suitable for Branch circuit: Manual type E if used with terminal, or suitable for group installations

See also → Page 7/34



PKZM0-0,25-C
229670

PKZM0-0,4-C
229671

PKZM0-0,63-C
229672

PKZM0-1-C
229673

PKZM0-1,6-C
229674

PKZM0-2,5-C
229675

PKZM0-4-C
229676

PKZM0-6,3-C
229677

PKZM0-10-C
229678

PKZM0-12-C
278488

PKZM0-16-C
229679

1 off

Accessories

3 Standard auxiliary contacts → 7/10

5 Trip-indicating auxiliary contact → 7/12

6 Shunt release, undervoltage release → 7/29

Only motor-protective circuit-breaker:

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102

Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height

PTB 02 ATEX 3153, see manual → 7/21

Accessories

3 Standard auxiliary contacts → 7/10

5 Trip-indicating auxiliary contact → 7/12

6 Shunt release, undervoltage release → 7/29

Only motor-protective circuit-breaker:

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102

Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height

PTB 02 ATEX 3153, see manual → 7/21

1 off

Not usable as a main switch

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.



Switching capacity of SCCR
65 kA (480 Y/277 V)
22 kA (600 Y/347 V)

²⁾ Product Standards UL 489; CSA-C22.2 no. 5-09; IEC60947-4-1; CE marking

NA Certification Request filed for UL and CSA

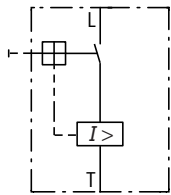
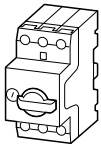
Specially designed for NA Yes

Suitable for Feeder and branch circuit as BCPD

Max. motor rating AC-3					Rated uninterrupted current I_u	Setting range		Screw terminals Part no. Article no.	Price See price list	Std. pack
220 V	380 V	440 V	500 V	660 V		Overload releases I_r	Short-circuit releases I_{rm}			
230 V	400 V			690 V						
240 V	415 V									
P	P	P	P	P	A	A	A			
kW	kW	kW	kW	kW						

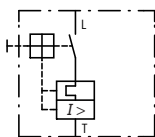
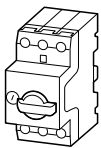
Motor-protective circuit-breakers for starter combinations

Short-circuit protective breakers without overload function



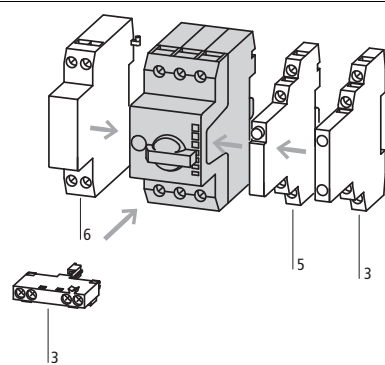
-	-	-	-	0.06	0.16		2.2	PKM0-0,16 072720		1 off
-	0.06	0.06	0.06	0.12	0.25		3.5	PKM0-0,25 072721		
0.06	0.09	0.12	0.12	0.18	0.4		5.6	PKM0-0,4 072722		
0.09	0.12	0.18	0.25	0.25	0.63		8.8	PKM0-0,63 072723		
0.12	0.25	0.25	0.38	0.55	1		14	PKM0-1 072724		
0.25	0.37	0.55	0.75	1.1	1.6		22	PKM0-1,6 072725		
0.37	0.75	1.1	1.1	1.5	2.5		35	PKM0-2,5 072726		
0.75	1.5	1.5	2.2	3	4		56	PKM0-4 072727		
1.1	2.2	3	3	4	6.3		88	PKM0-6,3 072728		
2.2	4	4	4	7.5	10		140	PKM0-10 072729		
3	5.5	5.5	5.5	11	12		168	PKM0-12 278490		
4	7.5	9	9	12.5	16		224	PKM0-16 044502		
5.5	9	11	12.5	15	20		280	PKM0-20 203594		
5.5	12.5	12.5	15	22	25		350	PKM0-25 044503		
7.5	15	15	22	30	32		448	PKM0-32 278491		

Transformer-protective circuit-breakers



-	-	-	-	-	0.16	0.1...0.16	2.4	PKZM0-0,16-T 088907		1 off
-	-	-	-	-	0.25	0.16...0.25	4.25	PKZM0-0,25-T 088908		
-	-	-	-	-	0.4	0.25...0.4	6.8	PKZM0-0,4-T 088909		
-	-	-	-	-	0.63	0.4...0.63	12	PKZM0-0,63-T 088910		
-	-	-	-	-	1	0.63...1	20	PKZM0-1-T 088911		
-	-	-	-	-	1.6	1...1.6	32	PKZM0-1,6-T 088912		
-	-	-	-	-	2.5	1.6...2.5	50	PKZM0-2,5-T 088913		
-	-	-	-	-	4	2.5...4	84	PKZM0-4-T 088914		
-	-	-	-	-	6.3	4...6.3	141	PKZM0-6,3-T 088915		
-	-	-	-	-	10	6.3...10	224	PKZM0-10-T 088916		
-	-	-	-	-	12	8...12	224	PKZM0-12-T 278492		
-	-	-	-	-	16	10...16	280	PKZM0-16-T 088917		
-	-	-	-	-	20	16...20	350	PKZM0-20-T 088918		
-	-	-	-	-	25	20...25	437	PKZM0-25-T 278493		

Notes



When using the PKM0 as short-circuit protection for motors with heavy starting duty, a device must be selected whose rated operational current I_e is higher by the following factors:

- CLASS 5 = 1.0
- CLASS 10 = 1.0
- CLASS 15 = 1.22
- CLASS 20 = 1.41
- CLASS 25 = 1.58
- CLASS 30 = 1.73
- CLASS 35 = 1.89
- CLASS 40 = 2.0

Accessories

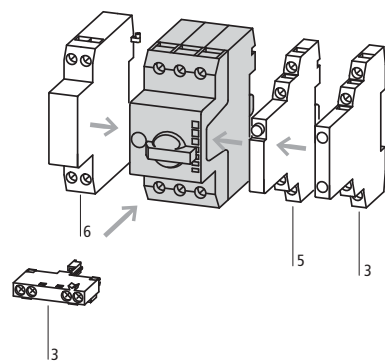
3 Standard auxiliary contacts	→ 7/10
5 Trip-indicating auxiliary contact	→ 7/12
6 Shunt release, undervoltage release	→ 7/29
Additional accessories	→ 2/46

Page

Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height

Assignment of the short-circuit protective breakers and contactors in "Fuseless motor-starter combinations" section.

An appropriate overload relay must be fitted to protect motors against overload.



Accessories

3 Standard auxiliary contacts	→ 7/10
5 Trip-indicating auxiliary contact	→ 7/12
6 Shunt release, undervoltage release	→ 7/29

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For the protection of transformers with a high inrush current

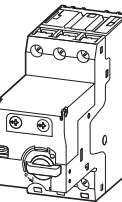
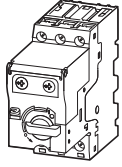
Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height

Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.



Motor rating	Motor full-load current					Setting range Overload releases	Basic device		Std. pack
	AC-3						Part no. Article no.	See price list	
	220 V 230 V 240 V	380 V 400 V 415 V	440 V	500 V	660 V 690 V				
P	I	I	I	I	I				
kW	A	A	A	A	A				

Motor-protective circuit-breakers, type "1" and type "2" coordination									
0.06	0.37	–	–	–	–	0.3...1.2 A	PKE12 121721	1off	
0.09	0.54	0.31	–	–	–				
0.12	0.72	0.41	0.37	0.33	–				
0.18	1.04	0.6	0.54	0.48	0.35				
0.25	–	0.8	0.76	0.7	0.5				
0.37	–	1.1	1.02	0.9	0.7				
0.55	–	–	–	–	0.9				
0.75	–	–	–	–	1.1				
0.18	1.04	–	–	–	–	1...4 A	PKE12 121721	1off	
0.25	1.4	–	–	–	–				
0.37	2	1.1	1.02	–	–				
0.55	2.7	1.5	1.39	1.2	–				
0.75	3.2	1.9	1.68	1.5	1.1				
1.1	–	2.6	2.41	2.1	1.5				
1.5	–	3.6	3.28	2.9	2.1				
2.2	–	–	–	4	2.9				
3	–	–	–	–	3.8				
0.75	3.2	–	–	–	–	3...12 A	PKE12 121721	1off	
1.1	4.6	–	–	–	–				
1.5	6.3	3.6	3.3	–	–				
2.2	8.7	5	4.6	4	–				
3	11.5	6.6	6	5.3	3.8				
4	–	8.5	7.7	6.8	4.9				
5.5	–	11.3	10.2	9	6.5				
7.5	–	–	–	–	8.8				
2.2	8.7	–	–	–	–	8...32 A	PKE32 121722	1off	
3	11.5	–	–	–	–				
4	14.8	8.5	–	–	–				
5.5	19.6	11.3	10.2	9	–				
7.5	26.4	15.2	13.8	12.1	8.8				
11	–	21.7	19.8	17.4	12.6				
15	–	29.3	26.6	23.4	17				
18.5	–	–	–	28.9	20.9				
22	–	–	–	–	23.8				
30	–	–	–	–	32				
5.5	19.6	–	–	–	–	16...65 A	PKE65 138258	1off	
7.5	26.4	–	–	–	–				
11	38	21.7	19.7	17.4	–				
15	51	29.3	26.6	23.4	17				
18.5	63	36	32.9	28.9	20.9				
22	–	41	37.4	33	23.8				
30	–	55	50.3	44	32				
37	–	–	61.4	54	39				
45	–	–	–	65	47				
55	–	–	–	–	58				
2.2	8.7	–	–	–	–	8...32 A	PKE65 138258	1off	
3	11.5	–	–	–	–				
4	14.8	8.5	–	–	–				
5.5	19.6	11.3	10.2	9	–				
7.5	26.4	15.2	13.8	12.1	8.8				
11	–	21.7	19.8	17.4	12.6				
15	–	29.3	26.6	23.4	17				
18.5	–	–	–	28.9	20.9				
22	–	–	–	–	23.8				
30	–	–	–	–	32				





















Notes

Select switchgear and cables according to Class as shown in the table on page 6/22.

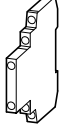
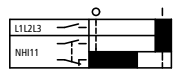
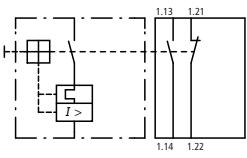

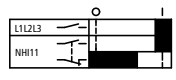
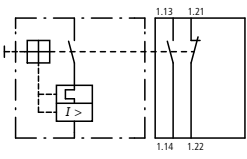
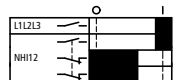
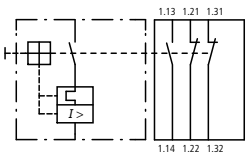
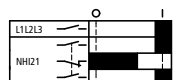
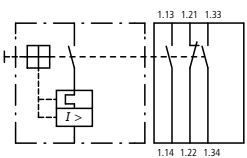

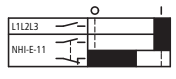
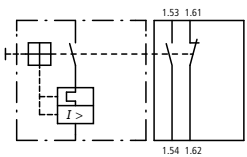

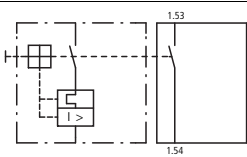

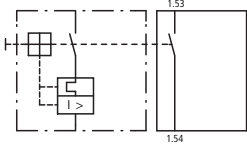
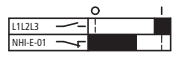
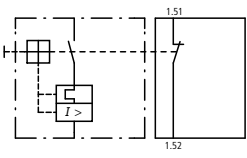
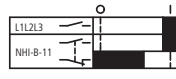
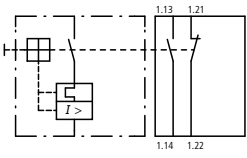
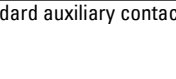
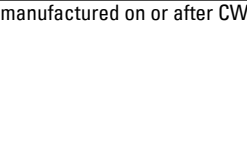


¹⁾ For communications, module PKE-SWD-32 for contactors is required in addition., → Page 1/14.

HPL07009EN

PKE

usable for	Trip module Standard			usable for	Trip module Expanded ¹⁾			Motor-protective circuit-breakers Standard Complete device	Std. pack
	Part no. Article no.	See price list	Std. pack		Part no. Article no.	See price list	Std. pack		
	PKE12	PKE-XTU-1,2 121723	1off  	PKE12	PKE-XTUA-1,2 121727	1off  	PKE12/XTU-1,2 121731	1off  	Start of delivery 07/2010
	PKE12	PKE-XTU-4 121724	1off  	PKE12	PKE-XTUA-4 121728	1off  	PKE12/XTU-4 121732	1off  	Start of delivery 05/2010
	PKE12 PKE32	PKE-XTU-12 121725	1off  	PKE12 PKE32	PKE-XTUA-12 121729	1off  	PKE12/XTU-12 121733	1off  	Start of delivery 05/2010
	PKE32	PKE-XTU-32 121726	1off  	PKE32	PKE-XTUA-32 121730	1off  	PKE32/XTU-32 121734	1off  	Start of delivery 05/2010
	PKE65	PKE-XTU-65 138259	1off  	PKE65	PKE-XTUA-65 138260	1off  	PKE65/XTU-65 138516	1off	Start of delivery 10/2010
	PKE65	PKE-XTUW-32 138261	1off  	PKE65	PKE-XTUWA-32 138262	1off  	PKE65/XTUW-32 138517	1 off	Start of delivery 10/2010



Contact configuration	Contact sequence	Circuit diagrams	Connection method	For use with	Part no. Article no.	Price See price list	Std. pack
Standard auxiliary contacts							
For motor-protective circuit-breakers							
	1 N/O	1 NC			Screw terminals	PKZM01 PKZM0 PKZM4 PKZM0-T PKM0 PKE ¹⁾	5 off 
	1 N/O	1 NC			Spring-loaded terminals		
	1 N/O	2 NC			Screw terminals		
	2 N/O	1 NC			Screw terminals		
	1 N/O	1 NC			Screw terminals	NHI11-PKZ0 072896	
	1 N/O	-			Screw terminals		
	1 N/O	-			Spring-loaded terminals		
	-	1 NC			Spring-loaded terminals		
	1 N/O	1 NC			Screw terminals		
	1 N/O	1 NC			Screw terminals		
	1 N/O	1 NC			Screw terminals		

Notes

¹⁾ Only standard auxiliary contacts manufactured on or after CW 36/2009 are for use with PKE.

Notes

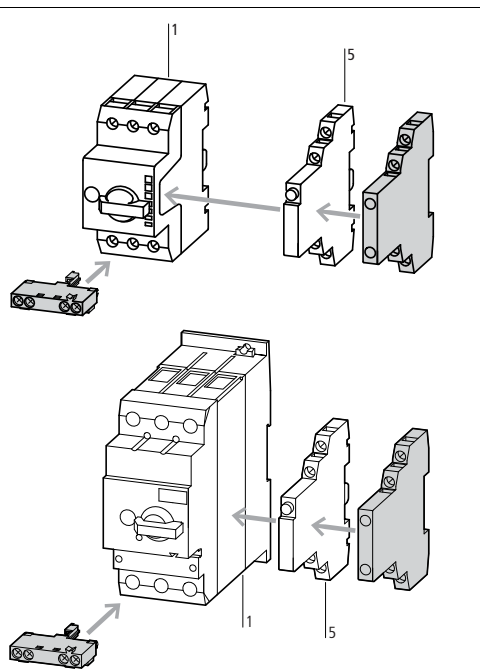
Notes

Information relevant for export to North America



Can be fitted to the right side of: motor-protective circuit-breakers, transformer protective circuit breakers and motor-protective circuit-breakers for starter combinations

Can be combined with:
Trip-indicating auxiliary contact AGM, NHI-E-...

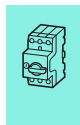


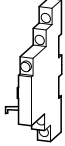
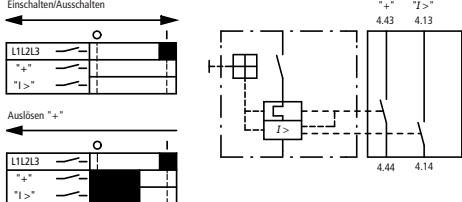


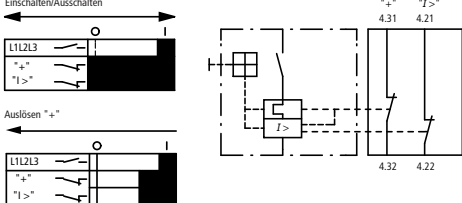





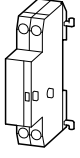


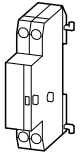


Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

Can be fitted to motor-protective circuit-breakers, transformer-protective circuit-breakers and motor-protective circuit-breakers for starter combinations from serial number 01. 45 mm (PKZM0 and PKZM01) or 55 mm (PKZM4) widths of the motor-protective circuit-breakers remain unchanged. NHI-E...-PKZ0-C not for use with MSC...-type motor starter combinations.

Accessories

- 1 Motor-protective circuit-breakers → 7/4
- 5 Trip-indicating auxiliary contact → 7/12
- Additional accessories → 7/20



Contact configuration		Contact sequence	Circuit diagrams	For use with	Part no. Article no.	Price See price list	Std. pack
N/O = normally open contact NC = normally closed contact							
Trip indicators							
For motor-protective circuit-breakers							
	2 x 1 N/O	—		PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE ¹⁾	AGM2-10-PKZ0 072898		2 off 
	—	2 x 1 NC		PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE ¹⁾	AGM2-01-PKZ0 072899		2 off 
Early-make auxiliary contacts							
For motor-protective circuit-breakers							
	2 N/O	—	—	PKZM0 PKZM0-T PKM0 PKZM4	VHI20-PKZ0 203595		2 off 
	2 N/O	—	—	PKZM01	VHI20-PKZ01 278495		5 off 
Shunt release (for power circuit-breakers)							
	—	—	—	PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE ²⁾	A-PKZ0(230V50HZ) 073187		2 off 
	—	—	—	PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE ²⁾	A-PKZ0(24VDC) 073200		2 off 
Undervoltage release							
	—	—	—	PKZM0 PKZM4 PKZM0-T PKM0 PKZM01 PKE ²⁾	U-PKZ0(230V50HZ) 073135		2 off 
Current limiters							
For increasing switching capacity of motor-protective circuit-breakers without auto-protection							
—	—	—	—	PKZM0 PKZM4 PKE	CL-PKZ0 082881		1 off 

Notes

- ¹⁾ Only AGM2-...-PKZ0 manufactured on or after 06/2009 can be fitted.
- ²⁾ Only A(U)-PKZ0... with serial number 02 or higher can be fitted.

Notes

Notes

Information relevant for export to North America

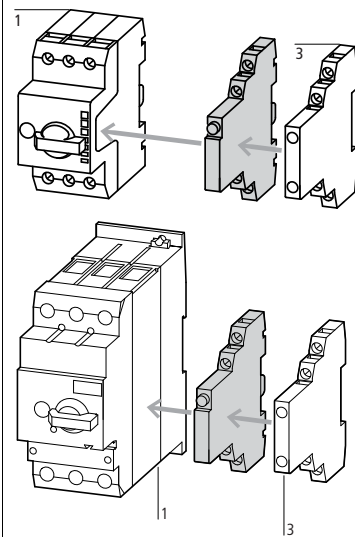


Can be fitted to the right side of motor-protective circuit-breakers

Can be combined with:
Standard auxiliary contacts
NHI11-PKZ0
NHI12-PKZ0
NHI21-PKZ0
NHI-E...

Separate indication of:
a) General trip indication (overload)
b) Short-circuit trip

Local short-circuit indication by red indicator, manually resettable.

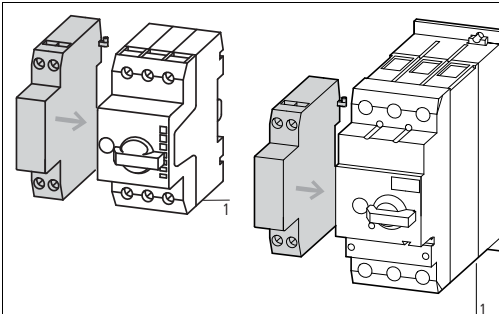


Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

Can be fitted to front of motor-protective circuit-breaker, 45 mm width of the motor-protective circuit-breaker remains unchanged.
For early energization of undervoltage release, e.g. in emergency switching off circuits to EN 60204.
VHI20-PKZ0 cannot be used in combination with PKZ0-X(R).

Accessories	Page
1 Motor-protective circuit-breakers	→ 7/4
3 Standard auxiliary contacts	→ 7/10

Can be fitted to the left side of motor-protective circuit-breakers.
Cannot be combined with:
undervoltage release U-PKZ0
DC: Intermittent operation 5 s



Can be fitted to the left side of motor-protective circuit-breakers.
Cannot be combined with:
A-PKZ0 shunt release
When combined with circuit-breaker, can be used as emergency switching off device to IEC/EN 60204.

Accessories	Page
1 Motor-protective circuit-breakers	→ 7/4
Further actuating voltages	→ 7/29

Max. rated operating voltage $U_e = 690$ V, rated uninterrupted current $I_u = 63$ A
Can be used for individual and group protection.
For group protection and in combination with PKZM4, order additional BK25/3 incoming terminal if required.
Mounting next to or behind the motor-protective circuit-breaker.
PKZM4: 16 - 63 A: 100 kA/400 V
PKZM4: 16 - 63 A: 10 kA/690 V



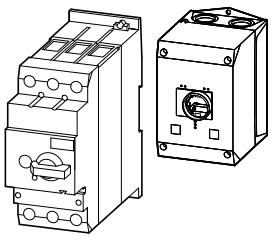
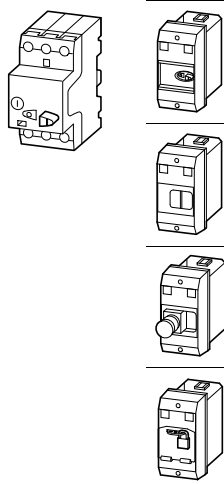
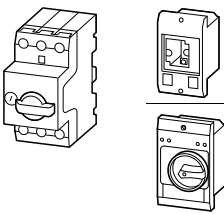
Engineering

Enclosure		Accessories									
Part no.	Part no.	Degree of protection	Handle color	NHI...-PKZ0	AGM2...-PKZ0	NHI-E...-PKZ0	VHI...-PKZ0	VHI...-PKZ01	U-PKZ0 or A-PKZ0	L-PKZ0	
Surface mounting enclosure											
Motor-protective circuit-breaker PKZM01											
	CI-PKZ01	IP40	—	—	—	●	—	—	●	●	
	CI-PKZ01-G	IP65	—	—	—	●	—	●	●	●	
	CI-PKZ01-PVT CI-PKZ01-PVS	IP65	Red-yellow	—	—	●	—	—	●	●	
	CI-PKZ01-SVB CI-PKZ01-SVB-V	IP65	—	—	—	●	—	—	●	●	
								● ¹⁾	●	●	
Motor-protective circuit-breaker PKZM0											
	CI-K2-PKZ0	IP41	—	●	—	●	—	—	●	●	
	CI-K2-PKZ0-G	IP65	Black	—	●	●	—	—	●	●	
	CI-K2-PKZ0-GR	IP65	Red-yellow	●	—	●	—	—	●	●	
	CI-PKZ0-M	IP40	—	●	—	●	—	—	—	●	
	CI-PKZ0-GM	IP55	Black	●	—	●	—	—	—	●	
	CI-PKZ0-GRM	IP55	Red-yellow	●	—	●	—	—	—	●	
Motor-protective circuit-breaker PKZM0 + early-make auxiliary contact VHI-PKZ0											
	CI-K2-PKZ0-GV	IP65	Black	●	—	—	●	—	●	●	
	CI-K2-PKZ0-GRV	IP65	Red-yellow	—	●	—	●	—	●	●	
	CI-K2-PKZ0-GVM	IP55	Black	●	—	—	●	—	—	●	
	CI-K2-PKZ0-GRVM	IP55	Red-yellow	●	—	—	●	—	—	●	

Notes

The combination possibilities of circuit-breakers in an enclosure with accessory modules are identified by a ●
¹⁾ Always required


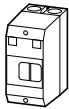


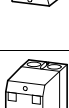

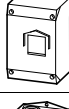


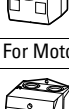
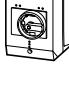

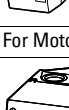
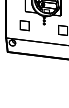

PKZM4, PKZM01, PKZM0




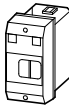










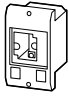



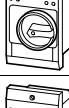

Enclosure				Accessories							
Part no.	Part no.	Degree of protection	Handle color	NHI...-PKZ0	AGM2...-PKZ0	NHI-E...-PKZ0	VHI...-PKZ0	VHI...-PKZ01	U-PKZ0 or A-PKZ0	L-PKZ0	
Surface mounting enclosure											
Motor-protective circuit-breaker PKZM4											
	CI-K4-PKZ4-G	IP65	Black	●	●	●	-	-	●	●	
	CI-K4-PKZ4-GR	IP65	Red-yellow	●	●	●	-	-	●	●	
				●	●	-	●	-	●	●	
				●	●	-	●	-	●	●	
Installation enclosure											
Motor-protective circuit-breaker PKZM01											
	E-PKZ01	IP40	-	-	-	●	-	-	●	●	
				-	-	-	-	●	●	●	
				●	-	●	-	-	-	●	
				●	-	-	-	●	-	●	
	E-PKZ01-G	IP65	-	-	-	●	-	-	●	●	
				-	-	-	-	●	●	●	
				●	-	●	-	-	-	●	
				●	-	-	-	●	-	●	
	E-PKZ01-PVT E-PKZ01-PVS	IP65	Red-yellow	-	-	●	-	-	●	●	
				-	-	-	-	●	●	●	
			-	-	●	-	-	●	●		
E-PKZ01-SVB E-PKZ01-SVB-V	IP65	-	-	-	-	-	-	●	●		
			-	-	-	-	● ¹⁾	●	●		
Motor-protective circuit-breaker PKZM0											
	E-PKZ0	IP40	-	●	-	-	-	-	-	●	
				-	-	-	-	-	●	●	
	E-PKZ0-G	IP55	Black	●	-	●	-	-	-	●	
				-	-	●	-	-	●	●	
	E-PKZ1-GR	IP55	Red-yellow	●	-	●	-	-	-	●	
			-	-	●	-	-	●	●		

Notes




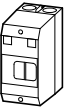





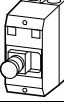

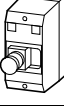









The combination possibilities of circuit-breakers in an enclosure with accessory modules are identified by a ●
¹⁾ Always required





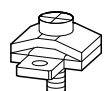

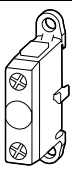







	Degree of protection	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Insulated enclosures for surface mounting						
For Motor-protective circuit-breaker PKZM01s						
	–	IP40	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	CI-PKZ01 281403	1 off	Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.
	With operating membrane	IP65		CI-PKZ01-G 281404		
	Lockable in Off position	IP65	PKZM01 +NHI-E or +U or A +L (2 off)	CI-PKZ01-SVB 281405		
	Lockable in Off position in combination with VHI-PKZ01	IP65		CI-PKZ01-SVB-V 281944		
	With emergency switching off mushroom button, maintained	IP65		CI-PKZ01-PVT 281406		
	With emergency switching off mushroom button, with key-release	IP65		CI-PKZ01-PVS 281407		
	For extension with inserts CI/E-PKZ01-X... unit	As insert	PKZM01	CI-PKZ01-X 289934		
For Motor-protective circuit-breakers PKZM0						
	Cover with aperture dimensioned to accommodate front of breaker. IP40, when mounted turned through 90° to left/right	IP41 with vertical mounting	PKZM0-... +NHI or AGM +U or A +NHI-E +L-PKZ0 (2 off)	CI-K2-PKZ0 219653	1 off	M25 metric cable entry knockout, top and bottom Cable push-through membrane top, bottom, in the back plate and as a control line entry. Insulated enclosure CI-K2 incl. N and PE terminal.
	With black-grey rotary knob	IP65		CI-K2-PKZ0-G 219654		
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP65	CI-K2-PKZ0-GR 219655			
	Cover with aperture dimensioned to accommodate front of breaker	IP40	PKZM0-... +NHI or U or A +L-PKZ0 (2 off)	CI-PKZ0-M 267083		Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.
	With black-grey rotary knob	IP55	PKZM0-... +NHI-E +NHI or U or A +L-PKZ0 (2 off)	CI-PKZ0-GM 260089		
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP55		CI-PKZ0-GRM 260104		
For Motor-protective circuit-breakers PKZM0 with early-make VHI auxiliary contacts						
	With black-grey rotary knob	IP65	PKZM0-... and VHI +NHI or AGM +U or A +L (2 off)	CI-K2-PKZ0-GV 219657	1 off	M25 metric cable entry knockout, top and bottom Cable push-through membrane top, bottom, in the back plate and as a control line entry. Insulated enclosure CI-K2 incl. N and PE terminal.
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP65		CI-K2-PKZ0-GRV 219656		
	With black-grey rotary knob	IP55	PKZM0-... and VHI +U or A (undervoltage or shunt release) +L-PKZ0 (2 off)	CI-PKZ0-GVM 263526		
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP55		CI-PKZ0-GRVM 263525		
For Motor-protective circuit-breakers PKZM4						
	With black-grey rotary knob	IP65	PKZM4-... +VHI or NHI-E +NHI and AGM +U or A +L-PKZ0 (2 off)	CI-K4-PKZ4-G 225524	1 off	Metric knockout: Top and bottom: M25/M32 In the back plate: M25/M32 Control cable entry: M20 CI-K4 insulated enclosure including insulated PE terminal
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204	IP65		CI-K4-PKZ4-GR 225525		

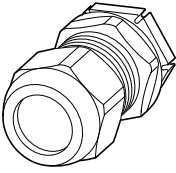
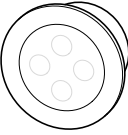





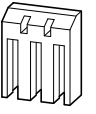









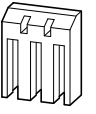









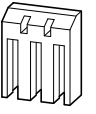




	Degree of protection	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Insulated enclosures for flush mounting						
For Motor-protective circuit-breaker PKZM01s Integrated terminal for PE(N) connection.						
	Front IP40	PKZM01 +NHI or U or A	E-PKZ01 281633		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV UL File No. UL CCN CSA File No. CSA Class No. NA Certification 12528 3211-05 UL Listed, CSA certified
	With operating membrane Front IP65	+NHI-E or VHI +L (2 off)	E-PKZ01-G 281634		1 off 	
	Lockable in Off position Front IP65	PKZM01 +U or A +NHI-E	E-PKZ01-SVB 281635		1 off 	
	Lockable in Off position, in combination with VHI-PKZ01 Front IP65	PKZM01 +U or A +NHI-E or VHI	E-PKZ01-SVB-V 281943		1 off 	
	With emergency switching off mushroom button, maintained Front IP65		E-PKZ01-PVT 281636		1 off 	
	With emergency switching off mushroom button, with key-release Front IP65		E-PKZ01-PVS 281637		1 off 	
	For extension with inserts Ci/E-PKZ01-X... unit As insert	PKZM01	E-PKZ01-X 289935		1 off	
For Motor-protective circuit-breakers PKZM0 Integrated terminal for PE(N) connection.						
	Cover with aperture dimensioned to accommodate front of breaker Front IP40	PKZM0-... +NHI or U or A +L-PKZ0 (2 parts)	E-PKZ0 072906		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV UL File No. UL CCN CSA File No. CSA Class No. NA Certification 12528 3211-05 UL Listed, CSA certified
	With black-grey rotary knob Front IP55	PKZM0-... +NHI or U or A +NHI-E +L-PKZ0 (2 parts)	E-PKZ0-G 072907		1 off 	
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204 Front IP55		E-PKZ0-GR 072908		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV UL File No. UL CCN CSA File No. CSA Class No. NA Certification 12528 3211-05 UL Listed, CSA certified Degree of Protection IEC: Front IP55, UL/CSA Type: 1, 12, 3R



	Degree of protection	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Insulated enclosures for surface mounting						
For Motor-protective circuit-breaker PKZM01s Integrated terminal for PE(N) connection.						
	IP41	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	CI-PKZ01-NA 281408		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947- 4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified Specially designed for NA✓ Degree of Protection IEC: IP41, UL/CSA Type: -
	With operating membrane IP65	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	CI-PKZ01-NA-G 281409		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947- 4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified Specially designed for NA✓ Degree of Protection IEC: IP65, UL/CSA Type: -
	Lockable in Off position IP65	PKZM01 +NHI-E or VHI-PKZ01 +U or A +L (2 off)	CI-PKZ01-NA-SVB 281630		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947- 4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified Specially designed for NA✓ Degree of Protection IEC: IP65, UL/CSA Type: -
	Lockable in Off position, in combination with VHI-PKZ01 IP65	PKZM01 +NHI-E +U or A +L (2 off)	CI-PKZ01-NA-SVB-V 281945		1 off 	
	With emergency switching off mushroom button, maintained IP65		CI-PKZ01-NA-PVT 281631		1 off 	
	With emergency switching off mushroom button, with key-release IP65		CI-PKZ01-NA-PVS 281632		1 off 	
For Motor-protective circuit-breakers PKZM0 Integrated N and PE terminals; lower section without knockouts						
	With black-grey rotary knob IP55	PKZM0-... +NHI or U or A +NHI-E +L-PKZ0 (2 parts)	CI-K2-PKZ0-NA-G 262680		1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947- 4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified Specially designed for NA✓ Degree of Protection IEC: IP55, UL/CSA Type: 1, 12, 3R
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204 IP55		CI-K2-PKZ0-NA-GR 262681		1 off 	
For Motor-protective circuit-breakers PKZM0 with early-make auxiliary contacts Integrated N and PE terminals; lower section without knockouts						
	With black-grey rotary knob IP55	PKZM0-... +VHI... + U... +L-PKZ0 (2 parts)	CI-K2-PKZ0-NA-GV 262682		1 off 	
	With red-yellow rotary knob, for use as emergency switching off device to EN 60204 IP55		CI-K2-PKZ0-NA-GRV 262683		1 off 	

	Degree of protection	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Insulated enclosures, accessories						
Padlocking feature						
For up to 3 padlocks with 3 – 6 mm hasp thickness, for use as main switch to IEC/EN 60204						
	Lockable in the 0-position of the PKZM0 or Motor-protective circuit-breaker PKZM4.	–	CI-K2-PKZ0-G(R)(V) CI-PKZ0-G(R)(V)M	SVB-PKZ0-CI 035129	3 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 CSA Class No. UL Listed, CSA certified NA Certification
–	–	–	E-PKZ0-G(R)	SVB-PKZ0-E 035127	3 off 	
–	–	–	CI-K4-PKZ4-G(R)	SVB-PKZ4-CI 225526	1 off	
Neutral terminal						
For connection of a 5th conductor						
	Flexible, 1 - 4 mm ²	–	CI-K2-PKZ0-...	K-CI-K1/2 207451	20 off 	UL/CSA certification not required
	63 A, flexible, 6 - 16 mm ²	–	CI-K4-PKZ4-G(R)	K25/1 096200	10 off	
	–	–	E-PKZ0(-G)(-GR) E-PKZ01(-G)	N-PKZ0 082160	20 off	
Units for insulated enclosures for PKZ01						
Combinable with CI-PKZ01-X and E-PKZ01-X.						
	With operating membrane	Front IP65	PKZM01 +NHI-E or VHI-PKZ01 +U or A or NHI +L (2 off)	CI/E-PKZ01-XG 289936	1 off	
	Lockable in Off position		PKZM01 +NHI-E +U or A +L (2 off)	CI/E-PKZ01-XSVB 289939		
	With emergency switching off mushroom button, maintained		PKZM01 +NHI-E or VHI-PKZ01 +U or A +L (2 off)	CI/E-PKZ01-XPVT 289937		
	With emergency switching off mushroom button, with key-release		PKZM01 +NHI-E or VHI-PKZ01 +U or A +L (2 off)	CI/E-PKZ01-XPVS 289938		
	Lockable in Off position, in combination with VHI-PKZ01		PKZM01 VHI-PKZ01 +U or A +L (2 off)	CI/E-PKZ01-XSVB-V 289980		




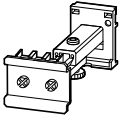






	Cable entry	Drilling dimensions mm	External cable diameter mm	Part no. Article no.	Price See price list	Std. pack																																																																																
Metric cable glands to EN 50262																																																																																						
<ul style="list-style-type: none"> With lock nut and built-in strain relief IP68 up to 5 bar, halogen free 																																																																																						
	M20	20.5	6 - 13	V-M20 206910		20 off																																																																																
	M25	25.5	9 - 17	V-M25 206911																																																																																		
	M32	32.5	13 - 21	V-M32 206912		10 off																																																																																
	M32	32.5	18 - 25	V-M32G 226156																																																																																		
Metric diaphragm grommets																																																																																						
<ul style="list-style-type: none"> IP66 With integral push-through diaphragm 																																																																																						
	M20	20.5	1 - 13	KT-M20 207602		100 off																																																																																
	M25	25.5	1 - 18	KT-M25 207603																																																																																		
	M32	32.5	1 - 25	KT-M32 207604																																																																																		
<table border="1"> <thead> <tr> <th></th> <th>For use with</th> <th>Part no. Article no.</th> <th>Price See price list</th> <th>Std. pack</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td colspan="6">Door coupling handles</td> </tr> <tr> <td colspan="6">Degree of protection IP65, UL/CS Type 4X / Type12</td> </tr> <tr> <td rowspan="8"></td> <td>For use as main switch to IEC/EN 60204</td> <td>Black</td> <td>PKZM0 PKZM4</td> <td>PKZ0-XH¹⁾ 106132</td> <td rowspan="4">1 off  </td> <td rowspan="8">Pluggable PKZ0-XAH extension shaft, can be cut to any required length for installation depths of 100...240 mm. Follower included in delivery. With ON/OFF switch position and "+" (tripped), lockable. With 3 padlocks, 4 – 8 mm hasp. Cannot be used in combination with VHI20-PKZ0.</td> </tr> <tr> <td>For use as a main switch with emergency switching off function to EN 60204</td> <td>Red-yellow</td> <td>PKZM0 PKZM4</td> <td>PKZ0-XRH¹⁾ 106133</td> </tr> <tr> <td>For use as a main switch to EN 60204 in MCC power distribution systems and with PKZM0 installed rotated by 90°</td> <td>Black</td> <td>PKZM0 PKZM4</td> <td>PKZ0-XH-MCC¹⁾ 106136</td> </tr> <tr> <td>For use as a main switch with emergency switching off function to EN 60204 in MCC power distribution systems and with PKZM0 installed rotated by 90°</td> <td>Red-yellow</td> <td>PKZM0 PKZM4</td> <td>PKZ0-XRH-MCC¹⁾ 106137</td> </tr> <tr> <td>For use as main switch to IEC/EN 60204</td> <td>Black</td> <td>PKE</td> <td>PKE-XH¹⁾ 142416</td> <td rowspan="4">1 off  </td> </tr> <tr> <td>For use as a main switch with emergency switching off function to EN 60204</td> <td>Red-yellow</td> <td>PKE</td> <td>PKE-XRH¹⁾ 142417</td> </tr> <tr> <td>For use as a main switch to EN 60204 in MCC power distribution systems and with PKE installed rotated by 90°</td> <td>Black</td> <td>PKE</td> <td>PKE-XH-MCC¹⁾ 142418</td> </tr> <tr> <td>For use as a main switch with emergency-switching off function to EN 60204 in MCC power distribution systems and with PKE installed rotated by 90°</td> <td>Red-yellow</td> <td>PKE</td> <td>PKE-XRH-MCC¹⁾ 142419</td> </tr> <tr> <td colspan="6">Clamp cover</td> </tr> <tr> <td rowspan="1"></td> <td>For increasing the degree of protection of the PKZM4 to IP2X</td> <td>–</td> <td>PKZM4</td> <td>HB-PKZ4²⁾ 256581</td> <td>1 off  </td> <td>Suitable for connecting cables with a max. external diameter of 9.5 mm</td> </tr> <tr> <td colspan="6">Pluggable extension shaft</td> </tr> <tr> <td>–</td> <td>–</td> <td>–</td> <td>PKZM0 PKZM4</td> <td>PKZ0-XAH¹⁾ 106134</td> <td>1 off  </td> <td>Follower not included</td> </tr> </tbody> </table>								For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Door coupling handles						Degree of protection IP65, UL/CS Type 4X / Type12							For use as main switch to IEC/EN 60204	Black	PKZM0 PKZM4	PKZ0-XH¹⁾ 106132	1 off  	Pluggable PKZ0-XAH extension shaft, can be cut to any required length for installation depths of 100...240 mm. Follower included in delivery. With ON/OFF switch position and "+" (tripped), lockable. With 3 padlocks, 4 – 8 mm hasp. Cannot be used in combination with VHI20-PKZ0.	For use as a main switch with emergency switching off function to EN 60204	Red-yellow	PKZM0 PKZM4	PKZ0-XRH¹⁾ 106133	For use as a main switch to EN 60204 in MCC power distribution systems and with PKZM0 installed rotated by 90°	Black	PKZM0 PKZM4	PKZ0-XH-MCC¹⁾ 106136	For use as a main switch with emergency switching off function to EN 60204 in MCC power distribution systems and with PKZM0 installed rotated by 90°	Red-yellow	PKZM0 PKZM4	PKZ0-XRH-MCC¹⁾ 106137	For use as main switch to IEC/EN 60204	Black	PKE	PKE-XH¹⁾ 142416	1 off  	For use as a main switch with emergency switching off function to EN 60204	Red-yellow	PKE	PKE-XRH¹⁾ 142417	For use as a main switch to EN 60204 in MCC power distribution systems and with PKE installed rotated by 90°	Black	PKE	PKE-XH-MCC¹⁾ 142418	For use as a main switch with emergency-switching off function to EN 60204 in MCC power distribution systems and with PKE installed rotated by 90°	Red-yellow	PKE	PKE-XRH-MCC¹⁾ 142419	Clamp cover							For increasing the degree of protection of the PKZM4 to IP2X	–	PKZM4	HB-PKZ4²⁾ 256581	1 off  	Suitable for connecting cables with a max. external diameter of 9.5 mm	Pluggable extension shaft						–	–	–	PKZM0 PKZM4	PKZ0-XAH¹⁾ 106134	1 off  	Follower not included
	For use with	Part no. Article no.	Price See price list	Std. pack	Notes																																																																																	
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	For use as a main switch with emergency switching off function to EN 60204 in MCC power distribution systems and with PKZM0 installed rotated by 90°	Red-yellow	PKZM0 PKZM4	PKZ0-XRH-MCC¹⁾ 106137																																																																																		
	For use as main switch to IEC/EN 60204	Black	PKE	PKE-XH¹⁾ 142416	1 off  																																																																																	
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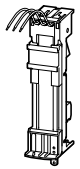


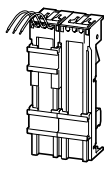


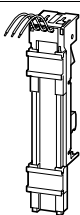


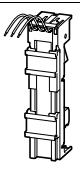


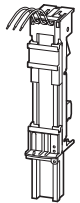
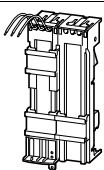




Information relevant for export to North America  

¹⁾ Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
Degree of Protection	IEC: IP65, UL/CSA Type: 4X, 12

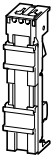


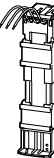













²⁾ Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-06
NA Certification	UL Listed, CSA certified

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Notes		Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 	
Telescopic adapters						
With 45 mm top-hat rail to IEC/EN 60715 for compensation of the mounting depth of rear-mounted devices enclosures CI-K and cabinets						
	Telescopic clip	Stepless adjustment via scale from 75 – 115 mm.	M22-TA 226161	1 off 	Product Standards IEC/EN 60947-5; UL 508; CSA-C22.2 No. 14-05; CSA-C22.2 No. 94-91; CE marking E29184 UL File No. E29184 UL CCN NKCR CSA File No. 012528 CSA Class No. 3211-03 NA Certification UL Listed, CSA certified	
Lockable rotary handle						
	For locking motor-protective circuit-breakers PKZM0, PKZM4 and PKE as a main switch in compliance with EN 60204. Can be padlocked in the "0" position. Hasp thickness: 3 – 6.35 mm	Can not be combined with VHI-PKZ0.	AK-PKZ0 030851	5 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 CSA Class No. UL Listed, CSA certified NA Certification	
Holding facility						
	To prevent tampering with the overload release and the test function, it can be sealed using industry standard sealing wire For use with motor-protective circuit-breakers PKZM0 and PKZM4	–	PL-PKZ0 203599	5 off		
Mounting angle bracket						
	For screw fixing to mounting plate	–	PKE32-XMB 134837	20 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking Request filed for UL and CSA NA Certification	
Documentation						
	Motor-protective circuit-breakers PKZM0, overload monitoring of EEx e motors	German/English	AWB1210-1458D/GB 266164	1 off		
	Motor-protective circuit-breakers PKZM4, overload monitoring of EEx e motors	German/English	AWB1210-1457D/GB 266165			
	Motor-protective circuit-breakers PKE, EEx electric motor overload monitoring	German/English	AWB1210-1631DE/EN 134836			
	For use with	Color	Voltage U_s V	Part no. Article no.	Price See price list	Std. pack
Indicator lights with glow lamp						
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	White	110 - 230	L-PKZ0(230V) 082151		10 off
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	White	230 - 400	L-PKZ0(400V) 082152		10 off
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	White	415 - 500	L-PKZ0(500V) 082153		5 off
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	Green	110 - 230	L-PKZ0-GN(230V) 082154		10 off
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	Green	230 - 400	L-PKZ0-GN(400V) 082155		10 off
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	Green	415 - 500	L-PKZ0-GN(500V) 082156		5 off
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	Red	110 - 230	L-PKZ0-RT(230V) 082157		10 off
	CI-K2-PKZ0-..., CI-K4-PKZ4, CI-PKZ0(1), E-PKZ0(1)	Red	230 - 400	L-PKZ0-RT(400V) 082158		10 off

	Rated operational voltage U_e V	Conductor cross-section	Adapter width mm	Mounting rails Number	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	
Busbar adapters for PKZ and PKE										
Approved to UL 508. For fitting to flat copper busbars with 60 mm between busbar centers, suitable for 5 mm and 10 mm busbar thickness.										
Rated operational current 16 A										
For starters with spring-loaded terminals										
	690	AWG 14 (2.5 mm ²)	45	2	PKZM0-C + DILMC7 PKZM0-C + DILMC9 PKZM0-C + DILMC12	BBA0C-16 101455		4 off  	According to UL 508: $I_e = 12 A$	
Rated operational current 25 A										
For reversing starters										
	690	AWG 12 (4 mm ²)	90	1	PKZM0, PKE + 2 x DILM7-01 PKZM0, PKE + 2 x DILM9-01 PKZM0, PKE + 2 x DILM12-01 MSC-R-0,25-M7... - MSC-R-12-M12...	BBA0R-25 101453		2 off  	In combination with individual components PKZM0 and DILM, use reversing starter kit PKZM0-XRM12. Fully assembled and tested combination with MSC-R → Page 8/20 Only busbar adapters/wiring sets manufactured on or after CW35/2009 can be used for PKE.	
Can be used universally										
	690	AWG 12 (4 mm ²)	45	2	–	BBA0-25/ZTS 101481		4 off  	Mounting rails can be moved within 1.25 mm grid.	
For DOL starters										
	690	AWG 12 (4 mm ²)	45	1	PKZM0, PKE + 2 x DILM17-01 PKZM0, PKE + 2 x DILM25-01 PKZM0, PKE + 2 x DILM25-01 PKZM0, PKE + 2 x DILM32-01 MSC-R-16-M17... MSC-R-32-M32...	BBA0-25 101451		4 off  	In combination with individual components PKZM0 and DILM, use DOL starter kit PKZM0-XRM12. Fully assembled and tested combination with MSC-D → Page 8/2 Only busbar adapters/wiring sets manufactured on or after CW35/2009 can be used for PKE.	
For soft starters										
	690	AWG 12 (4 mm ²)	45	1	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	BBA0L-25 142526		1 off	–	
Rated operational current 32 A										
For reversing starters										
	690	AWG 10 (6 mm ²)	90	3	PKZM0, PKE + 2 x DILM17-01 PKZM0, PKE + 2 x DILM25-01 PKZM0, PKE + 2 x DILM32-01 MSC-R-16-M17... - MSC-R-32-M32...	BBA0R-32 101454		2 off  	In combination with single components PKZM0 and DILM, wiring kit PKZM0-XM32DE and reversing starter wiring kit DILM32-XRL can be used. Fully assembled and tested combination with MSC-R → Page 8/20 Only busbar adapters/wiring sets manufactured on or after CW35/2009 can be used for PKE.	
Information relevant for export to North America  					Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking	CSA File No. CSA Class No. NA Certification Max. Voltage Rating	232140 3211-37 UL Listed, CSA certified 600 V AC		
					UL File No.	E300273				
					UL CCN	NMTR, NMTRZ				

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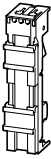










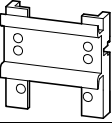


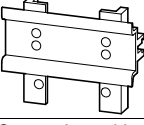






	Rated operational voltage U _e V	Conductor cross-section	Adapter width mm	Mounting rails Number	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Rated operational current 32 A									
Can be used universally.									
	690	–	45	2	PKZM0..., PKE + DILM...	BBA0-32/2TS-C²⁾ 116708		4 off  	Universal adapter 1-, 2- and 3-phase applications. Mounting rail can be moved within 1.25 mm grid. For conductor cross-sections, round conductors of up to 6 mm ² . Only busbar adapters/wiring sets manufactured on or after CW 35/2009 can be used for PKE.
For DOL starters.									
	690	AWG 10 (6 mm ²)	45	2	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32 MSC-D-16-M17... - MSC-D-32-M32...	BBA0-32¹⁾ 101452		4 off  	In combination with individual components PKZM0 and DILM wiring kit PKZM0-XM32DE can be used. Fully assembled and tested combination with MSC-D → Page 8/2 Only busbar adapters/wiring sets manufactured on or after CW35/2009 can be used for PKE.
For soft starters									
	690	AWG 10 (6 mm ²)	45	2	PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	BBA0L-32 142527		1 off	–
For 160 mm adapter system with motor-protective circuit-breakers									
–	690	AWG 10 (6 mm ²)	45	1	PKZM0, PKE	BBA0K-32 142528		1 off	–
Rated operational current 63 A									
For DOL starters.									
	690	AWG 8 (10 mm ²)	55	2	PKZM4 + DILM17 PKZM4 + DILM25 PKZM4 + DILM32 PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	BBA4L-63¹⁾ 101459		4 off  	The following can be used to establish an electrical connection: For PKZM4 + DILM17 to DILM32: MVS-LB0-0M-G For PKZM4 + DILM40 to DILM65: PKZM4-XM65DE.
	690	AWG 8 (10 mm ²)	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM40	BBA2L-63¹⁾ 101480		4 off  	The following can be used to establish an electrical connection: For PKZ2 + DILM7 to DILM12: MVS-LB0-00M-G For PKZ2 + DILM15 to DILM32: MVS-LB0-0M-G.
For motor-protective circuit-breakers									
	690	AWG 8 (10 mm ²)	54	1	PKZM4	BBA4-63¹⁾ 101457		4 off  	–
	690	AWG 8 (10 mm ²)	72	1	PKZ2	BBA2-63¹⁾ 101458		4 off  	–

Information relevant for export to North America



1)	
Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC

2)	
Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC




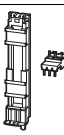





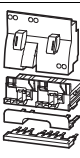


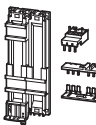














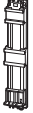
	Rated operational voltage U_e V	Conductor cross-section	Adapter width mm	Mounting rails Number	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Without electrical contacts									
Empty module.									
	-	-	45	2	-	BBA0/2TS-L¹⁾ 101482		4 off  	Mounting rails can be moved within a 1.25 mm grid. Can be used to mount reversing and star-delta starters.
	-	-	54	2	-	BBA4/2TS-L¹⁾ 101483		4 off  	Mounting rails can be moved within a 1.25 mm grid. Can be used to mount reversing and star-delta starters.
Side-mounted module, can be attached on both sides.									
	-	-	9	-	-	BBA-XSM¹⁾ 101484		10 off  	Can be grouped with busbar adapters in order to extend the mounting width.
Busbar adapters accessories									
Mounting rails									
	-	-	45	-	BBA...	PKZM0-XMR²⁾ 239364		10 off  	-
	-	-	54	-	BBA...	PKZM0-XMR5⁴⁾ 113911		10 off  	-
	-	-	72	-	BBA...	PKZM0-XMR7²⁾ 113912		10 off  	-
Connecting cable									
-	-	-	-	-	BBA...	BBA-XLT-6-130³⁾ 116902		30 off  	-
-	-	-	-	-	BBA...	BBA-XLT-16-142³⁾ 116903		30 off  	-

Information relevant for export to North America

1)	
Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified
Max. Voltage Rating	600 V AC

2)	
Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E300273
UL CCN	NMTR, NMTR7
CSA File No.	232140
CSA Class No.	3211-37
NA Certification	UL Listed, CSA certified

3)	
Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
UL File No.	On request
UL CCN	On request
CSA File No.	On request
CSA Class No.	On request
NA Certification	UL Recognized, CSA certified

For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Wiring set				
DOL starter				
	PKZM0, PKE + DILM7 PKZM0, PKE + DILM9 PKZM0, PKE + DILM12 PKZM0, PKE + DILM15 DS7-34...SX004... DS7-34...SX007... DS7-34...SX009... DS7-34...SX012...	PKZM0-XDM12 283149	1 off  	Consists of: • Mechanical connection element for PKZM0 and contactor • Main supply wiring between PKZM0 and contactor with tool-less plug connection • Cable routing As auxiliary contact, use DILA-XHIT... → Page 5/40 Cannot be combined with NHI-E...PKZ0-C. $U_e \leq 415\text{ V}^{1)}$
	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32	PKZM0-XDM32 283153	1 off  	Consists of: • Top-hat rail adapter plates • Power supply wiring between PKZ and contactor ¹⁾
	PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	PKZM4-XDM65 101053	1 off  	
Reversing starters				
	PKZM0, PKE + DILM7-01 PKZM0, PKE + DILM9-01 PKZM0, PKE + DILM12-01	PKZM0-XRM12 283185	1 off  	Consists of: • Mechanical connection element for PKZM0 and contactor • Reversing starters main supply wiring with tool-less plug connection • Control cables for electrical interlocking in tool-less plug connection: – K1M: A1 -K2M: 21 – K1M: 21 -K2M: A1 – K1M: A2 -K2M: A2 • Cable routing As auxiliary contact DILA-XHIT...use → Page 5/40 Can not be combined with AGM-PKZ0. $U_e \leq 415\text{ V}^{1)}$
	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32	PKZM0-XRM32 283189	1 off  	Consists of: • Top-hat rail adapter plates • Reversing starters supply wiring ¹⁾
Wiring kit				
	PKZM0, PKE + DILM17 PKZM0, PKE + DILM25 PKZM0, PKE + DILM32 DS7-34...SX016... DS7-34...SX024... DS7-34...SX032...	PKZM0-XM32DE 239349	5 off  	• Main supply wiring between PKZM0 and contactor • Use only in combination with busbar adapter or mounting rail adapter plate
	PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	PKZM4-XM65DE 101056	5 off  	• Main current supply between PKZM4 and contactor
Top-hat rail adapter plates				
	PKZM0-XDM12 PKZM0-XRM12	PKZM0-XC45 283132	4 off  	Consists of: • 45 mm wide adapter plate • Connection element for side-by-side positioning of further plates ¹⁾
	PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	PKZM4-XC55/2 101054	4 off  	Consists of: • 55 mm wide adapter plate • Connection cam for additional plates • For use with reversing and start-delta starters ¹⁾
Soft starters				
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	PKZM0-XC45L 142529	1 off	Consists of: • 45 mm wide adapter plate
	PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	PKZM0-XC45L/2 142570	1 off	Consists of: • 45 mm wide adapter plate

Notes

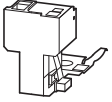

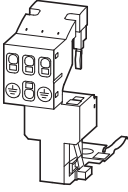

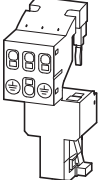

¹⁾ Use only busbar adapters/wiring sets manufactured on or after CW35/2009 for PKE.















Information relevant for export to North America  

²⁾
Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1;
CE marking
UL File No. E36332
UL CCN NLRV
CSA File No. 12528
CSA Class No. 3211-05
NA Certification UL Listed, CSA certified

³⁾
UL/CSA certification not required

⁴⁾
Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1;
CE marking
UL File No. E300273
UL CCN NMTR
CSA File No. 232140
CSA Class No. 3211-37
NA Certification UL Listed, CSA certified




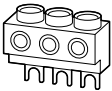


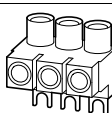


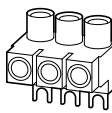


Description	For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
Motor feeder plug						
PE module with contact plate						
	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	DILM12-XMCE 121764		5 off 	35 x 7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: PE 0.75 – 4 mm ²	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking NA Certification Request filed for UL and CSA
Motor feeder plug with PE module and contact plate						
	DILM(C)7 DILM(C)9 DILM(C)12 DILM(C)15	DILM12-XMCP/E 121769		1 off 	35 x 7.5 (15) mm mounting rail (as per DIN EN 60715) with PE function required. For connection of: L1, L2, L3, PE 0.75 – 2.5 mm ²	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking NA Certification Request filed for UL and CSA
Motor feeder plug with PE module without contact plate						
	PKZM0/PKE + DILM(C)7 PKZM0/PKE + DILM(C)9 PKZM0/PKE + DILM(C)12 PKZM0/PKE + DILM(C)15 MSC-D(E)-...-M7... MSC-D(E)-...-M9... MSC-D(E)-...-M15...	DILM12-XMCP/T 121770		1 off 	For connection of: L1, L2, L3, PE 0.75 – 2.5 mm ²	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking NA Certification Request filed for UL and CSA

Circuit-breakers Number	Length mm	Unit width mm	Part no. Article no.	Price See price list	Std. pack	Notes
Three-phase commoning links, incoming unit via terminals 1, 3, and 5						
Finger- and back-of-hand-proof, short-circuit proof, U _e =690 V, I _n =63 A Can be extended through rotated installation						
For PKZM0-... or PKE without side-mounted auxiliary contacts or voltage releases						
	2	90	45	B3.0/2-PKZO¹⁾ 063961	10 off 	For parallel feeding of multiple motor-protective circuit-breakers on terminals 1, 3, and 5
	3	135	45	B3.0/3-PKZO¹⁾ 232289		
	4	180	45	B3.0/4-PKZO¹⁾ 063960		
	5	225	45	B3.0/5-PKZO¹⁾ 232290		
For motor-protective circuit-breakers with one auxiliary contact or trip-indicating auxiliary contact each fitted to right side						
	2	99	45 + 9	B3.1/2-PKZO¹⁾ 044945	10 off 	For parallel feeding of multiple motor-protective circuit-breakers on terminals 1, 3, and 5
	3	153	45 + 9	B3.1/3-PKZO¹⁾ 044946		
	4	207	45 + 9	B3.1/4-PKZO¹⁾ 044947		
	5	261	45 + 9	B3.1/5-PKZO¹⁾ 044948		
For PKZM0-... or PKE with one auxiliary contact or trip-indicating auxiliary contact each fitted to right side, or one voltage release fitted on left side						
	2	108	45 + 18	B3.2/2-PKZO¹⁾ 063963	10 off 	For parallel feeding of multiple motor-protective circuit-breakers on terminals 1, 3, and 5
	4	234	45 + 18	B3.2/4-PKZO¹⁾ 063959	10 off 	

Information relevant for export to North America




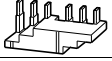

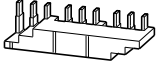
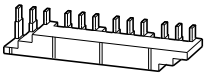
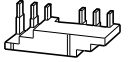





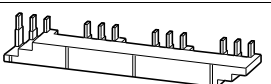


1)
Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No. E36332
UL CCN NLRV
CSA File No. 98494
CSA Class No. 3211-06
NA Certification UL Listed, CSA certified

Circuit-breakers	For use with	Unit width	Part no. Article no.	Price See price list	Std. pack	Notes
Number		mm				
Shroud for unused terminals						
Protection against direct contact. For covering unused terminals on three-phase commoning link B3...-PKZ0						
	-	-	H-B3-PKZ0¹⁾ 032721		20 off  	-
Incoming terminals						
	-	PKZM0 PKE	BK25/3-PKZ0²⁾ 032720		5 off  	For three-phase commoning link, protected against accidental contact, $U_g = 690\text{ V}$, $I_u = 63\text{ A}$ For conductor cross-sections: 2.5 - 25 mm ² stranded 2.5 - 16 mm ² flexible with ferrule AWG 14 - 6, usable on terminals 1, 3, and 5
	-	PKZM0	BK25/3-PKZ0-E³⁾ 262518		5 off  	For three-phase commoning link, protected against accidental contact, $U_g = 690\text{ V}$, $I_u = 60\text{ A}$ For conductor cross-sections: 2.5 - 25 mm ² stranded 2.5 - 16 mm ² flexible with ferrule AWG 14 - 6 For assembly of Type E starters.
	-	PKZM4	BK50/3-PKZ4-E⁴⁾ 272165		1 off  	Can be combined with three-phase commoning link B3...PKZ4. $I_u = 120\text{ A}$. For assembly of Type E starters.

























































Information relevant for export to North America



1)	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking	2)	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
	UL File No.	E36332		UL File No.	E36332
	UL CCN	NLRV		UL CCN	NLRV
	CSA File No.	98494		CSA File No.	12528
	CSA Class No.	3211-06		CSA Class No.	3211-05
	NA Certification	UL Listed, CSA certified		NA Certification	UL Listed, CSA certified
3)	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking	4)	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
	UL File No.	E36332		UL File No.	E36332
	UL CCN	NLRV		UL CCN	NLRV
	CSA File No.	98494		CSA File No.	12528
	CSA Class No.	3211-06		CSA Class No.	3211-06
	NA Certification	UL Listed, CSA certified		NA Certification	UL Listed, CSA certified
	Specially designed for NA	✓		Specially designed for NA	✓
	Suitable for	PKZM0/PKE, line terminal required for Type E/F applications		Suitable for	PKZM4/PKE, line terminal required for Type E/F applications

Circuit-breakers	Length	Unit width	Part no.	Price	Std. pack	Information relevant for export to North America
Number	mm	mm	Article no.	See price list		
Three-phase commoning links						
Finger- and back-of-hand-proof, short-circuit proof $U_e=690\text{ V}$, $I_u=128\text{ A}$						
For PKZM4 without side-mounted auxiliary contacts or voltage releases						
	2	110	55	B3.0/2-PKZ4 220220	1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No. E36332 UL CCN NLRV CSA File No. 12528 CSA Class No. 3211-06 NA Certification UL Listed, CSA certified
	3	165		B3.0/3-PKZ4 220221		
	4	220		B3.0/4-PKZ4 220222		
For PKZM4 with one auxiliary contact or trip-indicating auxiliary contact each fitted on the right side						
	2	119	55 + 9	B3.1/2-PKZ4 220223	1 off 	
	3	183		B3.1/3-PKZ4 220224		
	4	247		B3.1/4-PKZ4 220225		
For PKZM4 with one auxiliary contact or trip-indicating auxiliary contact each fitted to right side, or one voltage release fitted to left side						
	2	128	55 + 18	B3.2/2-PKZ4 220226	1 off 	
	4	274		B3.2/4-PKZ4 220227		
Shroud for unused terminals						
Protection against direct contact. To cover unused terminals on three-phase commoning link						
	-	-	-	H-B3-PKZ4 220228	10 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No. E36332 UL CCN NLRV CSA File No. 12528 CSA Class No. 3211-06 NA Certification UL Listed, CSA certified

HPL07029EN

Actuating voltage	Part no. Article no.	Price See price list	Std. pack	Part no. Article no.	Price See price list	Std. pack	Notes
Shunt release, undervoltage release							
AC							
Standard voltage							
24 V 50 Hz	A-PKZO(24V50HZ)¹⁾ 073181		2 off  	U-PKZO(24V50HZ)¹⁾ 073129		2 off  	
110 V 50 Hz	A-PKZO(110V50HZ)¹⁾ 073184		2 off  	U-PKZO(110V50HZ)¹⁾ 073132		2 off  	
220 V 50 Hz	A-PKZO(220V50HZ)¹⁾ 073186		2 off  	U-PKZO(220V50HZ)¹⁾ 073134		2 off  	
230 V 50 Hz	A-PKZO(230V50HZ)¹⁾ 073187		2 off  	U-PKZO(230V50HZ)¹⁾ 073135		2 off  	Only A(U)-PKZO... with serial number 02 or higher can be fitted
240 V 50 Hz	A-PKZO(240V50HZ)¹⁾ 073188		2 off  	U-PKZO(240V50HZ)¹⁾ 073136		2 off  	
380 V 50 Hz	A-PKZO(380V50HZ)¹⁾ 073189		2 off  	U-PKZO(380V50HZ)¹⁾ 073137		2 off  	
400 V 50 Hz	A-PKZO(400V50HZ)¹⁾ 073190		2 off  	U-PKZO(400V50HZ)¹⁾ 073138		2 off  	
415 V 50 Hz	A-PKZO(415V50HZ)¹⁾ 073191		2 off  	U-PKZO(415V50HZ)¹⁾ 073139		2 off  	
120 V 60 Hz	A-PKZO(120V60HZ)¹⁾ 073195		2 off  	U-PKZO(120V60HZ)¹⁾ 073143		2 off  	
240 V 60 Hz	A-PKZO(240V60HZ)¹⁾ 073198		2 off  	U-PKZO(240V60HZ)¹⁾ 073146		2 off  	
440 V 60 Hz	A-PKZO(440V60HZ)¹⁾ 082164		2 off  	U-PKZO(440V60HZ)¹⁾ 082161		2 off  	
480 V 60 Hz	A-PKZO(480V60HZ)¹⁾ 073199		2 off  	U-PKZO(480V60HZ)¹⁾ 073147		2 off  	
Non-standard voltages not covered by above standard voltages							
... V 50 Hz (24 - 500 V)	A-PKZO(*V50HZ)¹⁾ 982165		2 off  	U-PKZO(*V50HZ) 982162			The part number for ordering consists of the basic part number and the actuating voltage. For non-standard voltages, specify the required actuating voltage within the indicated range (... - ... V). Minimum order quantity is 10 units
... V 60 Hz (24 - 600 V)	A-PKZO(*V60HZ)¹⁾ 982166		2 off  	U-PKZO(*V60HZ) 982163			
DC							
Standard voltage							
24 V DC	A-PKZO(24VDC)¹⁾ 073200		2 off  				PKE can be fitted only with A(U)-PKZO... with serial number 02 or higher.
110 V DC	A-PKZO(110VDC)¹⁾ 073203		2 off  				



Information relevant for export to North America



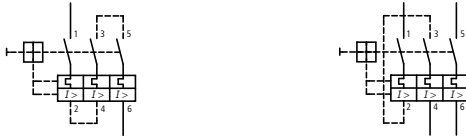
1)

Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

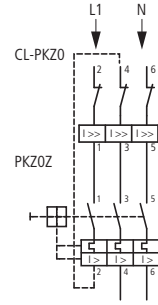
PKZ, PKZM

Engineering

1- and 2-pole-connected PKZM0, PKZM4 and PKZ2 with AC and DC



2-pole-connected PKZM0(1) and PKZM4 with CL-PKZO



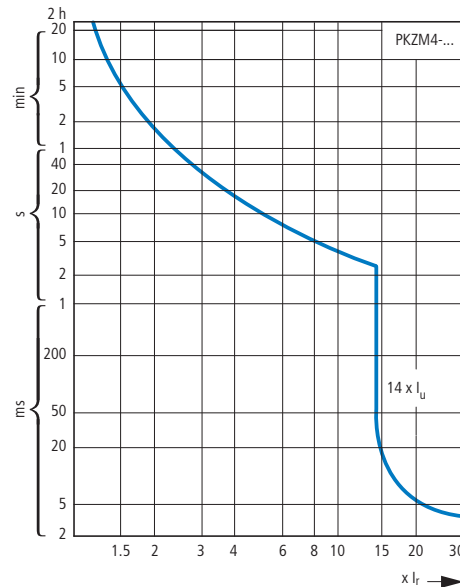
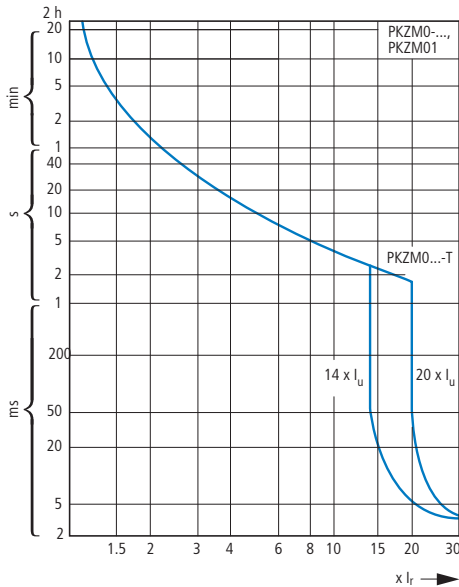
Protection of PVC-insulated cables against thermal overload on short-circuits

The table specifies which minimum conductor cross-sections are protected by motor-protective circuit-breaker PKZ(M) up to their rated conditional short-circuit current I_q .

Min. cross-section protected 380 – 415 V, 50 Hz, Cu mm ²					Device Part no.
4	2.5	1.5	1	0.75	
					PKZM0-0,16
					PKZM0-6,3
					PKZM0-10
					PKZM0-12
					PKZM0-16
					PKZM0-20
					PKZM0-25
					PKZM0-32
					PKZM4-16
					PKZM4-25
					PKZM4-32
					PKZM4-40
					PKZM4-50
					PKZM4-58
					PKZM4-63

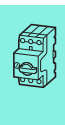
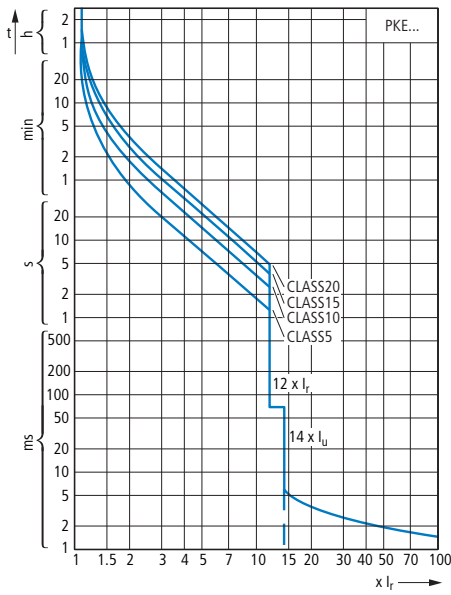
Min. cross-section protected 380 – 415 V, 50 Hz, Cu mm ²		Device Part no.
		PKZ2/ZM-0,6
		PKZ2/ZM-2,4
		PKZ2/ZM-4
		PKZ2/ZM-6
		PKZ2/ZM-10
		PKZ2/ZM-16
		PKZ2/ZM-25
		PKZ2/ZM-32
PKZ2/ZM-40		

PKZM0-...T tripping characteristics (not for PKM0-..., PKZM01)

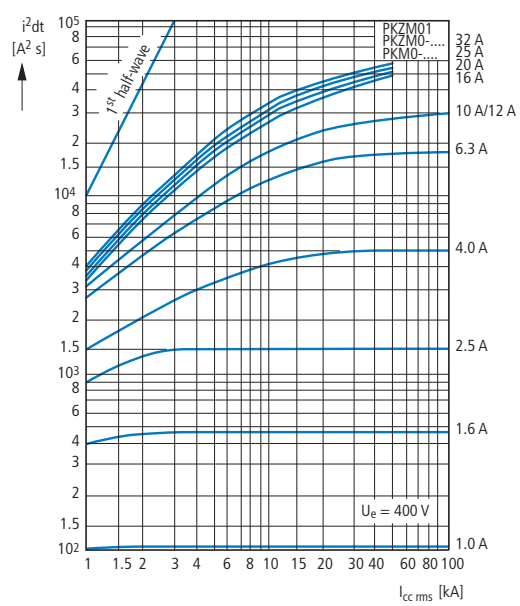
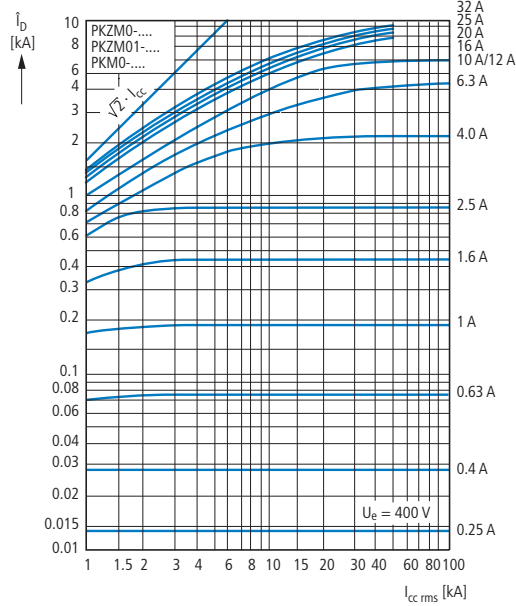


PKZM, PKE

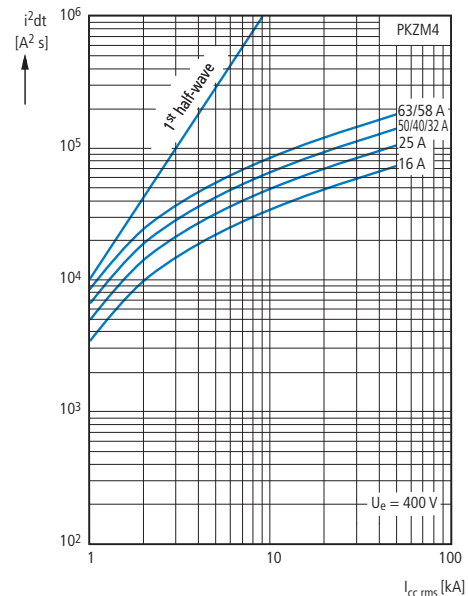
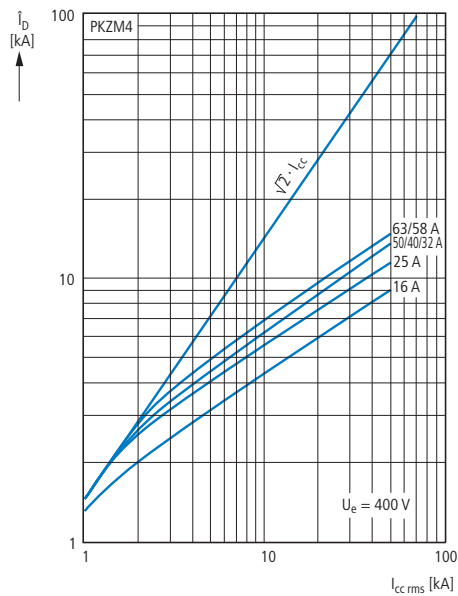
Tripping characteristic curves, wide-range circuit-breaker PKE



Let-through characteristics, motor-protective circuit-breaker, transformer-protective circuit-breakers, circuit-breaker for starter combinations



Motor-protective circuit-breaker let-through characteristics



Circuit-breaker switching capacity from serial no. 04

Rated uninterrupted current I_u

Rated conditional short-circuit current I_q IEC/EN 60947-4-1

Rated ultimate short-circuit breaking capacity I_{cu} } IEC/EN 60947-2
 Rated breaking capacity I_{cs}

I_u A	230 V				400 V				440 V				500 V				690 V			
	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾

PKZM0, PKZM0...-T, PKM0 with type "1" and "2" coordination

0.16 – 1	150	150	150	N	150	150	150	N				N				N				N
1.6	150	150	150	N	150	150	150	N				N				N				N
2.5	150	150	150	N	150	150	150	N				N				N	5	5	5	50
4	150	150	150	N	150	150	150	N				N				N	3	3	3	50
6.3	150	150	150	N	150	150	150	N				N	42	42	11	50	3	3	2	50
10	150	150	150	N	150	150	150	N	42	42	12	50	42	42	11	50	3	3	2	50
12	50	50	13	50	50	50	13	50	15	15	12	50	15	15	8	50	3	3	2	50
16	50	50	13	50	50	50	13	50	15	15	12	50	15	15	8	50	3	3	2	50
20	50	50	13	50	50	50	13	50	10	10	13	50	6	6	3	50	3	3	1	50
25	50	50	13	50	50	50	13	50	10	10	13	50	6	6	3	50	3	3	1	50
32	50	50	13	50	50	50	13	50	10	10	13	50	6	6	3	50	3	3	1	50

PKZM0 (PKZM0...-T, PKM0) + CL-PKZ0

0.16 – 1				N				N				N				N			20	N
1.6				N				N				N				N			20	N
2.5				N				N				N				N	20	20	20	N
4				N				N				N				N	20	20	20	N
6.3				N				N				N			50	N	20	20	20	N
10				N				N				N			20	N	20	20	20	N
12				N				N				N			20	N	5	5	2.5	N
16				N				N				N			20	N	5	5	2.5	N
20				N				N				N	10	10	10	N	5	5	2.5	N
25				N				N				N	10	10	10	N	5	5	2.5	N
32				N				N				N	10	10	10	N	5	5	2.5	N

PKZM0 (PKZM0...-T, PKM0) + 2 CL-PKZ0

0.16 – 1				N				N				N				N			20	N
1.6				N				N				N				N			20	N
2.5				N				N				N				N	40	40	20	N
4				N				N				N				N	40	40	20	N
6.3				N				N				N			50	N	20	20	20	N
10				N				N				N			40	N	20	20	20	N
12				N				N				N			40	N	10	10	2.5	N
16				N				N				N			40	N	10	10	2.5	N
20				N				N				N	20	20	20	N	10	10	2.5	N
25				N				N				N	20	20	20	N	10	10	2.5	N
32				N				N				N	20	20	20	N	10	10	2.5	N

Notes

■ No upstream protective device required, as it is the auto-protected range (100/150 kA)

N Not necessary

¹⁾ Required back-up fuse if the short-circuit current exceeds the device's rated conditional short-circuit current ($I_{cc} > I_q$).

Circuit-breaker switching capacity

Rated uninterrupted current I_u

Rated conditional short-circuit current I_q IEC/EN 60947-4-1

Rated maximum short-circuit breaking capacity I_{cu}
Rated breaking capacity I_{cs} } IEC/EN 60947-2

I_u A	230 V				400 V				440 V ²⁾				500 V ²⁾				690 V ²⁾			
	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾
PKZM01 with type "1" and "2" coordination																				
0.16 – 1	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
1.6	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
2.5	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
4	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
6.3	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
10	50	50	50	50	50	50	50	50	42	42	10	50	42	42	10	50	42	42	10	50
12	50	50	10	50	50	50	10	50	15	15	10	50	15	15	10	50	15	15	10	50
16	50	50	10	50	50	50	10	50	15	15	10	50	15	15	10	50	15	15	10	50
20, 25	50	50	10	50	50	50	10	50	10	10	3	50	10	10	3	50	10	10	3	50
PKZM4 with type "1" and "2" coordination																				
16	150	150	25	N	150	150	25	N	45	45	25	100	15	15	100	8	8	2.5	100	
25	150	150	25	N	150	150	25	N	45	45	25	100	15	15	100	8	8	2.5	100	
32	50	50	25	100	50	50	25	100	45	45	25	100	15	15	100	5	5	2.5	100	
40	50	50	25	100	50	50	25	100	45	45	25	100	15	15	100	5	5	2.5	100	
50	50	50	25	100	50	50	25	100	45	45	25	100	15	15	100	5	5	2.5	100	
58	50	50	25	160	50	50	25	160	45	45	25	160	15	15	160	5	5	2.5	160	
63	50	50	25	160	50	50	25	160	45	45	25	160	15	15	160	5	5	2.5	160	
PKE12... ²⁾ with type of coordination „1" and																				
0.3 - 1.2	100		50		100		50		50		50		10		50		3		50	
1 - 4	100		50		100		50		50		50		10		50		3		50	
3 - 12	100		50		100		50		15		50		10		50		3		50	
PKE32... ²⁾ with type of coordination „1" and																				
3 - 12	100		50		100		50		15		50		6		50		3		50	
8 - 32	100		50		100		50		25		50		6		50		3		50	

Notes

- No upstream protective device required, as it is the auto-protected range (150 kA)
- N Not necessary

- 1) Fuse (A gG/gL) for increasing the switching capacity of the motor-protective circuit-breaker to 100 kA
- 2) Please enquire for additional information regarding voltages >400 V and device combinations with CL-PKZ0.

Motor-protective circuit-breaker internal resistances

	Impedance	Heat dissipation (3 pole at operating temperature)	Rated uninterrupted current I_u
	Ω	W	A
PKZM0-0.16	78	6	0.16
PKZM0-0.25	32	6	0.25
PKZM0-0.4	13	6	0.4
PKZM0-0.63	5	6	0.63
PKZM0-1	2	6	1
PKZM0-1.6	0.8	6	1.6
PKZM0-2.5	0.32	6	2.5
PKZM0-4	0.13	6	4
PKZM0-6.3	0.050	6	6.3
PKZM0-10	0.020	6	10
PKZM0-12	0.014	6	12
PKZM0-16	0.008	6	16
PKZM0-20	0.005	6	20
PKZM0-25	0.003	6	25
PKZM0-32	0.002	6	32

	Impedance	Heat dissipation (3 pole at operating temperature)	Rated uninterrupted current I_u
	Ω	W	A
PKZM4-16	0.029	22	16
PKZM4-25	0.012	22	25
PKZM4-32	0.007	22	32
PKZM4-40	0.005	22	40
PKZM4-50	0.003	22	50
PKZM4-58	0.002	22	58
PKZM4-63	0.002	22	65
PKZ2-ZM-0.6	13	14	0.6
PKZ2-ZM-1	5	14	1
PKZ2-ZM-1.6	2	14	1.6
PKZ2-ZM-2.4	0.8	14	2.4
PKZ2-ZM-4	0.29	14	4
PKZ2-ZM-6	0.13	14	6
PKZ2-ZM-10	0.05	14	10
PKZ2-ZM-16	0.018	14	16
PKZ2-ZM-25	0.007	14	25
PKZ2-ZM-32	0.005	14	32
PKZ2-ZM-40	0.003	14	40



Approvals for world markets

Rating data for approved types ¹⁾ UL 508/CSA C 22.2 No. 14	Maximum motor rating				Setting ranges		Maximum protective device to UL/CSA							
	Three-phase current				Overload releases	Short-circuit-releases	Group protection ²⁾							
	200 V	230 V	460 V	575 V			Up to max. short-circuit current	Maximum fuse rating		Maximum circuit breaker				
	HP	HP	HP	HP	A	A	600 V	with CL	with CL	with CL	with CL	with CL	with CL	
							kA	kA	A	A	A	A	A	
Motor-protective circuit-breakers PKZM01	"Manual Motor Starter with thermal and magnetic trip"													
PKZM01-0,16	3)				0.1 – 0.16	2.2	50	600	600					
PKZM01-0,25					0.16 – 0.25	3.4	50	600	600					
PKZM01-0,4					0.25 – 0.4	5.6	50	600	600					
PKZM01-0,63					0.4 – 0.63	8.8	50	600	600					
PKZM01-1					0.63 – 1	14	50	600	600					
PKZM01-1,6			¾	¾	1 – 1.6	22	50	600	600					
PKZM01-2,5	½	½	1	1½	1.6 – 2,5	35	50	600	600					
PKZM01-4	¾	¾	2	3	2.5 – 4	56	50	600	600					
PKZM01-6,3	1	1½	3	5	4 – 6.3	88	50	600	600					
PKZM01-10	3	3	7½	10	6.3 – 11	140	22	50	150	600	125	600		
PKZM01-12	3	3	7½	10	9 – 12	168	18	50	150	600	125	600		
PKZM01-16	3	5	10	10	10 – 16	224	10	50	150	600	125	600		
PKZM01-20	5	-	-	15	16 – 20	280	10	18	150	600	125	600		
PKZM01-25	-	7½	15	20	20 – 25	350	10	18	150	600	125	600		
Motor-protective circuit-breakers PKZM0	"Manual Motor Starter with thermal and magnetic trip"													
PKZM0-0,16	3)				0.1 – 0.16	2.2	50	600	600					
PKZM0-0,25					0.16 – 0.25	3.4	50	600	600					
PKZM0-0,4					0.25 – 0.4	5.6	50	600	600					
PKZM0-0,63					0.4 – 0.63	8.8	50	600	600					
PKZM0-1					0.63 – 1	14	50	600	600					
PKZM0-1,6			¾	¾	1 – 1.6	22	50	600	600					
PKZM0-2,5	½	½	1	1½	1.6 – 2,5	35	50	600	600					
PKZM0-4	¾	¾	2	3	2.5 – 4	56	50	600	600					
PKZM0-6,3	1	1½	3	5	4 – 6.3	88	50	600	600					
PKZM0-10	3	3	7½	10	6.3 – 11	140	22	50	150	600	125	600		
PKZM0-12	3	3	7½	10	9 – 12	168	18	50	150	600	125	600		
PKZM0-16	3	5	10	10	10 – 16	224	10	50	150	600	125	600		
PKZM0-20	5	-	-	15	16 – 20	280	10	18	150	600	125	600		
PKZM0-25	-	7½	15	20	20 – 25	350	10	18	150	600	125	600		
PKZM0-32	7½	10	20	25	24 – 32	448	10	18	150	600	125	600		
Motor-protective circuit-breakers PKZM4														
PKZM4-16	3	5	10	15	10 – 16	224	50	600	600					
PKZM4-25	7½	7½	20	25	16 – 25	350	50	600	600					
PKZM4-32	10	10	25	30	25 – 34	448	50	600	600					
PKZM4-40	10	15	30	40	32 – 42	560	50	600	600					
PKZM4-50	10	15	30	40	40 – 52	700	10	600	600					
PKZM4-58	15	15	40	50	50 – 56	812	10	600	600					
PKZM4-63	15	15	40	50	52 – 58	882	10	600	600					

Notes

Service factor (SF)

Set value I_r , on the current scale, depending on the load factor

$$SF = 1.15 \rightarrow I_r = 1 \times I_{n \text{ mot}}$$

$$SF = 1 \rightarrow I_r = 0.9 \times I_{n \text{ mot}}$$

¹⁾ Devices for world markets IEC \triangleq UL/CSA²⁾ Caution: Changed requirements for group protection³⁾ Calculate motor output in this range according to rated operational current. Specified values as per NEC Table 430 – 150

Rating data for approved types ¹⁾ UL 508/CSA C 22.2 No. 14		For use with	Pilot Duty	General Use	
Accessories					
Standard auxiliary contacts	NHI11-PKZ0	PKZM0(-T) PKZM4	A 600, Q 300	5 A – 600 V AC 1 A – 250 V DC	–
	NHI12-PKZ0				
	NHI21-PKZ0				
	NHI2-11S-PKZ0				
	NHI-E-11-PKZ0				
	NHI-E-10-PKZ0		E150	0.5 A – 250 V AC	–
Early-make auxiliary contacts	VHI20-PKZ0	PKZM0(-T)	E150	0.5 A – 250 V AC	–
	VHI20-PKZ01	PKZM01			
Trip indicators	AGM2-10-PKZ0	PKZM0(-T) PKZM4	A 600, Q 300	5 A – 600 V AC 1 A – 250 V DC	–
	AGM2-01-PKZ0				
Shunt release	A-PKZ0(...)	PKZM0(-T) PKZM4	–	–	Actuating voltages and ordering information → Products for the German market
	U-PKZ0(...)				
Auxiliary contact for contact module	HI11-S/EZ-PKZ0	PKZM0	A 600, Q 300	5 A – 600 V AC 1 A – 250 V DC	–



Notes

¹⁾ Devices for world markets IEC = UL/CSA

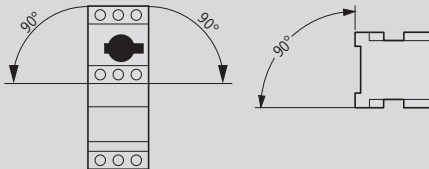
Motor-protective circuit-breakers PKZM0(4) used as "Manual self-protected Motor Starters" – UL 508 Type E

Maximum motor output AC				Setting ranges		Interrupting Capacity = Short Circuit Current (SCCR)			Components	Accessories
200 V	230 V	460 V	575 V	Overload releases	Short-circuit releases	240 V	480V/ 277 V ²⁾	600V/ 347 V ²⁾	Motor Protector	
208 V	240 V	480 V	600 V			[kA]	[kA]	[kA]	Part no.	Part no.
[HP]	[HP]	[HP]	[HP]	[A]	[A]					
¹⁾				0.1 – 0.16	2.2	65	65	50	PKZM0-0.16	BK25/3-PKZ0-E
				0.16 – 0.25	3.4	65	65	50	PKZM0-0.25	BK25/3-PKZ0-E
				0.25 – 0.4	5.6	65	65	50	PKZM0-0.4	BK25/3-PKZ0-E
				0.4 – 0.63	8.8	65	65	50	PKZM0-0.63	BK25/3-PKZ0-E
				0.63 – 1	14	65	65	50	PKZM0-1	BK25/3-PKZ0-E
		³ / ₄	³ / ₄	1 – 1.6	22	65	65	50	PKZM0-1.6	BK25/3-PKZ0-E
¹ / ₂	¹ / ₂	1	1½	1.6 – 2,5	35	65	65	50	PKZM0-2.5	BK25/3-PKZ0-E
³ / ₄	³ / ₄	2	3	2.5 – 4	56	65	65	50	PKZM0-4	BK25/3-PKZ0-E
1	1½	3	5	4 – 6.3	88	65	65	50	PKZM0-6.3	BK25/3-PKZ0-E
3	3	7½	10	6.3 – 11	140	65	65	50	PKZM0-10	BK25/3-PKZ0-E
3	3	7½	–	9 – 12	168	65	65	–	PKZM0-12	BK25/3-PKZ0-E
3	5	10	–	10 – 16	224	42	42	–	PKZM0-16	BK25/3-PKZ0-E
5	–	–	–	16 – 20	280	18	18	–	PKZM0-20	BK25/3-PKZ0-E
–	7½	15	–	20 – 25	350	18	18	–	PKZM0-25	BK25/3-PKZ0-E
7½	10	20	–	24 – 32	448	18	18	–	PKZM0-32	BK25/3-PKZ0-E
3	5	10	10	10 – 16	224	65	65	25	PKZM4-16	BK50/3-PKZ4-E
5	7½	15	20	16 – 27	350	65	65	25	PKZM4-25	BK50/3-PKZ4-E
7½	10	20	30	24 – 34	448	65	65	25	PKZM4-32	BK50/3-PKZ4-E
10	–	30	30	32 – 40	560	65	65	25	PKZM4-40	BK50/3-PKZ4-E
–	15	30	–	40 – 52	700	65	65	–	PKZM4-50	BK50/3-PKZ4-E
–	–	40	–	50 – 56	812	65	65	–	PKZM4-58	BK50/3-PKZ4-E
–	–	40	–	52 – 58	882	65	–	–	PKZM4-63	BK50/3-PKZ4-E

Notes

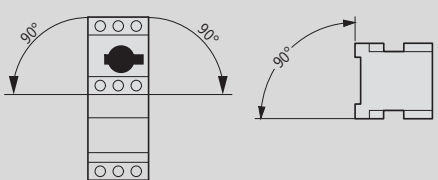
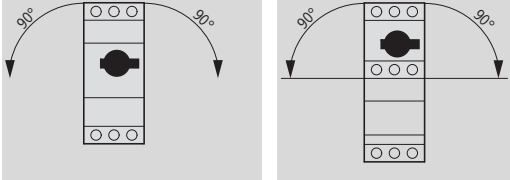
¹⁾ Calculate motor power in this range according to the rated current. Stated values to NEC Table 430 -150
²⁾ Suitable for networks with grounded star-point

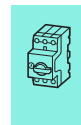
Technical data

				PKZM01...	PKZM0-... ¹⁾		
General							
Standards				IEC/EN 60947, VDE 0660, UL 508, CSA C 22.2 No. 14			
Climatic proofing				Damp heat, constant, to IEC 60068-2-78 Damp heat, cyclic, to IEC 60068-2-30			
Ambient temperature	Storage	°C	-25...80	-25...80			
	Open	°C	-25...55	-25...55			
	Encapsulated	°C	-25...40	-25...40			
Built-in position							
Direction of incoming supply				Any	Any		
Degree of protection	Device		IP20	IP20			
	Terminals		IP00	IP00			
Contact protection to EN 50274				Finger- and back-of-hand proof			
Shock resistance, half-sinusoidal shock, 10 ms to IEC 60068-2-27				g	25		
Installation altitude				m	max. 2000		
Terminal capacity, screw terminals	Solid		mm ²	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)		
		Flexible with ferrule to DIN 46228	mm ²	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)		
		Solid or stranded	AWG	18 - 10	18 - 10		
Terminal capacity, spring-loaded terminals	Solid		mm ²	–	1 x (1...2.5) 2 x (1...2.5)		
		Flexible with ferrule to DIN 46228	mm ²	–	1 x (1...2.5) 2 x (1...2.5)		
		Solid or stranded	AWG	–	18...14		
Terminal screw tightening torque	Main conductors	Nm	1.7	1.7			
	Auxiliary conductors	Nm	1	1			
Main contacts							
Rated impulse withstand voltage				U_{imp}	V AC	6000	6000
Overvoltage category/pollution degree						III/3	III/3
Rated operational voltage				U_e	V AC	690	690
Rated uninterrupted current = rated operational current				$I_u = I_e$	A	16 or current setting of the overcurrent release	32 or current setting of the overcurrent release
Rated frequency					Hz	40 - 60	40 - 60
Heat dissipation (3 pole at operating temperature)					W	6	6
Lifespan, mechanical				Operations	x 10 ⁶	0.05	0.1
Lifespan, electrical (AC-3 at 400 V)				Operations	x 10 ⁶	0.05	0.1
Maximum operating frequency				Operations/h	Ops/h	25	40
Short-circuit rating							
AC						→ Page 7/33	→ Page 7/32
DC					kA	60	60 (up to PKZM0-16) 40 (PKZM0-20 to PKZM0-32)
Motor switching capacity							
AC-3 up to 690 V					A	16	32
DC-5 (up to 250 V)					A	16 (3 contacts in series)	25 (3 contacts in series)
Trip blocks							
Temperature compensation							
To IEC/EN 60947, VDE 0660					°C	-5...40	-5...40
Operating range					°C	-25...55	-25...55
Temperature compensation residual error for T > 40 °C					%/K	≤ 0.25	≤ 0.25
Setting range of overload releases					x I_u	0.6 - 1	0.6 - 1
Short-circuit releases tolerance					%	± 20	± 20
Phase-failure sensitivity						IEC/EN 60947-4-1, VDE 0660 Part 102	IEC/EN 60947-4-1, VDE 0660 Part 102

Notes

¹⁾ Tested according to IEC/EN 60947-1 (isolating characteristics) and IEC/EN 60947-2

PKM0-...	PKZM0-...-T	PKZM4	PKE
IEC/EN 60947, VDE 0660, UL 508, CSA C 22.2 No. 14			
Damp heat, constant, to IEC 60068-2-78			
Damp heat, cyclic, to IEC 60068-2-30			
-25...80	-25...80	-25...70	-25...80
-25...55	-25...55	-25...55	-25...55
-25...40	-25...40	-25...40	-25...40
			
Any	Any	Any	Any
IP20	IP20	IP20	IP20
IP00	IP00	IP00	IP00
Finger- and back-of-hand proof			
25	25	15	25
max. 2000	max. 2000	max. 2000	max. 2000
1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 50) 2 x (1 - 35)	1 x (1 - 6) 2 x (1 - 6)
1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 6) 2 x (1 - 6)	1 x (1 - 35) 2 x (1 - 35)	1 x (1 - 6) 2 x (1 - 6)
18 - 10	18 - 10	14 - 2	18 - 10
1 x (1...2.5) 2 x (1...2.5)	-	-	1 x (1...2.5) 2 x (1...2.5)
1 x (1...2.5) 2 x (1...2.5)	-	-	1 x (1...2.5) 2 x (1...2.5)
18...14	-	-	18...14
1.7	1.7	3.3	1.7
1	1	1	1
6000	6000	6000	6000
III/3	III/3	III/3	III/3
690	690	690	690
32 or current setting of the overcurrent release	25 or current setting of the overcurrent release	65 Open 63 enclosed	32 A or set current of the overcurrent release
40 - 60	40 - 60	40 - 60	40 - 60
6	6	22	6
0.1	0.1	0.03	0.05
0.1	0.1	0.03	0.05
40	40	40	60
→ Page 7/32	→ Page 7/32	→ Page 7/33	→ Page 7/33
60 (up to PKM0-16) 40 (PKM0-20 to PKM0-32)	60 (up to PKZM0-16) 40 (PKZM0-20 to PKZM0-32)	60	-
32	25	65	32
25 (3 contacts in series)	25 (3 contacts in series)	63 (3 contacts in series)	-
-5...40	-5...40	-5...40	-5...40
-25...55	-25...55	-25...55	-25...55
≤ 0.25	≤ 0.25	≤ 0.25	0.25 - 1
± 20	0.6 - 1	0.6 - 1	± 20
-	± 20	± 20	± 20
-	IEC/EN 60947-1-1, VDE 0660 Part 102	IEC/EN 60947-4-1, VDE 0660 Part 102	Yes

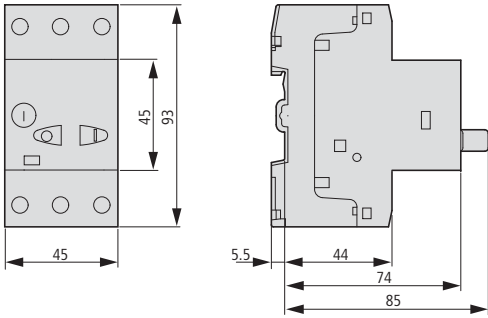


				NHI...PKZO	NHI-E-...PKZO	VHI...PKZO	AGM
Auxiliary contacts							
Rated impulse withstand voltage	U_{imp}	V AC		6000	4000	4000	6000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Rated operating voltage							
	U_e	V AC		500	440	440	500
	U_e	V DC		250	250	250	250
Safe isolation according to EN 61140							
Between auxiliary contacts and main contacts			V AC	690	690	690	690
Rated operational current							
AC-15							
	220 - 240 V	I_e	A	3.5	1	1	3.5
	380 - 415 V	I_e	A	2	–	–	2
	440 - 500 V	I_e	A	1	–	–	1
DC-13 L/R \leq 100 ms							
	24 V	I_e	A	2	2	2	2
	60 V	I_e	A	1.5	–	–	1.5
	110 V	I_e	A	1	–	–	1
	220 V	I_e	A	0.25	–	–	0.25
Durability							
Lifespan, mechanical	Operations	$\times 10^6$		> 0.1	> 0.1	> 0.1	> 0.01
Lifespan, electrical	Operations	$\times 10^6$		> 0.05	> 0.1	> 0.1	> 0.05
Control circuit reliability (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA)	Fault probability	λ		< 10^{-8} < 1 failure in 1×10^8 operations			
Interlocked opposing contacts				Yes	–	–	–
Short-circuit rating without welding							
Fuseless				FAZ-B4/1-HI	–	–	FAZ-B4/1-HI
Fuse			A gG/gL	10	10	10	10
Terminal capacity							
Solid or flexible conductor with ferrule			mm ²	0.75 - 2.5	0.75 - 1.5	0.75 - 1.5	0.75 - 2.5
Solid or stranded			AWG	18 - 14	18 - 16	18 - 16	18 - 14

				Undervoltage release U-PKZ...	Shunt release A-PKZ...
General					
Terminal capacity					
Solid or flexible conductor with ferrule			mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded			AWG	1 x (18 - 14) 2 x (18 - 14)	1 x (18 - 14) 2 x (18 - 14)
Main contacts					
Rated operating voltage	U_e	V AC		42 - 480	42 - 480
Rated operating voltage	U_e	V DC		24 - 250	24 - 250
Pick-up-/drop-out voltage					
Pick-up voltage	$x U_s$			0.85 - 1.1	
Drop-out voltage	$x U_s$			0.7 - 0.35	
Operating range					
AC voltage			$x U_s$		0.7...1.1
DC voltage (intermittent operation 5 s)			$x U_s$		0.7...1.1
Power consumption					
AC voltage					
AC pick-up rating			Pick-up	VA	5
AC consumption when closed			Holding	VA	3
DC voltage					
DC pick-up rating			Pick-up	W	–
DC consumption when closed			Holding	W	3

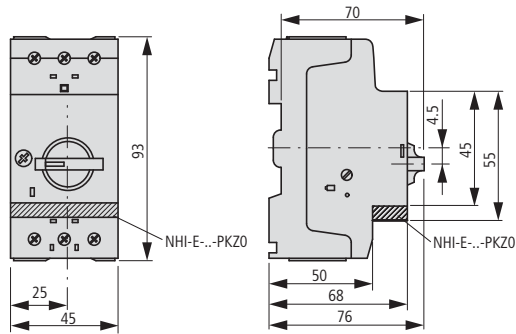
Dimensions

Motor-protective circuit-breaker
PKZM01...



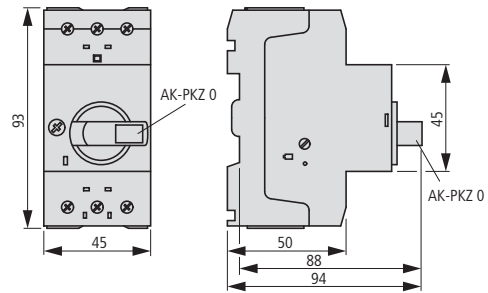
Motor-protective circuit-breaker
Transformer-protective circuit-breakers

Motor-protective circuit-breaker with
standard auxiliary contacts
PKZM0-...(+NHI-E-...-PKZ0)
PKZM0-...-T(+NHI-E-...-PKZ0)
PKM0-...(+NHI-E-...-PKZ0)

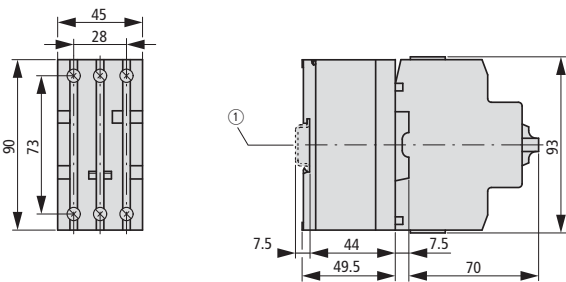


Motor-protective circuit-breakers with lockable rotary handles

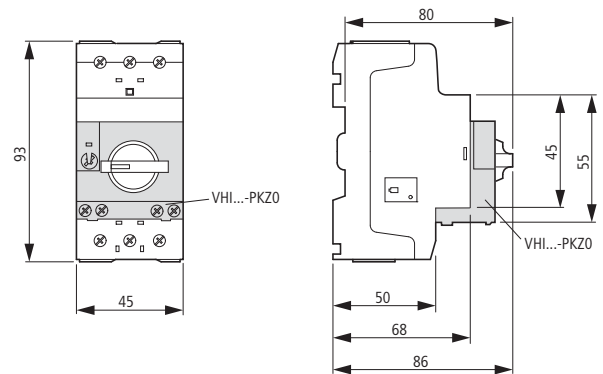
PKZM0-...+AK-PKZ0



Current limiters
CL-PKZ...



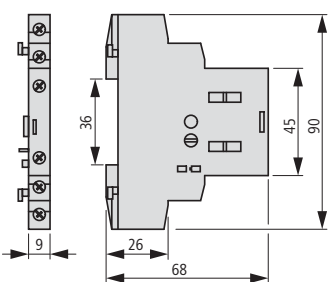
Motor-protective circuit-breakers with early-make auxiliary contacts
PKZM0-...+VHI-...-PKZ0



① Top-hat rail IEC/EN 60715

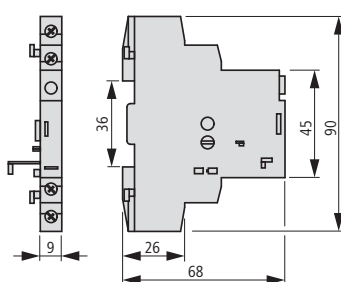
Standard auxiliary contacts

NHI...-PKZ0



Trip indicators

AGM2...-PKZ0

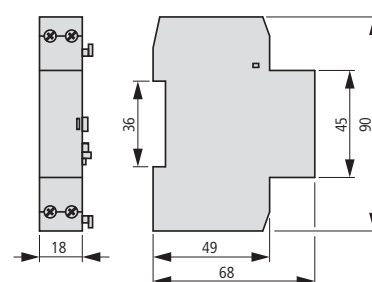


Shunt release

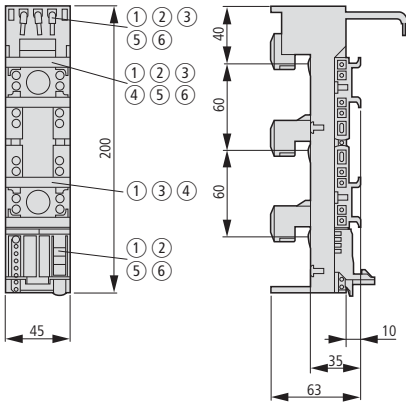
Undervoltage release

A-PKZ0...

U-PKZ0...

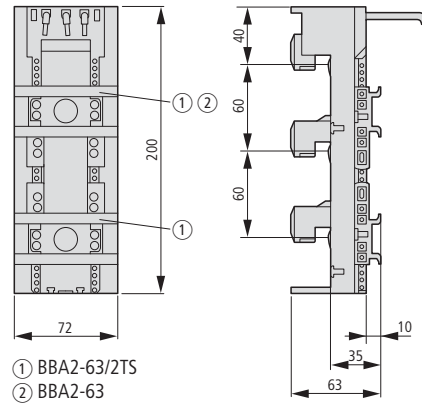


BBA0-25
BBA0-25/2TS
BBA0/2TS-L
BBA0-32
BBA0-32/2TS-C
BBA0C-16



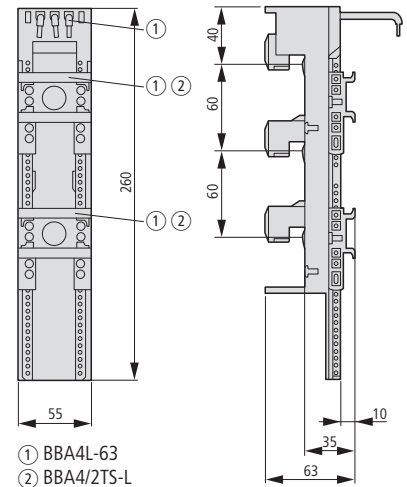
- ① BBA0-32/2TS-C
- ② BBA0-25/2TS
- ③ BBA0C-16
- ④ BBA0/2TS-L
- ⑤ BBA0-25
- ⑥ BBA0-32

BBA2-63
BBA2-63/2TS



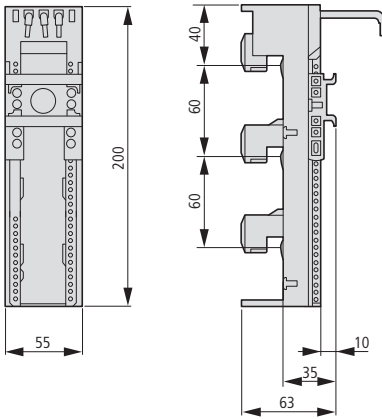
- ① BBA2-63/2TS
- ② BBA2-63

BBA4/2TS-L
BBA4L-63

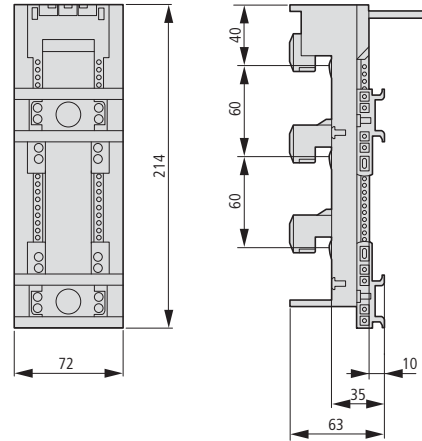


- ① BBA4L-63
- ② BBA4/2TS-L

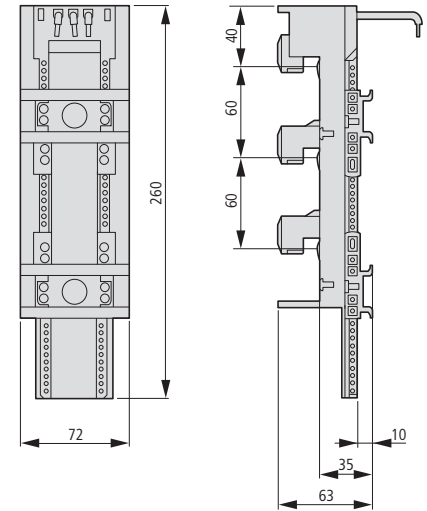
BBA4-63



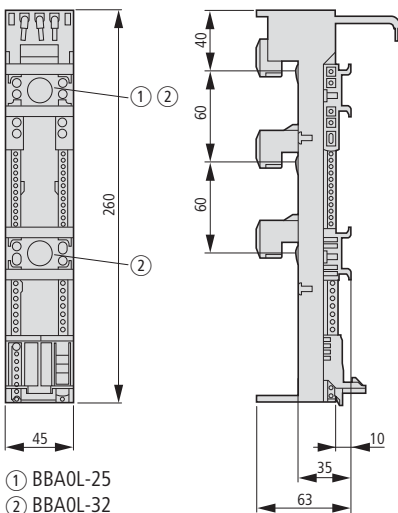
BBA2-80/2TS-S



BBA2L-63

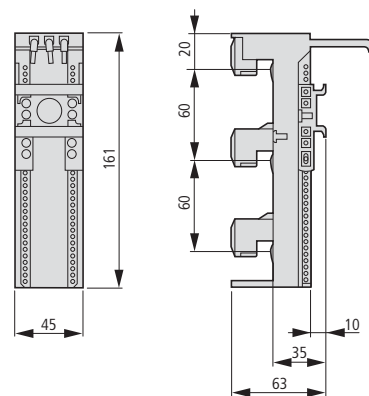


BBA0L-25
BBA0L-32

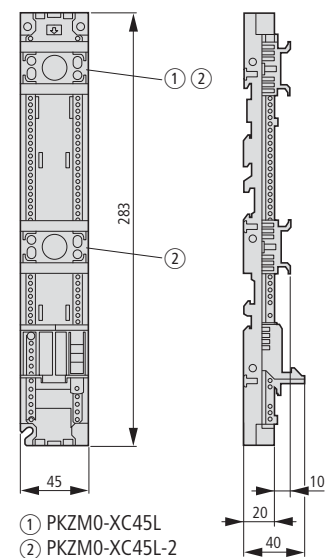


- ① BBA0L-25
- ② BBA0L-32

BBA0K-32



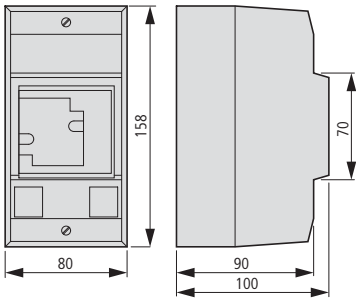
PKZM0-XC45L
PKZM0-XC45L-2



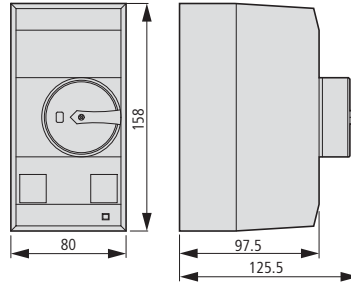
- ① PKZM0-XC45L
- ② PKZM0-XC45L-2

Insulated enclosures for surface mounting

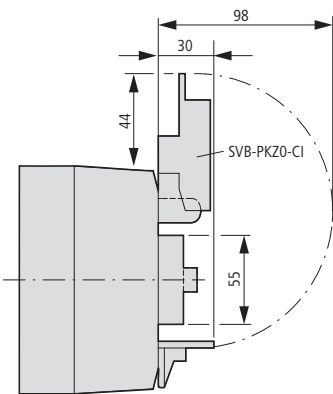
CI-PKZ0-M



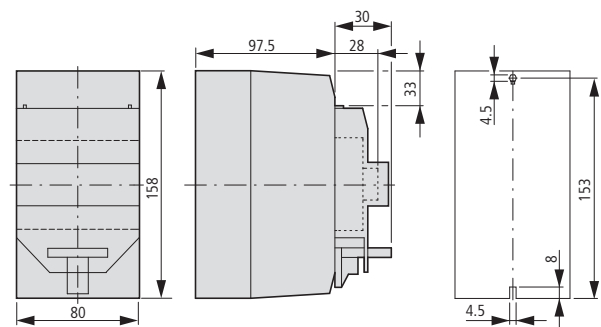
CI-PKZ10G...M



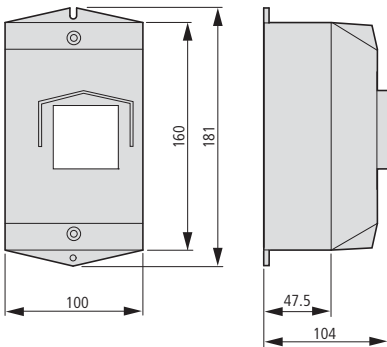
CI-PKZ0...M
+ SVB-PKZ0-CI



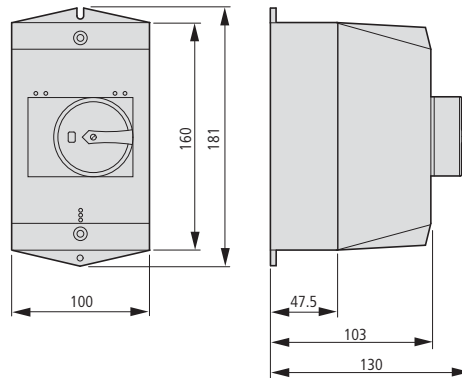
Drilling dimensions
CI-PKZ0...M



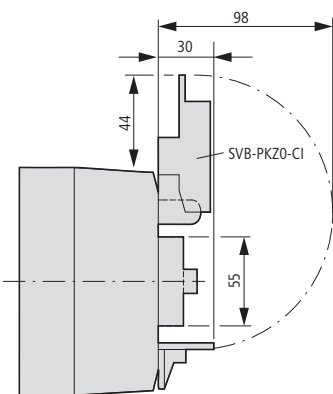
CI-K2-PKZ0



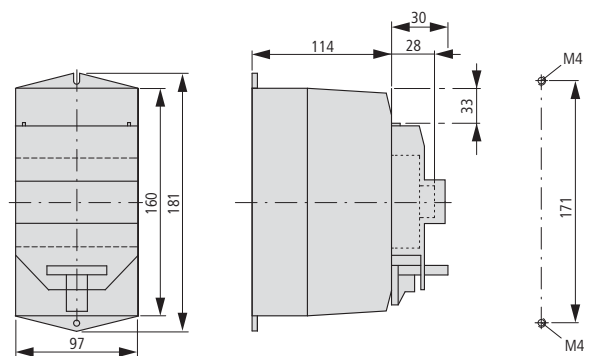
CI-K2-PKZ0G(R)(V)



CI-K2-PKZ0-G(R)(V)
+ SVB-PKZ0-CI

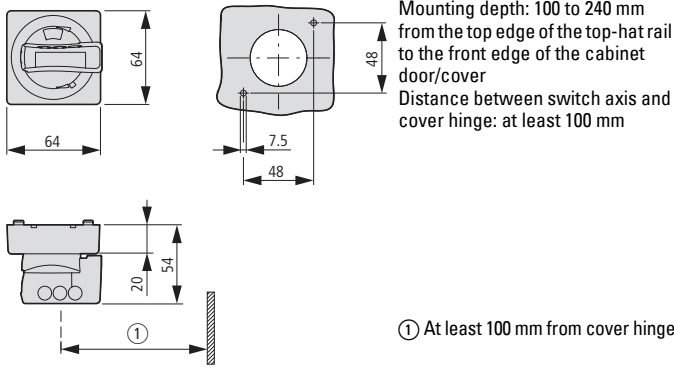


Drilling dimensions
CI-K2-PKZ0...



Door coupling handles

PKZ0-X(R)H...

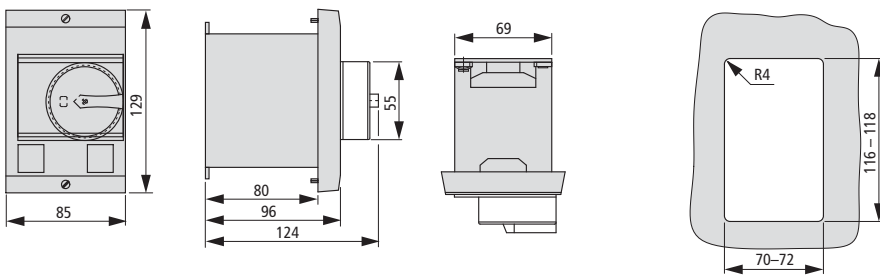


① At least 100 mm from cover hinge

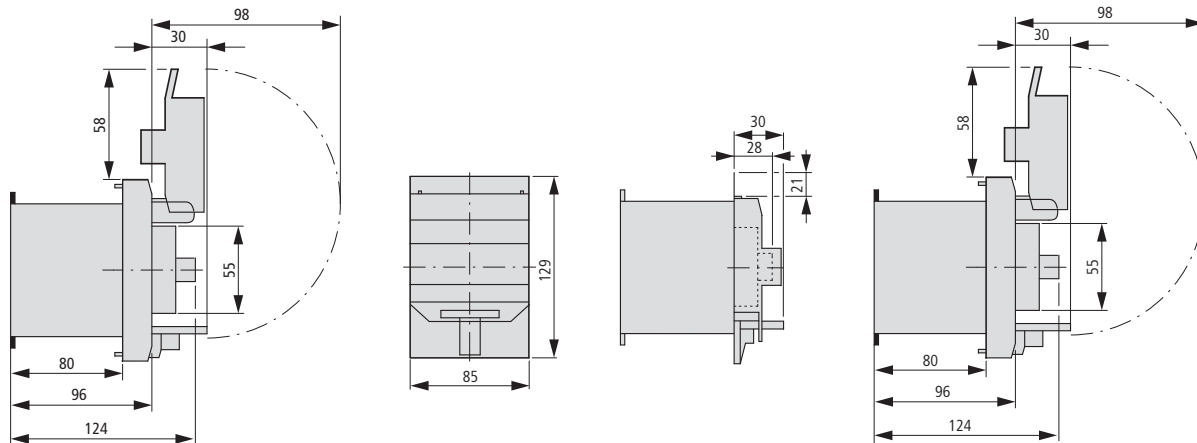
Insulated enclosures for flush mounting

E-PKZ0 E-PKZ0-G...

Mounting aperture E-PKZ0...



E-PKZ0-G... + SVB-PKZ0-E

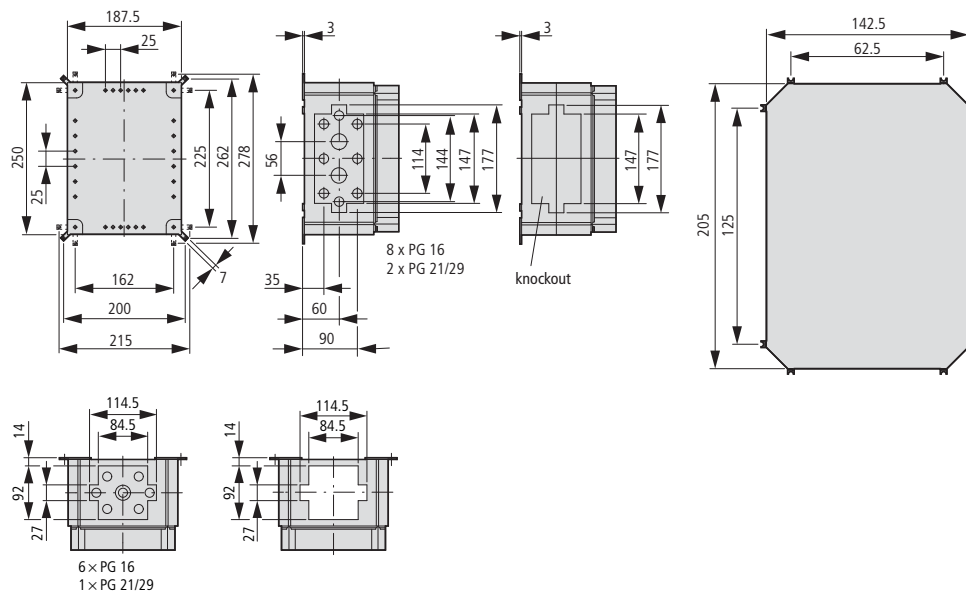


Insulated enclosures for surface mounting

CI23E...

Mounting plates

M3-CI23

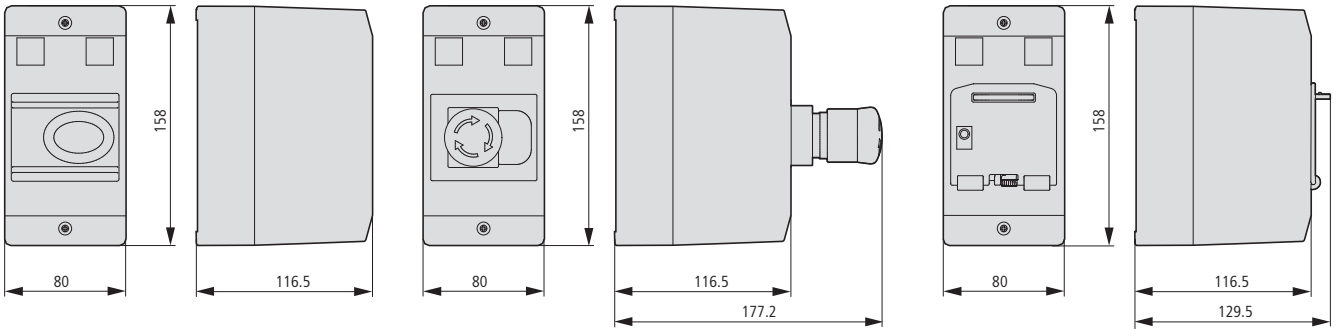


Insulated enclosures for surface mounting

CI-PKZ01
CI-PKZ01-G

CI-PKZ01-PVT
CI-PKZ01-PVS

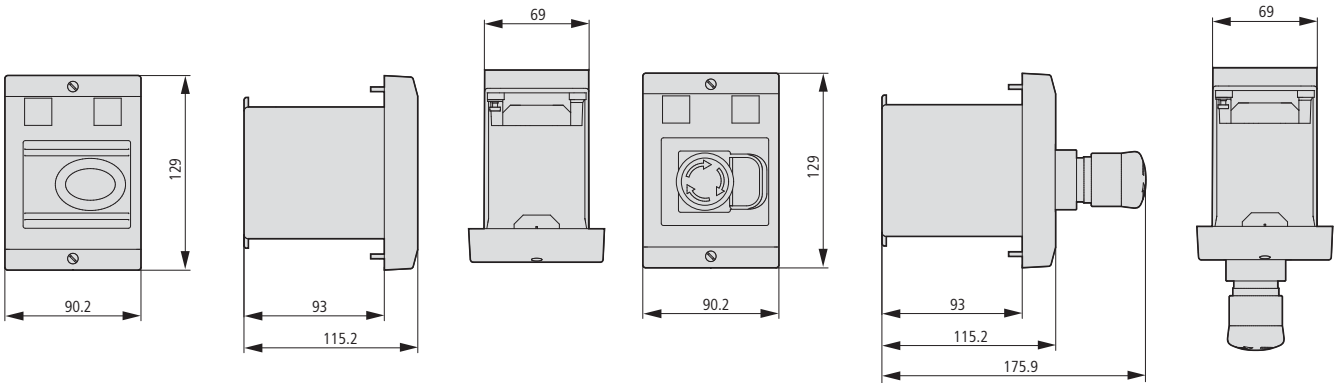
CI-PKZ01-SVB
CI-PKZ01-SVB-V



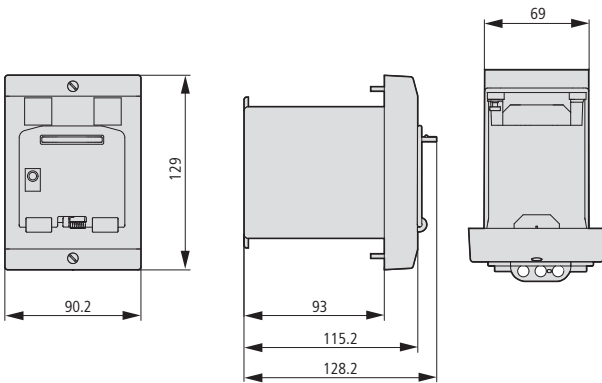
Insulated enclosures for flush mounting

E-PKZ01
E-PKZ01-G

E-PKZ01-PVT
E-PKZ01-PVS

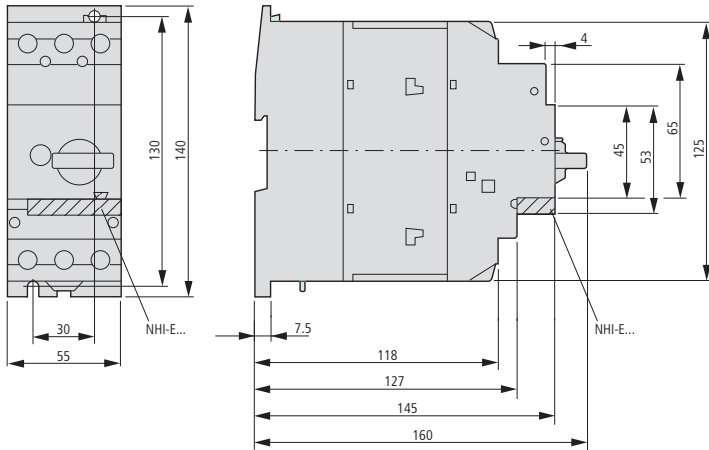


E-PKZ01-SVB
E-PKZ01-SVB-V



Motor-protective circuit-breaker

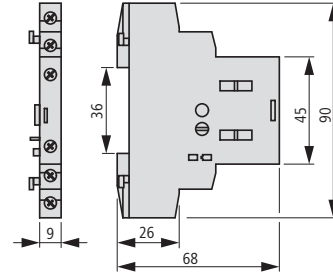
PKZM4-...



Standard auxiliary contacts

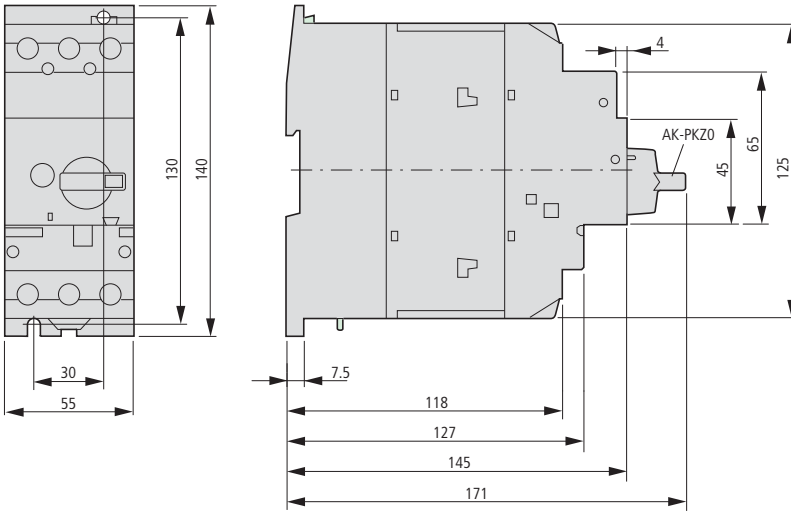
NHI...-PKZ...

NHI...-PKZ0



Motor-protective circuit-breakers with lockable cover

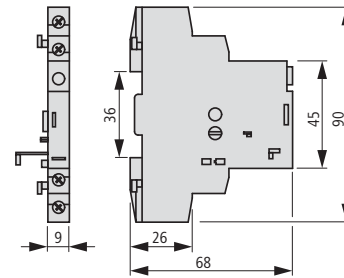
PKZM4-... +AK-PKZ0



Trip indicators

AGM2...-PKZ...

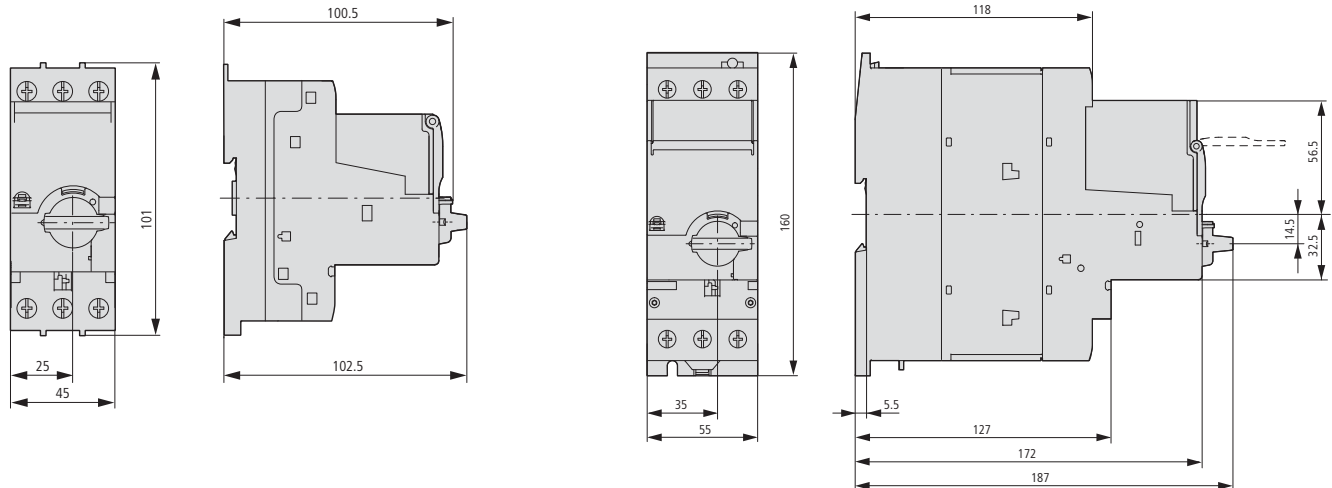
AGM2...-PKZ0



PKE Motor-protective circuit-breakers

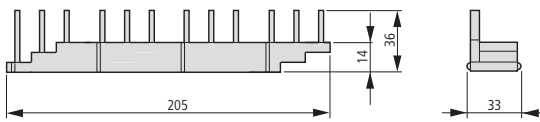
PKE12, PKE32

PKE65

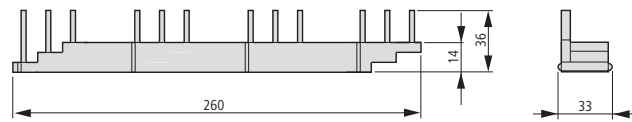


Three-phase commoning links

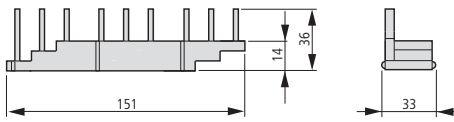
B3.0/4-PKZ4



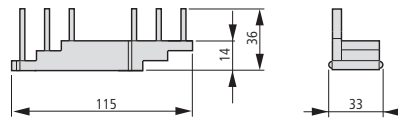
B3.2/4-PKZ4



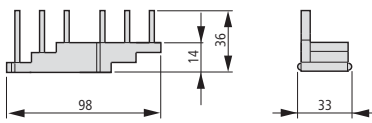
B3.0/3-PKZ4



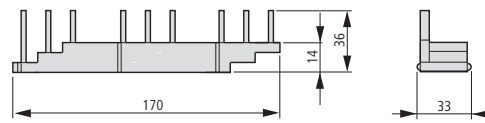
B3.2/2-PKZ4



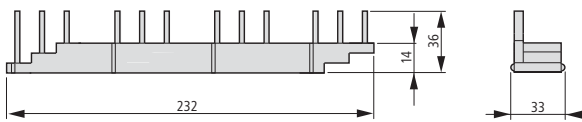
B3.0/2-PKZ4



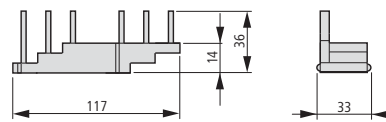
B3.1/3-PKZ4



B3.1/4-PKZ4



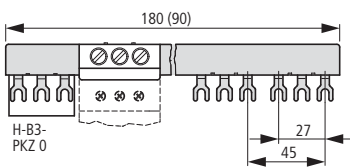
B3.1/2-PKZ4



Three-phase commoning links

B3.0/4-PKZ0

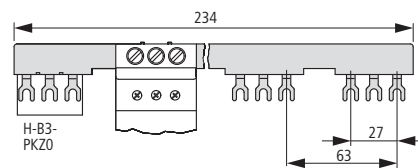
B3.0/2-PKZ0



Three-phase commoning links

B3.2/4-PKZ0

B3.2/2-PKZ0



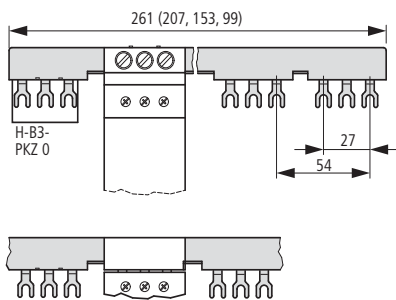
Three-phase commoning links

B3.1/5-PKZ0

B3.1/3-PKZ0

B3.1/4-PKZ0

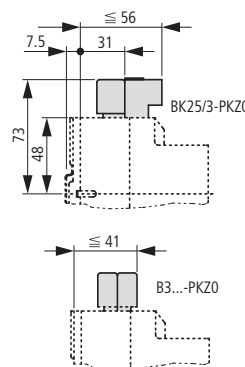
B3.1/2-PKZ0



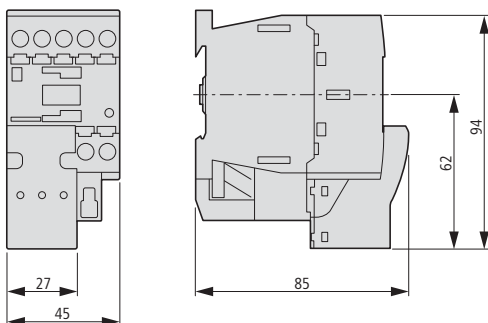
Incoming terminals

BK25/3-PKZ0

Overlapping mounting to extend the three-phase commoning link



Motor plug DILM12-XMCP/T

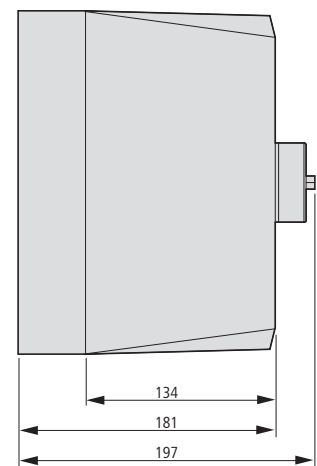
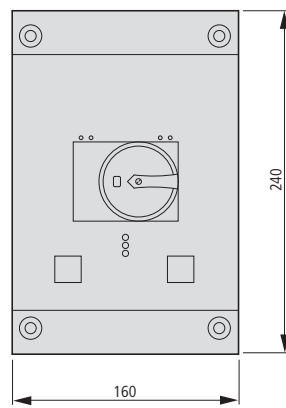
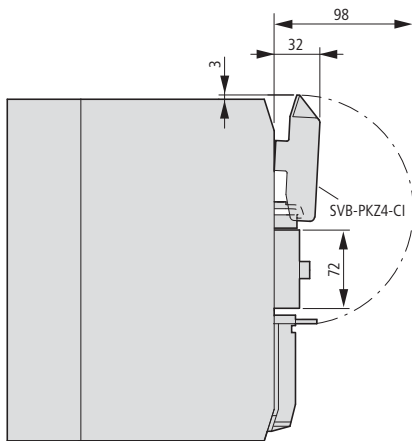


Insulated enclosures for surface mounting

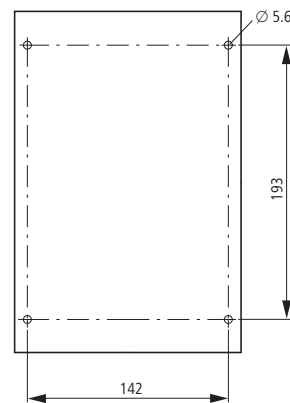
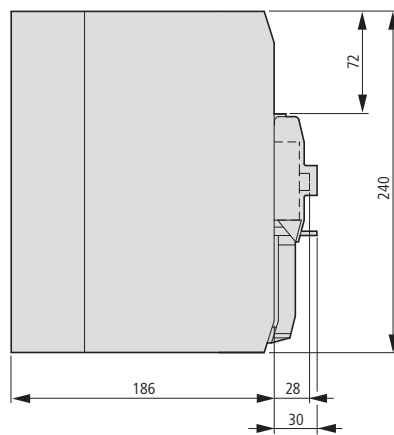
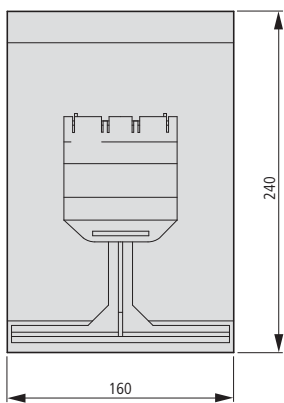
CI-K4-PKZ4-G(R)

+SVB-PKZ4-CI

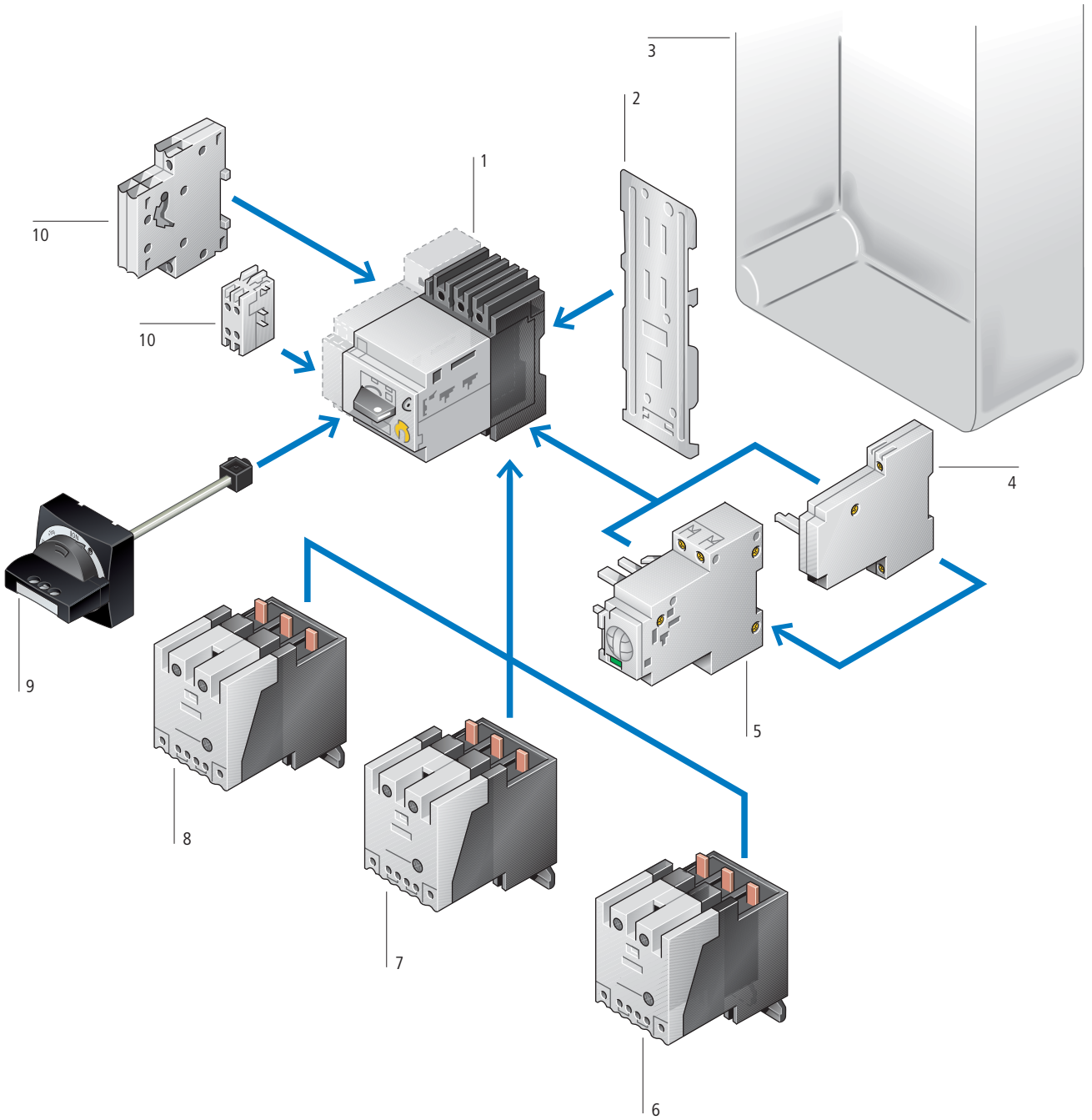
CI-K4-PKZ4-G



Drilling dimensions
CI-K4-PKZ4-G(R)



System overview



Basic devices

Motor-protective circuit-breakers	1
→ Page 7/48	
Circuit-breakers	1
→ Page 7/48	

Add-on functions



Contact modules	6
→ Page 7/64	
High-capacity contact modules	7
→ Page 7/64	
Auxiliary contacts	10
→ Page 7/58	

Current limiters	8
→ Page 7/58	
Shunt release	4
→ Page 7/60	
Remote operators	5
→ Page 7/62	

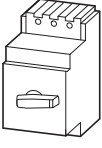
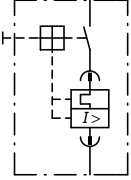
Mounting accessories

Mounting/wiring	2
→ Page 7/69	
Door coupling handles IP65	9
→ Page 7/57	
Insulated enclosures	3
→ Page 7/56	

Ordering

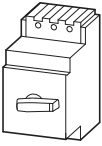
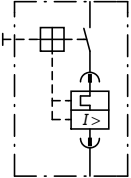
Max. motor rating					Rated uninterrupted current	Setting range	
AC-3					I_u	Overload releases	Short-circuit releases
220 V 230 V 240 V	380 V 400 V 415 V	440 V	500 V	690 V	A	I_r	I_{rm}
P	P	P	P	P		A	A
kW	kW	kW	kW	kW			

Motor-protective circuit-breakers, type of coordination "1" and "2"

 	0.09	0.12	0.18	0.25	0.25	0.6	0.4...0.6	5 ... 8
	0.12	0.25	0.25	0.37	0.55	1	0.6...1	8 ... 14
	0.25	0.55	0.55	0.75	1.1	1.6	1...1.6	14 ... 22
	0.37	0.75	1.1	1.1	1.5	2.4	1.6...2.4	20 ... 35
	0.75	1.5	1.5	2.2	3	4	2.4...4	35 ... 55
	1.1	2.2	3	3	4	6	4...6	50 ... 80
	2.2	4	4	5.5	7.5	10	6...10	80 ... 140
	4	7.5	9	9	12.5	16	10...16	130 ... 220
	5.5	12.5	12.5	15	22	25	16...25	200 ... 350
	7.5	15	17.5	22	22	32	24...32	275 ... 425
11	20	22	24	30	40	32...40	350 ... 500	

Circuit-breakers

For line and cable protection

 	-	-	-	-	-	10	6...10	50 ... 80	
	-	-	-	-	-	-	16	10...16	80 ... 140
	-	-	-	-	-	-	25	16...25	130 ... 210
	-	-	-	-	-	-	32	24...32	160 ... 280
	-	-	-	-	-	-	40	32...40	200 ... 350
	-	-	-	-	-	-	-	-	-



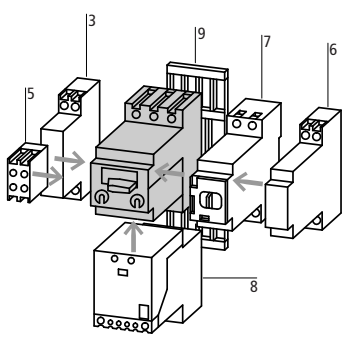
Notes

Information relevant for export to North America



Product Standards
 UL File No.
 UL CCN
 CSA File No.
 CSA Class No.
 NA Certification
 Suitable for
 See also

UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
 E36332
 NLRV
 12528
 3211-05
 UL Listed, CSA certified
 Branch circuit: as manual controller suitable for group installations
 → Page 7/75

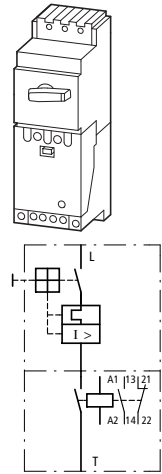
Part no. Article no.	Price See price list	Std. pack	Notes	Notes	Notes																				
PKZ2/ZM-0.6 021859 PKZ2/ZM-1 026605 PKZ2/ZM-1.6 028978 PKZ2/ZM-2.4 031351 PKZ2/ZM-4 033724 PKZ2/ZM-6 036097 PKZ2/ZM-10 038470 PKZ2/ZM-16 040843 PKZ2/ZM-25 043216 PKZ2/ZM-32 045589 PKZ2/ZM-40 047962		1 off 	Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102. Adjustable overload release $I_r = 0.6 - 1.0 \times I_u$ Adjustable short-circuit release $I_{rm} = 8.5 - 14 \times I_u$ factory-set to $12 \times I_u$  PTB 02 ATEX 3152 Observe manual.	Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height	 <table border="1"> <thead> <tr> <th>Accessories</th> <th>Page</th> </tr> </thead> <tbody> <tr> <td>3 Standard auxiliary contacts</td> <td>→ 7/58</td> </tr> <tr> <td>5 Trip-indicating auxiliary contact</td> <td>→ 7/58</td> </tr> <tr> <td>6 Shunt releases, undervoltage releases</td> <td>→ 7/60</td> </tr> <tr> <td>7 Remote operators</td> <td>→ 7/62</td> </tr> <tr> <td>8 Contact module, high-capacity contact modules, current limiters</td> <td>→ 7/64</td> </tr> <tr> <td>9 Clip plate</td> <td>→ 7/69</td> </tr> <tr> <td>Additional accessories</td> <td>→ 7/56</td> </tr> <tr> <td>Rated ultimate short-circuit breaking capacity</td> <td>→ 7/78</td> </tr> <tr> <td>Manual</td> <td>→ 7/69</td> </tr> </tbody> </table>	Accessories	Page	3 Standard auxiliary contacts	→ 7/58	5 Trip-indicating auxiliary contact	→ 7/58	6 Shunt releases, undervoltage releases	→ 7/60	7 Remote operators	→ 7/62	8 Contact module, high-capacity contact modules, current limiters	→ 7/64	9 Clip plate	→ 7/69	Additional accessories	→ 7/56	Rated ultimate short-circuit breaking capacity	→ 7/78	Manual	→ 7/69
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Rated ultimate short-circuit breaking capacity	→ 7/78																								
Manual	→ 7/69																								
PKZ2/ZM-10-8 050335 PKZ2/ZM-16-8 052708 PKZ2/ZM-25-8 055081 PKZ2/ZM-32-8 057454 PKZ2/ZM-40-8 059827		1 off	Adjustable overload release $I_r = 0.6 - 1.0 \times I_u$ Adjustable short-circuit release $I_{rm} = 5.0 - 8.5 \times I_u$ factory-set to $5 \times I_u$	Can be snap-fitted to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height																					



Max. motor rating						Rated uninterrupted current I_u A	Setting range		
AC-3		AC-3		AC-3			Overload releases I_r	Short-circuit releases I_{rm}	
220 V	230 V	380 V	400 V	440 V	500 V	660 V	690 V	A	A
240 V		415 V							
P		P		P		P			
kW		kW		kW		kW			

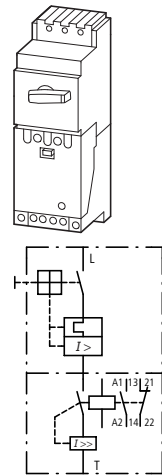


Compact starters, type "1" coordination



0.12	0.25	0.25	0.37	0.55	1	0.6...1	8...14
0.25	0.55	0.55	0.75	1.1	1.6	1...1.6	14...22
0.37	0.75	1.1	1.1	1.5	2.4	1.6...2.4	20...35
0.75	1.5	1.5	2.2	3	4	2.4...4	35...55
1.1	2.2	3	3	4	6	4...6	50...80
2.2	4	4	5.5	7.5	10	6...10	80...140
4	7.5	9	9	12.5	16	10...16	130...220
5.5	12.5	12.5	15	22	25	16...25	200...350
7.5	15	17.5	22	22	32	24...32	275...425
11	18.5	22	24	30	36	32...40	350...500

High-capacity compact starters, type "2" coordination



0.12	0.25	0.25	0.37	0.55	1	0.6...1	8...14
0.25	0.55	0.55	0.75	1.1	1.6	1...1.6	14...22
0.37	0.75	1.1	1.1	1.5	2.4	1.6...2.4	20...35
0.75	1.5	1.5	2.2	3	4	2.4...4	35...55
1.1	2.2	3	3	4	6	4...6	50...80
2.2	4	4	5.5	7.5	10	6...10	80...140
4	7.5	9	9	12.5	16	10...16	130...220
5.5	12.5	12.5	15	22	25	16...25	200...350
7.5	15	17.5	22	22	32	24...32	275...425
11	18.5	22	24	30	36	32...40	350...500

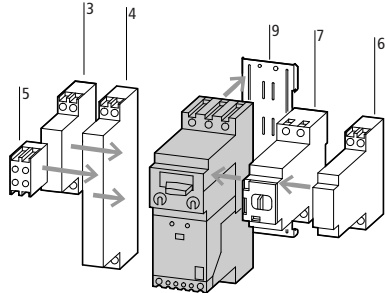



Notes

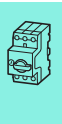
Information relevant for export to North America



Product Standards
UL File No.
UL CCN
CSA File No.
CSA Class No.
NA Certification
Suitable for
See also

IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
E36332
NLRV
012528
3211-05
UL Listed, CSA certified
Branch circuit: as manual controller with contactor, suitable for group installations
→ Page 7/75

Part no. Article no.	Price See price list	Std. pack	Notes	Notes																				
PKZ2/ZM-1/SE1A/11(230V50HZ,240V60HZ) 063364 PKZ2/ZM-1.6/SE1A/11(230V50HZ,240V60HZ) 063372 PKZ2/ZM-2.4/SE1A/11(230V50HZ,240V60HZ) 063382 PKZ2/ZM-4/SE1A/11(230V50HZ,240V60HZ) 063392 PKZ2/ZM-6/SE1A/11(230V50HZ,240V60HZ) 063402 PKZ2/ZM-10/SE1A/11(230V50HZ,240V60HZ) 063412 PKZ2/ZM-16/SE1A/11(230V50HZ,240V60HZ) 063422 PKZ2/ZM-25/SE1A/11(230V50HZ,240V60HZ) 063432 PKZ2/ZM-32/SE1A/11(230V50HZ,240V60HZ) 063442 PKZ2/ZM-40/SE1A/11(230V50HZ,240V60HZ) 063452		1 off	1 NC and 1 N/O auxiliary contact built into the contact module.	 <p>Accessories</p> <table border="0"> <thead> <tr> <th></th> <th style="text-align: right;">Page</th> </tr> </thead> <tbody> <tr> <td>3 Standard auxiliary contacts</td> <td style="text-align: right;">→ 7/58</td> </tr> <tr> <td>4 Standard auxiliary contacts</td> <td style="text-align: right;">→ 7/58</td> </tr> <tr> <td>5 Trip-indicating auxiliary contact</td> <td style="text-align: right;">→ 7/58</td> </tr> <tr> <td>6 Shunt release, undervoltage release</td> <td style="text-align: right;">→ 7/60</td> </tr> <tr> <td>7 Remote operators</td> <td style="text-align: right;">→ 7/62</td> </tr> <tr> <td>9 Clip plate</td> <td style="text-align: right;">→ 7/69</td> </tr> <tr> <td>Additional accessories</td> <td style="text-align: right;">→ 7/56</td> </tr> <tr> <td>Further actuating voltages</td> <td style="text-align: right;">→ 7/70</td> </tr> <tr> <td>Manual</td> <td style="text-align: right;">→ 7/69</td> </tr> </tbody> </table> <p>Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102</p> <p>Supplied ready mounted on clip plate C-PKZ2, can be snap-fitted to one or two IEC/EN 60715 top-hat rails, height 15 mm</p> <p>Overload releases adjustable $I_r = 0.6 - 1.0 \times I_u$</p> <p>Adjustable short-circuit release $I_{rm} = 8.5 - 14 \times I_u$ factory-set to $12 \times I_u$</p> <p> PTB 02 ATEX 3152</p> <p>Observe manual.</p> <p>The compact starters consist of a motor-protective circuit-breaker, which features a plug-in trip block and an attached contact module with the same matching profile. The devices are prefitted to a clip plate and can be snap-fitted, as a unit, centrally onto one or two top-hat rails to IEC/EN 60715 conform top-hat rails.</p> <p>They conform with IEC/EN 60947-4-1, VDE 0660 Part 102.</p> <p>I_q = Rated conditional short-circuit current</p>		Page	3 Standard auxiliary contacts	→ 7/58	4 Standard auxiliary contacts	→ 7/58	5 Trip-indicating auxiliary contact	→ 7/58	6 Shunt release, undervoltage release	→ 7/60	7 Remote operators	→ 7/62	9 Clip plate	→ 7/69	Additional accessories	→ 7/56	Further actuating voltages	→ 7/70	Manual	→ 7/69
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PKZ2/ZM-1/S(230V50HZ,240V60HZ) 063472 PKZ2/ZM-1.6/S(230V50HZ,240V60HZ) 063482 PKZ2/ZM-2.4/S(230V50HZ,240V60HZ) 063492 PKZ2/ZM-4/S(230V50HZ,240V60HZ) 063502 PKZ2/ZM-6/S(230V50HZ,240V60HZ) 063512 PKZ2/ZM-10/S(230V50HZ,240V60HZ) 063522 PKZ2/ZM-16/S(230V50HZ,240V60HZ) 063532 PKZ2/ZM-25/S(230V50HZ,240V60HZ) 063542 PKZ2/ZM-32/S(230V50HZ,240V60HZ) 063552 PKZ2/ZM-40/S(230V50HZ,240V60HZ) 063562		1 off  	Rated short-circuit current $I_q = 100 \text{ kA}/400 \text{ V}$ High-capacity contact module has built-in auxiliary contacts: 1 M/1 B																					



	Rated uninterrupted current I_u A	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Basic device, 3 poles, motor and system protection					
	40	PKZ2 026606		1 off 	 Circuit for ZM...PKZ2(4) M...PKZ2(4)
Basic device, 3 pole, motor protection					
	40	PKZ2/S(230V50HZ, 240V60HZ) 063572		1 off 	 ZMR...PKZ2
	40	PKZ2/SE1A/11(230V50HZ, 240V60HZ) 082142		1 off	Adjustable: H Δ manual position or A Δ automatic position For EEx e applications the 95/96 break contact must always be used to de-energize the (high-capacity) contact module or contactor. Motor-protective trip blocks ZMR...-PKZ2 cannot be combined with U/A voltage releases and RE/RS remote operators.
Basic device, 4 poles, system protection					
	40	PKZ24 004521		1 off	

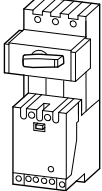
Adjustable:
 H Δ manual position or
 A Δ automatic position
 For EEx e applications the 95/96 break contact must always be used to de-energize the (high-capacity) contact module or contactor.
 Motor-protective trip blocks ZMR...-PKZ2 cannot be combined with U/A voltage releases and RE/RS remote operators.

Further actuating voltages → Page 7/70
 Manual → Page 7/69





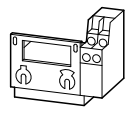



Information relevant for export to North America



Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
 UL File No. E36332
 UL CCN NLRV
 CSA File No. 12528
 CSA Class No. 3211-05
 NA Certification UL Listed, CSA certified

Maximum motor rating AC		Rated short-circuit breaking capacity I_{cn}			Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America	
200 V 230 V 460 V 575 V HP HP HP HP				240 V AC kA				480 V AC kA	600 V AC kA
Basic device									
<p>In connection with motor-protective trip blocks ZM-...PKZ2 → Page 7/70 The values given are maximum values, depending on the trip block</p>									
									
DOL starter					PKZ2/S-SP (110V50HZ,120V60HZ) 050940	1 off 	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking	
10	15	30	25	100			65	42	UL File No.
							UL CCN	NKJH	
							NA Certification	UL Listed, CSA certified	
							Suitable for	Branch circuit: as Type E self-protected combination motor controller	
							See also	TB_PKZ2_PRO_Netze_NA	
Reversing starters					PKZ2-SP-FVR(*V*HZ) 925109	1 off 	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking	
10	15	30	25	100			65	42	UL File No.
							UL CCN	NKJH	
							CSA File No.	12528	
							CSA Class No.	3211-06	
							NA Certification	UL Listed, CSA certified	
							Specially designed for NA	Yes	
							Suitable for	Branch circuit: as Reversing Type E self-protected combination motor controller	
							See also	TB_PKZ2_PRO_Netze_NA	
Notes									
Specify actuating voltage in the range 24 – 600 V 50 or 60 Hz.									
Application: Mains supply up to 27 A 600 Y/347 V AC									
480 Y/277 V AC									
27 – 42 A 480 Y/277 V AC									
Service factor (SF) Set value I_r on the current scale, depending on the load factor									
SF = 1.15 → $I_r = 1 \times I_{n \text{ mot}}$									
SF = 1 → $I_r = 0.9 \times I_{n \text{ mot}}$									
Terminal capacities, high-capacity compact starters PKZ2/ZM.../S									
Main terminals									
Cables Cu 75 °C, min. AWG 14, max. AWG 6									
Torque 1.8 Nm									
Control circuit terminals									
Cables min. AWG 20, max. AWG 16 (0.5–1 mm ²)									
With insulated/uninsulated blade terminal, nominal size 2.8									




Max. motor rating					Rated uninter- rupted current	Setting range		Part no. Article no.	Price See price list	Std. pack	Notes
AC-3						Overload releases	Short-circuit releases				
220 V	380 V	440 V	500 V	660 V	I_u	I_r	I_{rm}				
230 V	400 V		690 V								
240 V	415 V				A	A	A				
P	P	P	P	P	I_u	I_r	I_{rm}				
kW	kW	kW	kW	kW	A	A	A				
Motor-protective trip blocks, 3 pole											
With overload release											
	0.09	0.12	0.18	0.25	0.25	0.6	0.4...0.6	5...8	ZM-1,6-PKZ2 024232	1 off  	Phase failure sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102 Adjustable overload release $I_r = 0.6 - 1.0 \times I_u$ Adjustable short-circuit release $I_{rm} = 8.5 - 14 \times I_u$ Factory-set to $12 \times I_u$  PTB 02 ATEX 3152 Observe manual.
	0.12	0.25	0.25	0.37	0.55	1	0.6...1	8...14	ZM-1-PKZ2 028979		
	0.25	0.55	0.55	0.75	1.1	1.6	1...1.6	14...22	ZM-1,6-PKZ2 031352		
	0.37	0.75	1.1	1.1	1.5	2.4	1.6...2.4	20...35	ZM-2,4-PKZ2 033725		
	0.75	1.5	1.5	2.2	3	4	2.4...4	35...55	ZM-4-PKZ2 036098		
	1.1	2.2	3	3	4	6	4...6	50...80	ZM-6-PKZ2 038471		
	2.2	4	4	5.5	7.5	10	6...10	80...140	ZM-10-PKZ2 040844		
	4	7.5	9	9	12.5	16	10...16	130...220	ZM-16-PKZ2 043217		
	5.5	12.5	12.5	15	22	25	16...25	200...350	ZM-25-PKZ2 045590		
	7.5	15	17.5	22	22	32	24...32	275...425	ZM-32-PKZ2 047963		
11	20	22	24	30	40	32...40	350...500	ZM-40-PKZ2 050336			
With overload/relay function, with manual/automatic position											
	0.09	0.12	0.18	0.25	0.25	0.6	0.4...0.6	5...8	ZMR-0,6-PKZ2 033943	1 off  	Phase failure sensitivity, adjustability and  as ZM blocks. When using motor-protective trip blocks with overload relay function, an overload does not cause the motor-protective circuit-breaker to trip. The overload indication is provided by means of two auxiliary contacts.
	0.12	0.25	0.25	0.37	0.55	1	0.6...1	8...14	ZMR-1-PKZ2 033950		
	0.25	0.55	0.55	0.75	1.1	1.6	1...1.6	14...22	ZMR-1,6-PKZ2 033952		
	0.37	0.75	1.1	1.1	1.5	2.4	1.6...2.4	20...35	ZMR-2,4-PKZ2 033955		
	0.75	1.5	1.5	2.2	3	4	2.4...4	35...55	ZMR-4-PKZ2 033957		
	1.1	2.2	3	3	4	6	4...6	50...80	ZMR-6-PKZ2 033966		
	2.2	4	4	5.5	7.5	10	6...10	80...140	ZMR-10-PKZ2 033967		
	4	7.5	9	9	12.5	16	10...16	130...220	ZMR-16-PKZ2 033968		
	5.5	12.5	12.5	15	22	25	16...25	200...350	ZMR-25-PKZ2 033969		
	7.5	15	17.5	22	22	32	24...32	275...425	ZMR-32-PKZ2 033973		
11	20	22	24	30	40	32...40	350...500	ZMR-40-PKZ2 033975			


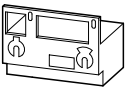
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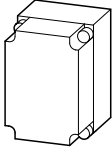
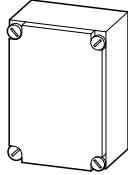




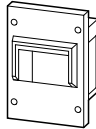
Information relevant for export to North America



Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E36332
UL CCN	NLRV
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified
See also	HPL2007/2008_17/36

Max. motor rating AC-3	Rated uninter- rupted current					Setting range Overload releases Short-circuit releases	Part no. Article no.	Price See price list	Std. pack	Notes																		
	220 V P kW	380 V P kW	440 V P kW	500 V P kW	660 V P kW						I_u A	I_r A	I_{rm} A															
220 V	380 V	440 V	500 V	660 V																								
230 V	400 V			690 V																								
240 V	415 V																											
Without overload release																												
	-	-	-	-	0.6				1 off	Adjustable short-circuit release $I_{rm} = 8.5 - 14 \times I_u$ Factory set to $12 \times I_u$ When using the M-...-PKZ2 as a short-circuit protective device for motors with heavy starting duty, rated operational current I_e must be overspecified with the following factors when designing the switchgear: <table border="1"> <thead> <tr> <th>CLASS</th> <th>Factor</th> </tr> </thead> <tbody> <tr><td>5</td><td>1.0</td></tr> <tr><td>10</td><td>1.0</td></tr> <tr><td>15</td><td>1.22</td></tr> <tr><td>20</td><td>1.41</td></tr> <tr><td>25</td><td>1.58</td></tr> <tr><td>30</td><td>1.73</td></tr> <tr><td>35</td><td>1.89</td></tr> <tr><td>40</td><td>2.0</td></tr> </tbody> </table>	CLASS	Factor	5	1.0	10	1.0	15	1.22	20	1.41	25	1.58	30	1.73	35	1.89	40	2.0
CLASS	Factor																											
5	1.0																											
10	1.0																											
15	1.22																											
20	1.41																											
25	1.58																											
30	1.73																											
35	1.89																											
40	2.0																											
	-	-	-	-	1																							
	-	-	-	-	1.6																							
	-	-	-	-	2.4																							
	-	-	-	-	4																							
	-	-	-	-	6																							
	-	-	-	-	10																							
	-	-	-	-	16																							
	-	-	-	-	25																							
	-	-	-	-	32																							
	-	-	-	-	40																							

Rated uninterrupted current I_u A	Setting range		Part no. Article no.	Price See price list	Std. pack	Notes
	Overload releases I_r A	Short-circuit releases I_{rm} A				
Trip blocks for system protection						
3 pole						
With overload release						
	10	6...10	50...80	ZM-10-8-PKZ2 062201	1 off	Adjustable overload release $I_r = 0.6 - 1.0 \times I_u$ Adjustable short-circuit release $I_{rm} = 5 - 8.5 \times I_u$ factory-set to $5 \times I_u$
	16	10...16	80...140	ZM-16-8-PKZ2 059828		
	25	16...25	130...210	ZM-25-8-PKZ2 057455		
	32	24...32	160...280	ZM-32-8-PKZ2 055082		
	40	32...40	200...350	ZM-40-8-PKZ2 052709		
4 pole						
With overload releases in all 4 poles						
	10	6...10	50...80	ZM-10-8-PKZ24 004526	1 off	Adjustable overload release $I_r = 0.6 - 1.0 \times I_u$ Adjustable short-circuit release $I_{rm} = 5 - 8.5 \times I_u$ factory-set to $5 \times I_u$ Circuit-breakers PKZ24/ZM-...-8 protect 4 poles
	16	10...16	80...140	ZM-16-8-PKZ24 004525		
	25	16...25	130...210	ZM-25-8-PKZ24 004524		
	32	24...32	160...280	ZM-32-8-PKZ24 004523		
	40	32...40	200...350	ZM-40-8-PKZ24 004522		


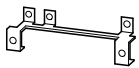




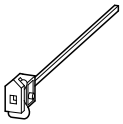


		For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Insulated enclosures for surface mounting						
For motor-protective circuit-breakers, 3 or 4 pole circuit-breaker						
	Degree of protection IP40, cover with aperture dimensioned to accommodate front of breaker incl. blanking strip	PKZ2/ZM-... +NHI + AGM + U or A and RE or RS PKZ24/ZM-... + NHI + AGM + U or A	CI19EA-PKZ2 026234		1 off	Integrated IEC/EN 60715 top-hat rail, separate terminals for PE(N) and N connection
	Degree of protection IP54 prepared for mounting of a PKZ2-X(R)H-CI rotary handle	PKZ2/ZM-... + NHI + AGM + U or A + (R)H	CI19EB-PKZ2 028607		1 off	Incl. cable entries 2 x PG 16/21/29
	Degree of protection IP54 prepared for mounting of a PKZ2-X(R)H-CI rotary handle	PKZ24/ZM-... + NHI + AGM + U or A + (R)H	CI19ED-PKZ24 005145		1 off	Indicator light L-PKZ0 be fitted
For 3 pole compact starter, high-capacity compact starter, combination circuit-breakers						
	Degree of protection IP40, cover with aperture dimensioned to accommodate front of breaker incl. blanking strip	PKZ2/ZM-.../S(E1A) + NHI + AGM + RE or RS and U or A	CI23EA-PKZ2 087936		1 off	Mounting plate L3/5-CI23 integrated
	Degree of protection IP54 prepared for mounting of a PKZ2-X(R)H-CI rotary handle	PKZ2/ZM-.../S + NHI + AGM + U or A + (R)H	CI23EB-PKZ2 090309		1 off	Prepared for a compact starter or a High-capacity compact starters PKZ2/ZM-.../S without fitted clip plate
Insulated enclosure for motor-protective circuit breakers PKZ2/ZM						
Degree of protection NEMA 12						
	Prepared for mounting a door coupling handle PKZ2-X(R)H	–	CI19EE-PKZ2-NA¹⁾ 003183		1 off  	Integrated IEC/EN 60715 top-hat rail, for connecting installation pipes and end-to-end earthing Not for use with PKZ2/ZM...S(-SP)
	With mounting plate without apertures	–	CI19E-125/M-NA²⁾ 033451		1 off  	For connection of conduit and continuous earthing Not for use with PKZ2/ZM...S(-SP)
Insulated enclosures for flush mounting						
For motor-protective circuit-breakers, 3 or 4 pole circuit-breaker						
	IP41 degree of protection, grey front plate with retaining frame, integral PE(N) terminal	PKZ2/ZM-... + NHI + AGM PKZ2/ZM-... +U or A (undervoltage or shunt release) PKZ24/ZM-...	E-PKZ2 003218		1 off	For side-wall or door mounting Vertical mounting position Indicator light L-PKZ0 can be fitted
	For degree of protection IP54, door coupling rotary handle PKZ2-X(R)H always required in addition	PKZ2/ZM-... + NHI + AGM PKZ2/ZM-... +U or A (undervoltage or shunt release) PKZ24/ZM-...	E54-PKZ2 033939		1 off	For side-wall or door mounting Vertical mounting position Indicator light L-PKZ0 can be fitted

Information relevant for export to North America

1)	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
	UL File No.	E36332
	UL CCN	NLRV
	CSA File No.	12528
	CSA Class No.	3211-05
	NA Certification	UL Listed, CSA certified
	Specially designed for NA	✓
	Degree of Protection	IEC: -, UL/CSA Type: 12
	See also	HPL2007/2008_17/36

2)	Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
	UL File No.	On request
	UL CCN	On request
	CSA File No.	12528
	CSA Class No.	3211-05
	NA Certification	UL Listed, CSA certified
	Specially designed for NA	✓
	Degree of Protection	IEC: -, UL/CSA Type: 12
	See also	HPL2007/2008_17/36

HPL07057EN

	Color	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America 
Neutral terminal						
For connecting a 5th conductor in enclosure E-PKZ2, E54-PKZ2						
	–	–	N-PKZ2 003219	1 off	–	
Door coupling handles						
Degree of protection IP65 / UL/CSA Type 4X/Type 12						
	For use as main switch to EN 60204	Black	PKZ2-XH 106127	1 off 	Lockable in 0-position Suitable for 3 padlocks with 4 – 8 mm hasp thickness	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 NA Certification UL Listed, CSA certified
	For use in MCC distribution boards with PKZ2 turned through 90°. For use as main switch according to EN 60204	Black	PKZ2-XH-MCC 106130	1 off 		
	For use as a main switch with emergency switching off function to EN 60204	Red-yellow	PKZ2-XRH 106128	1 off 		
Plug-in extension shaft for door coupling handle						
Can be cut to any required length for mounting depths from 171 – 300 mm						
	–	–	PKZ2-XAH 106129	1 off 	–	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 UL File No. NLRV UL CCN 12528 CSA File No. 3211-05 NA Certification UL Listed, CSA certified
Rotary handle for insulated enclosures CI19(23)...-PKZ2						
	–	Black	PKZ2-XH-CI 138580	1 off	–	
	–	Red-yellow	PKZ2-XRH-CI 138581	1 off	–	



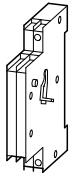
Contact configuration
 N/O = normally open contact
 NC = normally closed contact

Contact sequence

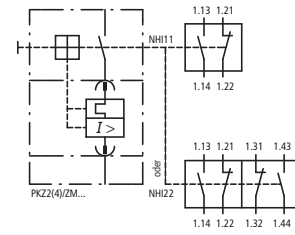
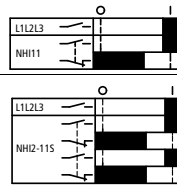
Circuit diagrams

Standard auxiliary contacts¹

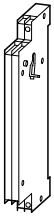
For motor-protective circuit-breaker, circuit-breakers and (high-capacity) compact starters



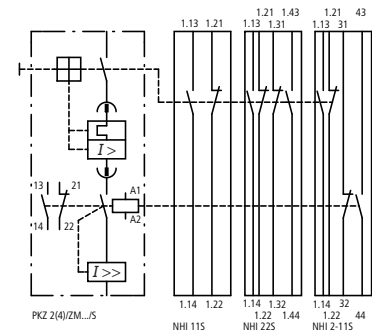
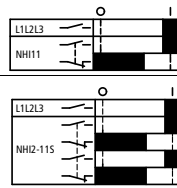
1 N/O	1 NC
2 N/O	2 NC



For compact starters

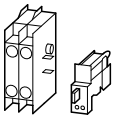


1 N/O	1 NC
2 N/O	2 NC
2 x 1 N/O	2 x 1 NC

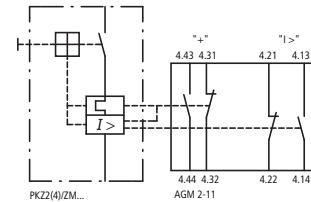
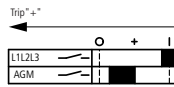


Trip indicating auxiliary contacts with short-circuit indicator¹

For motor-protective circuit-breaker, circuit-breakers and (high-capacity) compact starters

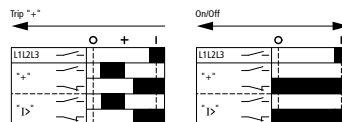


2 x 1 N/O	2 x 1 NC
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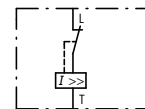
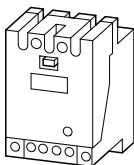
Short-circuit indicators²

For motor-protective circuit-breaker, circuit-breakers and (high-capacity) compact starters



Current limiters

Increase the switching capacity of non auto-protected motor-protective circuit-breakers to 100 kA/500 V




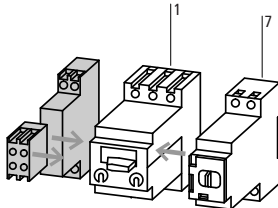




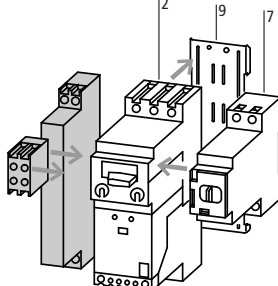


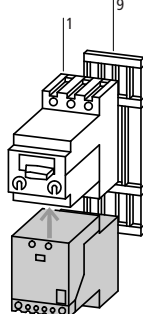
Information relevant for export to North America



1)
 Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1;
 CE marking
 UL File No. E29184
 UL CCN NKCR
 CSA File No. 12528
 CSA Class No. 3211-05
 NA Certification UL Listed, CSA certified

2)
 Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1;
 CE marking
 CSA File No. 1017555
 CSA Class No. 3211-05
 NA Certification UL Listed, CSA certified

HPL07059EN

Part no. Article no.	Price See price list	Std. pack	Notes	Notes
NHI11-PKZ2 090677		1 off 	Can be fitted to circuit-breakers and (high-capacity) compact starters.	
NHI22-PKZ2 097796		1 off 	Can be combined with trip-indicating auxiliary contacts AGM	<p>Accessories</p> <p>1 Motor-protective circuit-breaker, circuit-breakers → 7/48</p> <p>7 Remote operators → 7/62</p> <p>Additional accessories → 7/56</p>
NHI11S-PKZ2 007623		1 off 	Can be fitted to starter combinations	
NHI22S-PKZ2 000504		1 off 	Can be combined with AGM trip-indicating auxiliary contacts	
NHI2-11S-PKZ2 009996		1 off 		
AGM2-11-PKZ2 017115		1 off 	<p>Differential remote indication: a) General trip indication "+", overload, b) Short-circuit releases</p> <p>Can be fitted to circuit-breakers and (high-capacity) compact starters,</p> <p>Can be combined with standard auxiliary contacts NHI... or NHI...S</p>	<p>Accessories</p> <p>2 (High-capacity) compact starter → 7/51</p> <p>7 Remote operators → 7/62</p> <p>9 Clip plate → 7/69</p> <p>Additional accessories → 7/56</p>
K-AGM-PKZ2 021861		5 off 	<p>Local short-circuit indication by indicator, can be reset.</p> <p>Can be used in circuit-breakers and (high-capacity) compact starters</p>	
CL-PKZ2 076439		1 off	<p>Max. rated operating voltage $U_e = 690\text{ V}$ Rated uninterrupted current $I_u = 40\text{ A}$</p> <p>Can be retrofitted to circuit-breaker or separately positioned with EZ base</p> <p>Can be used for individual protection</p> <p>When fitting to circuit-breaker, clip plate C-PKZ2 always required</p>	 <p>Accessories</p> <p>1 Motor-protective circuit-breaker, circuit-breakers → 7/48</p> <p>9 Clip plate → 7/69</p> <p>Additional accessories → 7/56</p>



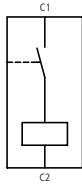
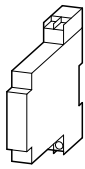
Circuit diagrams

Contact sequence

Actuating voltage
Voltage and frequency combination that can be implemented with a voltage trigger coil

Shunt release (for power circuit-breakers)

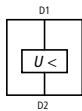
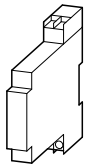
For AC and DC voltage



24 V DC	48 V DC	60V DC
24 V 50 Hz	48 V 50 Hz	
24 V 60 Hz	48 V 60 Hz	
110 V DC	125 V DC	250 V DC
110 V 50 Hz	127 V 50 Hz	220 V 50 Hz
230 V 50 Hz	240 V 50 Hz	
110 V 60 Hz	120 V 60 Hz	208 V 60 Hz
220 V 60 Hz	240 V 60 Hz	
380 V 50 Hz	400 V 50 Hz	415 V 50 Hz
440 V 50 Hz	500 V 50 Hz	
480 V 60 Hz	600 V 60 Hz	

Undervoltage releases, non-delayed

Without auxiliary contacts



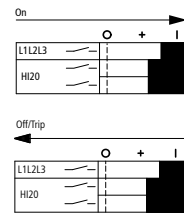
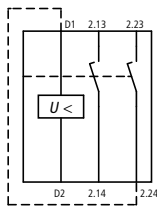
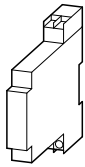
For AC

-

For DC

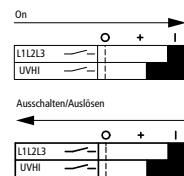
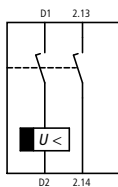
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With auxiliary contact for AC



Undervoltage releases off-delayed, delay time 200 ms

With auxiliary contact for AC


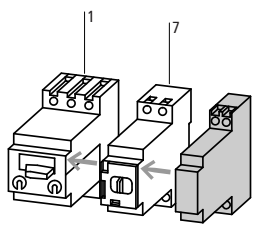



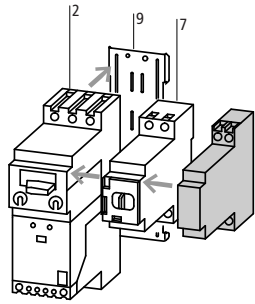





Information relevant for export to North America



Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

HPL07061EN

Part no. Article no.	Price See price list	Std. pack	Notes	Notes
A-PKZ2-A 063967		1 off 	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters Can be combined with remote operator.	 <p>Accessories</p> <p>1 Motor-protective circuit-breaker, circuit-breakers → 7/48</p> <p>7 Remote operators → 7/62</p> <p>Additional accessories → 7/56</p>
A-PKZ2-B 063964		1 off 		
A-PKZ2-C 063930		1 off 		
U-PKZ2(230V50HZ,240V60HZ) 065766		1 off 	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters	 <p>Accessories</p> <p>2 (High-capacity) compact starter → 7/51</p> <p>7 Remote operators → 7/62</p> <p>9 Clip plate → 7/69</p> <p>Additional accessories → 7/56</p> <p>Further actuating voltages → 7/70</p>
U-PKZ2(24VDC) 014463		1 off 	Can be combined with remote operator. When combined with circuit-breaker can be used as emergency switching off device to IEC/EN 60204.	
U-HI20-PKZ2(230V50HZ,240V60HZ) 065768		1 off 	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters Can be combined with remote operator. Two early-make N/O contacts built in. When combined with circuit-breaker, can be used as emergency switching off device to IEC/EN 60204. When the circuit-breaker is in the tripped position "+", the auxiliary contacts are closed. The undervoltage release can be energized early with an additional bridge (see circuit diagram). This function cannot be used in combination with RE/RS-PKZ2 (remote operator).	
UVHI-PKZ2(230V50HZ,240V60HZ) 065770		1 off 	Can be fitted to motor-protective circuit-breakers, circuit-breakers, and (high-capacity) compact starters Can be combined with remote operator. Two early-make N/O contacts built in. Voltage drops ≤ 200 ms do not cause opening; contact time 200 ms when switching on. When the circuit-breaker is in the tripped position "+", the auxiliary contacts are closed.	



Circuit diagrams

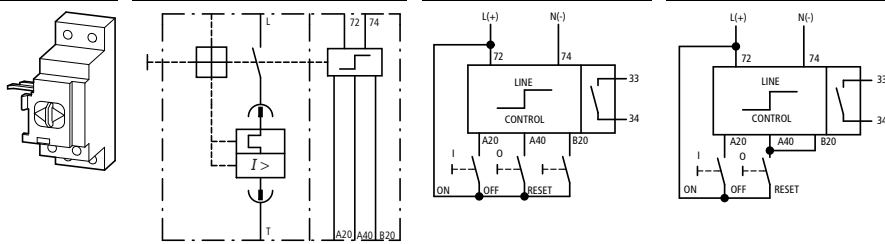
Circuit diagram for pulsed operation

OFF and RESET separate

OFF equals RESET

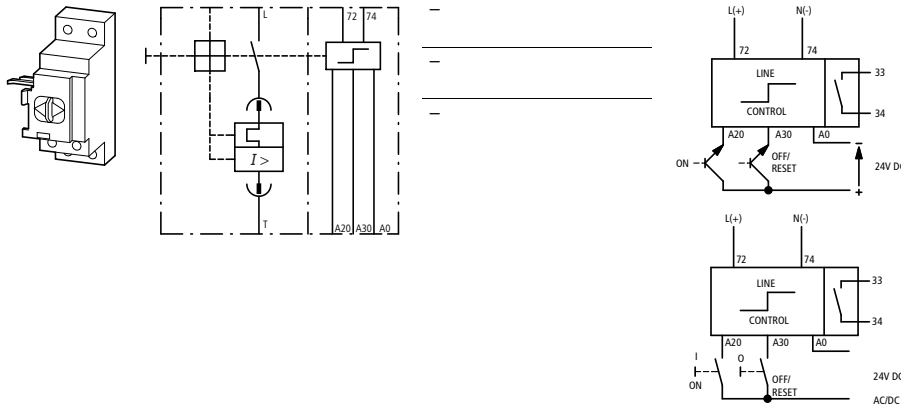
RE-PKZ2 remote operator

Actuation through auxiliary contact



Power and control sections (line and control) have the same reference potential. Pulsed actuation ($\geq 2 \text{ VA/W}$, 15 ms) and two-wire control actuation are possible. Upon activation, the power section is supplied with power directly from the mains (700 VA/W, 30 ms). The control section can be actuated through NHI, AGM, ETS4-VS3, M22-(C)K..., PLC with floating contacts without RC suppressor circuit.

Actuation through PLC semiconductor outputs



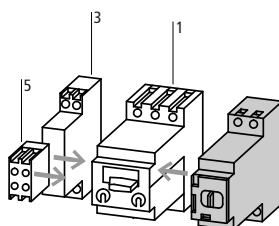
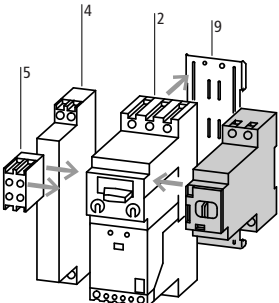
The power section and control section (line and control) are galvanically isolated from each other. Control section always 24 V. Safe isolation between the power section and control section is guaranteed. Pulsed ($\geq 2 \text{ VA/W}$, 15 ms) and two-wire control activation are possible. The control section can be actuated directly through PLC electronic outputs (24 VDC). When actuated, the power section is supplied with power directly from the mains (700VA/W, 30 ms).

Information relevant for export to North America

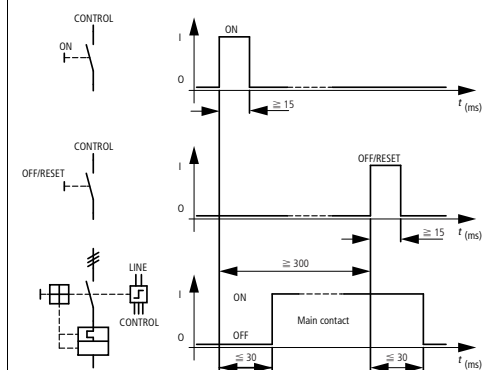


Product Standards	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	12528
CSA Class No.	3211-05
NA Certification	UL Listed, CSA certified

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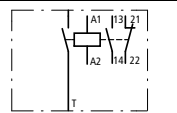
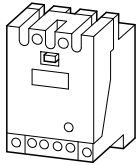
Part no. Article no.	Price See price list	Std. pack	Notes	Notes
RE-PKZ2(220-240V50/60HZ,DC) 063676		1 off 	<p>Can be fitted to circuit-breakers and (high-power) compact starters. Switches circuit-breakers ON/OFF remotely (or OFF after tripping). Remote operator can be switched off locally and the thumb-grip locked with a 6 mm padlock. Suitable for AC or DC voltage. Can be combined with voltage release U, U-HI20, UVHI-PKZ2 or A-PKZ2. Standard auxiliary contact NHI is always required for the combination of circuit-breaker and Remote operator RE/RS-PKZ2. Cannot be combined with door coupling handle PKZ2-X(R)H. . Mounting possible in switch position. Internal electronic interlock always prioritizes "OFF". Green slider position Δ, "Manual" position (33/34) open. Red slider position Δ, "Auto" position (33/34) closed. In "manual" position remote switching is not possible.</p>	 <p>Accessories</p> <p>1 Motor-protective circuit-breaker, circuit-breakers</p> <p>3 Standard auxiliary contacts</p> <p>5 Trip-indicating auxiliary contact</p> <p>Additional accessories</p> <p>Page</p> <p>→ 7/48</p> <p>→ 7/58</p> <p>→ 7/58</p> <p>→ 7/56</p>
RE-PKZ2(110-120V50/60HZ,DC) 063673		1 off 		
RE-PKZ2(24V50/60HZ,DC) 063670		1 off 		
RS-PKZ2(220-240V50/60HZ,DC) 063688		1 off 	<p>Can be fitted to circuit-breakers and (high-power) compact starters. Switches circuit-breakers ON/OFF remotely (or OFF after tripping). Remote operator can be switched off locally and the thumb-grip locked with a 6 mm padlock. Suitable for AC or DC voltage. Can be combined with voltage release U, U-HI20, UVHI-PKZ2 or A-PKZ2. Standard auxiliary contact NHI is always required for the combination of circuit-breaker and Remote operator RE/RS-PKZ2. Cannot be combined with door coupling handle PKZ2-X(R)H. . Mounting possible in switch position. Internal electronic interlock always prioritizes "OFF". Green slider position Δ, "Manual" position (33/34) open. Red slider position Δ, "Auto" position (33/34) closed. In "manual" position remote switching is not possible.</p>	 <p>Accessories</p> <p>2 (High-capacity) compact starter</p> <p>4 Standard auxiliary contacts</p> <p>5 Trip-indicating auxiliary contact</p> <p>9 Clip plate</p> <p>Page</p> <p>→ 7/51</p> <p>→ 7/58</p> <p>→ 7/58</p> <p>→ 7/69</p>
RS-PKZ2(380-415V50/60HZ) 063689		1 off 		
RS-PKZ2(24V50/60HZ,DC) 063682		1 off 		

Minimum command time:



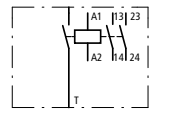
Circuit diagrams	Max. motor rating AC-3					Auxiliary contacts		For use with
	220 V 230 V 240 V	380 V 400 V 415 V	440 V	500 V	660 V 690 V	N/O = normally open contact	NC = normally closed contact	
	P kW	P kW	P kW	P kW	P kW			

Contact modules



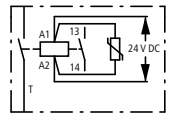
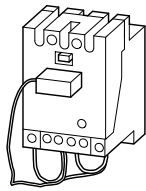
-

11 20 22 24 30 1 N/O 1 NC PKZ2(4)



-

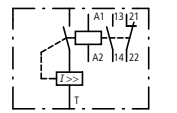
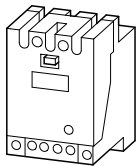
11 20 22 24 30 2 N/O - PKZ2(4)



-

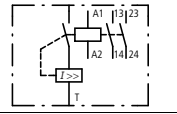
11 20 22 24 30 1 N/O - PKZ2(4)

High-capacity contact module, with current limiting contacts¹⁾



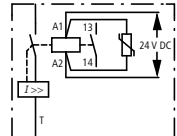
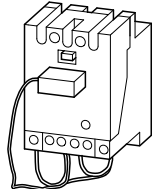
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11 20 22 24 30 1 N/O 1 NC PKZ2(4)



-

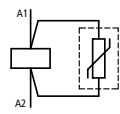
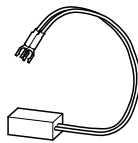
11 20 22 24 30 2 N/O - PKZ2(4)



-

11 20 22 24 30 1 N/O - PKZ2(4)

Varistor suppressor



24 - 48 V AC

- - - - - - - - - - -

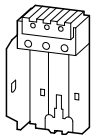
S(E1A)-...-PKZ2

110 - 250 V AC

- - - - - - - - - - -

S(E1A)-...-PKZ2

Bases for separate mounting²⁾



-

- - - - - - - - - - -

S(E1A)-...-PKZ2
CL-PKZ2

Information relevant for export to North America

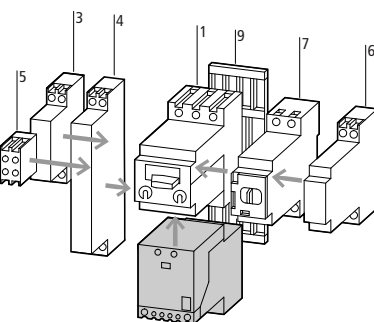


1)
 Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1;
 CE marking
 UL File No. E36332
 UL CCN NLRV
 CSA File No. 12528
 CSA Class No. 3211-05
 NA Certification UL Listed, CSA certified
 See also → Page 7/75

2)
 Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1;
 CE marking
 UL File No. E36332
 UL CCN NLRV
 CSA File No. 12528
 CSA Class No. 3211-05
 NA Certification UL Listed, CSA certified

HPL07065EN

Part no. Article no.	Price See price list	Std. pack	Notes	Notes
SE1A/11-PKZ2(230V50HZ,240V60HZ) 063711		1 off	Order clip plate for snap-fitting the combination separately. Can be fitted to 3 or 4 pole circuit-breaker. When combined with a clip plate, can be snap-fitted to one or two IEC/EN 60715 top-hat rails with 15 mm height.	<p>Accessories Page</p> <p>1 Motor-protective circuit-breaker, → 7/48 circuit-breakers</p> <p>3 Standard auxiliary contacts → 7/58</p> <p>4 Standard auxiliary contacts → 7/58</p> <p>5 Trip-indicating auxiliary contact → 7/58</p> <p>6 Shunt releases, undervoltage releases → 7/60</p> <p>7 Remote operators → 7/62</p> <p>9 Clip plate → 7/69</p> <p>Further actuation voltages → 7/71</p> <p>Additional accessories → 7/56</p>
SE1A/20-PKZ2(230V50HZ,240V60HZ) 063718		1 off	Can be mounted separately using base (see below), RC suppressor on request. DC version: The coil cannot be changed. Built-in auxiliary contact HI10-S-PKZ2 can be switched freely. The auxiliary contact cannot be changed. DC version with suppressor circuit (varistor suppressor).	
SE1A-G-10-PKZ2(24VDC) 058856		1 off	High-capacity contact modules with serial no. 01 suitable for mounting with MV-PKZ2.	
S-PKZ2(230V50HZ,240V60HZ) 063696		1 off 	Order clip plate for snap-fitting the combination separately. Can be fitted to 3 or 4 pole circuit-breaker. When combined with a clip plate, can be snap-fitted to one or two IEC/EN 60715 top-hat rails with 15 mm height.	
S/HI20-S-PKZ2(230V50HZ,240V60HZ) 063703		1 off 	Can be mounted separately using base (see below), RC suppressor on request. A coil change is not possible, the integrated HI10-S-PKZ2 auxiliary contact can be switched freely, an auxiliary contact change is not possible. With suppressor circuit (varistor suppressor).	
S-G-PKZ2(24VDC) 070921		1 off 	High-capacity contact modules with serial no. 01 suitable for mounting with MV-PKZ2.	
VGSPKZ48 063974		10 off	For (high-power) contact modules with AC actuation, 50 - 60 Hz	
VGSPKZ250 063973		10 off		
EZ-PKZ2 028596		1 off 	For retrofitting of (high-capacity) contact module or current limiter, separate mounting	
			When mounting separately, also functions as mounting base for auxiliary contact HI11-S/EZ-PKZ2.	
			Can be snap-fitted on IEC/EN 60715 top-hat rail, or optional M4 screw fixing	



Accessories	Page
1 Motor-protective circuit-breaker, circuit-breakers	→ 7/48
3 Standard auxiliary contacts	→ 7/58
4 Standard auxiliary contacts	→ 7/58
5 Trip-indicating auxiliary contact	→ 7/58
6 Shunt releases, undervoltage releases	→ 7/60
7 Remote operators	→ 7/62
9 Clip plate	→ 7/69
Further actuation voltages	→ 7/71
Additional accessories	→ 7/56



Contact configuration

N/O = normally open contact NC = normally closed contact

Contact sequence

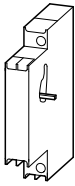
Circuit diagrams

Control cable connection



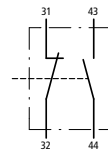
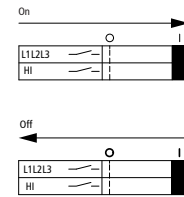
Auxiliary contacts for (high-capacity) contact module, separate mounting

Can be fitted on side of base for separate mounting



1 N/O

1 NC



Auxiliary contacts for (high-capacity) contact module

Auxiliary contacts for exchange of integrated auxiliary contact in (high-capacity) contact module
Exchange not possible with contact module SE1A-G-10-PKZ2 or high-capacity contact module S-G-PKZ2



1 N/O

1 NC



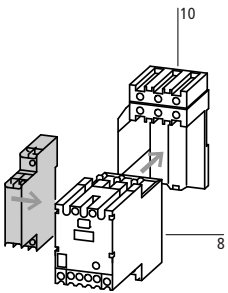



2 N/O

Mechanical interlock

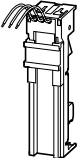




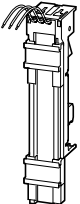




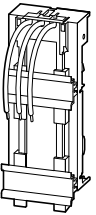


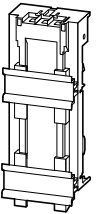


For mechanically interlocking two separately mounted (high-capacity) contact modules or two (high-capacity) compact starters.
4 end brackets are included
Can be combined with high-capacity contact module S-PKZ2 with serial no. 01



HPL07067EN

Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America
ST-PKZ2 010998		3 off 	1 set = 2 off VDE/IEC and UL/CSA compliant Connection option for fast-on connectors (insulated/non-insulated) 2.8 mm Max. cross-section 0.5 - 1 mm ² , 20 - 16 AWG Max. current tap off 1 A or 15 % of the set value Increase setting of thermal release accordingly. Enables control circuit supply to be tapped off between motor-protective circuit-breaker or circuit-breaker and (high-capacity) contact module.	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking
HI11-S/EZ-PKZ2 090305		1 off 	 <p>Accessories</p> <p>8 High-capacity contact modules → 7/64</p> <p>10 Base for separate mounting → 7/64</p> <p>Further actuating voltages → 7/70</p>	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No. E29184 UL CCN NKCR CSA File No. 12528 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified
HI11-S-PKZ2 033936		1 off 		
HI20-S-PKZ2 033935		1 off 		
MV-PKZ2 033938		1 off 		Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No. E29184 UL CCN NKCR CSA File No. 12528 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified



	Rated operating voltage U_e V	Cable cross-section	Adapter width mm	Mounting rails Number	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Busbar adapters for PKZ									
Approved to UL 508. For fitting to flat copper busbar with 60 mm between busbar centers, suitable for 5 mm and 10 mm busbar thickness.									
Rated operational current 63 A									
For motor-protective circuit breakers.									
	690	AWG 8 (10 mm ²)	72	1	PKZ2	BBA2-63¹⁾ 101458		4 Off  	-
	690	AWG 8 (10 mm ²)	54	1	PKZM4	BBA4-63¹⁾ 101457		4 Off  	-
For DOL starters.									
	690	AWG 8 (10 mm ²)	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM40	BBA2L-63¹⁾ 101480		2 Off  	-
	690	AWG 8 (10 mm ²)	55	2	PKZM4 + DILM17 PKZM4 + DILM25 PKZM4 + DILM32 PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	BBA4L-63¹⁾ 101459		4 Off  	The following can be used for an electrical connection: PKZM4 + DILM40 bis DILM65: PKZM4-XM65DE usable.
	690	AWG 8 (10 mm ²)	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM38 PKZ2 + DILM40 PKZ2 + DILM50 PKZ2 + DILM65 SE1A/...-PKZ2 + C-PKZ2 S-PKZ2 + C-PKZ2	BBA2-63/2TS²⁾ 116900		4 Off  	For DOL starters.
Rated operational current 80 A									
Can be used universally.									
	690	-	72	2	PKZ2 + DILM7 PKZ2 + DILM9 PKZ2 + DILM12 PKZ2 + DILM15 PKZ2 + DILM17 PKZ2 + DILM25 PKZ2 + DILM32 PKZ2 + DILM38 PKZ2 + DILM40 PKZ2 + DILM50 PKZ2 + DILM65	BBA2-80/2TS-S²⁾ 116901		4 Off  	Universal adapter for 1, 2 and 3-phase applications, not suitable without additional UL/CSA component. For conductor cross-section, round conductors up to 16 mm ² or AWG6.

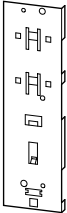


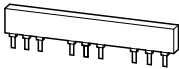


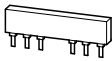






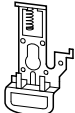





Notes

Information relevant for export to North America



1)	Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
	UL File No.	E300273
	UL CCN	NMTR
	CSA File No.	232140
	CSA Class No.	3211-37
	NA Certification	UL Recognized, CSA certified
	Max. Voltage Rating	600 V AC

2)	Product Standards	UL 508A; CSA-C22.2 No. 14; IEC60439-1; CE marking
	UL File No.	E300273
	UL CCN	NMTR
	NA Certification	UL Recognized, CSA certified
	Max. Voltage Rating	600 V AC

For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Clip plate				
For optional snap-on and M4 screw fixing for circuit-breakers with (high-power) contact module or current limiter				
	Can be used with busbar adapter	C-PKZ2 052710	2 Off  	Can be snap-fitted to one IEC/EN 60715 top-hat rails with 15 mm height or two top-hat rails exceeding 10 mm height UL/CSA certification not required
Three-phase commoning links				
	For wiring 3 PKZ2s, space is provided for either 2 auxiliary contacts or 2 voltage releases	B3.1/3-PKZ2¹⁾ 033940	5 Off  	Can be extended to several PKZ2s by rotated mounting, protected against accidental contact $U_e = 690 \text{ V}$, $I_u = 120 \text{ A}$, short-circuit proof
	For wiring of 2 PKZ2, space is provided for either 1 auxiliary contact or 1 shunt release	B3.1/2-PKZ2¹⁾ 063969	5 Off  	
Supply terminal				
For three-phase commoning link, protected against accidental contact $U_e = 690 \text{ V}$, $I_u = 120 \text{ A}$				
	-	BK50/3-PKZ2²⁾ 033941	2 Off  	For connection of: max. $1 \times 50 \text{ mm}^2$ or $2 \times 35 \text{ mm}^2$ above one another; min. $1 \times 1 \text{ mm}^2$ or $2 \times 1 \text{ mm}^2$
Shroud for unused terminals				
Protection against direct contact. To cover unused terminals on three-phase commoning link				
	-	H-B3-PKZ2 063968	10 Off	Snap-fitting option must be available on the three-phase commoning link
Padlocking feature				
For locking the circuit-breaker in the 0 position when the control panel door is open (rear-mounting type)				
	-	SVB-PKZ2¹⁾ 050337	5 Off  	Suitable for 3 padlocks with 5 – 8 mm hasp thickness
Coding pins				
For coding (in dual coding system) the devices assigned from trip block to PKZ2(4) basic device				
	-	CS-PKZ2³⁾ 055083	1 Off  	-
Documentation				
PKZM2 motor-protective circuit breakers, overload monitoring of EEx e motors				
German/English	AWB1210-1485D/GB 266166		1 Off	-

Information relevant for export to North America



1) Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV 12528 3211-05 UL Listed, CSA certified	2) Product Standards UL File No. UL CCN CSA File No. CSA Class No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV 98494 3211-06 UL Listed, CSA certified	3) Product Standards UL File No. UL CCN CSA File No. NA Certification	UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking E36332 NLRV On request UL Listed, CSA certified
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Compact starters

Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-1/SE1A/ 11(...)	PKZ2/ZM-1.6/SE1A/ 11(...)	PKZ2/ZM-2.4/SE1A/ 11(...)	PKZ2/ZM-4/SE1A/ 11(...)	PKZ2/ZM-6/SE1A/ 11(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltage	See price list	See price list	See price list	See price list	See price list
230 V 50 Hz, 240 V 60 Hz	063364	063372	063382	063392	063402
110 V 50/60 Hz	–	–	–	–	063408
230 V 50/60 Hz	063369	063379	063389	063399	063409

Compact starters

Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-10/ SE1A/11(...)	PKZ2/ZM-16/ SE1A/11(...)	PKZ2/ZM-25/ SE1A/11(...)	PKZ2/ZM-32/ SE1A/11(...)	PKZ2/ZM-40/ SE1A/11(...)	PKZ2/ SE1A/11(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltage	See price list	See price list	See price list	See price list	See price list	See price list
230 V 50 Hz, 240 V 60 Hz	063412	063422	063432	063442	063452	082142
110 V 50/60 Hz	063418	063428	063438	063448	063458	–
230 V 50/60 Hz	063419	063429	063439	063449	063459	082148

High-capacity compact starters

Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-1/S(...)	PKZ2/ZM-1.6/S(...)	PKZ2/ZM-2.4/S(...)	PKZ2/ZM-4/S(...)	PKZ2/ZM-6/S(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltage	See price list	See price list	See price list	See price list	See price list
230 V 50 Hz, 240 V 60 Hz	063472	063482	063492	063502	063512
110 V 50/60 Hz	063478	063488	063498	063508	063518
230 V 50/60 Hz	063479	063489	063499	063509	063519

High-capacity compact starters

Contact module with 1 normally open and 1 normally closed auxiliary contact

AC	PKZ2/ZM-10/ S(...)	PKZ2/ZM-16/ S(...)	PKZ2/ZM-25/ S(...)	PKZ2/ZM-32/ S(...)	PKZ2/ZM-40/ S(...)	PKZ2/S(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltage	See price list	See price list	See price list	See price list	See price list	See price list
110 V 50 Hz, 120 V 60 Hz	–	–	–	–	–	063570
230 V 50 Hz, 240 V 60 Hz	063522	063532	063542	063552	063562	063572
24 V 50/60 Hz	–	–	–	–	–	063577
110 V 50/60 Hz	063528	063538	063548	063558	063568	–
230 V 50/60 Hz	063529	063539	063549	063559	063569	063579

Notes

¹⁾ To obtain the complete part number, append the actuating voltage (...) to the part nos. given above.
Devices with **dual-voltage coils** must be ordered with a **single** article no.

Undervoltage release	When ordered separately		
	U-PKZ2(...)	U-HI20-PKZ2(...)	UVHI-PKZ2(...)
AC	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltage	See price list	See price list	See price list
24 V 50 Hz	055085	-	-
110 V 50 Hz, 120 V 60 Hz	-	063655	-
220 V 50 Hz, 240 V 60 Hz	065685	063656	-
230 V 50 Hz, 240 V 60 Hz	065766	065768	065770
400 V 50 Hz, 440 V 60 Hz	065767	-	-
24 V 50/60 Hz	-	063659	-
Non-standard voltages with the exception of the shown standard voltages ²⁾ .	-	See price list	-
...V 50Hz (24 – 600 V)	-	907537 ³⁾	-
...V 60Hz (24 – 600 V)	-	907538 ³⁾	-
DC			
Standard voltage	See price list	-	-
24V DC	014463	-	-
48V DC	028701	-	-

Notes

¹⁾ To obtain the complete part number, append the actuating voltage (...) to the part nos. given above.

Devices with **dual-voltage coils** must be ordered with a **single** article no.

²⁾ For non-standard voltages, specify the required actuating voltage within the indicated range (... - ... V).

³⁾ Minimum order quantity: 10 units.

(High-capacity) contact modules

AC	S-PKZ2(...)	S/Hi20-S-PKZ2(...)	SE1A/11-PKZ2(...)	SE1A/20-PKZ2(...)
	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾	Article no. ¹⁾
Standard voltage	See price list	See price list	See price list	See price list
24 V 50 Hz	026609	-	-	-
48 V 50 Hz	062651	056383	-	-
240 V 50 Hz	001882	057048	058716	058717
24 V 60 Hz	062501	-	-	-
110 V 50 Hz, 120 V 60 Hz	063694	063701	063709	063716
190 V 50 Hz, 220 V 60 Hz	063695	-	063710	063717
220 V 50 Hz, 240 V 60 Hz	063699	063706	-	-
230 V 50 Hz, 240 V 60 Hz	063696	063703	063711	063718
400 V 50 Hz, 440 V 60 Hz	063697	-	063712	063719
24 V 50/60 Hz	062500	-	058720	058721
110 V 50/60 Hz	-	-	058696	-
230 V 50/60 Hz	065103	056395	058712	058713
DC	S-G-PKZ2(...)	SE1A-G-10-PKZ2(...)		
	Article no. ¹⁾	Article no. ¹⁾		
Standard voltage	See price list	See price list		
24 V DC	070921	058856		

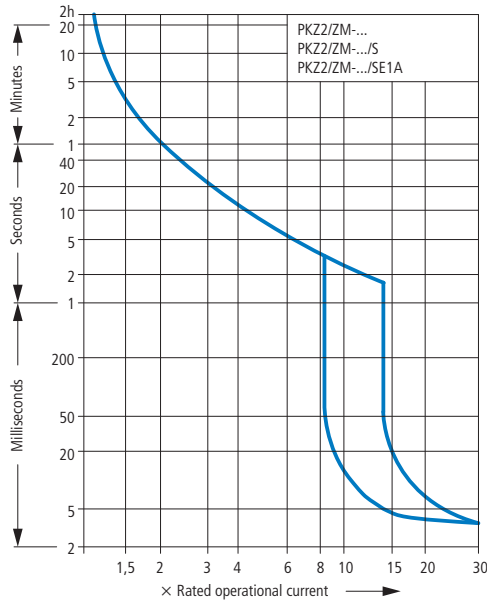
Notes

¹⁾ To obtain the complete part number, append the actuating voltage (...) to the part nos. given above.

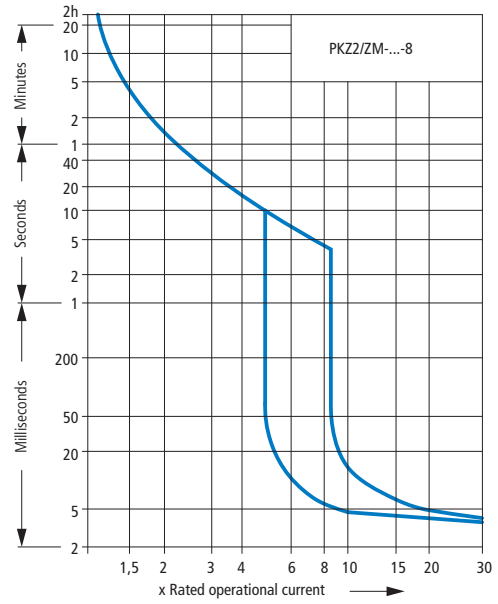
Devices with **dual-voltage coils** must be ordered with a **single** article no.



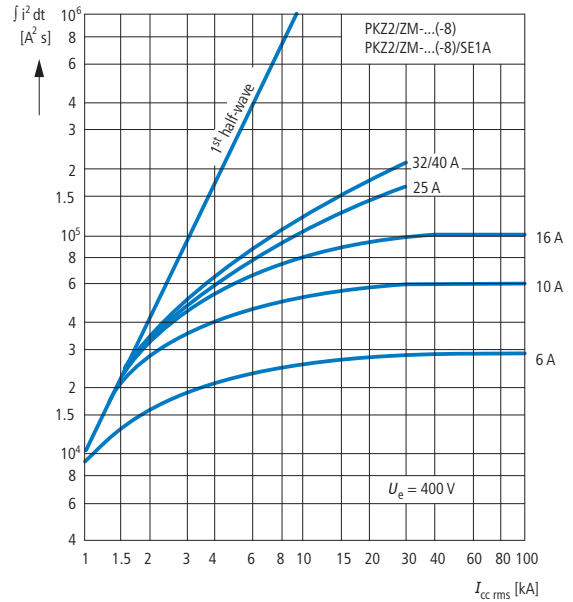
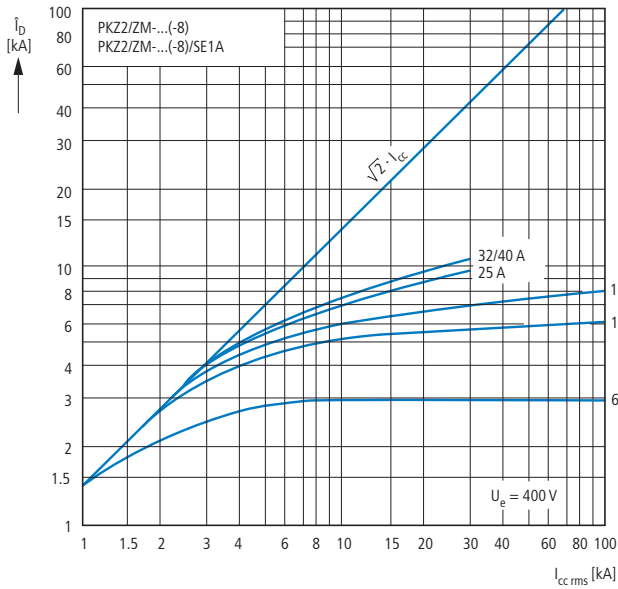
Tripping characteristic curves, motor-protective circuit-breakers, (high-power) compact starters



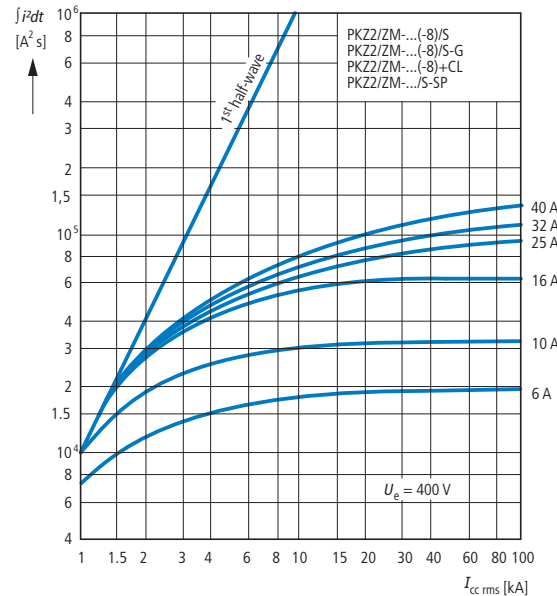
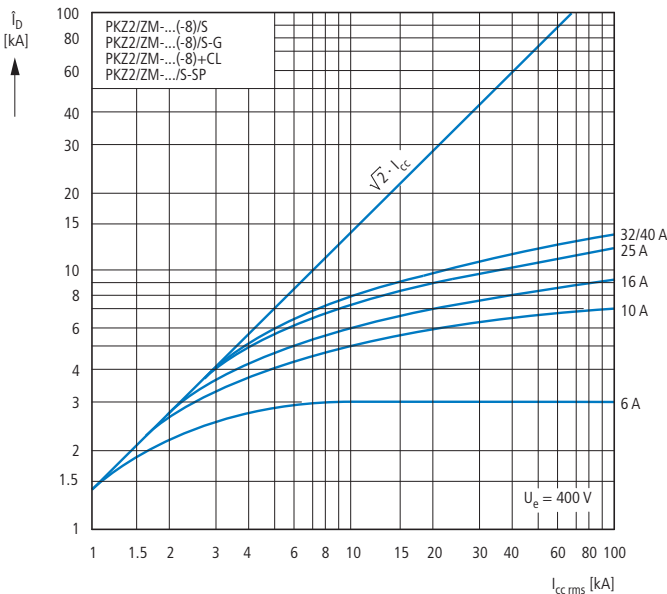
Tripping characteristic curves, line protection



Let-through characteristics, circuit-breakers, compact starters

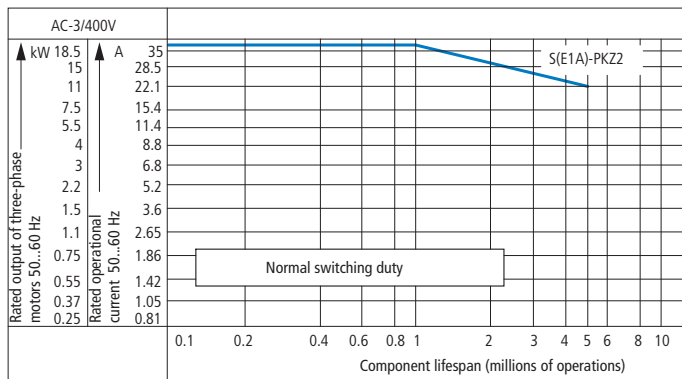


Let-through characteristics, high-capacity compact starters and circuit-breakers + current limiters CL



High-capacity contact module S-PKZ2, contact module SE1A-PKZ2

Normal switching duty



Squirrel-cage motor

Operating characteristics: Switch on: From standstill
Switch off: While running

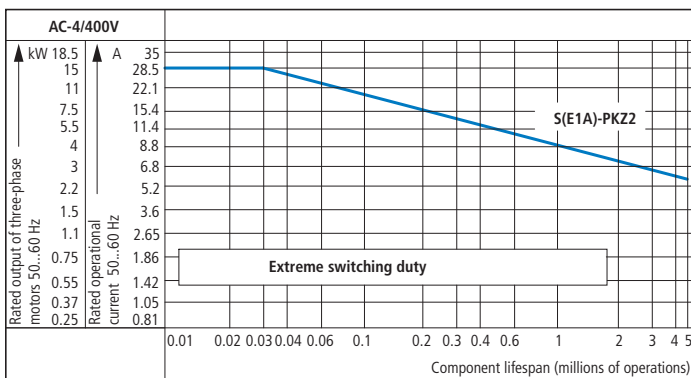
Typical applications: Compressors, Lifts, Mixers, Pumps, Escalators, Agitators, Fans, Conveyor belts, Centrifuges, Hinged flaps, Bucket-elevator, Air-conditioning system

General drives for manufacturing and processing machines

Electrical Characteristic: Switch on: Up to 6 x motor rated current
Switch off: 1 x motor rated current

Utilization category: 100 % AC-3

Extreme switching duty



Squirrel-cage motor

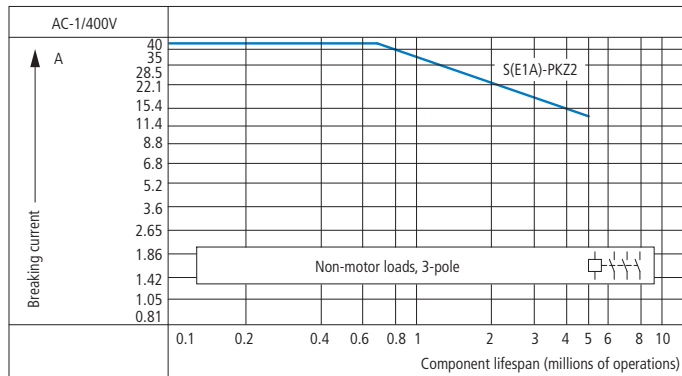
Operating characteristics: Inching, DC braking, reversing

Typical applications: Printing machines, Wire-drawing machines, Centrifuges, Special drives for machining centers and machine tools

Electrical Characteristic: Switch on: 6 x motor rated current
Switch off: 6 x motor rated current

Utilization category: 100 % AC-4

Light switching duty



Non-motor loads

Operating characteristics: Non inductive and slightly inductive loads

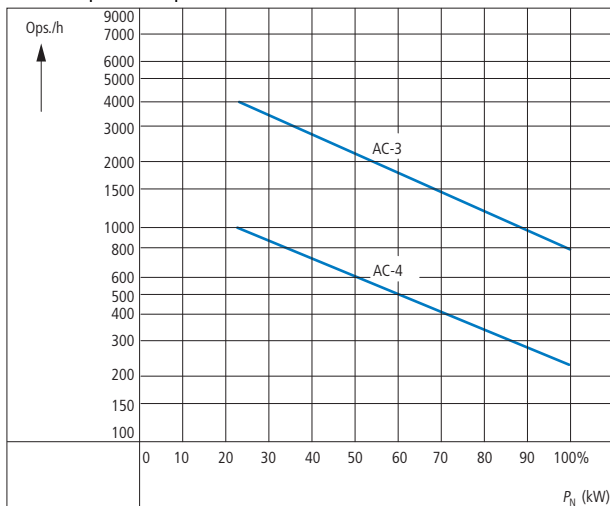
Typical applications: Electric heat

Electrical Characteristic: Switch on: Up to 1.5 x rated operational current
Switch off: Up to 1.5 x rated operational current

Utilization category: 100 % AC-1

Determination of the maximum operating frequency dependant on the rating and utilization category (recommended values) for (high capacity) contact modules

PN = max. motor rated output (kW)
Ops/h = max. operations per hour



Motor-protective circuit-breakerswitching capacity and (high-capacity) compact starter

Rated uninterrupted current I_u

Rated conditional short-circuit current I_q IEC/EN 60947-4-1

Rated ultimate short-circuit breaking capacity I_{cu}
 Rated breaking capacity I_{cs} } IEC/EN 60947-2

I_u A	230 V				400 V				440 V				500 V				690 V			
	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾	I_q kA	I_{cu} kA	I_{cs} kA	A ¹⁾
0.16 – 1.6				N				N				N				N				N
2.4				N				N				N				N				N
4				N				N				N				N				N
6				N				N				N				N				N
10			30	N			30	N	10	10	5	80	7	7	3.5	80			4.5	63
16			30	N			30	N	10	10	5	100	7	7	3.5	100			4.5	80
25	30	30	7.5	160	30	30	7.5	160	10	10	5	125	7	7	3.5	125			4.5	125
32	30	30	7.5	160	30	30	7.5	160	10	10	5	160	7	7	3.5	160			4.5	160
40	30	30	7.5	160	30	30	7.5	160	10	10	5	160	7	7	3.5	160			4.5	160

PKZ2/ZM + CL-PKZ2 type "1" and "2" coordination

0.16 – 1.6				N				N				N				N				N
2.4				N				N				N				N				N
4				N				N				N				N	10	4.5	2.5	N
6				N				N				N				N	10	4.5	2.5	N
10			30	N			30	N			5	N			3.5	N	10	4.5	2.5	N
16			30	N			30	N			5	N			3.5	N	10	4.5	2.5	N
25			7.5	N			7.5	N			5	N			3.5	N	10	4.5	2.5	N
32			7.5	N			7.5	N			5	N			3.5	N	10	4.5	2.5	N
40			7.5	N			7.5	N			5	N			3.5	N	10	4.5	2.5	N

PKZ2/ZM(R).../SE1A(-G)... with type "1" of coordination

0.16 – 1.6				N				N				N				N				N
2.4				N				N				N				N				N
4				N				N				N				N	4.5			63
6				N				N				N				N	4.5			80
10				N				N	10			80	7			80	4.5			80
16				N				N	10			100	7			100	4.5			100
25	30			160	30			160	10			125	7			125	4.5			125
32	30			160	30			160	10			160	7			160	4.5			160
40	30			160	30			160	10			160	7			160	4.5			160

PKZ2/ZM.../S(-G) with type "1" and "2" coordination

0.6 – 2.4				N				N				N				N				N
4 – 6				N				N				N				N	10			80
10 – 16				N				N				N				N	10			100
25 – 40				N				N				N				N	10			160

PKZ2/ZM...-8 and PKZ2/ZM...-8/SE1A(-G)

0.16 – 1.6	N			N	N			N	N			N	N			N	N			N
2.4	N			N	N			N	N			N	N			N	N			N
4	N			N	N			N	N			N	N			N	N	4.5	2.5	63
6	N			N	N			N	N			N	N			N	N	4.5	2.5	80
10	N		30	N	N		30	N	N	10	5	80	N	7	3.5	80	N	4.5	2.5	80
16	N		30	N	N		30	N	N	10	5	100	N	7	3.5	100	N	4.5	2.5	100
25	N	30	7.5	160	N	30	7.5	160	N	10	5	125	N	7	3.5	125	N	4.5	2.5	125
32	N	30	7.5	160	N	30	7.5	160	N	10	5	160	N	7	3.5	160	N	4.5	2.5	160
40	N	30	7.5	160	N	30	7.5	160	N	10	5	160	N	7	3.5	160	N	4.5	2.5	160

PKZ2/ZM...-8/S(-G)

0.6 – 2.4	N			N	N			N	N			N	N			N	N			N
4 – 6	N			N	N			N	N			N	N			N	N	10	5	80
10 – 16	N			N	N			N	N			N	N			N	N	10	5	100
25 – 40	N			N	N			N	N			N	N			N	N	10	5	160

Notes

■ No upstream protective device required, as it is the auto-protected range (100 kA)

N Not necessary

¹⁾ Fuse (A gG/gL) for increasing the switching capacity of the motor-protective circuit-breaker to 100 kA

Approvals for world markets

Approved rating data¹⁾
UL 508/CSA C 22.2 No. 14

	Maximum motor rating				Setting ranges		Maximum protective device to UL/CSA			
	Three-phase current				Overload releases	Short-circuit-releases	Group protection¹⁾			
	200 V HP	230 V HP	460 V HP	575 V HP			Up to max. short-circuit rating 480 V kA	600 V kA	Maximum fuse rating A	Maximum circuit breaker A
Motor-protective circuit-breakers PKZ2	"Manual Motor Starter with thermal and magnetic trip"									
PKZ2/ZM-0.6	2 ²⁾				0.4 – 0.6	5 – 8	65	42	500	600
PKZ2/ZM-1	½ ½				0.6 – 1	8 – 14	65	42	500	600
PKZ2/ZM-1.6	¾ 1				1 – 1.6	14 – 22	65	42	500	600
PKZ2/ZM-2.4	½	½	1	1½	1.6 – 2.4	20 – 35	65	42	500	600
PKZ2/ZM-4	1	1	2	3	2.4 – 4	35 – 55	65	42	500	600
PKZ2/ZM-6	1½	1½	3	5	4 – 6	50 – 80	65	42	500	600
PKZ2/ZM-10	2	3	5	7½	6 – 10	80 – 140	65	42	500	600
PKZ2/ZM-16	3	5	10	10	10 – 16	130 – 220	65	42	500	600
PKZ2/ZM-25	7½	7½	20	25	16 – 27	200 – 350	65	42	500	600
PKZ2/ZM-32	10	10	20	30	24 – 32	275 – 425	65	42	500	600
PKZ2/ZM-40	10	15	30	30	32 – 42	350 – 500	65	42	500	600
High-power compact starters PKZ2	"Manual Motor Starter with thermal, magnetic trip and contactor"									
PKZ2/ZM-0.6/S(...)	2 ²⁾				0.4 – 0.6	5 – 8	65	42	2000	2000
PKZ2/ZM-1/S(...)	½ ½				0.6 – 1	8 – 14	65	42	2000	2000
PKZ2/ZM-1.6/S(...)	¾ 1				1 – 1.6	14 – 22	65	42	2000	2000
PKZ2/ZM-2.4/S(...)	½	½	1	1½	1.6 – 2.4	20 – 35	65	42	2000	2000
PKZ2/ZM-4/S(...)	1	1	2	3	2.4 – 4	35 – 55	65	42	2000	2000
PKZ2/ZM-6/S(...)	1½	1½	3	5	4 – 6	50 – 80	65	42	2000	2000
PKZ2/ZM-10/S(...)	2	3	5	7½	6 – 10	80 – 140	65	42	2000	2000
PKZ2/ZM-16/S(...)	3	5	10	10	10 – 16	130 – 220	65	42	2000	2000
PKZ2/ZM-25/S(...)	7½	7½	20	25	16 – 27	200 – 350	65	42	2000	2000
PKZ2/ZM-32/S(...)	10	10	20	30	24 – 32	275 – 425	65	42	2000	2000
PKZ2/ZM-40/S(...)	10	15	30	30	32 – 42	350 – 500	65	42	2000	2000
High-capacity contact modules	"Contact module" in combination with PKZ2/ZM(R)-... motor-protective circuit-breaker or base for separate mounting of EZ-PKZ2									
S-PKZ2(...)	10	15	30	30						
S/HI20-S-PKZ2(...)	10	15	30	30						
S-G-PKZ2(...)	10	15	30	30						
Reversing combination	"Reversing combination" in combination with trip block ZM-...PKZ2 for motor protection									
PKZ2/SW-MV-11(...)	10	15	30	30						
Reversing busbar sys-	42 A 600 V AC									
	A BK50/3-PKZ2 terminal must be ordered separately for UL/CSA use.									

¹⁾ Caution: Changed requirements for group protection

²⁾ Calculate motor power in this range according to the rated operational current.



Approved rating data ¹⁾ UL 508/CSA C 22.2 No. 14	Maximum motor rating				Setting ranges	
	Three-phase current				Overload releases	Short-circuit-releases
	200 V	230 V	460 V	575 V	A	A
	208 V	240 V	480 V	600 V		
	HP	HP	HP	HP		
Basic device	"Basic device" In connection with motor protection trip block ZM-...-PKZ2 ZMR-...-PKZ2					
PKZ2	10	15	30	30		
Motor protection trip module with overload relay function	"Motor Protection Trip Module with overload relay function"					
ZMR-0.6-PKZ2	2)				0.4 – 0.6	5 – 8
ZMR-1-PKZ2					0.6 – 1	8 – 14
ZMR-1.6-PKZ2					1 – 1.6	14 – 22
ZMR-2.4-PKZ2	½	½	1	1½	1.6 – 2.4	20 – 35
ZMR-4-PKZ2	1	1	2	3	2.4 – 4	35 – 55
ZMR-6-PKZ2	1½	1½	3	5	4 – 6	50 – 80
ZMR-10-PKZ2	2	3	5	7½	6 – 10	80 – 140
ZMR-16-PKZ2	3	5	10	10	10 – 16	130 – 220
ZMR-25-PKZ2	7½	7½	20	25	16 – 27	200 – 350
ZMR-32-PKZ2	10	10	20	30	24 – 32	275 – 425
ZMR-40-PKZ2	10	15	30	30	32 – 42	350 – 500
Auxiliary contact ZMB	Pilot Duty General Purpose Terminal capacity Torque				D 300, R 300 1.5 A 240 V AC 0.6 A 600 V AC AWG 18 ... 14 1 Nm/9 lb.-in	
Motor protection Trip module						
ZM-1.6-PKZ2	2)				0.4 – 0.6	5 – 8
ZM-1-PKZ2					0.6 – 1	8 – 14
ZM-1.6-PKZ2					1 – 1.6	14 – 22
ZM-2.4-PKZ2	½	½	1	1½	1.6 – 2.4	20 – 35
ZM-4-PKZ2	1	1	2	3	2.4 – 4	35 – 55
ZM-6-PKZ2	1½	1	3	5	4 – 6	50 – 80
ZM-10-PKZ2	2	3	5	7½	6 – 10	80 – 140
ZM-16-PKZ2	3	5	10	10	10 – 16	130 – 220
ZM-25-PKZ2	7½	7½	20	25	16 – 27	200 – 350
ZM-32-PKZ2	10	10	20	30	24 – 32	275 – 425
ZM-40-PKZ2	10	15	30	30	32 – 42	350 – 500
Notes	Service factor (SF)	Set value I_r on the current scale depending on the load factor			¹⁾ Devices for world markets IEC q UL/CSA. ²⁾ Calculate motor power in this range according to the rated operational current. Stated values to NEC Table 430 – 150.	
		SF = 1.15 → $I_r = 1 \times I_{n\text{ mot}}$ SF = 1 → $I_r = 0.9 \times I_{n\text{ mot}}$				
	Terminal capacity	High-capacity compact starters PKZ2/ZM-.../S, Motor-protective circuit-breaker PKZ2/ZM-...				
		Cables	Cu 75 °C, min. AWG 14, max. AWG 6			
		Torque	1.8 Nm			

Approved rating data¹⁾			Pilot Duty	General Use	
Ordering data, motor-protective circuit-breaker PKZ2/S-SP "Self-Protected Starter" → Page 7/53				AC	DC
Accessories					
Standard auxiliary contacts	NHI11-PKZ2	PKZ2/ZM..., PKZ2...SP	A 600, R 300	5 A – 600 V	0.5 A – 250 V
	NHI22-PKZ2	PKZ2/ZM..., PKZ2...SP		10 A – 300 V	
	NHI11S-PKZ2	PKZ2/ZM-...			
	NHI22S-PKZ2	PKZ2/ZM-...			
	NHI2-11S-PKZ2	PKZ2/ZM-...			
Trip-indicating auxiliary contacts	AGM2-11-PKZ2	PKZ2/ZM..., PKZ2...SP	A 600, R 300	10 A – 600 V	0.5 A – 250 V ²⁾
Short-circuit indicators	K-AGM-PKZ2	PKZ2/ZM..., PKZ2...SP			
Shunt release	A-PKZ2-...	PKZ2/ZM..., PKZ2...SP	B 600, R 300	24 – 600 V	24 – 250 V
	U-PKZ2(...)	PKZ2/ZM..., PKZ2...SP		24 – 600 V	24 – 125 V
	U-HI20-PKZ2(...)	PKZ2/ZM..., PKZ2...SP		24 – 600 V	24 – 125 V
	UVHI-PKZ2(...)	PKZ2/ZM..., PKZ2...SP		24 – 600 V	24 – 125 V
Auxiliary contacts for contact module	HI11-S-PKZ2	PKZ2/ZM-...	A 600, R 300	10 A – 600 V	0.5 A – 250 V ²⁾
	HI20-S-PKZ2	PKZ2/ZM-...	A 600	10 A – 600 V	
	HI11-S/EZ-PKZ2	PKZ2/ZM-...	A 600, R 300	5 A – 600 V 10 A – 300 V	0.5 A – 250 V ²⁾
Remote operator	RE-PKZ2	PKZ2/ZM..., PKZ2...SP	³⁾		
	RS-PKZ2	PKZ2/ZM..., PKZ2...SP	D 300 – R 300	1.5 A – 240 V AC 0.6 A – 600 V AC	
Amplifier module for remote drives	ETS4-VS3	PKZ2/ZM..., PKZ2...SP	B 300 – R 300	5 A – 250 V AC	
Clip plates	C-PKZ2	PKZ2/ZM-...			
Door coupling handles	H-PKZ2	PKZ2/ZM..., PKZ2...SP			
	RH-PKZ2	PKZ2/ZM..., PKZ2...SP			
Extension shaft	A-H-PKZ2	PKZ2/ZM..., PKZ2...SP			
Base for separate mounting	EZ-PKZ2	–			
Three-phase commoning links	B3.1/3-PKZ2	PKZ2/ZM..., PKZ2...SP	max. 100 A		
	B3.1/2-PKZ2	PKZ2/ZM..., PKZ2...SP	max. 85 A		
Connecting Terminals for three-phase commoning links	BK50/3-PKZ2	PKZ2/ZM..., PKZ2...SP	max. 100 A Terminal capacity Torque	AWG 14-0 4.5 Nm	
Padlocking feature	SVB-PKZ2	PKZ2/ZM..., PKZ2...SP			
Mechanical interlock	MV-PKZ2	–			
Coding pins	CS-PKZ2	PKZ2/ZM..., PKZ2...SP			
Busbar adapters	AD-...	PKZ2/ZM..., PKZ2...SP			



Notes

Terminal capacities for all PKZ2 system add-on modules:

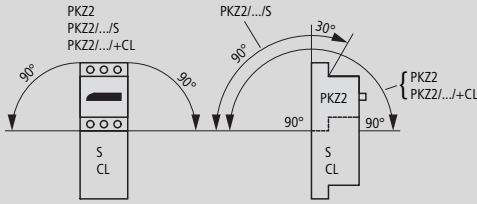
- Cables min. AWG 18, max. AWG 14
- Torque 1.0 Nm

¹⁾ Device for world markets IEC = UL/CSA.

²⁾ >150 V same polarity.

³⁾ Maximum actuating voltage 120 V 60 Hz or 120 V DC.

Technical data

				PKZ2/ZM-...(8)	PKZ2/ZM-... (8)/SE...	PKZ2/ZM-...(8)/S(+CL)	S(EA)...
General							
Standards				IEC/EN 60947, VDE 0660, UL 508, CSA C 22.2 No. 14, GL, LR, DNV, PRS, BV, RINA, RS, EZU, MEEI			
Climatic proofing				Damp heat, constant, to IEC 60068-2-78; cyclic to IEC 60068-2-30			
Ambient temperature	Storage	°C		-25...70	-25...70	-25...70	-25...70
	Open	°C		-25...60	-25...60	-25...60	-25...60
	Encapsulated	°C		-25...40	-25...40	-25...40	-25...40
Built-in position							
Direction of incoming supply				Any	Any	Any	Any
Degree of protection				IP00	IP00	IP00	IP00
Mechanical shock resistance							
Half-sinusoidal shock 20 ms to IEC 60068-2-27			g	30	8	8	8
Installation altitude				m	max. 2000	max. 2000	max. 2000
Terminal capacity	Solid or stranded	mm ²		1 x (1 - 16) 2 x (1 - 6)	1 x (1 - 16) 2 x (1 - 6)	1 x (1 - 16) 2 x (1 - 6)	1 x (1 - 16) 2 x (1 - 6)
		Flexible with ferrule	mm ²	1 x (1.5 - 10) 2 x (1.5 - 6)	1 x (1.5 - 10) 2 x (1.5 - 6)	1 x (1.5 - 10) 2 x (1.5 - 6)	1 x (1.5 - 10) 2 x (1.5 - 6)
	Solid or stranded	AWG		14 - 6	14 - 6	14 - 6	14 - 6
Terminal screw tightening torque	Main conductors	Nm		1.8	1.8	1.8	1.8
	Auxiliary conductors	Nm		1	1	1	1
Main contacts							
Rated impulse withstand voltage			U_{imp}	V AC	6000	6000	6000
Overvoltage category/pollution degree				III/3	III/3	III/3	III/3
Rated operational voltage			U_e	V AC	690	690	690
Rated uninterrupted current = rated operational current			$I_u = I_e$	A	40	40	40
Rated frequency				Hz	50 - 60	50 - 60	50 - 60
Heat dissipation (3 pole at operating temperature)				W	14	23	9
Lifespan, mechanical ¹⁾			Operations	x 10 ⁶	0.1	5	5
Lifespan, electrical	100 % AC-3	Operations	x 10 ⁶		0.05	1	1
	AC-4	Operations	x 10 ⁶		–	0.03	0.03
Maximum operating frequency			Operations/h	Ops/h	60	→ Page 7/72	
Motor switching capacity	AC-3 up to 690 V	A		40	40	40	40
	DC-5 up to 250 V	A		40	40	40	40
DC applications							
Breaking capacity I_{cn}	I_{cn} (250 V DC), L/R = 15 ms	kA		30	30	50	–
	I_{cn} (125 V DC), L/R = 15 ms	kA		50	50	65	–
Switching times in the even of a short-circuit load	Minimum command time	ms		Approx. 2	Approx. 2	Approx. 2	–
	Opening delay	ms		Approx. 0.5	Approx. 0.5	Approx. 0.5	–
	Total opening delay	ms		6	6	4	–
				ZM-...-PKZ2	ZMR-...-PKZ2	ZM-...-8-PKZ2(4)	
Trip blocks							
Function				Motor protection	Motor protection	System protection	
Temperature compensation	To IEC/EN 60947, VDE 0660	°C		-5...40	-5...40	-5...40	
	Operating range	°C		-25...60	-25...60	-25...60	
Temperature compensation residual error for T > 40 °C			%/K		≤ 0.25	≤ 0.25	≤ 0.25
Short-circuit release tolerance			%		± 20	± 20	± 20
Setting range of overload releases			x I_u		0.6 - 1	0.6 - 1	0.6 - 1
Short-circuit releases			x I_u		8.5 - 14	8.5 - 14	5 - 8.5
Notes				¹⁾ With dual-frequency coil 50/60 Hz the mechanical lifespan reduces by 30%			

SE.../...PKZ, CL-PKZ

				High-capacity contact module S(EA)...
Switching times				
Closing delay		ms		9 - 30
Opening delay		ms		4 - 12
Duty factor		% DF		100
Rated making capacity at p.f. = 0.45		A		400
Rated breaking capacity at p.f. = 0.45		A		400
Magnet systems				
AC operation				
Operating range				
Pick-up voltage		$x U_s$		0.85 - 1.1
Drop-out voltage		$x U_s$		0.4 - 0.6
Power consumption				
AC pick-up rating	Pick-up	VA		190
AC consumption when closed	Holding	VA		13
DC operation				
Rated control voltage	U_s	V DC		24
Operating range				
Pick-up voltage		$x U_s$		0.85 - 1.1
Power consumption				
DC pick-up rating	Pick-up	W		150
DC consumption when closed	Holding	W		2.7
Current consumption				
Pick-up current (16 - 22 ms)		A		6.3
Holding current		mA		113
Rated operational current, enclosed/open				
AC-1	230 V	I_e	A	40
	400 V	I_e	A	40
	440 V	I_e	A	40
	500 V	I_e	A	40
	690 V	I_e	A	40
AC-3	230 V	I_e	A	40
	400 V	I_e	A	40
	440 V	I_e	A	40
	500 V	I_e	A	40
	690 V	I_e	A	40
AC-4	230 V	I_e	A	30
	400 V	I_e	A	30
	440 V	I_e	A	30
	500 V	I_e	A	28
	690 V	I_e	A	25
				Current limiters CL-PKZ2
Rated making capacity at p.f. = 0.45			A	400
Rated breaking capacity at p.f. = 0.45			A	400
AC-1 operation	Conventional thermal current	I_{th}	A	40



				NHI11(S)-PKZ2	NHI22(S)-PKZ2	NHI2-11S-PKZ2	AGM2-11-PKZ2	HI...S-PKZ2	HI11-S/EZ-PKZ2	ZMR... (95 - 96)	ZMR... (97 - 98)	
Auxiliary contacts												
Rated impulse withstand voltage	U_{imp}	V AC		6000	6000	6000	6000	6000	6000	6000	6000	
Overvoltage category/degree of pollution				III/3	III/3	III/3	III/3	III/3	III/3	III/3	III/3	
Rated operating voltage	U_e	V AC		500	500	500	500	500	500	500	500	
Rated operational current												
AC-15	230 - 240 V	I_e	A	6	6	6	5	6	6	1.5	1.5	
				400 - 415 V	3	1.5	3	3	1.5	3	0.7	0.5
				440 V	1.5	1.5	1.5	1.5	1.5	1.5	0.5	0.3
				500 V	1.5	1.5	1.5	1.5	1.5	1.5	0.5	0.3
Lifespan, mechanical	Operations	$\times 10^6$	0.1	0.1	5	0.01	5	5	0.01	0.01		
Lifespan, electrical	Operations	$\times 10^6$	0.05	0.05	1	0.05	1	1	0.05	0.05		
Control circuit reliability (at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 10$ mA)	Fault probability	λ	Control circuit reliability through the entire mechanical lifespan									
Positive opening contacts as specified in EN60947-5-1 Appendix L			–	–	Yes	Yes	–	–	–	–		
Short-circuit strength without welding												
Fuseless				240 V: PKZM0-6.3 415 V: PKZM0-4 500 V: PKZM0-1.6				–				
Fuse				A gG/ gL	10	10	10	6	10	10	10	10
Terminal capacity												
Solid or flexible with ferrule				mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)							
Solid or stranded				AWG	1 x (22 - 14) 2 x (22 - 14)				22 - 14			
Safe isolation according to EN 61140												
Between auxiliary contacts and main contacts				V AC	690	690	500	–	500	500	–	–

				U-PKZ2...	U-HI20-PKZ2...	UVHI-PKZ2		
Undervoltage release								
Rated impulse withstand voltage	U_{imp}	V AC		6000	6000	6000		
Overvoltage category/pollution degree				III/3	III/3	III/3		
Terminal capacity								
Solid or flexible conductor with ferrule				mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	
Solid or stranded				AWG	22 - 14	22 - 14	22 - 14	
Rated operating voltage	U_e	V AC		24 - 600	24 - 600	24 - 600		
Rated operating voltage	U_e	V DC		24 - 125	24 - 125	24 - 125		
Drop-out voltage		$\times U_s$		0.7 - 0.35	0.7 - 0.35	0.7 - 0.35		
Power consumption								
AC voltage								
AC pick-up rating				Pick-up	VA	5	5	5
AC consumption when closed				Holding	VA	3	3	3
DC voltage								
DC pick-up rating				Pick-up	W	3	3	3
DC consumption when closed				Holding	W	3	3	3
OFF delay				–	–	200		
Rated operating current								
AC-15								
230 V				I_e	A	–	6	6
400 V				I_e	A	–	3	3
440 V				I_e	A	–	1.5	1.5

				A-PKZ2...
Shunt release (for power circuit-breakers)				
Rated impulse withstand voltage	U_{imp}	V AC		6000
Overvoltage category/pollution degree				III/3
Terminal capacity				
Solid or flexible conductor with ferrule		mm ²		1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
Solid or stranded		AWG		22 - 14
Rated operating voltage	U_e	V AC		24 - 600
Rated operating voltage	U_e	V DC		24 - 250
Operating range				
AC voltage		x U_s		0.7 - 1.1
DC voltage		x U_s		0.7 - 1.1
Power consumption				
AC voltage				
	AC pick-up rating	Pick-up	VA	5
	AC consumption when closed	Holding	VA	3
DC voltage				
	DC pick-up rating	Pick-up	W	3
	DC consumption when closed	Holding	W	0.3

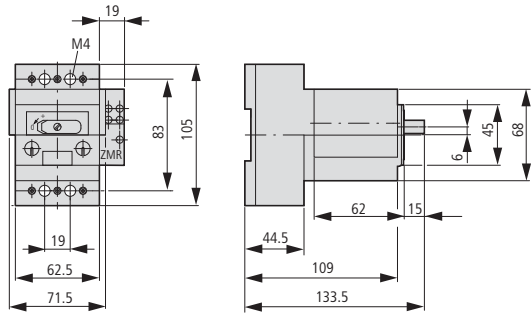


				RE-PKZ2	RS-PKZ2
Remote drives					
Rated impulse withstand voltage	U_{imp}	V AC		6000	6000
Overvoltage category/pollution degree				III/3	III/3
Rated operating voltage	U_e	V AC		380 - 440	380 - 440
Rated operating voltage	U_e	V AC/DC		24 - 240	24 - 240
Safe isolation to VDE 0106 Part 101 and Part 101 A1 between the auxiliary contacts and main circuits		V AC		500	500
Required short-time rating (30 ms)		VA/W		700	700
Control transformer short-time rating		VA		1000	1000
Short-circuit voltage		%		4.4	4.4
Closing delay		ms		≤ 30	≤ 30
Opening delay		ms		≤ 30	≤ 30
Reset time to OFF		ms		≤ 30	≤ 30
Maximum operating frequency					
	Max. operating frequency	Ops/h		60	60
Operating range					
	AC voltage	x U_s		0.85 - 1.1	0.85 - 1.1
	DC voltage	x U_s		0.85 - 1	0.85 - 1
Lifespan, electrical	Operations	x 10 ⁶		0.05	0.05
Integrated auxiliary contact (signal manual/automatic 33/34)					
	Thermal rated operational current	I_{th}	A	1.5	1.5
Rated operational current					
	AC-14	230/240 V	I_e	A	1.5
		400/415 V	I_e	A	1
		440 V	I_e	A	0.5
Terminal capacity					
	Solid or flexible conductor with ferrule		mm ²	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)	1 x (0.75 - 2.5) 2 x (0.75 - 2.5)
	Solid or stranded		AWG	22 - 14	22 - 14

				BK...-PKZ2, B3.1/...-PKZ2
Supply terminal and three-phase commoning link				
Rated impulse withstand voltage	U_{imp}	V AC		6000
Overvoltage category/pollution degree				III/3
Rated operating voltage	U_e	V AC		690
Rated uninterrupted current	I_u	A		120

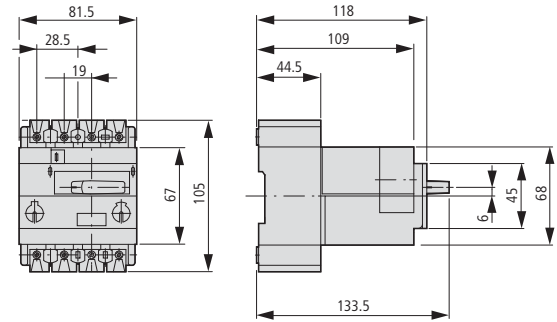
Motor-protective circuit-breakers and trip blocks

PKZ2/ZM... + ZMR...-PKZ2



Circuit-breakers

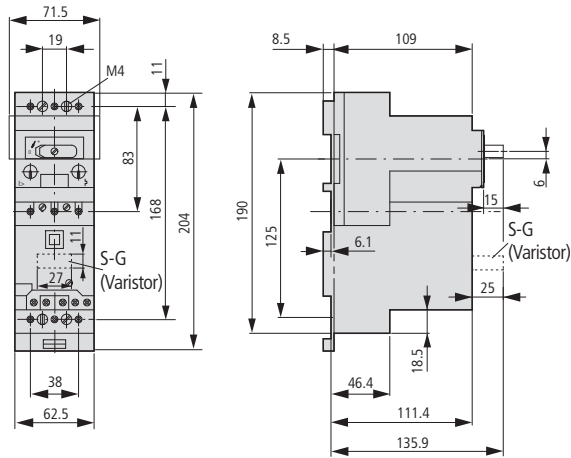
PKZ24



High-capacity compact starters

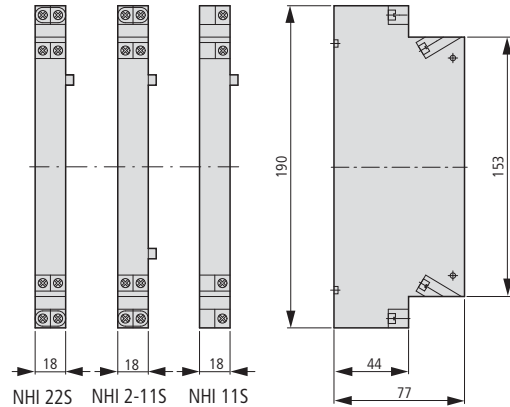
PKZ2/ZM.../S

PKZ2/ZM.../SE1A...



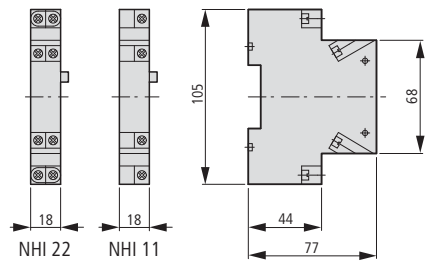
Standard auxiliary contacts for (high-capacity) compact starter

NHI...S-PKZ2



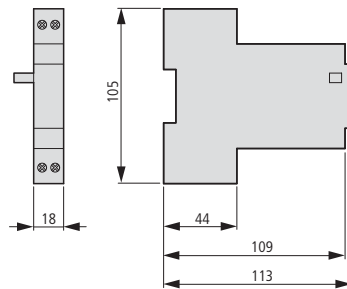
Standard auxiliary contacts

NHI...-PKZ2



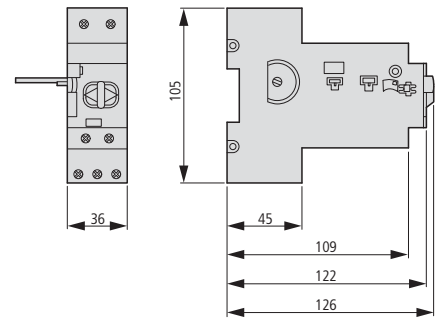
**Shunt release (for power circuit-breakers)
Undervoltage release**

U-PKZ2...
A-PKZ2...



Remote drives

RE-PKZ2...
RS-PKZ2...



Contact modules

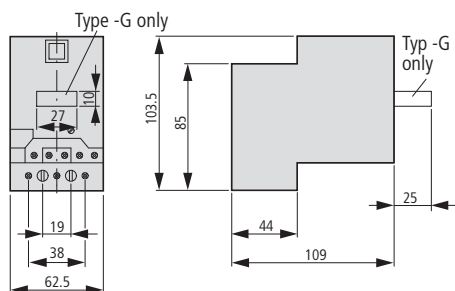
High-capacity contact modules

Current limiters

SE1A/11-PKZ2(...)

S-PKZ2(...)

CL-PKZ2

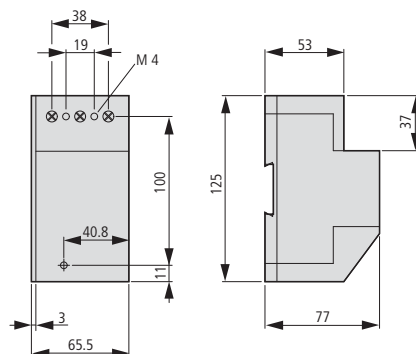


Base for separate mounting

Auxiliary contact for separate mounting

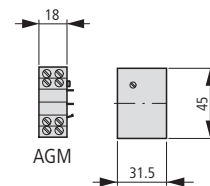
EZ-PKZ2

HI11-S/EZ-PKZ2



Trip-indicating auxiliary contacts

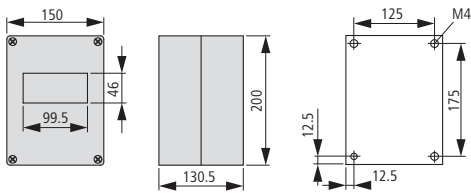
AGM2-11-PKZ2



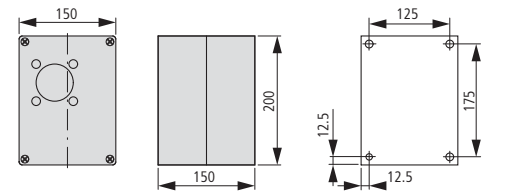
PKZ2: E-PKZ, B3...-PKZ, MV-PKZ

Insulated enclosures for surface mounting

C119EA-PKZ2

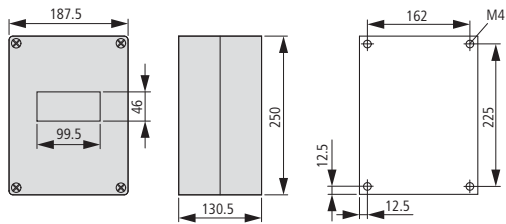


C119EB-PKZ2
C119ED-PKZ24

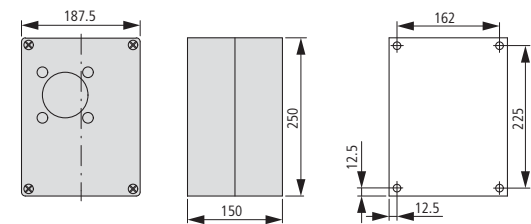


Drilling dimensions

C123EA-PKZ22



C123EB-PKZ22

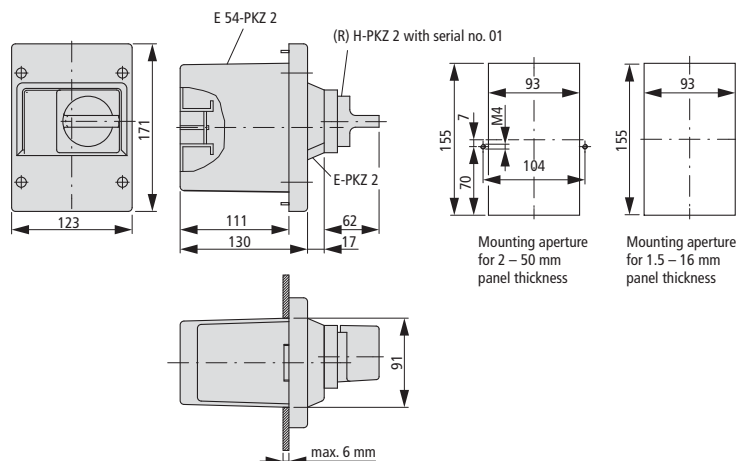


Drilling dimensions

Insulated enclosure for flush mounting

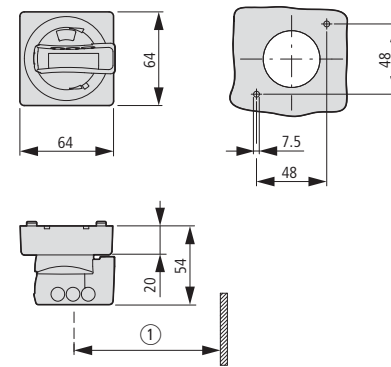
E-PKZ2

E54-PKZ2



Door coupling handles

PKZ2-X...

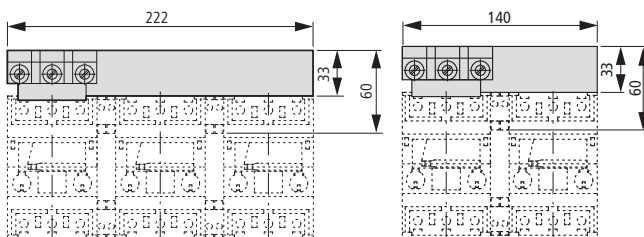


① At least 100 mm from cover hinge

Three-phase commoning links

B3.1/3-PKZ2

B3.1/2-PKZ2

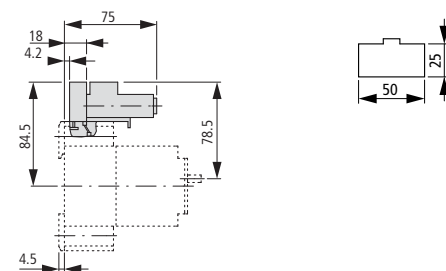


Extension terminal

BK50/3-PKZ2

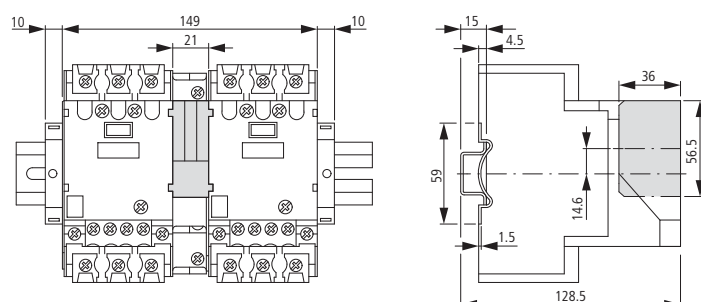
Shroud for unused terminals

H-B3-PKZ2



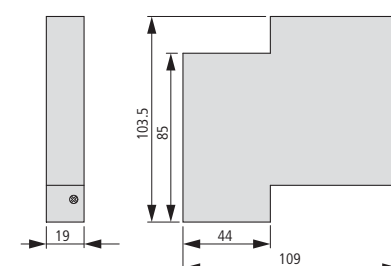
Mechanical interlock with (high-capacity) contact module

MV-PKZ2



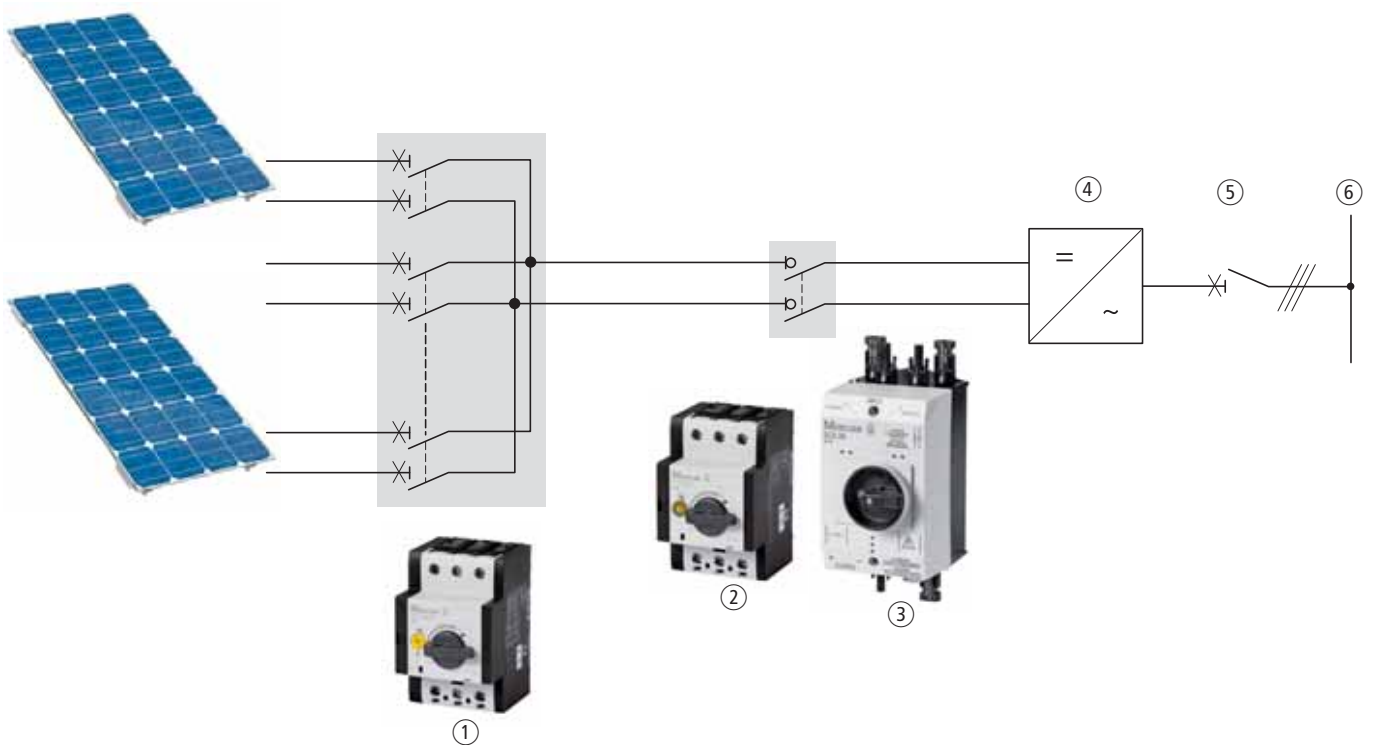
Neutral terminal for (high-capacity) contact module

N-PKZ2



P-SOL, PKZ-SOL, SOL

Description



- ① DC string circuit-breaker PKZ-SOL
- ② DC switch-disconnector P-SOL
- ③ Ready-to-install DC switch-disconnector SOL
- ④ Inverter module
- ⑤ AC main switch
- ⑥ Network

Photovoltaics description

Photovoltaic systems convert sunlight directly into electrical energy using solar cells. Photovoltaics represent a renewable source of energy that can be used on private and public buildings, as well as in large-scale power stations. These systems can be independent from the power grid or can be connected to it. Photovoltaic systems that are connected to the grid feed the generated power directly into the mains network. This eliminates the need for temporary storage. These systems consist of solar cells, one or more inverters, and a protective device for automatic cutoff in the event of a grid fault. Because of this, photovoltaic systems that are connected to the grid require extremely reliable and safe individual components.

Features

DC string circuit-breakers













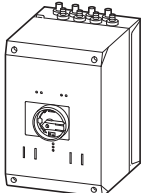





- Protect PV modules from fault currents, prevent (in larger systems, for instance) intact modules from feeding power back into a module with a short-circuit.
- Are ready for operation immediately after tripping and after the trip cause has been fixed.
- Open and for installation in customized generator terminal boxes.
- Tripping currents are adjustable within a wide range of limits.
- Optional shunt releases A-PKZ0 and undervoltage releases U-PKZ0 enable remote shutdown, e.g. for the fire department. Optional auxiliary contact NHI-E-PKZ0 signals switching state.
- When installed in an enclosure, suitable for voltages of up to 900 VDC.

DC switch-disconnectors

- Required, according to standard VDE 0100-712 (June 2006), between the PV module and inverter.
- Enclosed and open (for installation in enclosure) switch-disconnectors for voltages of up to 1,000 VDC.
- Usable as a separate switching point as required in VDI Guideline VDI 6012, e.g. by de-energizing an inverter in a completely safe manner.

- Two-pole switching, making it suitable for non-earthed systems as well.
- TÜV-certified.
- Open switch-disconnectors P-SOL are designed for installation in customer-specific enclosures or inverters.
- Mounting on 35 mm top-hat rails, their terminals enable a connection to all popular cable types.
- Separate rotary handles and shaft extensions allow for flexible installation.
- An auxiliary switching block can be mounted in order to provide switching state feedback.
- A shunt release or undervoltage release is available for remote tripping.
- Switch-disconnectors SOL with enclosure are ready for installation. Models for 2 and 4 or 4 and 8 strings and for the most popular connector types, such as MC3, MC4, and metric screw connectors, allow for easy integration into various system concepts.
- Enclosure provides degree of protection IP65, making outdoor mounting possible.
- Lockable mechanism provides safety when maintenance is required.
- Pressure-equalizing element prevents the formation of condensed water, preventing failures caused by voltage sparkovers.

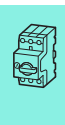
Ordering

	Inputs Number of strings	Connection type	Outputs Number of strings	Connection type	Max. rated operational current DC-21A I_e A	Part no. Article no.	Price See price list	Std. pack
DC switch-disconnector, ready-to-install								
Rated operational voltage U_e 1000 V Degree of protection IP65 Protection class 2 2 pole								
	2	MC3	1	MC3	20	SOL20/2MC3 120913		1 off 
	4	MC3	1	MC3	20	SOL20/4MC3 120914		1 off 
	2	MC4	1	MC4	20	SOL20/2MC4 120915		1 off 
	4	MC4	1	MC4	20	SOL20/4MC4 120916		1 off 
	2	Screw connector M12	1	Screw connector M16	20	SOL20/2MV 120919		1 off 
	2	MC3	1	MC3	30	SOL30/2MC3 120920		1 off 
	4	MC3	1	MC3	30	SOL30/4MC3 120921		1 off 
	2	MC4	1	MC4	30	SOL30/2MC4 120922		1 off 
	4	MC4	1	MC4	30	SOL30/4MC4 120923		1 off 
	2	Screw connector M12	1	Screw connector M16	30	SOL30/2MV 120926		1 off 
	4	MC3	1	Screw connector M20	63	SOL60/4MC3 120927		1 off 
	8	MC3	1	Screw connector M20	63	SOL60/8MC3 120928		1 off 
	4	MC4	1	Screw connector M20	63	SOL60/4MC4 120929		1 off 
	8	MC4	1	Screw connector M20	63	SOL60/8MC4 120930		1 off 
	4	Screw connector M12	1	Screw connector M20	63	SOL60/4MV 120933		1 off 

Information relevant for export to North America


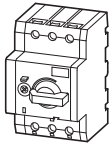

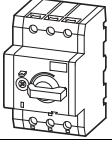
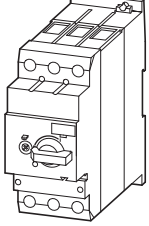
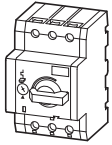

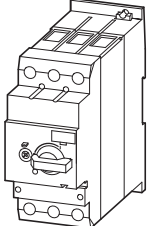


NA Certification Request filed for UL and CSA



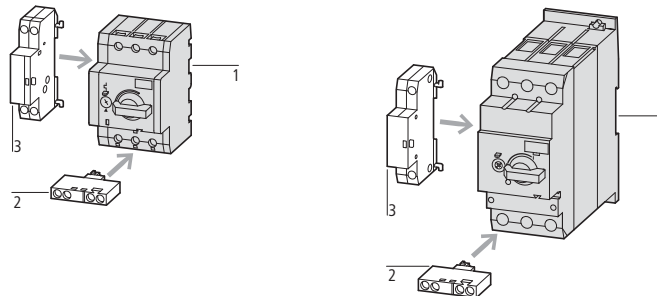
P-SOL, PKZ-SOL

HPL07086EN

	Max. rated operational current DC-21A I_e A	Permissible solar module short-circuit currents 	Part no. Article no.	Price See price list	Std. pack
DC switch-disconnector, open					
Rated operating voltage U_e 1000 V Protection class II 2 pole					
	20		P-SOL20 120934		1 off 
	30		P-SOL30 120935		
	63		P-SOL60 120936		
DC string circuit-breakers					
Rated operating voltage U_e 900 V Protection class II 2 pole					
	12	5 - 9	PKZ-SOL12 120937		1 off 
	20	9 - 15	PKZ-SOL20 120938		
	30	15 - 22	PKZ-SOL30 120939		
	40	22 - 30	PKZ-SOL40¹⁾ 120940		
	50	29 - 38	PKZ-SOL50¹⁾ 120941		
	60	38 - 47	PKZ-SOL60¹⁾ 120942		
					

Notes

¹⁾ Availability from November 2010



Accessories

- 2 Auxiliary contacts NHI-E
- 3 Shunt releases A-PKZ0
- 3 Undervoltage releases U-PKZ0

Page

- 7/10
- 7/29
- 7/29

Information relevant for export to North America



NA Certification Request filed for UL and CSA

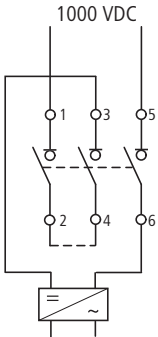
P-SOL, PKZ-SOL, SOL

Engineering

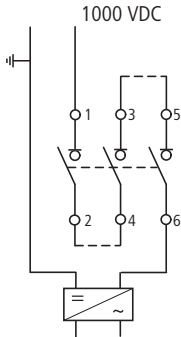
P-SOL and PKZ-SOL wiring

Switch-disconnector P-SOL

Non-earthed grid

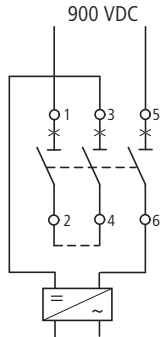


Earthed grid

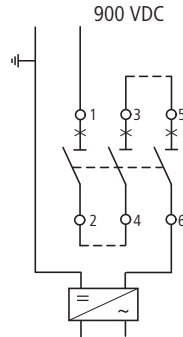


String circuit-breaker PKZ-SOL

Non-earthed grid

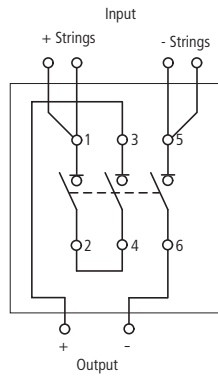


Earthed grid

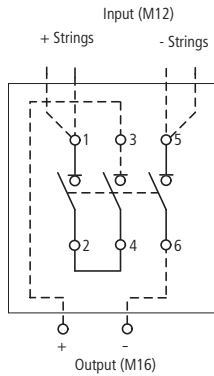


SOL internal circuit

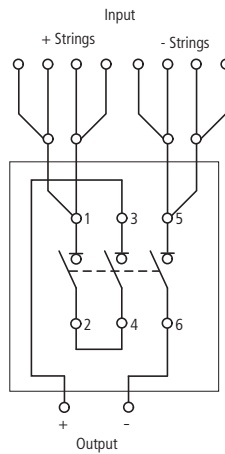
SOL20/2MC3
SOL20/2MC4
SOL30/2MC3
SOL30/2MC4



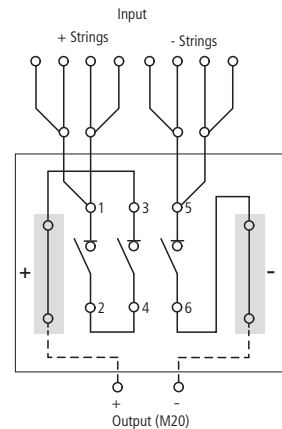
SOL20/2MV
SOL30/2MV



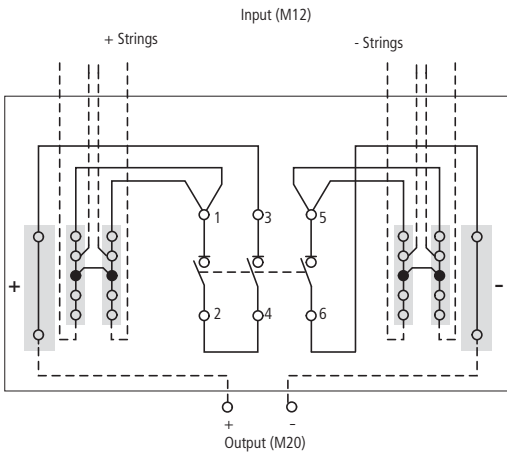
SOL20/4MC3
SOL20/4MC4
SOL30/4MC3
SOL30/4MC4



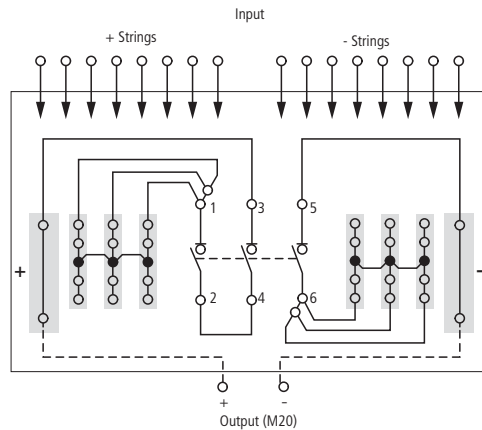
SOL60/4MC3
SOL60/4MC4



SOL60/4MV

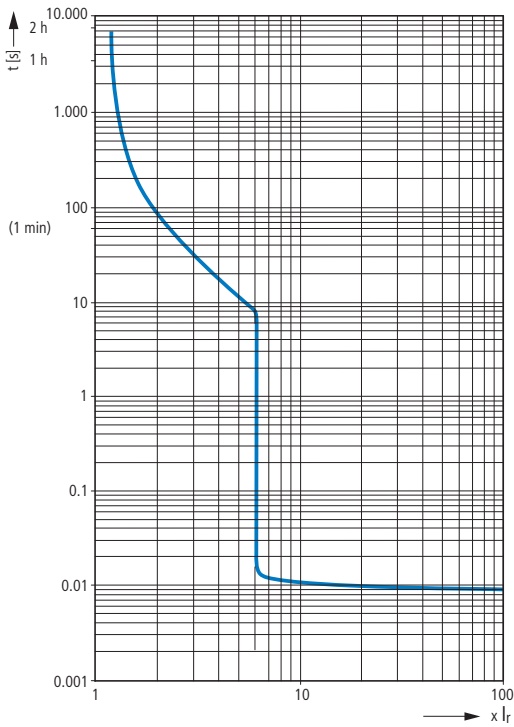


SOL60/8MC3
SOL60/8MC4



Tripping characteristics

Tripping characteristics
DC string circuit-breaker PKZ-SOL



Characteristic curve set value - short-circuit current

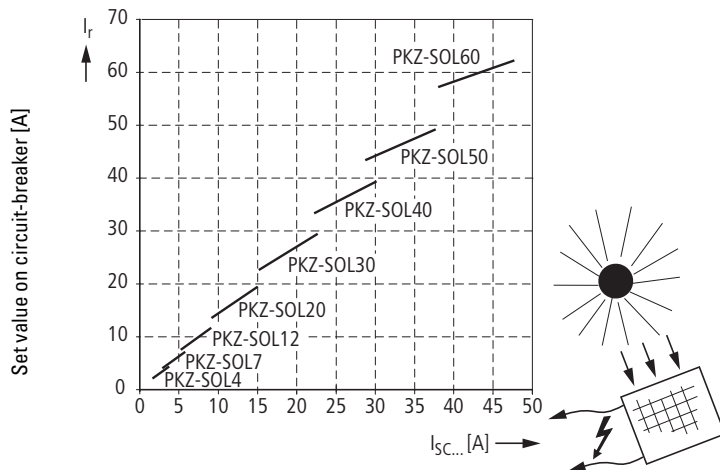
As specified in the IEC 62548-1 draft for the protection of photovoltaic modules, the tripping current of the circuit-

breaker must lie between 1.4 and 2 times the value of the photovoltaic module's short-circuit current.

Since only the current values of the installed overload release can be plotted on the setting scale for the

circuit-breaker¹⁾, the correlation between the protective device's tripping current and the photovoltaic module's short-circuit current must be specified for each point of the scale in a suitable form.

Setting aid for string circuit-breaker PKZ-SOL



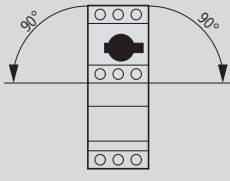
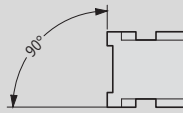
Short-circuit current in solar module [A]

¹⁾ Standard IEC/EN 60947-2 (Section 4.7.3) prohibits directly specifying the photovoltaic short-circuit current on the circuit-breaker's setting scale, meaning that only the current set value of the operating current can be plotted there.

Technical data

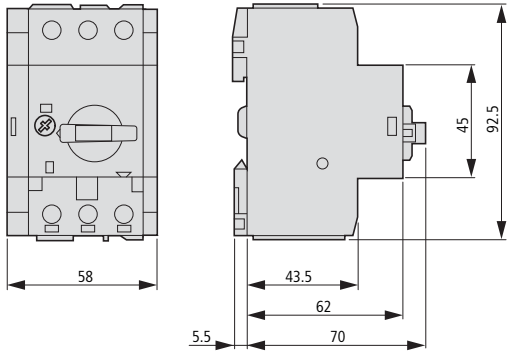
			SOL20	SOL30	SOL60
Rated operational current I_e at DC-21A		A	20	30	63
Number of poles			2	2	2
Rated operational voltage U_e		V DC	1000	1000	1000
Isolating characteristics			Yes	Yes	Yes
Standards			IEC/EN 60 947-3 UL 508, TÜV certificate		
Lifespan mechanical	Operations		100,000	100,000	30,000
Lifespan electrical	Operations		100,000	100,000	30,000
Max. operating frequency, mechanical		Ops/h	120	120	120
Climatic proofing			Damp heat, constant, to IEC 60 068-2-78 Damp heat, cyclic, to IEC 60 068-2-30		
Ambient temperature	min./max.	°C	-25 ... +60	-25 ... +60	-25 ... +60
Mounting position			Any	Any	Any
Degree of protection		IP	65	65	65
Dimensions					
Width		mm	100	100	160
Height		mm	215	215	305
Depth		mm	130	130	210
Weight		kg	0.42	0.42	2.2
Lockable in OFF position			Yes	Yes	Yes
Rated short-time withstand current , 1 s to EN 60947-3	I_{cw}	kA	0.24	0.36	0.72
Rated short-circuit making capacity to EN 60947-3	I_{cm}	kA	0.32	0.32	0.6
Internal resistance		mΩ	8	7	4
			P-SOL20	P-SOL30	P-SOL60
Rated operational current at DC-21A	I_e	A	20	30	63
Number of poles			2	2	2
Rated operational voltage	U_e	V DC	1000	1000	1000
Isolating characteristics			Yes	Yes	Yes
Standards			IEC/EN 60 947-3 UL 508, TÜV certificate		
Lifespan mechanical	Operations		100,000	100,000	30,000
Lifespan electrical	Operations		100,000	100,000	30,000
Max. operating frequency, mechanical		Ops/h	120	120	120
Climatic proofing			Damp heat, constant, to IEC 60 068-2-78 Damp heat, cyclic, to IEC 60 068-2-30		
Ambient temperature					
Open	min./max.	°C	-25 ... +60	-25 ... +60	-25 ... +60
Mounting position			Any	Any	Any
Dimensions					
Width		mm	58	58	55
Height		mm	93	93	140
Depth		mm	76	76	160
Mounting					
Top-hat rail			35 mm	35 mm	35 mm
Screw mounting			–	–	2 x M4 x 18 30 x 130
Weight		kg	0.32	0.32	1.25
Terminals					
Flexible with ferrule		mm ²	1 x (1-6)	1 x (1-6)	1 x (1-35)
		mm ²	2 x (1-6)	2 x (1-6)	2 x (1-35)
solid/stranded		AWG	18 - 14	18 - 14	14 - 2
Rated short-time withstand current , 1 s to EN 60947-3	I_{cw}	kA	0.24	0.36	0.72
Rated short-circuit making capacity to EN 60947-3	I_{cm}	kA	0.32	0.32	0.6
Internal resistance		mΩ	6	5	3



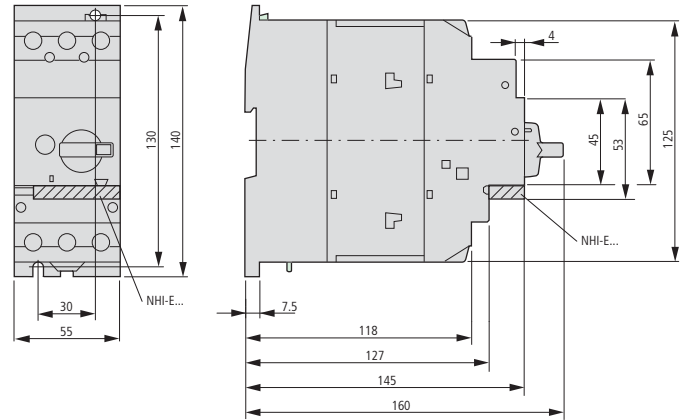
			PKZ-SOL12	PKZ-SOL20	PKZ-SOL30	PKZ-SOL40	PKZ-SOL50	PKZ-SOL60
Rated operational current at DC-21A/750VDC	I_e	A	12	20	30	40	50	63
Number of poles			2	2	2	2	2	2
Rated operational voltage	U_e	V DC	900	900	900	900	900	900
Thermal tripping			1.05 ... 1.3 x I_e					
Electromagnetic tripping			6 x I_e					
Standards			IEC/EN 60 947-2 UL 508, TÜV certificate					
Climatic proofing			Damp heat, constant, to IEC 60 068-2-78 Damp heat, cyclic, to IEC 60 068-2-30					
Ambient temperature								
Open	min./max.	°C	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60	-25 ... +60
Mounting position			 <p>PKZ-SOL12 to PKZ-SOL40</p>			 <p>PKZ-SOL40 to PKZ-SOL60</p>		
Dimensions								
Width		mm	58	58	58	55	55	55
Height		mm	93	93	93	140	140	140
Depth		mm	76	76	76	160	160	160
Mounting								
Top-hat rail			35 mm	35 mm	35 mm	35 mm	35 mm	35 mm
Screw mounting			–	–	–	2 x M4 x 18 30 x 130	2 x M4 x 18 30 x 130	2 x M4 x 18 30 x 130
Weight		kg	0.32	0.32	0.32	1.25	1.25	1.25
Terminals								
flexible with ferrule		mm ²	1 x (1-6)	1 x (1-6)	1 x (1-6)	1 x (1-35)	1 x (1-35)	1 x (1-35)
		mm ²	2 x (1-6)	2 x (1-6)	2 x (1-6)	2 x (1-35)	2 x (1-35)	2 x (1-35)
solid/stranded		AWG	18 - 14	18 - 14	18 - 14	14 - 2	14 - 2	14 - 2
Internal resistance		mΩ	31	12	7	–	–	–

Dimensions

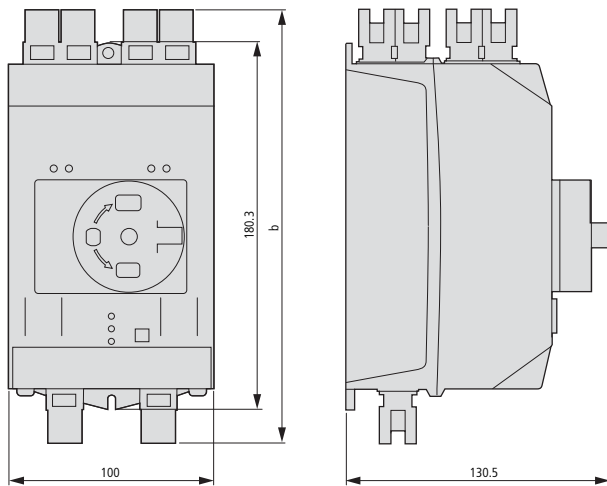
P-SOL20
P-SOL30
PKZ-SOL12
PKZ-SOL20
PKZ-SOL30



P-SOL60
PKZ-SOL40
PKZ-SOL50
PKZ-SOL60

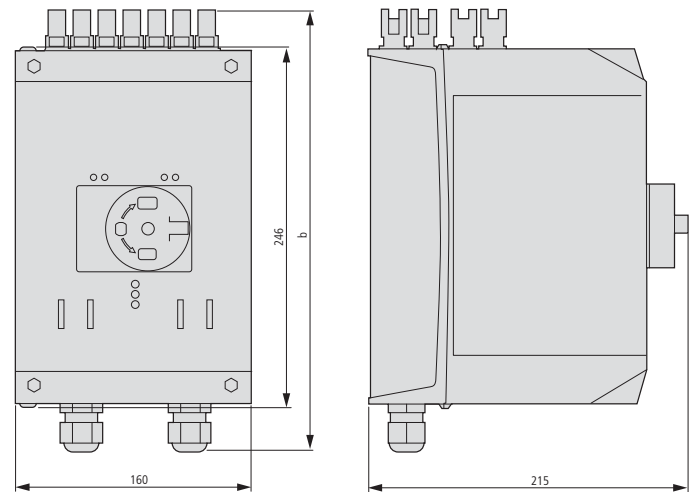


SOL20
SOL30



Connection type	b mm
MC3	195
MC4	234
MV	224

SOL60



Connection type	b mm
MC3	275
MC4	314
MV	304





Motor-starter combinations

Combining a motor protective circuit breaker or circuit breaker with a contactor results in a motor starter according to coordination type "1" or "2". Both types of coordination safely control short-circuit by switching it off. Coordination type "2" starters offer a high degree of operational continuity: after the cause of the short circuit has been removed, they can be switched back on immediately.



Motor-starter combination - motor starter up to 1400 A

Highest safety through proven combination in coordination type "1" or "2" +++ Approved combinations for export to North America

DOL starter and reversing starter MSC... – motor starter with motor-protective circuit-breaker PKZM0 up to 32A

Mounted starters minimize wiring time +++ Plug & Play with starters on busbar adapters +++ Attractive design for high-quality installations +++ Direct field bus connection through SmartWire-Darwin communication system via plug-in type protective module



DOL starter and reversing starter MSC-DE... – motor starter with electric motor-protective circuit-breaker PKE up to 32A

Increased safety through separate contact systems between switching and safety devices +++ Direct field bus connection through SmartWire-Darwin communication system via plug-in type protective module +++ Direct reading of motor current and state, transfer to subordinate control system through SmartWire-Darwin

Conditions for fulfilling type of coordination

Coordination type: "1": Secure switching off of the entered short-circuit current I_q +++ No danger to personnel or installations in case of short-circuit +++ For further operation without repair and partial renewal, switch does not need to be suitable +++ Damage to the switch or individual components approved

Coordination type: "2": Secure switching off of the entered short-circuit current I_q +++ No danger to personnel or installations in case of short-circuit +++ Switch remains suitable for further operation +++ No damage to switch, except to welds of protective contacts, when these can be easily separated without significant deformation

Ordering

Direct-on-line starters MSC-D

MSC-D complete units	8/02
MSC-US complete units	8/04
MSC-DEA complete units	8/06
Compact starters PKZ2/ZM	8/08
Modules PKZM0/PKZM4 + DILM	8/10
Modules NZMN/NZMH + DILM	8/14
Modules PKM0 + DILM + ZB	8/18
Modules NZMN + DILM + ZB/ZEV	8/18

Ordering

Reversing starter MSC-R

MSC-R complete units	8/20
Modules PKZM0/PKZM4 + DILM	8/22
Modules NZMN/NZMH + DILM	8/24

Ordering

Starter on busbar adapter

DOL starter complete units MSC-D/BBA	8/26
Reversing starters complete units MSC-R/BBA	8/28

Ordering

Starter for North America

DOL starters, modules PKZ2/S-SP + ZMR/ZM	8/30
Reversing starters, modules PKZ2/S-SP-FVR + ZMR/ZM	8/32
Modules type F starter combinations	8/34
Modules DILEM/DILM + ZE/ZB/Z5/ZW7	8/35
Modules NZMH-...-CNA + DILM + ZB/Z5/ZW7	8/36

System overview, description

Connection system SmartWire	8/37
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Ordering

Connection system SmartWire	8/38
Accessories	8/39

Engineering

Connection system SmartWire	8/40
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Technical data

Connection system SmartWire	8/41
DOL starters MSC-D, MSC-DE(A)	8/45
Reversing starter MSC-R	8/45

Dimensions

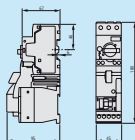
Direct-on-line starter MSC-D

MSC-D complete units	8/45
MSC-D/BBA complete units	8/45
MSC-DE(A) complete units	8/46

Reversing starter MSC-R

MSC-R complete units	8/46
MSC-R/BBA complete units	8/46

Connection system SmartWire	8/47
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Complete units

MSC-D: PKZM0, DILM

HPL08002EN

Ordering

Motor data				Setting range		Motor starters actuating voltage 230 V 50 Hz		Std. pack
Motor rating	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release	Part no. Article no.	Price See price list	
AC-3 380 V 400 V 415 V	AC-3 400 V	380 - 415 V Type "1" coordination Type "2" coordination						
P kW	I_e A	I_q kA	I_q kA	I_r A	I_{rm} A			
Complete units MSC-D								
	0.06	0.21	150	50	0.16 - 0.25	3.5	MSC-D-0.25-M7(230V50HZ) ¹⁾ 281925	1 off
	0.09	0.31	150	50	0.25 - 0.4	5.6	MSC-D-0.4-M7(230V50HZ) ¹⁾ 281926	1 off
	0.12 0.18	0.41 0.6	150	50	0.4 - 0.63	8.82	MSC-D-0.63-M7(230V50HZ) ¹⁾ 281927	1 off
	0.25	0.8	150	50	0.63 - 1	14	MSC-D-1-M7(230V50HZ) ¹⁾ 281929	1 off
	0.37 0.55	1.1 1.5	150	50	1 - 1.6	22.4	MSC-D-1.6-M7(230V50HZ) ¹⁾ 283140	1 off
	0.75	1.9	150	50	1.6 - 2.5	35	MSC-D-2.5-M7(230V50HZ) ¹⁾ 283142	1 off
	1.1 1.5	2.6 3.6	150	50	2.5 - 4	56	MSC-D-4-M7(230V50HZ) ¹⁾ 283143	1 off
	2.2	5	150	50	4 - 6.3	88.2	MSC-D-6.3-M7(230V50HZ) ¹⁾ 283145	1 off
	3	6.6	150	–	6.3 - 10	140	MSC-D-10-M7(230V50HZ) 283146	1 off
	4	8.5	150	–	6.3 - 10	140	MSC-D-10-M9(230V50HZ) 283147	1 off
5.5	11.3	50	–	8 - 12	168	MSC-D-12-M12(230V50HZ) 283148	1 off	
7.5	15.2	50	–	10 - 16	224	MSC-D-16-M15(230V50HZ) 100414	1 off	
	3 4	6.6 8.5	50	50	6.3 - 10	140	MSC-D-10-M17(230V50HZ) 101045	1 off
	5.5	11.3	50	50	8 - 12	168	MSC-D-12-M17(230V50HZ) 101046	1 off
	7.5	15.2	50	50	10 - 16	224	MSC-D-16-M17(230V50HZ) ¹⁾ 283150	1 off
	11	21.7	50	50	20 - 25	350	MSC-D-25-M25(230V50HZ) ¹⁾ 283151	1 off
	15	29.3	50	50	25 - 32	448	MSC-D-32-M32(230V50HZ) ¹⁾ 283152	1 off

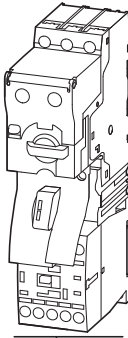
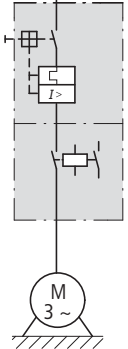
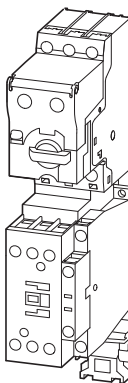
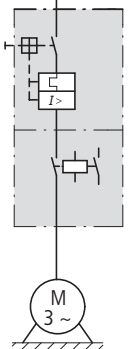
Motor starters actuating voltage 24 V DC	Std. pack	Motor protective circuit breaker	Contactor	DOL starter wiring set	Notes												
Part no. Article no.	Price See price list	Type	Type	Type													
MSC-D-0.25-M7(24VDC) ¹⁾ 283154	1 off	PKZM0-0,25	DILM7-10(...)	PKZM0-XDM12	<p>The DOL starters (complete devices) consist of a motor protective circuit breaker PKZM0 and a contactor DILM.</p> <p>With the adapterless top-hat rail mounting of starters up to 15 A, only the motor-protective circuit-breaker on the top-hat rail requires an adapter. The contactors are provided with mechanical support via a mechanical connection element.</p> <p>Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter.</p> <p>From 16 A, the motor protective circuit breaker and contactors are mounted on the top-hat rail adapter plate.</p> <p>The connection of the main circuit between PKZ and contactor is established with electrical contact modules.</p> <p>When using auxiliary contacts DILA-XHIT... (→ 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact.</p> <p>Cannot be combined with NHI-E...-PKZ0-C standard auxiliary contact with spring-loaded terminal.</p> <table border="0"> <tr> <td>Further information</td> <td>Page</td> </tr> <tr> <td>Technical data PKZM0</td> <td>→ Chapter 7</td> </tr> <tr> <td>Accessories PKZ</td> <td>→ 7/10</td> </tr> <tr> <td>Technical data DILM</td> <td>→ Chapter 5</td> </tr> <tr> <td>Further actuating voltages</td> <td>→ 5/73</td> </tr> <tr> <td>DILM accessories</td> <td>→ 5/54</td> </tr> </table>	Further information	Page	Technical data PKZM0	→ Chapter 7	Accessories PKZ	→ 7/10	Technical data DILM	→ Chapter 5	Further actuating voltages	→ 5/73	DILM accessories	→ 5/54
Further information	Page																
Technical data PKZM0	→ Chapter 7																
Accessories PKZ	→ 7/10																
Technical data DILM	→ Chapter 5																
Further actuating voltages	→ 5/73																
DILM accessories	→ 5/54																
MSC-D-0.4-M7(24VDC) ¹⁾ 283155	1 off	PKZM0-0,4	DILM7-10(...)	PKZM0-XDM12													
MSC-D-0.63-M7(24VDC) ¹⁾ 283156	1 off	PKZM0-0,63	DILM7-10(...)	PKZM0-XDM12													
MSC-D-1-M7(24VDC) ¹⁾ 283158	1 off	PKZM0-1	DILM7-10(...)	PKZM0-XDM12													
MSC-D-1.6-M7(24VDC) ¹⁾ 283159	1 off	PKZM0-1,6	DILM7-10(...)	PKZM0-XDM12													
MSC-D-2.5-M7(24VDC) ¹⁾ 283161	1 off	PKZM0-2,5	DILM7-10(...)	PKZM0-XDM12													
MSC-D-4-M7(24VDC) ¹⁾ 283162	1 off	PKZM0-4	DILM7-10(...)	PKZM0-XDM12													
MSC-D-6.3-M7(24VDC) ¹⁾ 283164	1 off	PKZM0-6,3	DILM7-10(...)	PKZM0-XDM12													
MSC-D-10-M7(24VDC) 283165	1 off	PKZM0-10	DILM7-10(...)	PKZM0-XDM12													
MSC-D-10-M9(24VDC) 283166	1 off	PKZM0-10	DILM9-10(...)	PKZM0-XDM12													
MSC-D-12-M12(24VDC) 283167	1 off	PKZM0-12	DILM12-10(...)	PKZM0-XDM12													
MSC-D-16-M15(24VDC) 100415	1 off	PKZM0-16	DILM15-10(...)	PKZM0-XDM12													
MSC-D-10-M17(24VDC) 101047	1 off	PKZM0-10	DILM17-10(...)	PKZM0-XDM32													
MSC-D-12-M17(24VDC) 101048	1 off	PKZM0-12	DILM17-10(...)	PKZM0-XDM32													
MSC-D-16-M17(24VDC) 283168	1 off	PKZM0-16	DILM17-10(...)	PKZM0-XDM32													
MSC-D-25-M25(24VDC) 283169	1 off	PKZM0-25	DILM25-10(...)	PKZM0-XDM32													
MSC-D-32-M32(24VDC) 283170	1 off	PKZM0-32	DILM32-10(...)	PKZM0-XDM32													

¹⁾ To assemble Type F starters that conform with UL508, incoming terminals BK25/3-PKZ0-E and, if necessary, three-phase terminal blocks B3.../...-PKZ0 can be added to motor starter combinations. Type F starter → Page 8/34

Complete units 400/415 V

MSC-DE: PKE, DILM

HPL08004EN

Motor data			Setting range			Motor starters actuating voltage 230 V 50 Hz	Std. pack	
Rated operational power AC-3	Rated operational current AC-3	Rated short- circuit current	Overload trip	Short- circuit release	Type of coordina- tion			Part no. Article no.
380 V 400 V 415 V	400 V	380 - 415 V						
P kW	I_e A	I_q kA	I_r A	I_{rm} A				
Complete units MSC-US								
	0.06	0.21	100	0.3 - 1.2	16.8	"1"	MSC-DE-1.2-M7(230V50HZ) 121735	1 off
	0.09	0.31	100	0.3 - 1.2	16.8	"1"	MSC-DE-1.2-M7(230V50HZ) 121735	1 off
	0.12	0.41	100	0.3 - 1.2	16.8	"1"	MSC-DE-1.2-M7(230V50HZ) 121735	1 off
	0.18	0.6	100	0.3 - 1.2	16.8	"1"	MSC-DE-1.2-M7(230V50HZ) 121735	1 off
	0.25	0.8	100	0.3 - 1.2	16.8	"1"	MSC-DE-1.2-M7(230V50HZ) 121735	1 off
	0.37	1.1	100	0.3 - 1.2	16.8	"1"	MSC-DE-1.2-M7(230V50HZ) 121735	1 off
	0.55	1.5	100	1 - 4	56	"1"	MSC-DE-4-M7(230V50HZ) 121737	1 off
	0.75	1.9	100	1 - 4	56	"1"	MSC-DE-4-M7(230V50HZ) 121737	1 off
	1.1	2.6	100	1 - 4	56	"1"	MSC-DE-4-M7(230V50HZ) 121737	1 off
	1.5	3.6	100	1 - 4	56	"1"	MSC-DE-4-M7(230V50HZ) 121737	1 off
	2.2	5	100	3 - 12	168	"1"	MSC-DE-12-M7(230V50HZ) 121739	1 off
	3	6.6	100	3 - 12	168	"1"	MSC-DE-12-M7(230V50HZ) 121739	1 off
	4	8.5	100	3 - 12	168	"1"	MSC-DE-12-M9(230V50HZ) 121741	1 off
	5.5	11.3	100	3 - 12	168	"1"	MSC-DE-12-M12(230V50HZ) 121743	1 off
	2.2	5	100	3 - 12	168	"1", "2"	MSC-DE-12-M17(230V50HZ) 121745	1 off
	3	6.6	100	3 - 12	168	"1", "2"	MSC-DE-12-M17(230V50HZ) 121745	1 off
	4	8.5	100	3 - 12	168	"1", "2"	MSC-DE-12-M17(230V50HZ) 121745	1 off
	5.5	11.3	100	3 - 12	168	"1", "2"	MSC-DE-12-M17(230V50HZ) 121745	1 off
	7.5	16.7	100	8 - 32	448	"1", "2"	MSC-DE-32-M17(230V50HZ) 121747	1 off
	11	21.7	100	8 - 32	448	"1", "2"	MSC-DE-32-M25(230V50HZ) 121749	1 off
	15	29.3	100	8 - 32	448	"1", "2"	MSC-DE-32-M32(230V50HZ) 121751	1 off



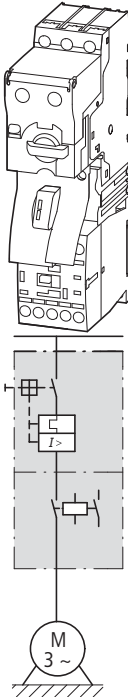
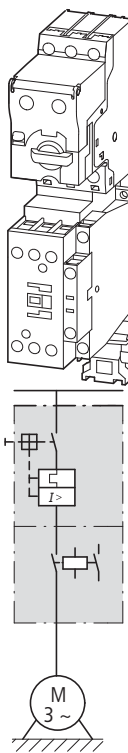
Motor starters actuating voltage 24 V DC	Price See price list	Std. pack	Motor protective circuit breaker	Contactor	DOL starter wiring set	Notes
Part no. Article no.			Type	Type	Type	
MSC-DE-1.2-M7(24VDC) 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	<p>The DOL starters (complete devices) consist of a PKE motor protective circuit breaker and a DILM contactor. With the adapterless top-hat rail mounting of starters up to 15 A, only the motor protective circuit breaker on the top-hat rail requires an adapter. The contactors are provided with mechanical support via a mechanical connection element. Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter. From 16 A, the motor protective circuit breaker and contactor are mounted on the top-hat rail adapter plate. The connection of the main circuit between PKE and contactor is established with electrical contact modules. When using auxiliary contacts DILA-XHIT... (-> 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminals.</p> <p>Further information</p> <p>Technical data PKE → Chapter 7 Accessories PKE → 7/10 Technical data DILM → Chapter 5 Further actuating voltages → 5/73 DILM accessories → 5/54</p>
MSC-DE-1.2-M7(24VDC) 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-1.2-M7(24VDC) 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-1.2-M7(24VDC) 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-1.2-M7(24VDC) 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-1.2-M7(24VDC) 121736		1 off	PKE12/XTU-1.2	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-4-M7(24VDC) 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-4-M7(24VDC) 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-4-M7(24VDC) 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-4-M7(24VDC) 121738		1 off	PKE12/XTU-4	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-12-M7(24VDC) 121740		1 off	PKE12/XTU-12	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-12-M7(24VDC) 121740		1 off	PKE12/XTU-12	DILM7-10(...)	PKZM0-XDM12	
MSC-DE-12-M9(24VDC) 121742		1 off	PKE12/XTU-12	DILM9-10(...)	PKZM0-XDM12	
MSC-DE-12-M12(24VDC) 121744		1 off	PKE12/XTU-12	DILM12-10(...)	PKZM0-XDM12	
MSC-DE-12-M17(24VDC) 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
MSC-DE-12-M17(24VDC) 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
MSC-DE-12-M17(24VDC) 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
MSC-DE-12-M17(24VDC) 121746		1 off	PKE12/XTU-12	DILM17-10(...)	PKZM0-XDM32	
MSC-DE-32-M17(24VDC) 121748		1 off	PKE32/XTU-32	DILM17-10(...)	PKZM0-XDM32	
MSC-DE-32-M25(24VDC) 121750		1 off	PKE32/XTU-32	DILM25-10(...)	PKZM0-XDM32	
MSC-DE-32-M32(24VDC) 121752		1 off	PKE32/XTU-32	DILM32-10(...)	PKZM0-XDM32	



Complete units 400/415 V



MSC-DEA: PKE, DILM

HPL08006EN

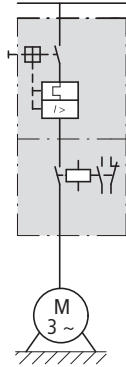
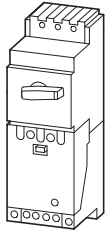
Motor data	Setting range					
	Rated operational power AC-3	Rated operational current AC-3	Rated short-circuit current	Overload trip	Short-circuit release	Type of coordination
380 V 400 V 415 V	400 V	380 - 415 V				
P kW	I_e A	I_q kA	I_r A 	I_{rm} A 		
Complete devices MSD-DEA						
	0.06	0.21	100	0.3 - 1.2	16.8	"1"
	0.09	0.31	100	0.3 - 1.2	16.8	"1"
	0.12	0.41	100	0.3 - 1.2	16.8	"1"
	0.18	0.6	100	0.3 - 1.2	16.8	"1"
	0.25	0.8	100	0.3 - 1.2	16.8	"1"
	0.37	1.1	100	0.3 - 1.2	16.8	"1"
	0.55	1.5	100	1 - 4	56	"1"
	0.75	1.9	100	1 - 4	56	"1"
	1.1	2.6	100	1 - 4	56	"1"
	1.5	3.6	100	1 - 4	56	"1"
	2.2	5	100	3 - 12	168	"1"
	3	6.6	100	3 - 12	168	"1"
	4	8.5	100	3 - 12	168	"1"
	5.5	11.3	100	3 - 12	168	"1"
	7.5	16.7	100	8 - 32	448	"1", "2"
	11	21.7	100	8 - 32	448	"1", "2"
	15	29.3	100	8 - 32	448	"1", "2"

Motor starters actuating voltage 24 V DC	Price See price list	Std. pack	Motor protective circuit breaker	Contactor	DOL starter wiring set	Notes												
Part no. Article no.			Type	Type	Mechanical con- nection module and electrical contact module													
			Type	Type	Type													
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12	<p>The DOL starters (complete devices) consist of a PKE motor protective circuit breaker and a DILM contactor.</p> <p>With the adapterless top-hat rail mounting of starters up to 15 A, only the motor protective circuit breaker on the top-hat rail requires an adapter.</p> <p>The contactors are provided with mechanical support via a mechanical connection element.</p> <p>Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter.</p> <p>From 16 A, the motor protective circuit breaker and contactor are mounted on the top-hat rail adapter plate.</p> <p>The connection of the main circuit between PKE and contactor is established with electrical contact modules.</p> <p>When using auxiliary contacts DILA-XHIT... (→ 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminals.</p> <p>The DOL starters MSC-DEA... are prepared for communication via SmartWire-Darwin. For this the SWD-PKE communication must be added.</p> <table border="0"> <tr> <td>Further information</td> <td>Page</td> </tr> <tr> <td>Technical data PKE</td> <td>→ Chapter 7</td> </tr> <tr> <td>Accessories PKE</td> <td>→ 7/10</td> </tr> <tr> <td>Technical data DILM</td> <td>→ Chapter 5</td> </tr> <tr> <td>Further actuating voltages</td> <td>→ 5/73</td> </tr> <tr> <td>DILM accessories</td> <td>→ 5/54</td> </tr> </table>	Further information	Page	Technical data PKE	→ Chapter 7	Accessories PKE	→ 7/10	Technical data DILM	→ Chapter 5	Further actuating voltages	→ 5/73	DILM accessories	→ 5/54
Further information	Page																	
Technical data PKE	→ Chapter 7																	
Accessories PKE	→ 7/10																	
Technical data DILM	→ Chapter 5																	
Further actuating voltages	→ 5/73																	
DILM accessories	→ 5/54																	
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-1.2-M7(24VDC) 121753		1 off	PKE12/XTUA-1.2	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-4-M7(24VDC) 121754		1 off	PKE12/XTUA-4	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-12-M7(24VDC) 121755		1 off	PKE12/XTUA-12	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-12-M7(24VDC) 121755		1 off	PKE12/XTUA-12	DILM7-10(...)	PKZM0-XDM12													
MSC-DEA-12-M9(24VDC) 121756		1 off	PKE12/XTUA-12	DILM9-10(...)	PKZM0-XDM12													
MSC-DEA-12-M12(24VDC) 121757		1 off	PKE12/XTUA-12	DILM12-10(...)	PKZM0-XDM12													
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32													
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32													
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32													
MSC-DEA-12-M17(24VDC) 121758		1 off	PKE12/XTUA-12	DILM17-10(...)	PKZM0-XDM32													
MSC-DEA-32-M17(24VDC) 121759		1 off	PKE32/XTUA-32	DILM17-10(...)	PKZM0-XDM32													
MSC-DEA-32-M25(24VDC) 121760		1 off	PKE32/XTUA-32	DILM25-10(...)	PKZM0-XDM32													
MSC-DEA-32-M32(24VDC) 121761		1 off	PKE32/XTUA-32	DILM32-10(...)	PKZM0-XDM32													



Motor data						Setting range			Type of coordination
Rated operational power		Rated operational current		Rated short-circuit current		Overload trip	Short-circuit release		
AC-3		AC-3							
380 V	500 V	400 V	500 V	380 - 415 V	500 V				
400 V									
415 V									
P	P	I_e	I_e	I_q	I_q	I_r	I_{rm}		
kW	kW	A	A	kA	kA	A 	A 		

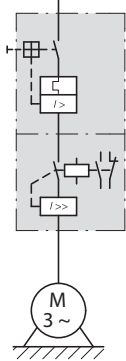
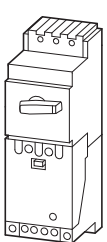
Compact starter PKZ2



0.18	0.25	0.8	0.6	100	100	0.6 - 1	8 - 14
0.25	0.37		0.9				
0.37	0.55	1.1	1.2	100	100	1 - 1.6	14 - 22
0.55	0.75	1.5	1.5				
0.75	1.1	1.9	2.1	100	100	1.6 - 2.4	20 - 35
1.1	1.5	2.65	2.9	100	100	2.4 - 4	35 - 55
1.5		3.6					
2.2	2.2	5	4	100	100	4 - 6	50 - 80
3	4	6.6	6.8	100	7	6 - 10	80 - 140
4	5.5	8.5	9				
5.5	7.5	11.3	12.1	100	7	10 - 16	130 - 220
7.5		15.2					
11	11	21.7	17.4	30	7	16 - 25	200 - 350
	15		23.4				
15	18.5	29.3	28.9	30	7	24 - 32	275 - 425
18.5	22	36	33	30	7	32 - 40	350 - 500

"1"

High-capacity compact starter PKZ2



0.18	0.25	0.8	0.6	100	100	0.6 - 1	8 - 14
0.25	0.37		0.9				
0.37	0.55	1.1	1.2	100	100	1 - 1.6	14 - 22
0.55	0.75	1.5	1.5				
0.75	1.1	1.9	2.1	100	100	1.6 - 2.4	20 - 35
1.1	1.5	2.6	2.9	100	100	2.4 - 4	35 - 55
1.5		3.6					
2.2	2.2	5	4	100	100	4 - 6	50 - 80
3	4	6.6	6.8	100	100	6 - 10	80 - 140
4	5.5	8.5	9				
5.5	7.5	11.3	12.1	100	100	10 - 16	130 - 220
7.5		15.2					
11	11	21.7	17.4	100	100	16 - 25	200 - 350
	15		23.4				
15	18.5	29.3	28.9	100	100	24 - 32	275 - 425
18.5	22	36	33	100	100	32 - 40	350 - 500

"2"

HPL08009EN

PKZ2/ZM.../S...



Part no. Article no.	Price See price list	Std. pack	Notes
PKZ2/ZM-1/SE1A/11(230V50HZ,240V60HZ) 063364		1 off	<p>The compact starters consist of a motor protective circuit breaker, which features a plug-in trip block and an attached contact module with matching profile. The devices are prefitted to a clip plate and can be snap fitted as a unit, centrally onto one or two IEC/EN 60715 top-hat rails.</p> <p>They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102.</p> <p>I_q = rated conditional short-circuit current</p>
PKZ2/ZM-1.6/SE1A/11(230V50HZ,240V60) 063372			
PKZ2/ZM-2.4/SE1A/11(230V50HZ,240V60) 063382			
PKZ2/ZM-4/SE1A/11(230V50HZ,240V60HZ) 063392			
PKZ2/ZM-6/SE1A/11(230V50HZ,240V60HZ) 063402			
PKZ2/ZM-10/SE1A/11(230V50HZ,240V60) 063412			
PKZ2/ZM-16/SE1A/11(230V50HZ,240V60) 063422			
PKZ2/ZM-25/SE1A/11(230V50HZ,240V60) 063432			
PKZ2/ZM-32/SE1A/11(230V50HZ,240V60) 063442			
PKZ2/ZM-40/SE1A/11(230V50HZ,240V60) 063452			
PKZ2/ZM-1/S(230V50HZ,240V60HZ) 063472		1 off	<p>The high-capacity compact starters consist of a motor protective circuit breaker and an attached contact module with matching profile. The devices are prefitted to a clip plate and can be snap fitted as a unit, centrally onto one or two IEC/EN 60715 top-hat rails.</p> <p>They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102.</p> <p>I_q = rated conditional short-circuit current</p>
PKZ2/ZM-1.6/S(230V50HZ,240V60HZ) 063482			
PKZ2/ZM-2.4/S(230V50HZ,240V60HZ) 063492			
PKZ2/ZM-4/S(230V50HZ,240V60HZ) 063502			
PKZ2/ZM-6/S(230V50HZ,240V60HZ) 063512			
PKZ2/ZM-10/S(230V50HZ,240V60HZ) 063522			
PKZ2/ZM-16/S(230V50HZ,240V60HZ) 063532			
PKZ2/ZM-25/S(230V50HZ,240V60HZ) 063542			
PKZ2/ZM-32/S(230V50HZ,240V60HZ) 063552			
PKZ2/ZM-40/S(230V50HZ,240V60HZ) 063562			



Modules

PKZM, DILM

HPL08010EN

Motor data				Setting range	
Rated operational power	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release
AC-3	AC-3	380 - 415 V	380 - 415 V		
380 V 400 V 415 V	400 V	Type "1" coordination	Type "2" coordination		
P	I_e	I_q	I_q	I_r	I_{rm}
kW	A	kA	kA	A 	A 

Modules PKZM0 and DILM



0.06	0.21	150	50	0.16 - 0.25	3.5
0.09	0.31	150	50	0.25 - 0.4	5.6
0.12	0.41	150	50	0.4 - 0.63	8.82
0.18	0.6	150	50	0.4 - 0.63	8.82
0.25	0.8	150	50	0.63 - 1	14
0.37	1.1	150	50	1 - 1.6	22.4
0.55	1.5	150	50	1 - 1.6	22.4
0.75	1.9	150	50	1.6 - 2.5	35
1.1	2.6	150	50	2.5 - 4	56
1.5	3.6	150	50	2.5 - 4	56
2.2	5	150	50	4 - 6.3	88.2
3	6.6	150	50	6.3 - 10	140
4	8.5	150	50	6.3 - 10	140
5.5	11.3	50	50	8 - 12	168
7.5	15.2	50	50	10 - 16	224
11	21.7	50	50	20 - 25	350
15	29.3	50	50	25 - 32	448

Modules PKZM4 and DILM

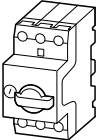
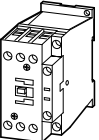
5.5	11.3	50	50	10 - 16	224
7.5	15.2	50	50	10 - 16	224
11	21.7	50	50	20 - 25	350
15	29.3	50	50	25 - 32	448
18.5	36	50	50	32 - 40	560
22	41	50	50	40 - 50	700
30	55	50	50	50 - 58	812
34	63	50	50	55 - 65	882

Motor protective circuit breaker	Contactor	Contactor	Notes
Type	Type	Type	
PKZM0-0,25	DILM7-...(…)	DILM7-...(…)	<p>The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current</p> <p>Further information</p> <p>Technical data PKZM0 → Chapter 7 Accessories PKZ → 7/10 Technical data DILM → Chapter 5 Further actuating voltages → 5/73 DILM accessories → 5/54</p>
PKZM0-0,4	DILM7-...(…)	DILM7-...(…)	
PKZM0-0,63	DILM7-...(…)	DILM7-...(…)	
PKZM0-0,63	DILM7-...(…)	DILM7-...(…)	
PKZM0-1	DILM7-...(…)	DILM7-...(…)	
PKZM0-1,6	DILM7-...(…)	DILM7-...(…)	
PKZM0-1,6	DILM7-...(…)	DILM7-...(…)	
PKZM0-2,5	DILM7-...(…)	DILM7-...(…)	
PKZM0-4	DILM7-...(…)	DILM7-...(…)	
PKZM0-4	DILM7-...(…)	DILM7-...(…)	
PKZM0-6,3	DILM7-...(…)	DILM7-...(…)	
PKZM0-10	DILM7-...(…)	DILM17-...(…)	
PKZM0-10	DILM9-...(…)	DILM17-...(…)	
PKZM0-12	DILM12-...(…)	DILM17-...(…)	
PKZM0-16	DILM15-...(…)	DILM17-...(…)	
PKZM0-25	DILM25-...(…)	DILM25-...(…)	
PKZM0-32	DILM32-...(…)	DILM32-...(…)	
PKZM4-16	DILM17-...(…)	DILM17-...(…)	
PKZM4-16	DILM17-...(…)	DILM17-...(…)	
PKZM4-25	DILM25-...(…)	DILM25-...(…)	
PKZM4-32	DILM32-...(…)	DILM32-...(…)	
PKZM4-40	DILM40(…)	DILM40(…)	
PKZM4-50	DILM50(…)	DILM50(…)	
PKZM4-58	DILM65(…)	DILM65(…)	
PKZM4-63	DILM65(…)	DILM65(…)	

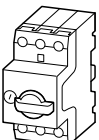
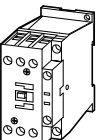


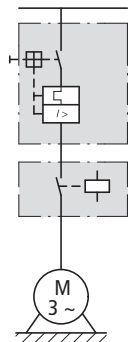
Motor data				Setting range	
Rated operational power	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release
AC-3	AC-3	500 V	500 V		
500 V	500 V	Type "1" coordination	Type "2" coordination		
P kW	I _e A	I _q kA	I _q kA	I _r A 	I _m A 

Modules PKZM0 and DILM

	0.06	0.17	100	50	0.16 - 0.25	3.5
	0.09	0.25	100	50	0.25 - 0.4	5.6
	0.12	0.33	100	50	0.25 - 0.4	5.6
	0.18	0.48	100	50	0.4 - 0.63	8.8
	0.25	0.7	100	50	0.63 - 1	14
	0.37	0.9	100	50	0.63 - 1	14
	0.55	1.2	100	50	1 - 1.6	22
	0.75	1.5	100	50	1 - 1.6	22
	1.1	2.1	100	50	1.6 - 2.5	35
	1.5	2.9	100	50	2.5 - 4	56
	2.2	4	42	18	4 - 6.3	88
	2.2	4	—	50	4 - 6.3	88
	3	5.3	42	18	4 - 6.3	88
	3	5.3	—	50	4 - 6.3	88
	4	6.8	42	18	6.3 - 10	140
	4	6.8	—	50	6.3 - 10	140
	5.5	9	42	18	6.3 - 10	140
	5.5	9	—	50	6.3 - 10	140
	6.5	10.6	42	18	8 - 12	168
	6.5	10.6	—	50	8 - 12	168
	7.5	12.1	15	18	10 - 16	224
	7.5	12.1	—	50	10 - 16	224
	11	17.4	6	—	16 - 20	280
	11	17.4	15	—	16 - 20	280
	15	23.4	6	—	20 - 25	350
	15	23.4	15	—	20 - 25	350
	18.5	28.9	6	—	25 - 32	448
	18.5	28.9	15	—	25 - 32	448

Modules PKZM4 and DILM

	11	17.4	50	50	16 - 25	350
	15	23.4	50	50	16 - 25	350
	18.5	28.9	50	50	25 - 32	448
	22	33	50	50	32 - 40	560
	30	44	50	50	40 - 50	700
	37	54	50	50	50 - 58	812
	45	65	50	50	55 - 65	882





Motor protective circuit breaker	Contactor	Contactor	Current limiter	Notes												
	Type "1" coordination	Type "2" coordination														
Type	Type	Type	Type													
PKZM0-0,25	DILM7-...(…)	DILM7-...(…)	–	<p>The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current.</p> <table border="0"> <tr> <td>Further information</td> <td>Page</td> </tr> <tr> <td>Technical data PKZM...</td> <td>→ Chapter 7</td> </tr> <tr> <td>PKZM accessories...</td> <td>→ 7/10</td> </tr> <tr> <td>Technical data DILM</td> <td>→ Chapter 5</td> </tr> <tr> <td>Further actuating voltages</td> <td>→ 5/73</td> </tr> <tr> <td>DILM accessories</td> <td>→ 5/56</td> </tr> </table>	Further information	Page	Technical data PKZM...	→ Chapter 7	PKZM accessories...	→ 7/10	Technical data DILM	→ Chapter 5	Further actuating voltages	→ 5/73	DILM accessories	→ 5/56
Further information	Page															
Technical data PKZM...	→ Chapter 7															
PKZM accessories...	→ 7/10															
Technical data DILM	→ Chapter 5															
Further actuating voltages	→ 5/73															
DILM accessories	→ 5/56															
PKZM0-0,4	DILM7-...(…)	DILM7-...(…)	–													
PKZM0-0,4	DILM7-...(…)	DILM7-...(…)	–													
PKZM0-0,63	DILM7-...(…)	DILM7-...(…)	–													
PKZM0-1	DILM7-...(…)	DILM7-...(…)	–													
PKZM0-1	DILM7-...(…)	DILM7-...(…)	–													
PKZM0-1,6	DILM7-...(…)	DILM7-...(…)	–													
PKZM0-1,6	DILM7-...(…)	DILM7-...(…)	–													
PKZM0-2,5	DILM7-...(…)	DILM17-...(…)	–													
PKZM0-4	DILM7-...(…)	DILM17-...(…)	–													
PKZM0-6,3	DILM7-...(…)	DILM17-...(…)	–													
PKZM0-6,3	–	DILM17-...(…)	CL-PKZO													
PKZM0-6,3	DILM7-...(…)	DILM17-...(…)	–													
PKZM0-6,3	–	DILM17-...(…)	CL-PKZO													
PKZM0-10	DILM9-...(…)	DILM17-...(…)	–													
PKZM0-10	–	DILM17-...(…)	CL-PKZO													
PKZM0-10	DILM9-...(…)	DILM17-...(…)	–													
PKZM0-10	–	DILM17-...(…)	CL-PKZO													
PKZM0-12	DILM12-...(…)	DILM17-...(…)	–													
PKZM0-12	–	DILM17-...(…)	CL-PKZO													
PKZM0-16	DILM17-...(…)	DILM17-...(…)	–													
PKZM0-16	–	DILM17-...(…)	CL-PKZO													
PKZM0-20	DILM25-...(…)	–	–													
PKZM0-20	DILM25-...(…)	–	CL-PKZO													
PKZM0-25	DILM25-...(…)	–	–													
PKZM0-25	DILM25-...(…)	–	CL-PKZO													
PKZM0-32	DILM32-...(…)	–	–													
PKZM0-32	DILM32-...(…)	–	CL-PKZO													
PKZM4-25	DILM40(…)	DILM40(…)	–	<p>The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current.</p> <table border="0"> <tr> <td>Further information</td> <td>Page</td> </tr> <tr> <td>Technical data PKZM...</td> <td>→ Chapter 7</td> </tr> <tr> <td>PKZM accessories...</td> <td>→ 7/10</td> </tr> <tr> <td>Technical data DILM</td> <td>→ Chapter 5</td> </tr> <tr> <td>Further actuating voltages</td> <td>→ 5/75</td> </tr> <tr> <td>DILM accessories</td> <td>→ 5/56</td> </tr> </table>	Further information	Page	Technical data PKZM...	→ Chapter 7	PKZM accessories...	→ 7/10	Technical data DILM	→ Chapter 5	Further actuating voltages	→ 5/75	DILM accessories	→ 5/56
Further information	Page															
Technical data PKZM...	→ Chapter 7															
PKZM accessories...	→ 7/10															
Technical data DILM	→ Chapter 5															
Further actuating voltages	→ 5/75															
DILM accessories	→ 5/56															
PKZM4-25	DILM40(…)	DILM40(…)	–													
PKZM4-32	DILM40(…)	DILM40(…)	–													
PKZM4-40	DILM40(…)	DILM40(…)	–													
PKZM4-50	DILM50(…)	DILM50(…)	–													
PKZM4-58	DILM65(…)	DILM65(…)	–													
PKZM4-63	DILM65(…)	DILM65(…)	–													



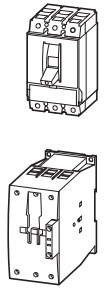
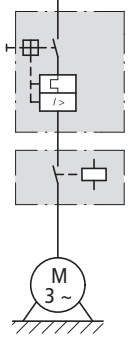
Modules

NZMN, NZMH, DILM

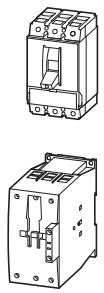
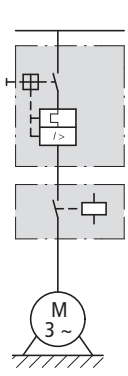
HPL08014EN

Motor data			Setting range	
Rated operational power AC-3	Rated operational current AC-3	Rated short-circuit current	Overload trip	Short-circuit release
380 V 400 V 415 V	400 V	400/415 V	I_r A 	I_{rm} A 
P kW	I_e A	I_q kA		

Modules NZMN and DILM



	18.5	36	50	32 - 40	320 - 560
	22	41	50	40 - 50	400 - 700
	30	55	50	50 - 63	504 - 882
	37	68	50	63 - 80	640 - 1120
	45	81	50	80 - 100	800 - 1250
	55	99	50	80 - 100	800 - 1250
	75	134	50	125 - 160	1280 - 2240
	90	161	50	160 - 200	1600 - 2500
	110	196	50	160 - 200	1600 - 2500
	132	231	50	175 - 350	350 - 4900
	160	279	50	175 - 350	350 - 4900
	200	349	50	175 - 350	350 - 4900
	250	437	50	225 - 450	450 - 6300
	315	544	50	275 - 550	550 - 7700
	400	683	50	438 - 875	875 - 12250
	450	750	50	438 - 875	875 - 12250
	500	820	50	438 - 875	875 - 12250
	560	947	50	700 - 1400	1400 - 19600

Modules NZMH and DILM


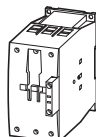
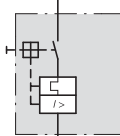
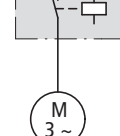
	22	41	100	40 - 50	400 - 700	
	30	55	100	50 - 63	504 - 882	
	37	68	100	63 - 80	640 - 1120	
	45	81	100	80 - 100	800 - 1250	
	55	100	100	100 - 125	1000 - 1750	
	75	134	100	125 - 160	1280 - 2240	
		30	55	100	45 - 90	90 - 1260
		37	68	100	45 - 90	90 - 1260
		45	81	100	45 - 90	90 - 1260
		55	100	100	70 - 140	140 - 1960
75		134	100	70 - 140	140 - 1960	
90		161	100	110 - 120	220 - 3080	
110		196	100	110 - 120	220 - 3080	
132		231	100	175 - 350	350 - 4900	
160		279	100	175 - 350	350 - 4900	
200		349	100	175 - 350	350 - 4900	

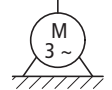
Circuit-breaker	Contactor Type "1" coordination	Contactor Type "2" coordination	Notes
Type	Type	Type	
NZMN1-M40	DILM40(...)	DILM80(...)	<p>The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102.</p> <p>I_q = conditional rated current</p>
NZMN1-M50	DILM50(...)	DILM80(...)	
NZMN1-M63	DILM65(...)	DILM80(...)	
NZMN1-M80	DILM80(...)	DILM80(...)	
NZMN1-M100	DILM95(...)	DILM95(...)	
NZMN1-M100	DILM115(...)	DILM115(...)	
NZMN2-M160	DILM150(...)	DILM150(...)	
NZMN2-M200	DILM185A/22(...)	DILM185A/22(...)	
NZMN2-M200	DILM225A/22(...)	DILM225A/22(...)	
NZMN3-ME350	DILM250/22(...)	DILM250/22(...)	
NZMN3-ME350	DILM300A/22(...)	DILM300A/22(...)	
NZMN3-ME350	DILM400/22(...)	DILM400/22(...)	
NZMN3-ME450	DILM500/22(...)	DILM500/22(...)	
NZMN4-ME550	DILM580/22(...)	–	
NZMN4-ME875	DILM650/22(...)	–	
NZMN4-ME875	DILM750/22(...)	–	
NZMN4-ME875	DILM820/22(...)	–	
NZMN4-ME1400	DILM1000/22(...)	–	
NZMH2-M50	DILM80(...)	DILM80(...)	<p>The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102.</p> <p>I_q = conditional rated current</p>
NZMH2-M63	DILM80(...)	DILM80(...)	
NZMH2-M80	DILM80(...)	DILM80(...)	
NZMH2-M100	DILM95(...)	DILM95(...)	
NZMH2-M125	DILM115(...)	DILM115(...)	
NZMH2-M160	DILM150(...)	DILM150(...)	
NZMH2-ME90	DILM80(...)	DILM80(...)	
NZMH2-ME90	DILM80(...)	DILM80(...)	
NZMH2-ME90	DILM95(...)	DILM95(...)	
NZMH2-ME140	DILM115(...)	DILM115(...)	
NZMH2-ME140	DILM150(...)	DILM150(...)	
NZMH2-ME220	DILM185A/22(...)	DILM185A/22(...)	
NZMH2-ME220	DILM225A/22(...)	DILM225A/22(...)	
NZMH3-ME350	DILM250/22(...)	DILM250/22(...)	
NZMH3-ME350	DILM300A/22(...)	DILM300A/22(...)	
NZMH3-ME350	DILM400/22(...)	DILM400/22(...)	



Motor data				Setting range	
Rated operational power AC-3	Rated operational current		Rated short-circuit current	Overload trip	Short-circuit release
500 V 525 V	500 V	525 V	500/525 V		
P kW	I_e A	I_e A	I_q kA	I_r A 	I_{rm} A 

Modules NZMH and DILM

	11	17.4	17	50	16 - 20	350 - 350
	15	23.4	22.5	50	20 - 25	350 - 350
	18.5	28.9	28	50	25 - 32	320 - 448
	22	33	32	50	32 - 40	320 - 560
	30	44	43	50	40 - 50	400 - 700
	37	54	54	50	50 - 63	504 - 882
	45	65	64	50	63 - 80	640 - 1120
	55	79	78	50	63 - 80	640 - 1120
	75	107	106	50	100 - 125	1000 - 1750
	90	129	127	50	125 - 160	1280 - 2240
	30	44	43	50	45 - 90	90 - 1260
	37	54	54	50	45 - 90	90 - 1260
	45	65	64	50	45 - 90	90 - 1260
	55	79	78	50	45 - 90	90 - 1260
	75	107	106	50	70 - 140	140 - 1960
	90	129	127	50	70 - 140	140 - 1960



Circuit-breaker	Contactor	Contactor	Notes
Type	Type	Type	
	Type "1" coordination	Type "2" coordination	
NZMH2-M20	DILM40(...)	DILM80(...)	The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current
NZMH2-M25	DILM40(...)	DILM80(...)	
NZMH2-M32	DILM40(...)	DILM80(...)	
NZMH2-M40	DILM40(...)	DILM80(...)	
NZMH2-M50	DILM80(...)	DILM80(...)	
NZMH2-M63	DILM80(...)	DILM80(...)	
NZMH2-M80	DILM80(...)	DILM80(...)	
NZMH2-M80	DILM80(...)	DILM80(...)	
NZMH2-M125	DILM115(...)	DILM115(...)	
NZMH2-M160	DILM150(...)	DILM150(...)	
NZMH2-ME90	DILM80(...)	DILM80(...)	
NZMH2-ME90	DILM80(...)	DILM80(...)	
NZMH2-ME90	DILM80(...)	DILM80(...)	
NZMH2-ME90	DILM80(...)	DILM80(...)	
NZMH2-ME140	DILM115(...)	DILM115(...)	
NZMH2-ME140	DILM150(...)	DILM150(...)	



Modules

PKZM0, DILM, ZB; NZMN1, DILM, ZB, ZEV

HPL08018EN

Motor data		Setting range		Basic unit
Rated operational power AC-3	Rated operational current AC-3	Rated short-circuit current	Overload trip	
380 V 400 V 415 V	400 V	380 - 415 V	I_r A	I_{rm} A
P kW	I_e A	I_q kA		Type

Modules PKM0, DILM and ZB with and without automatic reset

	0.06	0.21	100	0.16 - 0.24	3.5	PKM0-0,25
	0.09	0.31	100	0.24 - 0.4	5.6	PKM0-0,4
	0.12	0.41	100	0.4 - 0.6	8.82	PKM0-0,63
	0.18	0.6	100	0.4 - 0.6	8.82	PKM0-0,63
	0.25	0.8	100	0.6 - 1	14	PKM0-1
	0.37	1.1	100	1 - 1.6	22.4	PKM0-1,6
	0.55	1.5	100	1 - 1.6	22.4	PKM0-1,6
	0.75	1.9	100	1.6 - 2.4	35	PKM0-2,5
	1.1	2.6	100	2.4 - 4	56	PKM0-4
	1.5	3.6	100	2.4 - 4	56	PKM0-4
	2.2	5	100	4 - 6	88.2	PKM0-6,3
	3	6.6	100	6 - 10	140	PKM0-10
	4	8.5	100	6 - 10	140	PKM0-10
	5.5	11.3	50	8 - 12	168	PKM0-12
	5.5	11.3	50	10 - 16	168	PKM0-12
7.5	15.2	50	10 - 16	224	PKM0-16	
11	21.7	50	16 - 24	350	PKM0-25	
15	29.3	50	20 - 32	448	PKM0-32	

Modules NZMN1, DILM and Z...

	18.5	36	50	24 - 40	320 - 560	NZMN1-S40
	18.5	36	50	3 - 65	320 - 560	NZMN1-S40
	22	41	50	40 - 57	400 - 700	NZMN1-S50
	22	41	50	3 - 65	400 - 700	NZMN1-S50
	30	55	50	40 - 57	504 - 882	NZMN1-S63
	30	55	50	3 - 65	504 - 882	NZMN1-S63
	37	68	50	50 - 70	640 - 1120	NZMN1-S80
	37	68	50	10 - 145	640 - 1120	NZMN1-S80
	45	81	50	70 - 100	800 - 1250	NZMN1-S100
	45	81	50	10 - 145	800 - 1250	NZMN1-S100
	55	99	50	70 - 100	800 - 1250	NZMN1-S100
	55	99	50	10 - 145	800 - 1250	NZMN1-S100

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PKZM0, DILM, ZB; NZMN1, DILM, ZB, ZEV

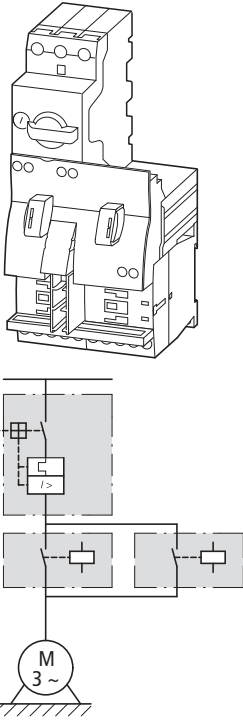
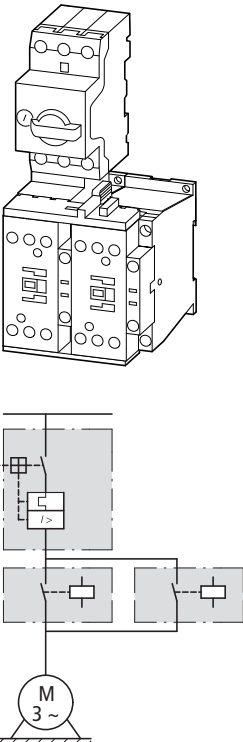
Contactor Type "1" coordination	Overload relay Type "1" coordination	Contactor Type "2" coordination	Overload relay Type "2" coordination	Current sensor	Notes																		
Type	Type	Type	Type	Type																			
DILM7-...(...)	ZB12-0,24	DILM7-...(...)	ZB12-0,24	–	<p>The motor-starter combinations consist of the motor protective circuit breaker (without overload function), a contactor and overload relay modules. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102.</p> <p>I_q = conditional rated current</p> <p>The combinations can be operated with or without manual reset. In the Manual position, the combination is blocked against automatic restarting and must be reset locally. In the Auto position, the combination automatically switches on again after the bimetallic elements have cooled down.</p> <table border="0"> <tr> <td>Further information</td> <td>Page</td> </tr> <tr> <td>Technical data PKZM0</td> <td>→ Chapter 7</td> </tr> <tr> <td>Accessories PKZ</td> <td>→ 7/10</td> </tr> <tr> <td>Technical data DILM</td> <td>→ Chapter 5</td> </tr> <tr> <td>Further actuating voltages</td> <td>→ 5/73</td> </tr> <tr> <td>DIL accessories</td> <td>→ 5/56</td> </tr> <tr> <td>Technical data ZB...</td> <td>→ Chapter 6</td> </tr> <tr> <td>Accessories ZB...</td> <td>→ 6/26</td> </tr> </table>	Further information	Page	Technical data PKZM0	→ Chapter 7	Accessories PKZ	→ 7/10	Technical data DILM	→ Chapter 5	Further actuating voltages	→ 5/73	DIL accessories	→ 5/56	Technical data ZB...	→ Chapter 6	Accessories ZB...	→ 6/26		
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Technical data PKZM0	→ Chapter 7																						
Accessories PKZ	→ 7/10																						
Technical data DILM	→ Chapter 5																						
Further actuating voltages	→ 5/73																						
DIL accessories	→ 5/56																						
Technical data ZB...	→ Chapter 6																						
Accessories ZB...	→ 6/26																						
DILM7-...(...)	ZB12-0,4	DILM7-...(...)	ZB12-0,4	–																			
DILM7-...(...)	ZB12-0,6	DILM7-...(...)	ZB12-0,6	–																			
DILM7-...(...)	ZB12-0,6	DILM7-...(...)	ZB12-0,6	–																			
DILM7-...(...)	ZB12-1	DILM7-...(...)	ZB12-1	–																			
DILM7-...(...)	ZB12-1,6	DILM7-...(...)	ZB12-1,6	–																			
DILM7-...(...)	ZB12-1,6	DILM7-...(...)	ZB12-1,6	–																			
DILM7-...(...)	ZB12-2,4	DILM7-...(...)	ZB12-2,4	–																			
DILM7-...(...)	ZB12-4	DILM7-...(...)	ZB12-4	–																			
DILM7-...(...)	ZB12-4	DILM7-...(...)	ZB12-4	–																			
DILM7-...(...)	ZB12-6	DILM17-...(...)	ZB32-6	–																			
DILM9-...(...)	ZB12-10	DILM17-...(...)	ZB32-10	–																			
DILM9-...(...)	ZB12-10	DILM17-...(...)	ZB32-10	–																			
DILM12-...(...)	ZB12-12	–	–	–																			
–	–	DILM17-...(...)	ZB32-16	–																			
DILM17-...(...)	ZB32-16	DILM17-...(...)	ZB32-16	–																			
DILM25-...(...)	ZB32-24	DILM25-...(...)	ZB32-24	–																			
DILM32-...(...)	ZB32-32	DILM32-...(...)	ZB32-32	–																			
DILM40(...)	ZB65-40	–	–	–	<p>The motor-starter combinations consist of the circuit-breaker (without overload function), contactor and overload relay module. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102.</p> <p>I_q = conditional rated current</p> <p>The combinations can be operated with or without manual reset. In the Manual position, the combination is blocked against automatic restarting and must be reset locally. In the Auto position, the combination automatically switches on again after the bimetallic elements have cooled down.</p> <p>Maximum tripping tolerance CLASS10.</p> <table border="0"> <tr> <td>Further information</td> <td>Page</td> </tr> <tr> <td>Technical data NZMN1</td> <td>→ Chapter 17</td> </tr> <tr> <td>Accessories NZM1</td> <td>→ 17/78</td> </tr> <tr> <td>Technical data DILM</td> <td>→ Chapter 5</td> </tr> <tr> <td>Further actuating voltages</td> <td>→ 5/75</td> </tr> <tr> <td>DIL accessories</td> <td>→ 5/54</td> </tr> <tr> <td>Technical data ZB..., ZEV</td> <td>→ Chapter 6</td> </tr> <tr> <td>Accessories ZB...</td> <td>→ 6/26</td> </tr> <tr> <td>Accessories ZEV</td> <td>→ 6/20</td> </tr> </table>	Further information	Page	Technical data NZMN1	→ Chapter 17	Accessories NZM1	→ 17/78	Technical data DILM	→ Chapter 5	Further actuating voltages	→ 5/75	DIL accessories	→ 5/54	Technical data ZB..., ZEV	→ Chapter 6	Accessories ZB...	→ 6/26	Accessories ZEV	→ 6/20
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Technical data NZMN1	→ Chapter 17																						
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DIL accessories	→ 5/54																						
Technical data ZB..., ZEV	→ Chapter 6																						
Accessories ZB...	→ 6/26																						
Accessories ZEV	→ 6/20																						
–	–	DILM40(...)	ZEV	ZEV-XSW-65																			
DILM50(...)	ZB65-57	–	–	–																			
–	–	DILM50(...)	ZEV	ZEV-XSW-65																			
DILM65(...)	ZB65-57	–	–	–																			
–	–	DILM65(...)	ZEV	ZEV-XSW-65																			
DILM80(...)	ZB150-70	–	–	–																			
–	–	DILM80(...)	ZEV	ZEV-XSW-145																			
DILM95(...)	ZB150-100	–	–	–																			
–	–	DILM95(...)	ZEV	ZEV-XSW-145																			
DILM115(...)	ZB150-100	–	–	–																			
–	–	DILM115(...)	ZEV	ZEV-XSW-145																			



Complete units

MSC-R: PKZM0, DILM



HPL08020EN

	Motor data				Setting range		Motor starters actuating voltage 230 V 50 Hz Part no. Article no.	Price See price list
	Rated operational power AC-3 380 V 400 V 415 V P kW	Rated operational current AC-3 I_e A	Rated short-circuit current 380 - 415 V Type "1" coordination I_q kA	Rated short-circuit current 380 - 415 V Type "2" coordination I_q kA	Overload trip I_r A	Short-circuit releases I_{rm} A		
	0.06	0.21	150	50	0.16 - 0.25	3.5	MSC-R-0.25-M7(230V50HZ) 283171	
	0.09	0.31	150	50	0.25 - 0.4	5.6	MSC-R-0.4-M7(230V50HZ) 283172	
	0.12 0.18	0.41 0.6	150	50	0.4 - 0.63	8.82	MSC-R-0.63-M7(230V50HZ) 283173	
	0.25	0.8	150	50	0.63 - 1	14	MSC-R-1-M7(230V50HZ) 283175	
	0.37 0.55	1.1 1.5	150	50	1 - 1.6	22.4	MSC-R-1.6-M7(230V50HZ) 283176	
	0.75	1.9	150	50	1.6 - 2.5	35	MSC-R-2.5-M7(230V50HZ) 283178	
	1.1 1.5	2.6 3.6	150	50	2.5 - 4	56	MSC-R-4-M7(230V50HZ) 283179	
	2.2	5	150	50	4 - 6.3	88.2	MSC-R-6.3-M7(230V50HZ) 283181	
	3	6.6	150	–	6.3 - 10	140	MSC-R-10-M7(230V50HZ) 283182	
	4	8.5	150	–	6.3 - 10	140	MSC-R-10-M9(230V50HZ) 283183	
5.5	11.3	50	–	8 - 12	168	MSC-R-12-M12(230V50HZ) 283184		
	3	6.6	50	50	6.3 - 10	140	MSC-R-10-M17(230V50HZ) 101049	
	4	11.3	50	50	8 - 12	168	MSC-R-12-M17(230V50HZ) 101050	
	7.5	15.2	50	50	10 - 16	224	MSC-R-16-M17(230V50HZ) 283186	
	11	21.7	50	50	20 - 25	350	MSC-R-25-M25(230V50HZ) 283187	
	15	29.3	50	50	25 - 32	448	MSC-R-32-M32(230V50HZ) 283188	

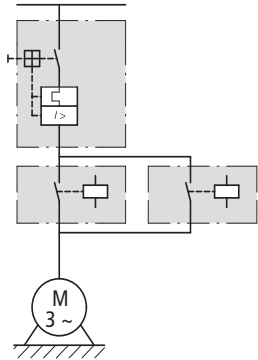
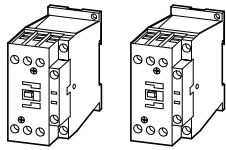
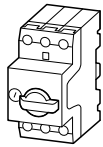
Motor starters actuating voltage 24 V DC Part no. Article no.	Price See price list	Std. pack	Motor protective circuit breaker Type	Contactor Type	Reversing starter wiring set Mechanical connection module, electrical contact module and reversing connector Type	Notes
MSC-R-0.25-M7(24VDC) 283190		1 off	PKZM0-0,25	DILM7-01(...)	PKZM0-XRM12	The reversing starters (complete devices) consist of a PKZM0 motor protective circuit breaker and two contactors DILM. With the adapterless top-hat rail mounting of starters up to 12 A, only the motor-protective circuit-breaker on the top-hat rail requires an adapter. The contactors are provided with mechanical support via a mechanical connection element. Control wire guide with max. 6 conductors with up to 2.5 mm external diameter or 4 conductors up to 3.5 mm external diameter. From 16 A, the motor protective circuit breaker and contactors are mounted on the top-hat rail adapter plate. The connection of the main circuit between PKZ and contactor is established with electrical contact modules. Complete units with mechanical interlock, starters up to 12 A also with electrical interlock. When using auxiliary contacts DILA-XHIT... (→ 5/40) the electrical plugs can be pulled without having to remove the front mounting auxiliary contact. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminal.
MSC-R-0.4-M7(24VDC) 283191			PKZM0-0,4	DILM7-01(...)	PKZM0-XRM12	
MSC-R-0.63-M7(24VDC) 283192			PKZM0-0,63	DILM7-01(...)	PKZM0-XRM12	
MSC-R-1-M7(24VDC) 283194			PKZM0-1	DILM7-01(...)	PKZM0-XRM12	
MSC-R-1.6-M7(24VDC) 283195			PKZM0-1,6	DILM7-01(...)	PKZM0-XRM12	
MSC-R-2.5-M7(24VDC) 283197			PKZM0-2,5	DILM7-01(...)	PKZM0-XRM12	
MSC-R-4-M7(24VDC) 283198			PKZM0-4	DILM7-01(...)	PKZM0-XRM12	
MSC-R-6.3-M7(24VDC) 283200			PKZM0-6,3	DILM7-01(...)	PKZM0-XRM12	
MSC-R-10-M7(24VDC) 283201			PKZM0-10	DILM7-01(...)	PKZM0-XRM12	
MSC-R-10-M9(24VDC) 283202			PKZM0-10	DILM9-01(...)	PKZM0-XRM12	
MSC-R-12-M12(24VDC) 283203			PKZM0-12	DILM12-01(...)	PKZM0-XRM12	
MSC-R-10-M17(24VDC) 101051			PKZM0-10	DILM17-01(...)	PKZM0-XRM32	
MSC-R-12-M17(24VDC) 101052			PKZM0-12	DILM17-01(...)	PKZM0-XRM32	
MSC-R-16-M17(24VDC) 283204		PKZM0-16	DILM17-01(...)	PKZM0-XRM32		
MSC-R-25-M25(24VDC) 283205		PKZM0-25	DILM25-01(...)	PKZM0-XRM32		
MSC-R-32-M32(24VDC) 283206		PKZM0-32	DILM32-01(...)	PKZM0-XRM32		

Further information	Page
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Accessories PKZ	→ 7/10
Technical data DILM	→ Chapter 5
Further actuation voltages	→ 5/73
DILM accessories	→ 5/54



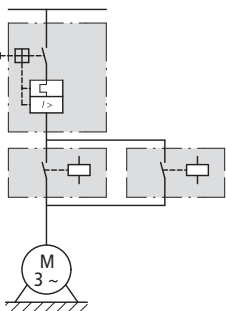
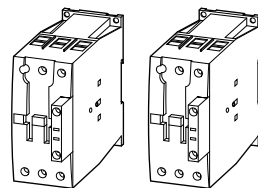
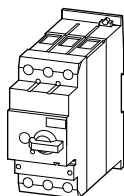
Motor data				Setting range	
Rated operational power	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release
400 V	AC-3 400 V	380 - 415 V	380 - 415 V		
		Type "1" coordination	Type "2" coordination		
P kW	I_e A	I_{q1} kA	I_{q2} kA	I_r A 	I_{rm} A 

Modules PKZM0 and DILM



0.06	0.21	150	50	0.16 - 0.25	3.5
0.09	0.31	150	50	0.25 - 0.4	5.6
0.12	0.41	150	50	0.4 - 0.63	8.82
0.18	0.6	150	50	0.4 - 0.63	8.82
0.25	0.8	150	50	0.63 - 1	14
0.37	1.1	150	50	1 - 1.6	22.4
0.55	1.5	150	50	1 - 1.6	22.4
0.75	1.9	150	50	1.6 - 2.5	35
1.1	2.6	150	50	2.5 - 4	56
1.5	3.6	150	50	2.5 - 4	56
2.2	5	150	50	4 - 6.3	88.2
3	6.6	150	50	6.3 - 10	140
4	8.5	150	50	6.3 - 10	140
5.5	11.3	50	50	8 - 12	168
7.5	15.2	50	50	10 - 16	224
11	21.7	50	50	20 - 25	350
15	29.3	50	50	25 - 32	448



Modules PKZM4 and DILM



5.5	11.3	50	50	10 - 16	224
7.5	15.2	50	50	10 - 16	224
11	21.7	50	50	20 - 25	350
15	29.3	50	50	25 - 32	448
18.5	36	50	50	32 - 40	560
22	41	50	50	40 - 50	700
30	55	50	50	50 - 58	812
34	63	50	50	55 - 65	882

Motor protective circuit breaker		Contactor Type "1" coordination		Contactor Type "2" coordination	Notes
Type		Type		Type	
PKZM0-0,25	2 x	DILM7-...(…)	2 x	DILM7-...(…)	<p>The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = conditional rated current</p> <p>Further information Page</p> <p>Technical data PKZM0 → Chapter 7</p> <p>Accessories PKZ → 7/10</p> <p>Technical data DILM → Chapter 5</p> <p>Other operating voltages → 5/73</p> <p>DILM accessories → 5/54</p>
PKZM0-0,4		DILM7-...(…)		DILM7-...(…)	
PKZM0-0,63		DILM7-...(…)		DILM7-...(…)	
PKZM0-0,63		DILM7-...(…)		DILM7-...(…)	
PKZM0-1		DILM7-...(…)		DILM7-...(…)	
PKZM0-1,6		DILM7-...(…)		DILM7-...(…)	
PKZM0-1,6		DILM7-...(…)		DILM7-...(…)	
PKZM0-2,5		DILM7-...(…)		DILM7-...(…)	
PKZM0-4		DILM7-...(…)		DILM7-...(…)	
PKZM0-4		DILM7-...(…)		DILM7-...(…)	
PKZM0-6,3		DILM7-...(…)		DILM7-...(…)	
PKZM0-10		DILM9-...(…)		DILM17-...(…)	
PKZM0-10		DILM9-...(…)		DILM17-...(…)	
PKZM0-12		DILM12-...(…)		DILM17-...(…)	
PKZM0-16		DILM17-...(…)		DILM17-...(…)	
PKZM0-25		DILM25-...(…)		DILM25-...(…)	
PKZM0-32		DILM32-...(…)		DILM32-...(…)	
PKZM4-16	2 x	DILM17-...(…)	2 x	DILM17-...(…)	<p>The motor-starter combinations consist of the motor protective circuit breaker or a circuit breaker and a contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = rated conditional short-circuit current.</p> <p>Further information Page</p> <p>Technical data PKZM0 → Chapter 7</p> <p>Accessories PKZ → 7/10</p> <p>Technical data DILM → Chapter 5</p> <p>Other operating voltages → 5/74</p> <p>DILM accessories → 5/54</p>
PKZM4-16		DILM17-...(…)		DILM17-...(…)	
PKZM4-25		DILM25-...(…)		DILM25-...(…)	
PKZM4-32		DILM32-...(…)		DILM32-...(…)	
PKZM4-40		DILM40(…)		DILM40(…)	
PKZM4-50		DILM50(…)		DILM50(…)	
PKZM4-58		DILM65(…)		DILM65(…)	
PKZM4-63		DILM65(…)		DILM65(…)	



Motor data			Setting range	
Rated operational power	Rated operational current	Rated short-circuit current	Overload trip	Short-circuit release
AC-3	AC-3			
380 V 400 V 415 V	400 V	400/415 V		
P kW	I_e A	I_q kA	I_r A 	I_{rm} A 

Modules NZMN and DILM

15	29.3	50	25 - 32	320 - 448
18.5	36	50	32 - 40	320 - 560
22	41	50	40 - 50	400 - 700
30	55	50	50 - 63	504 - 882
37	68	50	63 - 80	640 - 1120
45	81	50	80 - 100	800 - 1250
55	99	50	80 - 100	800 - 1250
75	134	50	125 - 160	1280 - 2240
90	161	50	160 - 200	1600 - 2500
110	196	50	160 - 200	1600 - 2500
132	231	50	175 - 350	350 - 4900
160	279	50	175 - 350	350 - 4900
200	349	50	175 - 350	350 - 4900
250	437	50	225 - 450	450 - 6300
315	544	50	275 - 550	550 - 7700
400	683	50	438 - 875	875 - 12250
450	750	50	438 - 875	875 - 12250
500	820	50	438 - 875	875 - 12250
560	947	50	700 - 1400	1400 - 19600

Modules NZMH and DILM

22	41	100	40 - 50	400 - 700
30	55	100	50 - 63	504 - 882
37	68	100	63 - 80	640 - 1120
55	81	100	80 - 100	800 - 1250
55	100	100	100 - 125	1000 - 1750
75	134	100	125 - 160	1280 - 2240
30	55	100	45 - 90	90 - 1260
37	68	100	45 - 90	90 - 1260
45	81	100	45 - 90	90 - 1260
55	100	100	70 - 140	140 - 1960
75	134	100	70 - 140	140 - 1960
90	161	100	110 - 120	220 - 3080
110	196	100	110 - 120	220 - 3080
132	231	100	175 - 350	350 - 4900
160	279	100	175 - 350	350 - 4900
200	349	100	175 - 350	350 - 4900

Circuit-breaker	Contactor Type "1" coordination	Contactor Type "2" coordination	Notes
Type	Type	Type	
NZMN1-M32	2 x DILM40(...)	2 x DILM80(...)	The motor starter combinations consist of the motor protective circuit-breaker and a contactor. They comply with IEC/EN 60947-4-1 and VDE 0660 Part 102. I_q = conditional rated current.
NZMN1-M40	2 x DILM40(...)	2 x DILM80(...)	
NZMN1-M50	2 x DILM50(...)	2 x DILM80(...)	
NZMN1-M63	2 x DILM65(...)	2 x DILM80(...)	
NZMN1-M80	2 x DILM80(...)	2 x DILM80(...)	
NZMN1-M100	2 x DILM95(...)	2 x DILM95(...)	
NZMN1-M100	2 x DILM115(...)	2 x DILM115(...)	
NZMN2-M160	2 x DILM150(...)	2 x DILM150(...)	
NZMN2-M200	2 x DILM185A/22(...)	2 x DILM185A/22(...)	
NZMN2-M200	2 x DILM225A/22(...)	2 x DILM225A/22(...)	
NZMN3-ME350	2 x DILM250/22(...)	2 x DILM250/22(...)	
NZMN3-ME350	2 x DILM300A/22(...)	2 x DILM300A/22(...)	
NZMN3-ME350	2 x DILM400/22(...)	2 x DILM400/22(...)	
NZMN3-ME450	2 x DILM500/22(...)	2 x DILM500/22(...)	
NZMN4-ME550	2 x DILM580/22(...)	2 x –	
NZMN4-ME875	2 x DILM650/22(...)	2 x –	
NZMN4-ME875	2 x DILM750/22(...)	2 x –	
NZMN4-ME875	2 x DILM820/22(...)	2 x –	
NZMN4-ME1400	2 x DILM1000/22(...)	2 x –	
NZMH2-M50	2 x DILM80(...)	2 x DILM80(...)	
NZMH2-M63	2 x DILM80(...)	2 x DILM80(...)	
NZMH2-M80	2 x DILM80(...)	2 x DILM80(...)	
NZMH2-M100	2 x DILM95(...)	2 x DILM95(...)	
NZMH2-M125	2 x DILM115(...)	2 x DILM115(...)	
NZMH2-M160	2 x DILM150(...)	2 x DILM150(...)	
NZMH2-ME90	2 x DILM80(...)	2 x DILM80(...)	
NZMH2-ME90	2 x DILM80(...)	2 x DILM80(...)	
NZMH2-ME90	2 x DILM95(...)	2 x DILM95(...)	
NZMH2-ME140	2 x DILM115(...)	2 x DILM115(...)	
NZMH2-ME140	2 x DILM150(...)	2 x DILM150(...)	
NZMH2-ME220	2 x DILM185A/22(...)	2 x DILM185A/22(...)	
NZMH2-ME220	2 x DILM225A/22(...)	2 x DILM225A/22(...)	
NZMH3-ME350	2 x DILM250/22(...)	2 x DILM250/22(...)	
NZMH3-ME350	2 x DILM300A/22(...)	2 x DILM300A/22(...)	
NZMH3-ME350	2 x DILM400/22(...)	2 x DILM400/22(...)	



DOL starters

MSC-D.../BBA

HPL08026EN

Motor data				Setting range		Motor starters actuating voltage 230 V 50 Hz Part no. Article no.	Price See price list	Std. pack
Motor rating	Rated operational current	Rated short-circuit current		Overload trip	Short-circuit release			
AC-3	AC-3	380 - 415 V	380 - 415 V					
380 V 400 V 415 V	400 V	Type "1" coordination	Type "2" coordination					
P kW	I _e A	I _q kA	I _q kA	I _r A	I _{rm} A			
Complete devices PKZ and DIL on BBA								
	0.06	0.21	100	50	0.16 - 0.25	3.5	MSC-D-0.25-M7(230V50HZ)/BBA ¹⁾ 102737	1 off
	0.09	0.31	100	50	0.25 - 0.4	5.6	MSC-D-0.4-M7(230V50HZ)/BBA ¹⁾ 102738	
	0.12 0.18	0.41 0.6	100	50	0.4 - 0.63	8.82	MSC-D-0.63-M7(230V50HZ)/BBA ¹⁾ 102739	
	0.25	0.8	100	50	0.63 - 1	14	MSC-D-1-M7(230V50HZ)/BBA ¹⁾ 102950	
	0.37 0.55	1.1 1.5	100	50	1 - 1.6	22.4	MSC-D-1.6-M7(230V50HZ)/BBA ¹⁾ 102951	
	0.75	1.9	100	50	1.6 - 2.5	35	MSC-D-2.5-M7(230V50HZ)/BBA ¹⁾ 102952	
	1.1 1.5	2.6 3.6	100	50	2.5 - 4	56	MSC-D-4-M7(230V50HZ)/BBA ¹⁾ 102953	
	2.2	5	100	50	4 - 6.3	88.2	MSC-D-6.3-M7(230V50HZ)/BBA ¹⁾ 102954	
	3	6.6	100	-	6.3 - 10	140	MSC-D-10-M7(230V50HZ)/BBA 102955	
	4	8.5	100	-	6.3 - 10	140	MSC-D-10-M9(230V50HZ)/BBA 102956	
5.5	11.3	100	-	8 - 12	168	MSC-D-12-M12(230V50HZ)/BBA 102957		
7.5	15.2	50	-	10 - 16	224	MSC-D-16-M15(230V50HZ)/BBA 102958		
	3	6.6	100	50	6.3 - 10	140	MSC-D-10-M17(230V50HZ)/BBA 102959	
	4	8.5	100	50	8 - 12	168	MSC-D-12-M17(230V50HZ)/BBA 102960	
	5.5	11.3	100	50	8 - 12	168	MSC-D-12-M17(230V50HZ)/BBA 102960	
	7.5	15.2	50	50	10 - 16	224	MSC-D-16-M17(230V50HZ)/BBA ¹⁾ 102961	
	11	21.7	50	50	20 - 25	350	MSC-D-25-M25(230V50HZ)/BBA ¹⁾ 102962	
15	29.3	50	50	25 - 32	448	MSC-D-32-M32(230V50HZ)/BBA ¹⁾ 102963		

Motor starters actuating voltage 24 V DC Part no. Article no.	Price See price list	Std. pack	Motor protective circuit breaker Type	Contactore Type	DOL starter wiring set Mechanical con- nection module and electrical contact module Type	Busbar adapter Type	Notes
MSC-D-0.25-M7(24VDC)/BBA¹⁾ 102964		1 off	PKZM0-0,25	DILM7-10(...)	PKZM0-XDM12	BBA0-25	The DOL starters (complete devices) consist of a motor protective circuit breaker PKZM0 and a contactor DILM. These combinations are mounted on busbars. The connection of the main circuit between PKZ and contactor is established with electrical contact modules. Cannot be combined with standard auxiliary contact NHI-E-...-PKZ0-C with spring-loaded terminal.
MSC-D-0.4-M7(24VDC)/BBA¹⁾ 102965			PKZM0-0,4	DILM7-10(...)	PKZM0-XDM12		
MSC-D-0.63-M7(24VDC)/BBA¹⁾ 102966			PKZM0-0,63	DILM7-10(...)	PKZM0-XDM12		
MSC-D-1-M7(24VDC)/BBA¹⁾ 102967			PKZM0-1	DILM7-10(...)	PKZM0-XDM12		
MSC-D-1.6-M7(24VDC)/BBA¹⁾ 102968			PKZM0-1,6	DILM7-10(...)	PKZM0-XDM12		
MSC-D-2.5-M7(24VDC)/BBA¹⁾ 102969			PKZM0-2,5	DILM7-10(...)	PKZM0-XDM12		
MSC-D-4-M7(24VDC)/BBA¹⁾ 102970			PKZM0-4	DILM7-10(...)	PKZM0-XDM12		
MSC-D-6.3-M7(24VDC)/BBA 102971			PKZM0-6,3	DILM7-10(...)	PKZM0-XDM12		
MSC-D-10-M7(24VDC)/BBA 102972			PKZM0-10	DILM7-10(...)	PKZM0-XDM12		
MSC-D-10-M9(24VDC)/BBA 102973			PKZM0-10	DILM9-10(...)	PKZM0-XDM12		
MSC-D-12-M12(24VDC)/BBA 102974			PKZM0-12	DILM12-10(...)	PKZM0-XDM12		
MSC-D-16-M15(24VDC)/BBA 102975			PKZM0-16	DILM15-10(...)	PKZM0-XDM12		
MSC-D-10-M17(24VDC)/BBA 102976		PKZM0-10	DILM17-10(...)	PKZM0-XM32DE	BBA0-32		
MSC-D-12-M17(24VDC)/BBA 102977		PKZM0-12	DILM17-10(...)	PKZM0-XM32DE			
MSC-D-16-M17(24VDC)/BBA 102978		PKZM0-16	DILM17-10(...)	PKZM0-XM32DE			
MSC-D-25-M25(24VDC)/BBA 102979		PKZM0-25	DILM25-10(...)	PKZM0-XM32DE			
MSC-D-32-M32(24VDC)/BBA 102980		PKZM0-32	DILM32-10(...)	PKZM0-XM32DE			

Further information	Page
Technical data PKZM0	→ Chapter 7
Accessories PKZ	→ 7/10
Technical data DILM	→ Chapter 5
DILM accessories	→ 5/54

¹⁾ To assemble Type F starters that conform with UL508, incoming terminals BK25/3-PKZ0-E and, if necessary, three-phase terminal blocks B3.../...-PKZ0 can be added to motor starter combinations.
Type F starter → Page 8/34



							Motor starters actuating voltage 230 V 50 Hz	Price See price list
Motor data		Setting range				Part no. Article no.		
Motor rating	Rated operational current	Rated short-circuit current	Overload trip	Short-circuit release				
AC-3	AC-3	380 - 415 V	380 - 415 V					
380 V 400 V 415 V	400 V	Type "1" coordina- tion	Type "2" coordina- tion					
P kW	I _e A	I _q kA	I _q kA	I _r A	I _{rm} A			
Complete devices PKZ and DILM on BBA for reversing starters								
	0.06	0.21	100	50	0.16 - 0.25	3.5	MSC-R-0.25-M7(230V50HZ)/BBA 102981	
	0.09	0.31	100	50	0.25 - 0.4	5.6	MSC-R-0.4-M7(230V50HZ)/BBA 102982	
	0.12 0.18	0.41 0.6	100	50	0.4 - 0.63	8.82	MSC-R-0.63-M7(230V50HZ)/BBA 102983	
	0.25	0.8	100	50	0.63 - 1	14	MSC-R-1-M7(230V50HZ)/BBA 102984	
	0.37 0.55	1.1 1.5	100	50	1 - 1.6	22.4	MSC-R-1.6-M7(230V50HZ)/BBA 102985	
	0.75	1.9	100	50	1.6 - 2.5	35	MSC-R-2.5-M7(230V50HZ)/BBA 102986	
	1.1 1.5	2.6 3.6	100	50	2.5 - 4	56	MSC-R-4-M7(230V50HZ)/BBA 102987	
	2.2	5	100	50	4 - 6.3	88.2	MSC-R-6.3-M7(230V50HZ)/BBA 102988	
	3	6.6	100	-	6.3 - 10	140	MSC-R-10-M7(230V50HZ)/BBA 102989	
	4	8.5	100	-	6.3 - 10	140	MSC-R-10-M9(230V50HZ)/BBA 102990	
5.5	11.3	100	-	8 - 12	168	MSC-R-12-M12(230V50HZ)/BBA 102991		
	3	6.6	100	50	6.3 - 10	140	MSC-R-10-M17(230V50HZ)/BBA 102992	
	4	8.5	100	50	6.3 - 10	140	MSC-R-10-M9(230V50HZ)/BBA 102990	
	5.5	11.3	100	50	8 - 12	168	MSC-R-12-M17(230V50HZ)/BBA 102993	
	7.5	15.2	50	50	10 - 16	224	MSC-R-16-M17(230V50HZ)/BBA 102994	
	11	21.7	50	50	20 - 25	350	MSC-R-25-M25(230V50HZ)/BBA 102995	
	15	29.3	50	50	25 - 32	448	MSC-R-32-M32(230V50HZ)/BBA 102996	



Motor starters actuating voltage 24 V DC	Price See price list	Std. pack	Motor protective circuit breaker		Contactora	Wiring set Reversing starters	Busbar adapter	Notes
Part no. Article no.			Type		Type	Type	Type	
MSC-R-0.25-M7(24VDC)/BBA 102997		1 off	PKZM0-0,25	2 x	DILM7-01(...)	PKZM0-XRM12	BBA0R-25	<p>The reversing starters (complete devices) consist of a PKZM0 motor protective circuit breaker and two contactors DILM.</p> <p>These combinations are mounted on busbars.</p> <p>The connection of the main circuit between PKZ and contactor is established with electrical contact modules. Complete units with mechanical interlock, starters up to 12 A also with electrical interlock.</p> <p>Further information Page</p> <p>Technical data PKZM0 → Chapter 7</p> <p>Accessories PKZ → 7/10</p> <p>Technical data DILM → Chapter 5</p> <p>DILM accessories → 5/54</p>
MSC-R-0.4-M7(24VDC)/BBA 102998			PKZM0-0,4	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-0.63-M7(24VDC)/BBA 102999			PKZM0-0,63	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-1-M7(24VDC)/BBA 103000			PKZM0-1	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-1.6-M7(24VDC)/BBA 103001			PKZM0-1,6	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-2.5-M7(24VDC)/BBA 103002			PKZM0-2,5	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-4-M7(24VDC)/BBA 103003			PKZM0-4	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-6.3-M7(24VDC)/BBA 103004			PKZM0-6,3	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-10-M7(24VDC)/BBA 103005			PKZM0-10	2 x	DILM7-01(...)	PKZM0-XRM12		
MSC-R-10-M9(24VDC)/BBA 103006			PKZM0-10	2 x	DILM9-01(...)	PKZM0-XRM12		
MSC-R-12-M12(24VDC)/BBA 103007			PKZM0-12	2 x	DILM12-01(...)	PKZM0-XRM12		
MSC-R-10-M17(24VDC)/BBA 103008			PKZM0-10	2 x	DILM17-01(...)	PKZM0-XM32DE+ DILM32-XRL	BBA0R-32	
MSC-R-12-M17(24VDC)/BBA 103009			PKZM0-12	2 x	DILM17-01(...)	PKZM0-XM32DE+ DILM32-XRL		
MSC-R-16-M17(24VDC)/BBA 103010			PKZM0-16	2 x	DILM17-01(...)	PKZM0-XM32DE+ DILM32-XRL		
MSC-R-25-M25(24VDC)/BBA 103011			PKZM0-25	2 x	DILM25-01(...)	PKZM0-XM32DE+ DILM32-XRL		
MSC-R-32-M32(24VDC)/BBA 103012			PKZM0-32	2 x	DILM32-01(...)	PKZM0-XM32DE+ DILM32-XRL		



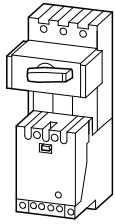
DOL starters, modules

 **PKZ2/S-SP, ZMR, ZM**

HPL08030EN

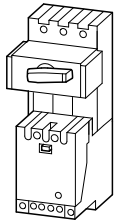
Maximum motor rating				Setting range			Basic unit		
Alternating current HP				Overload trip	Short-circuit release	Rated short-circuit breaking capacity			Type
200 V 208 V	230 V 240 V	460 V 480 V	575 V 600 V			240 V	480 Y 277 V	600 Y 347 V	
HP	HP	HP	HP	I_r A 	I_{rm} A 	kA	kA	kA	

Modules PKZ2/S-SP and trip blocks ZMR with overload relay function



1)				0.4 - 0.6	5 - 8	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
		½	½	0.6 - 1	8 - 14	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
		¾	1	1 - 1.6	14 - 22	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
½	½	1	1½	1.6 - 2.4	20 - 35	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
1	1	2	3	2.4 - 4	35 - 55	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
1½	1½	3	5	4 - 6	50 - 80	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
2	3	5	7½	6 - 10	80 - 140	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
3	5	10	10	10 - 16	130 - 220	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
7½	7½	20	25	16 - 27	200 - 350	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
10	10	20	30	24 - 32	275 - 425	100	65	-	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
10	15	30	30	32 - 42	350 - 500	100	65	-	PKZ2/S-SP(110V50HZ,120V60HZ) 050940

Modules PKZ2/S-SP and trip blocks ZM





1)				0.4 - 0.6	5 - 8	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
		½	½	0.6 - 1	8 - 14	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
		¾	1	1 - 1.6	14 - 22	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
½	½	1	1½	1.6 - 2.4	20 - 35	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
1	1	2	3	2.4 - 4	35 - 55	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
1½	1½	3	5	4 - 6	55 - 80	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
2	3	5	7½	6 - 10	80 - 140	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
3	5	10	10	10 - 16	130 - 220	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
7½	7½	20	25	16 - 27	200 - 350	100	65	42	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
10	10	20	30	24 - 32	275 - 425	100	65	-	PKZ2/S-SP(110V50HZ,120V60HZ) 050940
10	15	30	30	32 - 42	350 - 500	100	65	-	PKZ2/S-SP(110V50HZ,120V60HZ) 050940

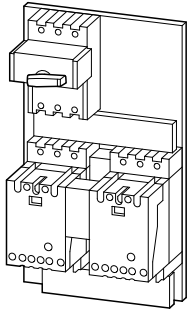
Notes

¹⁾ Calculate motor power in this range according to the rated operational current.
Stated values to NEC Table 430 ... 150

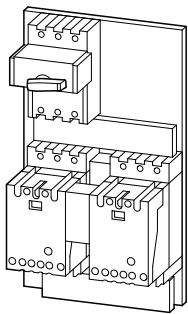
Trip block Type	Price Total of module prices Euro DG	Std. pack	Notes
ZMR-0.6-PKZ2 033943		1 off	For use with networks with grounded star point Up to 27 A 600 Y/347 V AC 480 Y/277 V AC 27 – 42 A 480 Y/277 V AC Service factor (SF) Set value I _r on the current scale, depending on the load factor SF = 1.15 → I _r = 1 x I _{n mot} SF = 1 → I _r = 0.9 x I _{n mot} Terminal capacity of high-capacity compact starters PKZ2/ZM.../S Main terminals Cables Cu 75 °C, min. AWG 14, max. AWG 6 Torque 1.8 Nm Control circuit terminals Cables min. AWG 20, max. AWG 16 (0.5–1 mm ²) With insulated/uninsulated blade terminal, nominal size 2.8
ZMR-1-PKZ2 033950		1 off	
ZMR-1.6-PKZ2 033952		1 off	
ZMR-2.4-PKZ2 033955		1 off	
ZMR-4-PKZ2 033957		1 off	
ZMR-6-PKZ2 033966		1 off	
ZMR-10-PKZ2 033967		1 off	
ZMR-16-PKZ2 033968		1 off	
ZMR-25-PKZ2 033969		1 off	
ZMR-32-PKZ2 033973		1 off	
ZMR-40-PKZ2 033975		1 off	
ZM-0.6-PKZ2 024232		1 off	
ZM-1-PKZ2 028979		1 off	
ZM-1.6-PKZ2 031352		1 off	
ZM-2.4-PKZ2 033725		1 off	
ZM-4-PKZ2 036098		1 off	
ZM-6-PKZ2 038471		1 off	
ZM-10-PKZ2 040844		1 off	
ZM-16-PKZ2 043217		1 off	
ZM-25-PKZ2 045590		1 off	
ZM-32-PKZ2 047963		1 off	
ZM-40-PKZ2 050336		1 off	



Maximum motor rating				Setting range		Rated short-circuit breaking capacity I_{cn}		
Alternating current HP				Overload trip	Short-circuit release	240 V	480 Y 277 V	600 Y 347 V
200 V	230 V	460 V	575 V	I_r 	I_{rm} 	kA	kA	kA
208 V	240 V	480 V	600 V					
HP	HP	HP	HP					

Modules PKZ2/S-SP and trip blocks ZMR with overload relay function


1)				0.4 - 0.6	5 - 8	100	65	42		
				$\frac{1}{2}$	$\frac{1}{2}$	0.6 - 1	8 - 14	100	65	42
				$\frac{3}{4}$	1	1 - 1.6	14 - 22	100	65	42
$\frac{1}{2}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	1.6 - 2.4	20 - 35	100	65	42		
1	1	2	3	2.4 - 4	35 - 55	100	65	42		
$1\frac{1}{2}$	$1\frac{1}{2}$	3	5	4 - 6	50 - 80	100	65	42		
2	3	5	$7\frac{1}{2}$	6 - 10	80 - 140	100	65	42		
3	5	10	10	10 - 16	130 - 220	100	65	42		
$7\frac{1}{2}$	$7\frac{1}{2}$	20	25	16 - 25	200 - 350	100	65	42		
10	10	20	–	24 - 32	275 - 425	100	65	–		
10	15	30	–	32 - 40	350 - 500	100	65	–		

Modules PKZ2/S-SP and trip blocks ZM


1)				0.4 - 0.6	5 - 8	100	65	42		
				$\frac{1}{2}$	$\frac{1}{2}$	0.6 - 1	8 - 14	100	65	42
				$\frac{3}{4}$	1	1 - 1.6	14 - 22	100	65	42
$\frac{1}{2}$	$\frac{1}{2}$	1	$1\frac{1}{2}$	1.6 - 2.4	20 - 35	100	65	42		
1	1	2	3	2.4 - 4	35 - 55	100	65	42		
$1\frac{1}{2}$	$1\frac{1}{2}$	3	5	4 - 6	50 - 80	100	65	42		
2	3	5	$7\frac{1}{2}$	6 - 10	80 - 140	100	65	42		
3	5	10	10	10 - 16	130 - 220	100	65	42		
$7\frac{1}{2}$	$7\frac{1}{2}$	20	25	16 - 25	200 - 350	100	65	42		
10	10	20	–	24 - 32	275 - 425	100	65	–		
10	15	30	–	32 - 40	350 - 500	100	65	–		

Notes

1) Calculate motor power in this range according to the rated operational current. Stated values to NEC Table 430 ... 150

2) Specify actuating voltage in the range 24 – 600 V 50 or 60 Hz.

Basic unit	Trip block	Price Total of module prices	Std. pack	Notes
Type2)	Type	Euro DG		
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-0.6-PKZ2 033943		1 off	For use with networks with grounded star point Up to 27 A 600 Y/347 V AC 27 – 42 A 480 Y/277 V AC Service factor (SF) Set value I _r on the current scale, depending on the load factor SF = 1.15 → I _r = 1 x I _{n mot} SF = 1 → I _r = 0.9 x I _{n mot} Terminal capacity of high-capacity compact starters PKZ2/ZM.../S Main terminals Cables Cu 75 °C, min. AWG 14, max. AWG 6 Torque 1.8 Nm Control circuit terminals Cables min. AWG 20, max. AWG 16 (0.5–1 mm ²) With insulated/uninsulated blade terminal, nominal size 2.8
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-1-PKZ2 033950		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-1.6-PKZ2 033952		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-2.4-PKZ2 033955		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-4-PKZ2 033957		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-6-PKZ2 033966		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-10-PKZ2 033967		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-16-PKZ2 033968		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-25-PKZ2 033969		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-32-PKZ2 033973		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZMR-40-PKZ2 033975		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-0.6-PKZ2 024232		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-1-PKZ2 028979		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-1.6-PKZ2 031352		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-2.4-PKZ2 033725		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-4-PKZ2 036098		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-6-PKZ2 038471		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-10-PKZ2 040844		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-16-PKZ2 043217		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-25-PKZ2 045590		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-32-PKZ2 047963		1 off	
PKZ2-SP-FVR(*V*HZ) 925109	ZM-40-PKZ2 050336		1 off	



Type F starter combinations


PKZM0, DILM, BK...

HPL08034EN

Maximum motor rating				Setting range		Rated short-circuit breaking capacity I_{cn}			Extension terminal	Motor protective circuit breaker	Contactor
Alternating current HP				Overload trip	Short-circuit release	240 V	480 V	600 V	Type	Type	Type
200 V	230 V	460 V	575 V								
208 V	240 V	480 V	600 V								
HP	HP	HP	HP	I_r A	I_{rm} A	kA	kA	kA			
Modules PKZM0, DIL, BK											
1)				0.1 - 0.16	2.2	65	65	50	BK25/3-PKZ0	PKZM0-0,16	DILEM...(...)
				0.1 - 0.16	2.2	65	65	50	BK25/3-PKZ0	PKZM0-0,16	DILM7-...(...)
				0.16 - 0.25	3.4	65	65	50	BK25/3-PKZ0	PKZM0-0,25	DILEM...(...)
				0.16 - 0.25	3.4	65	65	50	BK25/3-PKZ0	PKZM0-0,25	DILM7-...(...)
				0.25 - 0.4	5.6	65	65	50	BK25/3-PKZ0	PKZM0-0,4	DILEM...(...)
				0.25 - 0.4	5.6	65	65	50	BK25/3-PKZ0	PKZM0-0,4	DILM7-...(...)
				0.4 - 0.63	8.8	65	65	50	BK25/3-PKZ0	PKZM0-0,63	DILEM...(...)
				0.4 - 0.63	8.8	65	65	50	BK25/3-PKZ0	PKZM0-0,63	DILM7-...(...)
				½	½	65	65	50	BK25/3-PKZ0	PKZM0-1	DILEM...(...)
				½	½	65	65	50	BK25/3-PKZ0	PKZM0-1	DILM7-...(...)
				¾	1	65	65	50	BK25/3-PKZ0	PKZM0-1,6	DILEM...(...)
				¾	1	65	65	50	BK25/3-PKZ0	PKZM0-1,6	DILM7-...(...)
½	½	1	1½	1.6 - 2.5	35	65	65	50	BK25/3-PKZ0	PKZM0-2,5	DILEM...(...)
½	½	1	1½	1.6 - 2.5	35	65	65	50	BK25/3-PKZ0	PKZM0-2,5	DILM7-...(...)
1	1	2	3	2.5 - 4	56	65	65	50	BK25/3-PKZ0	PKZM0-4	DILEM...(...)
1	1	2	3	2.5 - 4	56	65	65	50	BK25/3-PKZ0	PKZM0-4	DILM7-...(...)
1½	1½	3	5	4 - 6.3	88	65	65	50	BK25/3-PKZ0	PKZM0-6,3	DILEM...(...)
1½	1½	3	5	4 - 6.3	88	65	65	50	BK25/3-PKZ0	PKZM0-6,3	DILM7-...(...)
3	3	7½	10	6.3 - 11	140	65	65	50	BK25/3-PKZ0	PKZM0-10	DILM9-...(...)
3	3	7½	–	9 - 12	168	65	65	50	BK25/3-PKZ0	PKZM0-12	DILM12-...(...)
3	5	10	–	10 - 16	224	50	50	–	BK50/3-PKZ4-E	PKZM0-16	DILM17-...(...)
3	5	10	–	10 - 16	224	18	18	–	BK50/3-PKZ4-E	PKZM0-16	DILM17-...(...)
5	5	10	–	16 - 20	280	18	18	–	BK50/3-PKZ4-E	PKZM0-20	DILM25-...(...)
5	7½	15	–	20 - 25	350	18	18	–	BK50/3-PKZ4-E	PKZM0-25	DILM25-...(...)
7½	10	20	–	25 - 32	448	18	18	–	BK50/3-PKZ4-E	PKZM0-32	DILM32-...(...)
Modules PKZM4, DIL, BK											
3	5	10	15	10 - 16	224	65	65	50	BK50/3-PKZ4-E	PKZM4-16	DILM17-...(...)
5	7½	15	20	16 - 27	350	65	65	50	BK50/3-PKZ4-E	PKZM4-25	DILM25-...(...)
7½	10	25	30	24 - 34	448	65	65	50	BK50/3-PKZ4-E	PKZM4-32	DILM32-...(...)
10	15	30	30	32 - 40	560	65	65	50	BK50/3-PKZ4-E	PKZM4-40	DILM40(...)
10	15	30	–	40 - 52	700	65	65	–	BK50/3-PKZ4-E	PKZM4-50	DILM50(...)
15	15	40	–	50 - 56	812	65	65	–	BK50/3-PKZ4-E	PKZM4-58	DILM65(...)
15	15	40	–	52 - 58	882	65	65	–	BK50/3-PKZ4-E	PKZM4-63	DILM65(...)

NotesDevice for world markets IEC \triangle UL/CSA

Service factor (SF)

Set value I_r on the current scale, depending on the load factorSF=1.15 $\rightarrow I_r = 1 \times I_{n\text{ mot}}$ SF=1.0 $\rightarrow I_r = 0.9 \times I_{n\text{ mot}}$


1) Calculate motor power in this range according to the rated operational current. Stated values to NEC Table 430 - 150.

2) Suitable for networks with grounded star-point

Type F starter combinations do not need an upstream protective device.

For use in Canada, the switch must be fitted with an AK-PKZ0.

HPL08035EN

DILM, ZE, ZB, Z5, ZW7 

Rating data for approved types ¹⁾				Max. rated motor current	Contactor	Overload relay	Maximum short-circuit protective device for North America		
Maximum motor rating							Fuse CEC or NEC	Circuit-breaker ²⁾	
Alternating current HP				A	Type	Type ³⁾	Continuous current	Short-circuit release	
200 V 208 V HP	230 V 240 V HP	460 V 480 V HP	575 V 600 V HP				A	A	
Modules DIL, Z									
–	–	½	½	1	DILEM-...(...)	ZE-1.0	3	15	–
–	–	¾	1	1.4	DILEM-...(...)	ZE-1.6	6	15	–
½	½	1	1½	2.3	DILEM-...(...)	ZE-2.4	6	15	–
–	1	2	3	3.9	DILEM-...(...)	ZE-4	15	15	–
1½	1½	3	–	6	DILEM-...(...)	ZE-6	20	15	–
–	2	–	–	6.8	DILEM-...(...)	ZE-9	35	15	–
2	2	5	5	7.8	DILEM-...(...)	ZE-9	35	15	–
2	3	5	5	9.6	DILEM-...(...)	ZE-12	45	–	–
–	–	½	½	1	DILM7...(...)	ZB12-1	3	25	200
–	–	¾	1	1.4	DILM7...(...)	ZB12-1,6	6	25	200
½	½	1	1½	2.3	DILM7...(...)	ZB12-2,4	6	25	200
1	1	2	3	3.9	DILM7...(...)	ZB12-4	15	25	200
1½	½	3	–	6	DILM7...(...)	ZB12-6	20	25	200
–	–	–	7½	9	DILM9...(...)	ZB12-10	25	25	200
–	3	5	7½	9.6	DILM12...(...)	ZE-12	25	25	200
–	–	7½	10	11	DILM12...(...)	ZB12-12	45	25	200
–	5	10	–	15.2	DILM15...(...)	ZB12-16	60	40	320
–	–	½	½	1	DILM17...(...)	ZB32-1	3	25	200
–	–	¾	1	1.4	DILM17...(...)	Z78447	6	25	200
½	½	1	1½	2.3	DILM17...(...)	ZB32-2,4	6	25	200
1	1	2	3	3.9	DILM17...(...)	ZB32-4	15	25	200
½	1½	3	–	6	DILM17...(...)	ZB32-6	20	25	200
–	3	5	7½	9.6	DILM17...(...)	ZB32-10	25	25	200
–	–	7½	10	11	DILM17...(...)	ZB32-16	40	30	320
–	5	10	–	15.2	DILM17...(...)	ZB32-16	40	30	320
–	7½	15	20	22	DILM25...(...)	ZB32-24	90	100	1200
–	10	20	25	32.2	DILM32...(...)	ZB32-32	125	125	1200
–	3	5	7½	9.6	DILM40(...)	ZB65-10	40	40	380
–	5	10	10	15.2	DILM40(...)	ZB65-16	60	60	760
–	7½	20	25	32.2	DILM40(...)	ZB65-24	90	90	1200
–	10	20	30	34	DILM40(...)	ZB65-40	125	125	1200
–	20	40	50	54	DILM50(...)	ZB65-57	200	150	2000
–	20	50	50	63	DILM65(...)	ZB65-65	200	160	2000
–	25	50	60	68	DILM80(...)	ZB150-70	250	250	2500
–	30	75	100	99	DILM95(...)	ZB150-100	400	400	3200
–	40	100	100	124	DILM115(...)	ZB150-125	500	500	4000
–	60	125	125	156	DILM150(...)	ZB150-150	600	600	4800
50	60	125	150	156	DILM185A/22(...)	Z5-160/FF225A	600 CLASS J	600	7200
60	75	150	200	192	DILM225A/22(...)	Z5-220/FF225A	800 CLASS J	800	16000
75	100	200	250	248	DILM250/22(...)	Z5-250/FF250	700 CLASS J	600	–
100	125	250	300	312	DILM300A/22(...)	ZW7-400	1000	1000	–
125	150	300	400	382	DILM400/22(...)	ZW7-400	1000	1000	–
150	200	400	500	480	DILM500/22(...)	ZW7-540	1000	600	–

Notes

¹⁾ Devices for world markets IEC ≙ UL/CSA

²⁾ Circuit-breaker -> Chapter 17



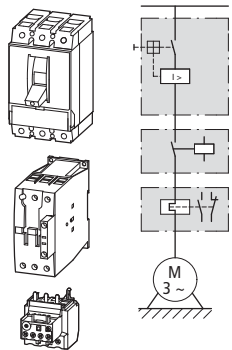
³⁾ The electronic overload relay ZEV can alternatively be used on request.



Function Blocks

 **NZMH...-S...-CNA, DILM..., ZB, Z5, ZW7**

HPL08036EN

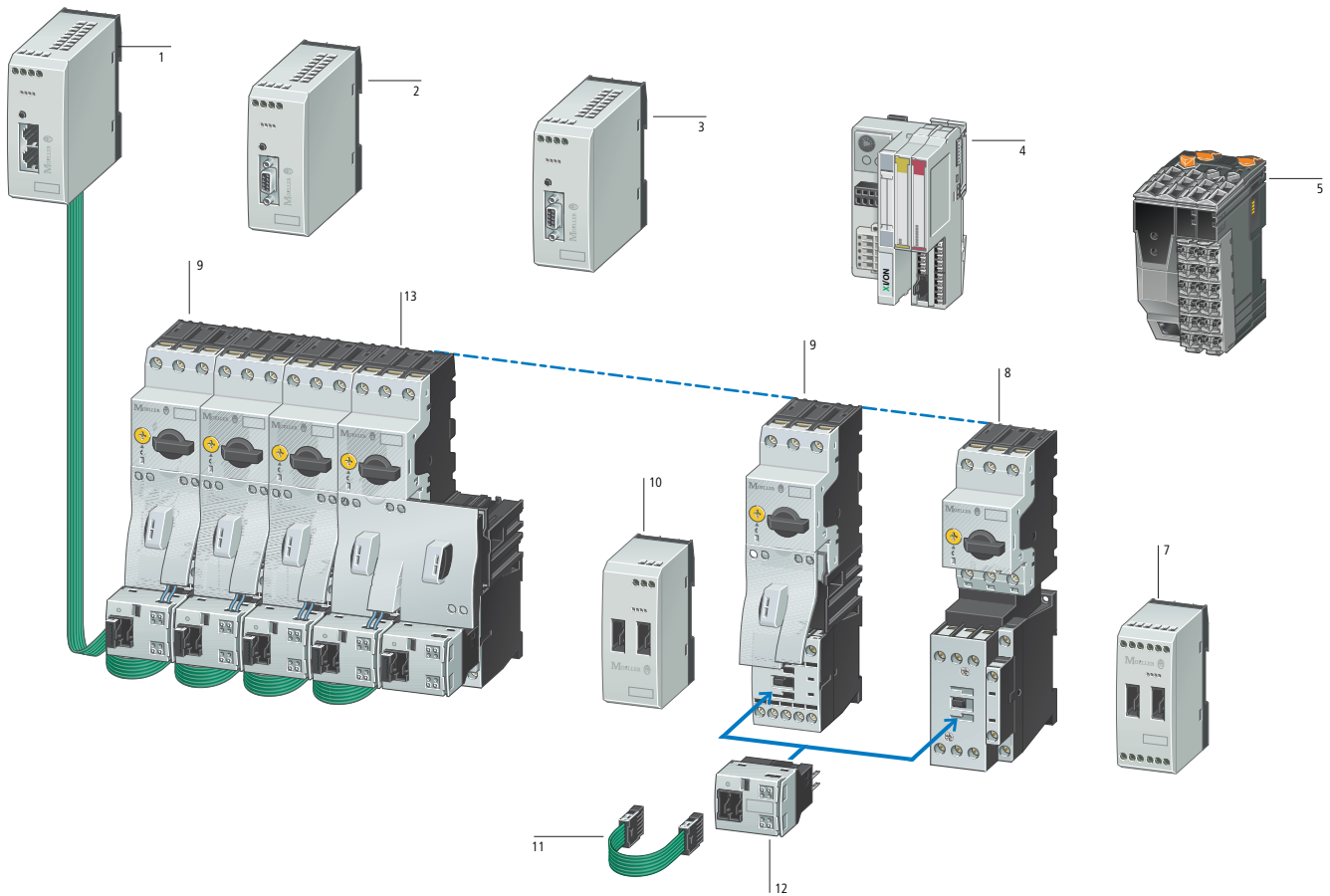
Rating data for approved types					Setting range			Circuit-breaker	Contactor	Overload relay	Minimum enclosure volume		
Maximum motor rating Alternating current HP				Max. rated motor current	Rated short-circuit breaking capacity			Overload trip	Short-circuit releases				
200 V	230 V	460 V	575 V	A	480 V	600 Y	600 V	I_r A 	I_{rm} A 	Type	Type	Type	cm ³
208 V	240 V	480 V	600 V		kA	kA	kA						
Module NZMH...-S...-CNA, DILM, Z													
													
-	-	-	½	0.9	100	50	-	0.6 - 1	12.8 - 22.5	NZMH2-S1.6-CNA	DILM17-...(…)	ZB32-1	81.5
-	-	½	¾	1.3	100	50	-	1 - 1.6	12.8 - 22.5	NZMH2-S1.6-CNA	DILM17-...(…)	ZB32-1,6	81.5
-	-	¾	-	1.6	100	50	-	1 - 1.6	19.2 - 33.6	NZMH2-S2.4-CNA	DILM17-...(…)	ZB32-1,6	81.5
-	-	1	1	2.1	100	50	-	1.6 - 2.4	19.2 - 33.6	NZMH2-S2.4-CNA	DILM17-...(…)	ZB32-2,4	81.5
-	½	-	1½	2.4	100	50	-	1.6 - 2.4	32 - 56	NZMH2-S5-CNA	DILM17-...(…)	ZB32-2,4	81.5
¾	¾	2	3	3.9	100	50	-	2.4 - 4	32 - 56	NZMH2-S5-CNA	DILM17-...(…)	ZB32-4	81.5
-	1	-	-	4.2	100	50	-	4 - 6	32 - 56	NZMH2-S5-CNA	DILM17-...(…)	ZB32-6	81.5
1	1½	3	-	6	100	50	-	4 - 6	48 - 84	NZMH2-S8-CNA	DILM17-...(…)	ZB32-6	81.5
1½	2	-	5	6.9	100	50	-	6 - 10	48 - 84	NZMH2-S8-CNA	DILM17-...(…)	ZB32-10	81.5
2	3	5	7½	9.6	100	50	-	6 - 10	80 - 140	NZMH2-S12-CNA	DILM17-...(…)	ZB32-10	81.5
3	5	10	10	15.2	100	50	-	10 - 16	128 - 224	NZMH2-S18-CNA	DILM17-...(…)	ZB32-16	81.5
5	-	-	15	17.5	100	50	-	16 - 24	200 - 350	NZMH2-S26-CNA	DILM17-...(…)	ZB32-24	81.5
-	7½	15	20	22	100	50	-	16 - 24	200 - 350	NZMH2-S26-CNA	DILM25-...(…)	ZB32-24	81.5
7½	-	-	-	25.3	100	50	-	24 - 32	256 - 448	NZMH2-S33-CNA	DILM25-...(…)	ZB32-32	81.5
-	10	20	25	28	100	50	-	24 - 32	256 - 448	NZMH2-S33-CNA	DILM32-...(…)	ZB32-32	81.5
10	-	-	-	32.2	100	50	-	24 - 32	320 - 560	NZMH2-S40-CNA	DILM32-...(…)	ZB32-32	81.5
-	-	25	30	34	100	50	-	32 - 40	320 - 560	NZMH2-S40-CNA	DILM40(…)	ZB65-40	81.5
-	-	30	-	40	100	50	-	32 - 40	400 - 700	NZMH2-S50-CNA	DILM40(…)	ZB65-40	81.5
-	15	-	40	42	100	50	-	40 - 57	400 - 700	NZMH2-S50-CNA	DILM40(…)	ZB65-57	81.5
15	20	40	50	54	100	50	-	40 - 57	504 - 882	NZMH2-S63-CNA	DILM50(…)	ZB65-57	81.5
20	-	50	60	65	100	50	-	57 - 65	640 - 1120	NZMH2-S80-CNA	DILM65(…)	ZB65-65	81.5
-	25	-	-	68	100	50	-	50 - 70	640 - 1120	NZMH2-S80-CNA	DILM80(…)	ZB150-70	163
25	30	60	75	80	100	50	-	70 - 100	800 - 1400	NZMH2-S100-CNA	DILM80(…)	ZB150-100	163
-	40	75	100	104	100	50	-	70 - 100	1000 - 1750	NZMH2-S125-CNA	DILM95(…)	ZB150-100	163
30	-	-	-	92	100	50	-	70 - 100	1000 - 1750	NZMH2-S125-CNA	DILM115(…)	ZB150-100	163
40	-	100	125	125	100	50	-	100 - 125	1280 - 2240	NZMH2-S160-CNA	DILM115(…)	ZB150-125	163
-	50	-	-	130	100	50	-	125 - 150	1280 - 2240	NZMH2-S160-CNA	DILM115(…)	ZB150-150	163
-	-	125	-	156	100	50	-	125 - 150	1600 - 2500	NZMH2-S200-CNA	DILM150(…)	ZB150-150	265
50	60	-	150	154	100	50	-	120 - 160	1600 - 2500	NZMH2-S200-CNA	DILM185/22(…)	Z5-160/FF250	265
60	75	150	200	192	100	50	-	160 - 220	220 - 3080	NZMH2-SE220-CNA	DILM225/22(…)	Z5-220/FF250	265
75	100	200	250	248	100	50	50	160 - 220	350 - 4900	NZMH3-SE350-CNA	DILM250/22(…)	Z5-220/FF250	306
100	-	-	300	289	100	50	50	190 - 290	350 - 4900	NZMH3-SE350-CNA	DILM300/22(…)	ZW7-290	306
-	125	250	-	302	100	50	50	270 - 400	450 - 6300	NZMH3-SE450-CNA	DILM300/22(…)	ZW7-400	306
125	150	300	400	382	100	50	50	270 - 400	450 - 6300	NZMH3-SE450-CNA	DILM400/22(…)	ZW7-400	306

Notes

¹⁾ Suitable for networks with grounded star-point

SWIRE...

Description



- 1 Gateway easyNET/CANopen
- 2 Gateway PROFIBUS-DP
- 3 Gateway MODBUS
- 4 Coupling unit XI/ON with SmartWire Interface card
MicroInnovation AG,
www.microinnovation.com
- 5 Interface module B & R CS1011 for X20 system,
www.br-automation.com
- 6 SmartWire I/O module
- 7 DOL starter MSC-D up to 32 A
- 8 DOL starter MSC-D up to 15.5 A
- 9 SmartWire power module
- 10 Connection cable
- 11 SmartWire module for DILM
- 12 Reversing starter MSC-R up to 12 A

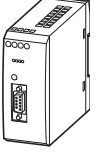





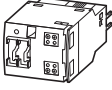








System description

With the SmartWire connection system, switchgear can be connected to a programmable logic controller without the need for complex control wiring. Plug-in SmartWire cards for DILM and a preassembled connection cable replace the control wiring, dramatically reducing wiring complexity and completely eliminating wiring errors. SmartWire also cuts the time needed for installation, commissioning and troubleshooting. The PLC's inputs and outputs are replaced by the SmartWire module for DILM, and no control wiring terminals are required. Connection to the various fieldbus systems is through third-party gateways or interface modules.

Features

- Gateway
 - Connects the SmartWire cards with the fieldbus
 - Supports the fieldbus standards PROFIBUS-DP, MODBUS, CANopen and easy-NET
 - Supplies the control voltage for the motor starter or contactor
 - Supplies the supply voltage for the SmartWire connection system
 - Configuration button for automatic addressing of the SmartWire modules for DILM
- Interface of third-party manufacturers, e.g. for the XI/ON I/O system, X20 system CS1011 interface module
 - Connection to the field buses PROFIBUS-DP, MODBUS, CANopen and DeviceNET
- SmartWire module for DILM
 - Pluggable on contactors
 - Suitable for contactors DILM7 to DILM32 (24 V DC), DILMC7 to DILMC32 (24 V DC), DILMP20 (24 V DC) or motor starter MSC... (24 V DC)
 - Use the standard switchgear of the xStart range
 - Suitable for DOL and reversing starters
 - The accessories of the contactor series can be used
 - Suitable for contactor combinations with PKZ or with Z relays
- Integrated switch position monitoring of the contactors
- Integrated mechanical switch position display
- Actuation of the contactors
- Scanning of a potential-free contact, e.g. NHI-E-10-PKZ0
- Electrical interlocking, e.g. possible with reversing starters
- LED for status and diagnostic display
- Connection to gateway or interface from third party devices
- SmartWire I/O module
 - 4 digital inputs for connection of potential-free contacts
 - Power supply for the digital inputs comes from the device
 - 2 relay outputs 250 V AC
- SmartWire power module
 - Supply of the 24 V DC control voltage for actuation of contactors DILM
 - Assembly of Emergency Off groups
 - Increases the control voltage power in the SmartWire line
- Safety engineering
 - Emergency switching off disconnection as per IEC/EN 954-1, Switching Category 3
 - Central switch off of control voltage at the gateway or SmartWire power module
 - Combination with safety-relevant switchgear possible

Ordering

Description	Part no. Article no.	Price See price list	Std. pack	Notes
Gateway				
PROFIBUS-DP				
 <p>Gateway with integrated supply for the SmartWire module and control voltage for the switchgear.</p> <ul style="list-style-type: none"> - Connection to PROFIBUS-DP as slave. - Transmission rate: 9.6 Kbits/s to 12 MBit/s. - 9 pole SUB-D socket. - Address range 1...126. - Connection to SmartWire module as master. - Supports 16 SmartWire modules. 	SWIRE-GW-DP 107027		1 off  	—
MODBUS				
 <p>Gateway with integrated supply for the SmartWire module and control voltage for the switchgear.</p> <ul style="list-style-type: none"> - Connection to MODBUS-RTU as slave. - Transmission rate: 9.6 to 57.6 Kbits/s. - 9 pole SUB-D socket RS232/RS485. - Address range 1...31. - Connection to SmartWire module as master. - Supports 16 SmartWire modules. 	SWIRE-GW-MB 118562		1 off  	—
Modules				
SmartWire module for DILM				
 <p>SmartWire module to assemble on the contactors DILM(C)7...DILM(C)38, DILA..., DILMP20</p> <ul style="list-style-type: none"> - One module is necessary per contactor. - Connection to SmartWire gateway as slave. - Max. 16 SmartWire modules per line. - 1 digital input for floating contact. - Signaling contactor switch position. 	SWIRE-DIL 107028		5 off  	<ul style="list-style-type: none"> • Take account of the max. current consumption of the contactor coils per SmartWire line. • Length of connection cable at the input and the electrical interlock < 2.8 m. • The A2 connection of the contactors must not be linked. • Electrical interlocking only possible via the terminals on the module for DILM. • Wiring sets DILM 12-XRL and PKZM0-XRM12 cannot be used. • Connection terminals for electrical interlocking are not suitable for safety technology.
SmartWire power module				
 <p>Power module for supplying the control voltage.</p> <ul style="list-style-type: none"> - Connection on SmartWire gateway as interactive station (no address). 	SWIRE-PF 107029		1 off  	Max. 4 power modules per SmartWire line.
SmartWire I/O module				
 <p>4 digital inputs 2 digital relay outputs</p>	SWIRE-4DI-2DO-R 107030		1 off  	Max. 4 SmartWire I/O modules per line.















Information relevant for export to North America



Product Standards	IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking
UL File No.	E29184
UL CCN	NKCR
CSA File No.	012528
CSA Class No.	2252-01
NA Certification	UL Listed, CSA certified

HPL08039EN

SWIRE-...

Description	Part no. Article no.	Price See price list	Std. pack	Notes
Accessory				
SmartWire connection cable ¹⁾				
Length: 85 mm	SWIRE-CAB-008 107032		25 off  	Cable lengths: Engineering → A8/40
Length: 110 mm	SWIRE-CAB-011 107033			
Length: 150 mm	SWIRE-CAB-015 107034		5 off  	
Length: 250 mm	SWIRE-CAB-025 107035			
Length: 500 mm	SWIRE-CAB-050 112027		1 off  	
Length: 1000 mm	SWIRE-CAB-100 107036			
Length: 2000 mm	SWIRE-CAB-200 107037			
Termination connector ¹⁾				
- Termination plug for last SmartWire card, 6 pole, no electrical function.	SWIRE-CAB-000 107031		25 off  	-
Data cable ¹⁾				
- 6-core, ribbon cable, length: 100 m.	SWIRE-CAB-100M 107038		1 off  	Preassembly of cable only possible with special tool.
Plug ¹⁾				
- 6-pin plug for ribbon cable.	SWIRE-CAB-CON 107039		50 off  	For use with SWIRE-CAB-100M.
NHI-E with cable ¹⁾				
- NHI-E-10-PKZ0 with connection cable AWG18 blue, for connection to SmartWire module for DILM.	NHI-E-10L-PKZ0 107040		5 off	-
Plug-in reversing bridge ²⁾				
- For assembling reversing starters with tool-less plug connection	DILM12-XR 110099		20 off  	For use with DILM7...DILM15, without A2 link.

Information relevant for export to North America



1)
 Product Standards IEC/EN 60947-4-1; UL 508;
 CSA-C22.2 No. 14-05; CE marking
 UL File No. E29184
 UL CCN NKCR
 CSA File No. 012528
 CSA Class No. 2252-01
 NA Certification UL Listed, CSA certified

2)
 Product Standards IEC/EN 60947-4-1; UL 508;
 CSA-C22.2 No. 14-05; CE marking
 UL File No. E36332
 UL CCN NLRV
 CSA File No. 012528
 CSA Class No. 3211-05
 NA Certification UL Listed, CSA certified



SWIRE-...

Engineering

Cable lengths

For connection between motor starters and contactors DILM, the cable lengths depend on the combination and assembly of the devices.

Applications	PKZ accessories	from	to	Cable length
Contactors DILM	None (45 grid)	DILM7-...15	DILM7-...15	85 mm
		DILM17-...38	DILM17-...38	85 mm
		DILM7-...38	DILM17-...38	110 mm
		DILM17-...38	DILM7-...15	110 mm
	PKZM0 with U-/A.../NHI.../AGM...	DILM7-...15	DILM7-...15	110 mm
		DILM17-...32	DILM17-...32	110 mm
		DILM7-...15	DILM17-...32	110 mm
		DILM17-...32	DILM7-...15	110 mm
Motor starters MSC	None (45 grid)	DILM7-...15	DILM7-...15	85 mm
		DILM17-...32	DILM17-...32	85 mm
		DILM7-...15	DILM17-...32	110 mm
		DILM17-...32	DILM7-...15	110 mm
	PKZM0 with U-/A.../NHI.../AGM...	DILM7-...15	DILM7-...15	110 mm
		DILM17-...32	DILM17-...32	110 mm
		DILM7-...15	DILM17-...32	150 mm
		DILM17-...32	DILM7-...15	150 mm

The cable lengths for connecting SmartWire devices depend on the combination and assembly of the devices.

Applications	Cable length
Connection from power module to SWIRE-DIL with mounting beside PKZ	250 mm
Connection from power module to SWIRE-DIL with mounting beside DILM	150 mm
Connection from gateway to SWIRE-DIL with mounting beside PKZ	250 mm
Connection from coupling unit to SWIRE-DIL with mounting beside DILM	250 mm

Magnet systems

The number of motor starters or contactors DILM that can be connected is dependant on the power consumption of the magnet systems per SmartWire line. To increase the number of SmartWire modules that can be connected, power modules can be used.

24 V DC		DILM7	DILM9	DILM12	DILM15	DILM17	DILM25	DILM32/38
Pick-up power	W	3	3	4.5	12 at 24 V	12 at 24 V	12 at 24 V	12 at 24 V
Holding power	W	3	3	4.5	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V

Technical data

			SWIRE-GW-DP	SWIRE-PF	SWIRE-DIL
General					
Standards					
General			IEC/EN 60947 EN 55011 EN 55022 IEC/EN 61000-4 IEC/EN 60068-2-27		
Profibus-DP			IEC 61158	–	–
Mounting			Top-hat rail IEC/EN 60715 (35mm) or screw fixing with fixing brackets ZB4-101-GF1 (accessories)		on DILM7...DILM38
Dimensions (w x d x h)			mm	35 x 90 x 109	35 x 90 x 74
Weight			kg	0.15	0.1
0.04					
Terminal capacity					
Solid			mm ²	0.34...1.5	0.34...1.5
Flexible with ferrule			mm ²	0.34...1.5	0.34...1.5
Solid or stranded			AWG	22...16	22...16
Flat-blade screwdriver			mm	3.5 x 0.8	3.5 x 0.8
Max. tightening torque			Nm	0.6	0.6
0.5					
Ambient climatic conditions					
Ambient temperature					
Operation			°C	-25 - +55	-25 - +55
Storage			°C	-25 - +70	-25 - +70
Condensation			Prevent condensation by means of suitable measures		
Relative humidity, non-condensing (IEC/EN 60068-2-30)			%	5 - 95	5 - 95
Air pressure (in operation)			hPa	795 - 1080	795 - 1080
Ambient mechanical conditions					
Protection type (IEC/EN 60529)				IP20	IP20
Pollution degree				2	2
Mounting position				Vertical	Vertical
As per DILM7 to DILM38					
Electromagnetic compatibility (EMC)					
Electrostatic discharge (IEC EN 61000-4-2, Level 3, ESD)					
Air discharge			kV	8	8
Contact discharge			kV	–	–
Electromagnetic fields (IEC/EN 61000-4-3, RFI)			V/m	10	10
Radio interference suppression (EN 55011, EN 55022)				Class A	Class A
Burst pulses (IEC/EN 61000-4-4, level 3)					
Supply cables			kV	2	2
Signal cables			kV	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5, level 2)			kV	0.5 (supply cables, symmetrical)	
Emitted RFI (IEC/EN 61000-4-6)			V	10	10
Insulation resistance					
Clearances and creepage distances			EN 50178, EN 60947-1, UL 508, CSA C22.2 No 142		
Insulation resistance			EN 50178, EN 60947-1		
Supply voltage, gateway electronics and SmartWire station electronics					
U_{gateway}					
Rated operational voltage U _{gateway}			V DC	24, -15 %, +20 %	–
Permissible range				20.4...28.8	20.4...28.8
Ripple			%	≤ 5	–
Maximum coupling unit power consumption at 24 V DC			mA	500 (typically 100 for gateway + typically 25 per SmartWire module)	–
Voltage dips (IEC/EN 61131-2)			ms	10	–
Heat dissipation at 24 V DC			W	Normally 6	Normally 1
Protection against polarity reversal				Yes	–
Short-circuit protection, SmartWire side				Yes	–



SWIRE-...

			SWIRE-GW-DP	SWIRE-PF	SWIRE-DIL
General					
Supply voltage U_{AUX} (supply voltage for switching SmartWire elements, e.g. contactor coils)					
Rated operational voltage U_{AUX}		V DC	24, -15 %, +20 % (Derating from > 40 °C)	24, -15 %, +20 % (Derating from > 40 °C)	Supply from gateway or power module
Permissible range		V DC	20.4...28.8, at 45 °C: 21...28.8, at 50 °C: 21.6...28.8, at 55 °C: 22.2...27.6	20.4...28.8, at 45 °C: 21...28.8, at 50 °C: 21.6...28.8, at 55 °C: 22.2...27.6	Supply from gateway or power module
Input current U_{AUX} at 24 V DC		A	Normally 3	Normally 3	–
Ripple		%	≤ 5	≤ 5	–
Voltage dips (IEC/EN 61131-2)		ms	10	10	–
Protection against polarity reversal					
Short-circuit protection, SmartWire side			No, external fuse 3 A or FAZ-Z3	No, external fuse 3 A or FAZ-Z3	–
LED indicators					
Operational			Ready: green	–	Ready: green
Power supply, SmartWire contactors			U_{AUX} : green	U_{AUX} : green	–
PROFIBUS-DP status			PROFIBUS-DP: green	–	–
SmartWire status			SmartWire: green	–	above Ready
Output status			–	–	–
Connection floating contacts					
Number			–	–	1
Rated voltage (internal supply)	U_e	V DC	–	–	17
Input current at "1" signal, typically		mA	–	–	5
Potential isolation			–	–	No
Max. cable length		m	–	–	< 2.8
PROFIBUS-DP					
Terminal type			SUB-D 9-pole, socket	–	–
Station address			1 ... 125	–	–
Address setting			DIP switches	–	–
Potential isolation					
From U_{AUX} power supply			Yes		
From $U_{Gateway}$ power supply			Yes		
To SmartWire			Yes		
Function			PROFIBUS-DP slave	–	–
Bus protocol			PROFIBUS-DP	–	–
Bus Terminating Resistors			can be connected via plug	–	–
Baud rate			Automatic, up to 12 Mbits/s	–	–
SmartWire					
Terminal type			Plug, 6-pole	Plug, 6-pole	Plug, 6-pole
Data/power cable			6-core ribbon cable	6-core ribbon cable	6-core ribbon cable
Maximum cable length, SmartWire system		m	Max. 4	Max. 4	Max. 4
Bus termination			No	Plug connectors	Plug connectors
Station address			Automatic assignment	None	1...16
Station			max. 126 PROFIBUS stations	Max. 4 SmartWire cards per line	Max. 16 SmartWire cards per line
Address setting			None	None	automatically via SmartWire
Potential isolation					
From U_{AUX} power supply			No	No	No
From $U_{Gateway}$ power supply			No	No	No
Function			SmartWire master	no SmartWire station	SmartWire slave
Data transfer time, SmartWire system					
Write switch			–	–	Normally 20 ms for all stations
Read status information			–	–	Normally 10 ms per station

SWIRE-...

			SWIRE-4DI-2DO-R	SWIRE-GW-MB
General				
Standards				
General			IEC/EN 60947, EN 55011, EN 55022, IEC/EN 61000-4, IEC/EN 60068-2-27	
Mounting			Tophat rail IEC/EN 60715 (35 mm) or screw fixing with fixing brackets ZB4-101-GF1 (accessories)	
Dimensions (w x d x h)		mm	35 x 90 x 74	35 x 90 x 109
Weight		kg	0.12	0.15
Terminal capacity				
Solid		mm ²	0.5...1.5	0.5...1.5
Flexible with ferrule		mm ²	0.5...1.5	0.5...1.5
Solid or stranded		AWG	22...16	22...16
Flat-blade screwdriver		mm	3.5 x 0.8	3.5 x 0.8
Max. tightening torque		Nm	0.6	0.6
Ambient climatic conditions				
Ambient temperature	Operation	°C	-25 - +55	-25 - +55
	Storage	°C	-25 - +70	-25 - +70
Condensation			Prevent condensation by means of suitable measures	
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5 - 95	5 - 95
Air pressure (in operation)		hPa	795 - 1080	795 - 1080
Ambient mechanical conditions				
Protection type (IEC/EN 60529, EN50178, VBG 4)			IP20	IP20
Pollution degree			2	2
Mounting position			Vertical	Vertical
Electromagnetic compatibility (EMC)				
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)				
Air discharge		kV	8	8
Contact discharge		kV	–	–
Electromagnetic fields (IEC/EN 61000-4-3, RFI)	V/m		10	10
Radio interference suppression (EN 55011, EN 55022)			Class A	Class A
Burst pulses (IEC/EN 61000-4-4, level 3)				
Supply cables		kV	2	2
Signal cables		kV	–	2
power pulses (surge) (IEC/EN 61000-4-5, level 2)		kV	0.5 (supply cables, symmetrical)	
Emitted RFI (IEC/EN 61000-4-6)		V	10	10
Insulation resistance				
Clearances and creepage distances			EN 50178, EN 60947-1, UL 508, CSA C22.2 No 142	
Insulation resistance			EN 50178, EN 60947-1	
Supply voltage, gateway electronics and SmartWire station electronics U_{gateway}				
Rated operational voltage U_{gateway}		V DC	–	24, -15 %, +20 %
Permissible range			Supply from gateway or power module	20.4...28.8
Ripple		%	–	≤ 5
Maximum gateway current consumption at 24 V DC		mA	–	500 (normally 100 coupling unit + normally 25 per SmartWire card)
Voltage dips (IEC/EN 61131-2)		ms	–	10
Heat dissipation at 24 V DC		W	–	Normally 6
Protection against polarity reversal				Yes
Short-circuit protection, SmartWire side			–	Yes
Power supply U_{AUX} (power supply for switching the SmartWire slaves, e.g. contactor coils)				
Rated operational voltage U_{AUX}		V DC	–	24, -15 %, +20 % (Derating from > 40 °C)
Permissible range		V DC	–	20.4...28.8, at 45 °C: 21...28.8, at 50 °C: 21.6...28.8, at 55 °C: 22.2...27.6
Input current I_{AUX} at 24 V DC		A	–	Normally 3
Ripple		%	–	≤ 5
Voltage dips (IEC/EN 61131-2)		ms	–	10
Protection against polarity reversal				Yes
Voltage	U_s	V	–	Yes
Short-circuit protection, SmartWire side			–	No, external 3 A fuse or FAZ-Z3



SWIRE-...

			SWIRE-4DI-2DO-R	SWIRE-GW-MB
LED indicators				
Operational			Ready: green	Ready: green
Power supply, SmartWire contactors			–	U _{AUX} : green
MODBUS status			–	MODBUS: yellow
SmartWire status			–	SmartWire: green
Output status			Q1, Q2: green	–
Connection floating contacts				
Number			4	–
Rated voltage (internal supply)	U _e	V DC	17	–
Input current at "1" signal, typically		mA	5	–
Potential isolation			–	Yes
Max. cable length		m	< 2.8	–
MODBUS				
Terminal type			–	SUB-D, 9 pole, socket RS232/RS485
Station address			–	1 ... 31
Address setting			–	DIP switches
Potential isolation				
From U _{AUX} power supply			–	Yes
From U _{Gateway} power supply			–	Yes
To SmartWire			–	Yes
Function			–	MODBUS-RTU Slave
Bus protocol			–	MODBUS-RTU
Bus Terminating Resistors			–	can be connected via plug
Baud rate			–	Adjustable up to 57.6 (9.6/19.2/38.4) kbit/s
SmartWire				
Terminal type			Plug, 6-pole	Plug, 6-pole
Data/power cable			6-core ribbon cable	6-core ribbon cable
Maximum cable length, SmartWire system		m	Max. 4	Max. 4
Bus termination			Plug connectors	No
Station address			1...16	Automatic assignment
Station			Max. 4 SmartWire modules per line.	Max. 16
Address setting			automatically via SmartWire	None
Potential isolation				
From U _{AUX} power supply			No	No
From U _{Gateway} power supply			No	No
Function			SmartWire slave	SmartWire master
Data transfer time, SmartWire system				
Write switch			Normally 20 ms for all stations	–
Read status information			Normally 10 ms per station	–
Relay outputs				
Rated impulse withstand voltage	U _{imp}	V AC	4000	–
Overvoltage category/pollution degree			III/3	–
Rated insulation voltage	U _i	V	250	–
Rated operating voltage	U _e	V	250	–
Making capacity		A	30	–
Breaking capacity	380/400 V	A	10	–
Rated operational current				
AC-15, 250 V	I _e	A	3	–
DC-12, 30 V	I _e	A	3	–
Conventional thermal current	I _{th}	A	6	6
Short-circuit rating without welding				
max. fuse		A gG/gL	10	–

DOL starters, reversing starters

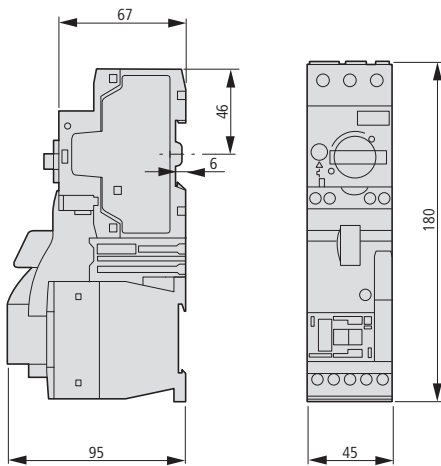
MSC-D, MSC-R, MSC-DE(A)

General	Standards	IEC/EN 60947-4-1, VDE 0660 UL 508 (please enquire) CSA C 22.2 No. 14 (please enquire)		
	Mounting position			
Main contacts	Rated impulse withstand voltage	U_{imp}	V AC	6000
	Overvoltage category/pollution degree			III/3
	Rated operating voltage	U_e	V	230 - 415
Further technical data	Motor protective circuit breaker PKZM0, PKE	→ Chapter 7		
	Contactors DILM	→ Chapter 5		

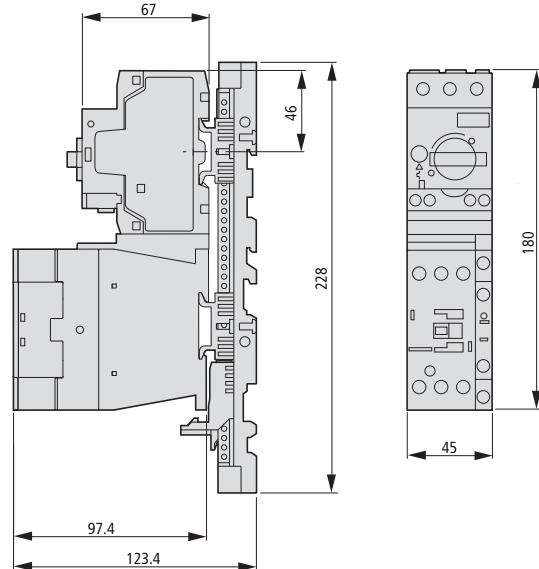
Dimensions

DOL starters

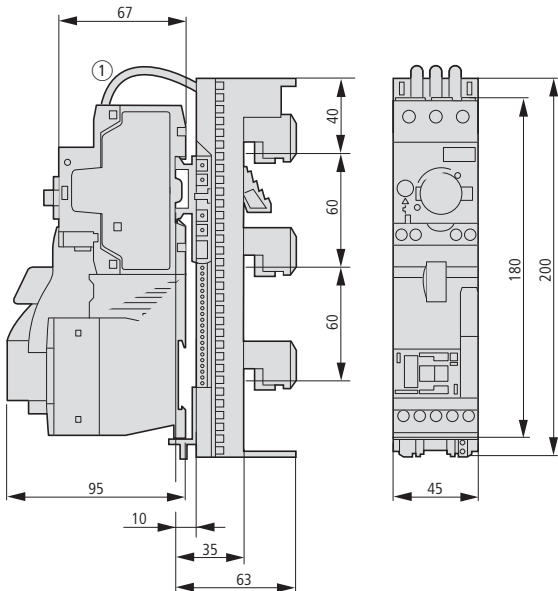
MSC-D-...-M7[...15]...



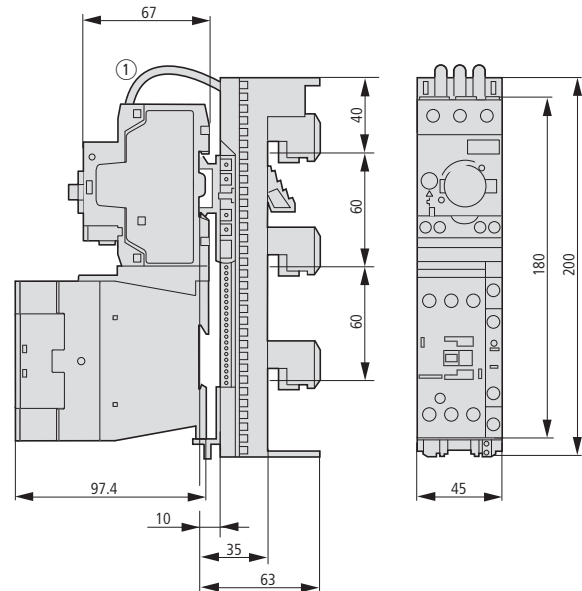
MSC-D-...-M17[...32]...



MSC-D-...-M7[...15]BBA...



MSC-D-...-M17[...32]BBA...

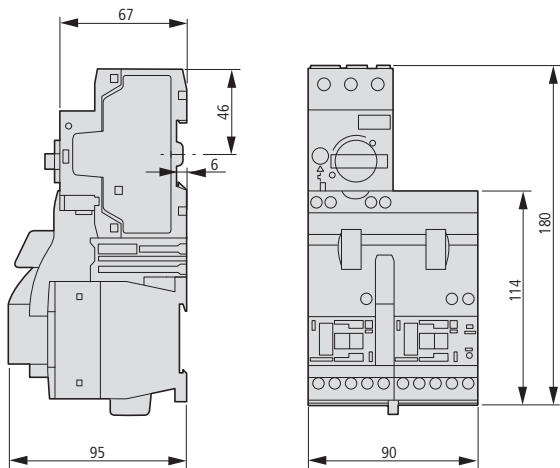


DOL starters, reversing starters

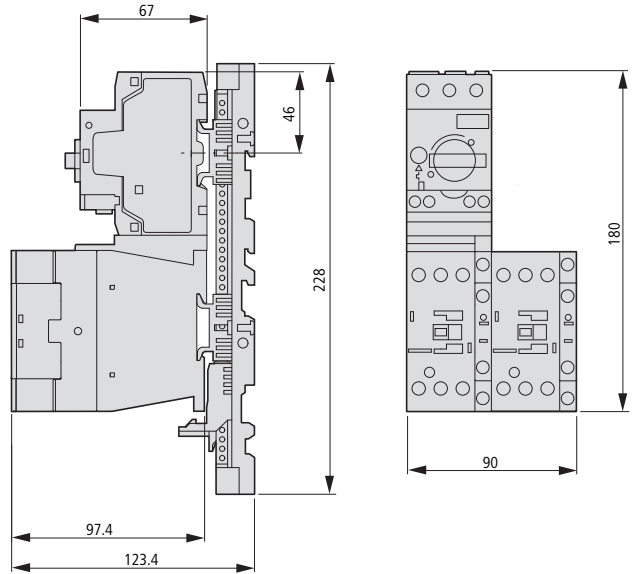
MSC-DE(A), MSC-R

Reversing starters

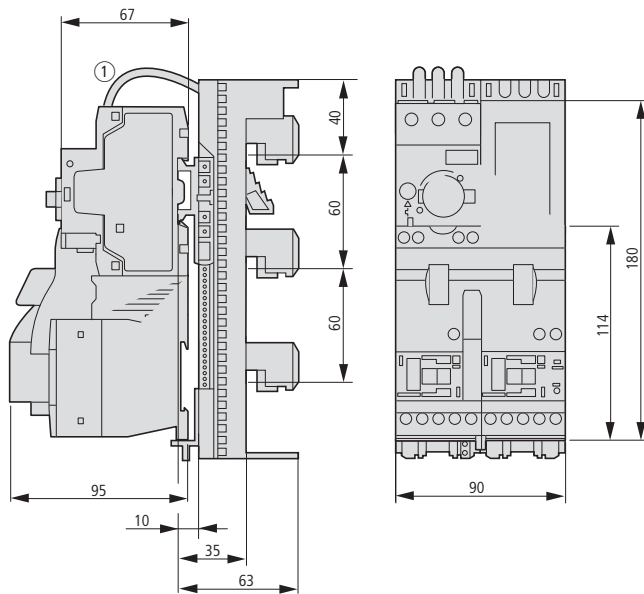
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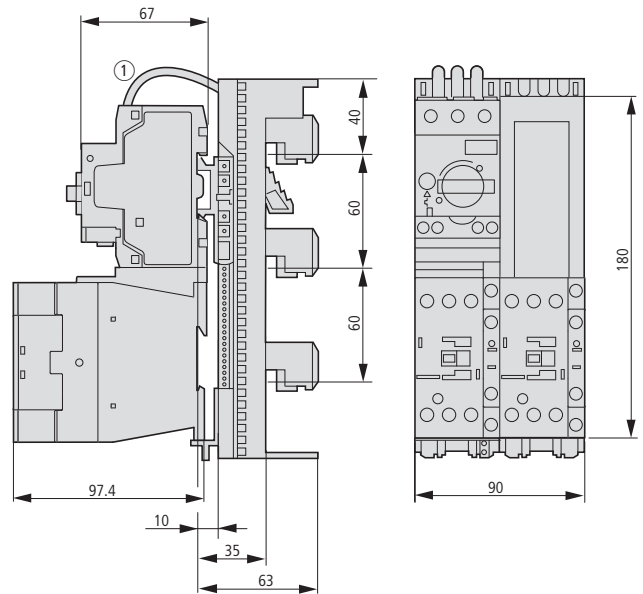
MSC-R-...-M17[...32]...



MSC-R-...-M7[...12]BBA...

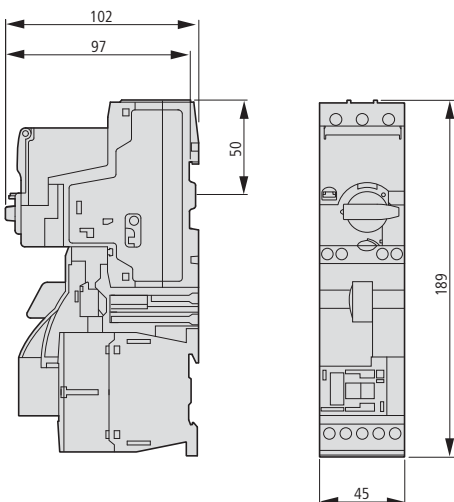


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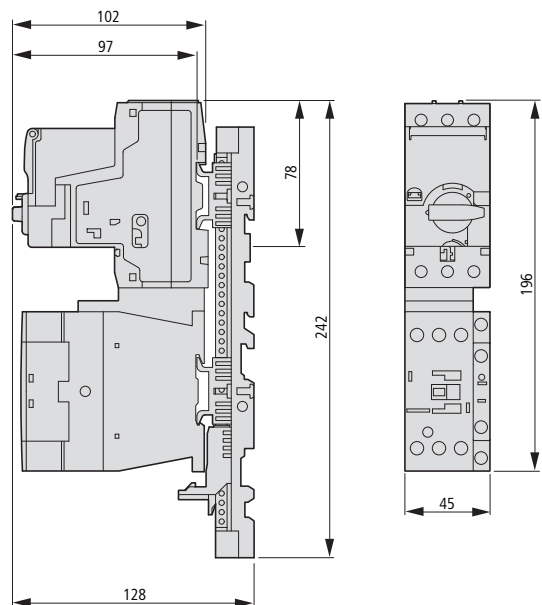


DOL starters

MSC-DE(A)-...-M7[...12]...

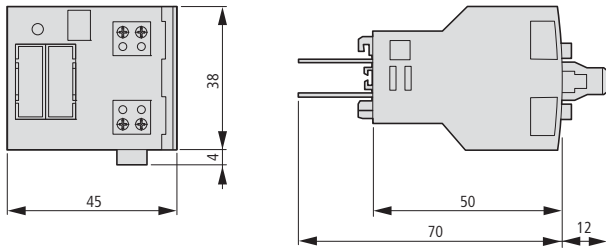


MSC-DE(A)-...-M17[...32]...

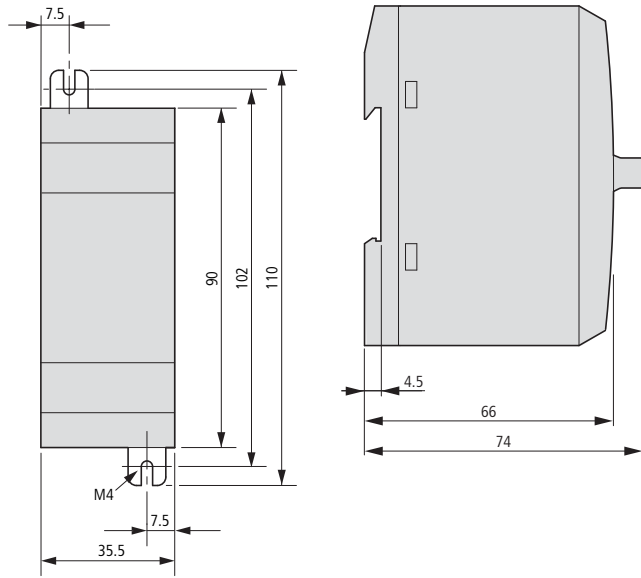


Modules

SWIRE-DIL

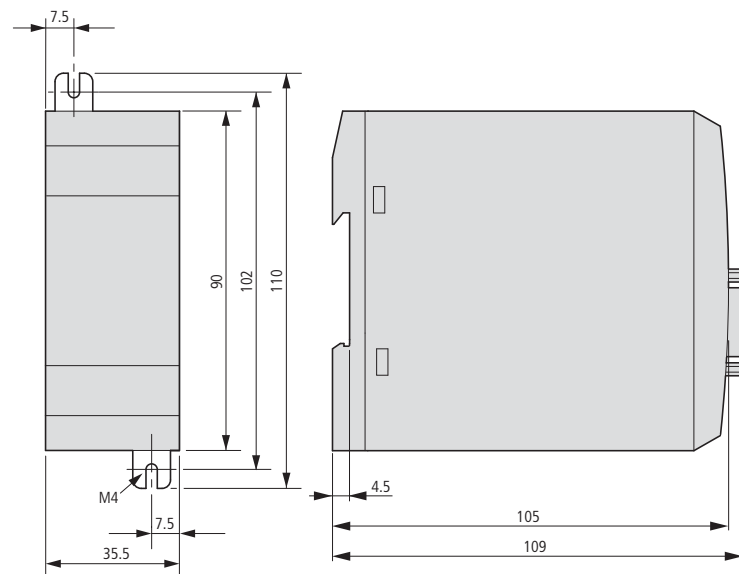


SWIRE-PF, SWIRE-4DI-2DO-R



Gateways

SWIRE-GW-DP..., SWIRE-GW-MB





DS, DM soft starters

Soft starters enable the gentle start of alternating current asynchronous motors through a continuously variable control of the motor supply voltage during the start phase. The resulting torque increase ensures that the motor is adapted to the load characteristics of the machine and is accelerated smoothly. The soft starter DS7 is available in a communications-capable version for connection to the SmartWire-Darwin communication system.



Eaton After Sales Service

Testing switching devices in compliance with regulations applicable to this technology
 → Chapter 22

Two-phase controlled DS6 soft starter with internal bypass

Easy setting through three regulating switches(U-start, t-start, t-stop) +++ special control method (asymmetrical ignition control) +++ Performance range 41 – 200 A, 18.5 – 110 kW (with 400 V) → Page 9/19

Two-phased controlled DS7 soft starter with asymmetrical trigger

Easy setting through three regulating switches(U-start, t-start, t-stop) +++ special control method (asymmetrical ignition control) +++ Optional fan to increase switching rate +++ can be used with numerous contactor options +++ Ramp times and start voltages adjustable by potentiometer +++ Performance range: 3 – 200 A, 1.1 – 110 kW (with 400 V) → Page 9/31

Three-phased controlled DM4 soft starter

Parameterizable and communication-capable +++ Selector switch with 10 standard applications +++ Performance range: 16 – 900 A, 7.5 – to 900 kW (with 400 V) → Page 9/55

DS, DM soft starters

Technical overview

DS6, DS7, DM4 soft starters	9/2
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Description

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DM4 key to part numbers	9/4

DS6 soft starters

System overview

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Description

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Ordering

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Engineering

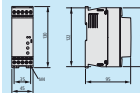
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Technical data

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Dimensions

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DS7 soft starter

System overview

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Description

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Ordering

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Engineering

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Technical data

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Dimensions

DS7 soft starters	9/38
Fuse bases, fuses	9/63

DM4 soft starters

System overview

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Description

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Ordering

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Engineering

Connection examples

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Assigned switching and protective elements DM4

Short start-up time	9/50
Long start-up time	9/52

Technical data

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Dimensions

DM4 soft starters	9/62
Fuse bases, fuses	9/63



Technical overview

DS6, DS7, DM4

	DS6-340-...-MX	DS7-34...SX...	DM4-340-...
Power section	Thyristors in two phases	Thyristors in two phases	Thyristors in three phases
Mains supply voltage U_{LN}	230 - 460 V ± 15 %	230 - 480 V ± 10 %	230 - 460 V ± 15 %
Supply voltage	24 V DC	24 V AC/DC, 110/230 V AC	24 V DC, 110 - 230 V AC
Mains frequency	45 - 65 Hz ± 0 %	45 - 65 Hz ± 0 %	45 - 65 Hz ± 0 %
Rated operational current I_e			
Heating load AC 51	–	–	–
Motor load AC 53	41 - 196 A	3 - 200 A	16 - 900 A
Assigned motor rating at 400 V	18.5 - 110 kW	1.1 - 110 kW	7.5 - 500 kW, 11 - 900 kW
Overload cycle	10 starts per h with $3 \times I_N$ for 5 s	10 starts per h with $3 \times I_N$ for 5 s	10 starts per h at $3.5 \times I_N$ for 35 s (up to part no. ... 90K)
Operating temperature	0 - 40 °C	0 - 40 °C	0 - 40 °C
Storage temperature	-25 - +55 °C	-25 - +55 °C	-25 - +55 °C
Installation altitude	Up to 1000 m a.s.l., over 1000 m with reduced current (2.5 % per 100 m)	Up to 1000 m a.s.l., over 1000 m with reduced current (2.5 % per 100 m)	Up to 1000 m a.s.l., over 1000 m with reduced current (2.5 % per 100 m)
Protection type	IP20	IP20	IP20
Changeover time for reversing contactors (transition from 100 % FWD to 100 % REV)	–	–	–
Fields of application			
Three-phase resistive and inductive loads	–	–	●
Three-phase motors	●	●	●
Functions			
Fast and silent switching (semiconductor contactor)	–	–	–
Soft start/Soft stop	●	●	●
Reversing function	–	–	–
Suppression of DC components on motors	●	●	●
Potential isolation between power section and control section	●	●	●
Internal bypass	●	●	–
Product standard, determination	IEC/EN 60 947-4-2	IEC/EN 60 947-4-2	IEC/EN 60 947-4-2
Approval, certification	UL, CSA, CCC	UL, CSA, CCC, Gost, Gost-R	UL, cUL

Notes

The value range specifications for the rated operational current and the assigned motor output within each column refer to the entire group, and not to an individual device.
Depending on the specific model, DS7 series soft starters require 24 VDC/VAC or 110/230 VAC as a supply voltage.
An Easy200-POW power supply is sufficient for operation (keep the total load in mind!).

DS6, DS7, DM4

Key to part numbers

DS6 soft starters

DS6-340-22K-MX (example)

DS	6	-	3	4	0	-	22K	-	M	X
DS	6		3	4	0	–	Variable three-digit code	–	M	X

DS = Drives soft starters

Device series

6 = Generation 6

Number of phases

3 = Three-phase connection

Voltage class

4 = 400 V/480 V

Version

0

Motor rating (in kW)

x(x)(x)Ky xx = Decimal specification, whole-number component, y = decimal place

Motor code

M = For three-phase AC motors

Code for additional functions

X = With internal bypass

DS7 soft starters

DS7-340SX081N0-N (example)

DS7	3	4	0	SX	081	N	0	-	N	
DS7	3	4	0	SX	Variable three-digit code	N	0	–	N	
			2							D
			D							

DS7 = Device series, Generation 7

Number of phases

3 = Three-phase mains supply voltage

Voltage class

4 = 400 V (380 V – -15 % to 480 V + +10 %)

Control voltage supply

0 = 24 V AC/DC

2 = 110/230 V AC

D = 24 V DC SmartWire-Darwin

Device version

SX = Standard soft starters with internal bypass

Rated operational current

Variable magnitude in decimal notation

Radio interference suppression filters

N = No internal radio interference suppression filter

Protection type

0 = IP20

Options

N = No option

D = SmartWire-Darwin



DM4 soft starter

DM4-340-200K (example)

DM	4	-	3	4	0	-	200	K
DM	4		3	4	0		Variable three-digit code	K

DM = drives, motor controllers**Device series**

4 = Generation 4

Number of phases

3 = Three-phase connection

Voltage class

4 = 400 V/480 V

Version

0

Motor rating (in kW)

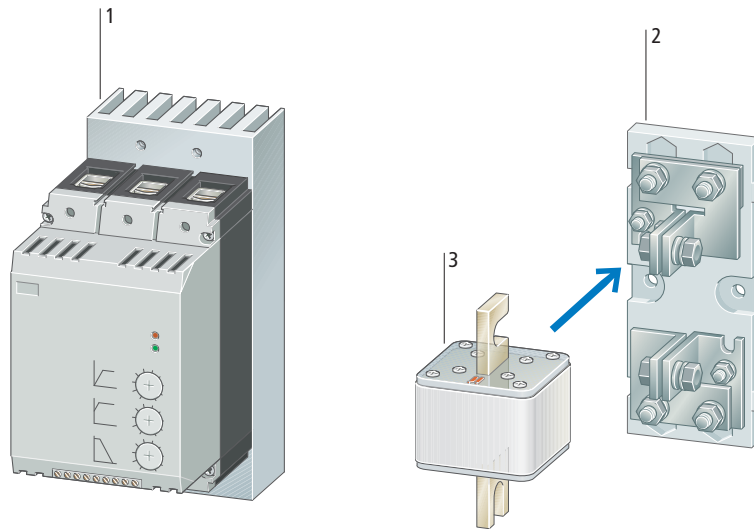
x(x)(x)Ky xx = Decimal specification, whole-number component, y = decimal place

Unit

K = kW



System overview



Basic devices

DS6 soft starters

1

Soft starters for three-phase AC motors

Assigned motor rating: 18.5 to 110 kW at 400 V

Rated operating voltage: 230 to 480 V

Asymmetric trigger control for clearly improved true run behavior (Moeller Patent: PCT/EPO0/12938)

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/7

Add-on functions

Superfast semiconductor fuses

3

Fuses for protecting the DS7 soft starters from short-circuits or to achieve type "2" coordination for external surface mounting

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/8

Fuse bases

2

For external surface mounting of the superfast semiconductor fuse

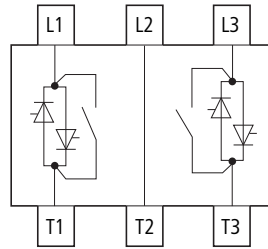
Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/8



DS6

Description



Application

The DS6 series soft starters are intended for three-phase motors with normal operating frequency and a rating range of 22 to 110 kW. A significant reduction of the inrush current for three-phase lamps and heaters (with an ungrounded star point) is achieved by setting a short soft start ramp time (at least 1 s). The special actuation method (asymmetrical trigger phase control) for the soft start function avoids the DC components that would normally occur in two-phase-controlled soft starters. This suppresses the generation of an elliptical rotating field, which would cause uneven motor starting and increase the motor's acceleration phase. The true run behavior of the DS6 is therefore comparable with that of a three-phase-controlled soft starter.

Features

The soft starter DS6-340-MX is available with a rating of 22 to 110 kW. Starting transients and DC components during startup are effectively suppressed and guarantee even motor starting. The ramp times and the start voltage are adjustable via potentiometers. The time can be adjusted between 1 and 30 s (start) and between 0 and 30 s (stop); the start voltage (i.e. the starting torque) from 30 to 100 % mains voltage. The DS6-340-MX models feature built-in bypass contacts that close automatically at TOR (top-of-ramp) and bypass the built-in thyristors. This function provides radio interference level "B" in continuous operation without additional measures.

Typical applications for soft starters

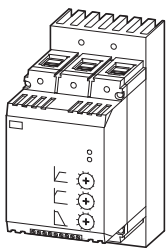
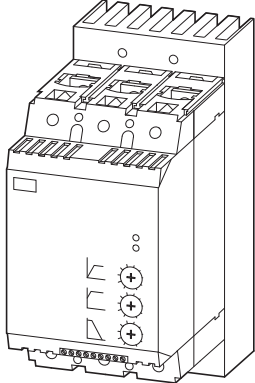


- Pump drives: Soft starting prevents sudden pressure surges. The mechanical load on the whole plant is reduced and its service life increases.
- Fan drives: Soft starting prevents drive belt slippage and premature wear. This reduces operating costs and extends durability.
- Conveyors: The conveyor belt starts up gently instead of with a jerk. The conveyed goods do not fall over, the mechanical stress on the conveyor is reduced and its lifespan increased.

Documentation

Installation instructions
AWA8250-2330

Manual
AWB8250-1346
("Design of soft starters")

Notes:
See also Engineering of DS7 Settings for Potentiometer

	Mains supply voltage (50/60 Hz)	Assigned motor rating		Rated operational current (AC-53)	Part no. Article no.	Price See price list	Std. pack
		400 V	480 V				
	U_{LN} V AC	P kW	P HP	I_e A			
DS6 soft starters							
 	230...480	22	30	41	DS6-340-22K-MX 103086		1 off  
		30	40	55	DS6-340-30K-MX 103087		
		37	50	68	DS6-340-37K-MX 103088		
		45	60	81	DS6-340-45K-MX 103089		
		55	75	99	DS6-340-55K-MX 103150		
		75	100	134	DS6-340-75K-MX 103151		
		90	125	161	DS6-340-90K-MX 103152		
		110	150	196	DS6-340-110K-MX 103153		

Information relevant for export to North America


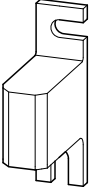









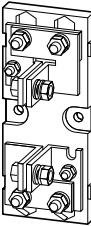
Product Standards

IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05


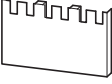

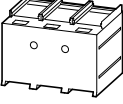

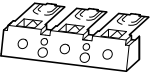





UL File No. E251034
 UL CCN NMFT
 CSA File No. 012528
 CSA Class No. 3211-06
 NA Certification UL Listed, CSA certified
 Suitable for Branch circuits
 Max. Voltage Rating 480 V
 Degree of Protection IP20; UL/CSA Type 1



	Rated operational current	Maximum power loss P _v W	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Accessories								
Fuse links								
	100	22	80	DS6-340-22K-MX	20.282.20-100 106654		6 off 	Product Standards UL 248-13 CE marking E180276 JFHR2 UL File No. UL CCN CSA File No. UL report applies to both US and Canada JFHR8 UL Recognized, certified by UL for use in Canada Max. Voltage Rating 660V
	125	24	80	DS6-340-30K-MX	20.282.20-125 232087		6 off 	
	200	44	80	DS6-340-37K-MX DS6-340-45K-MX DS6-340-55K-MX	20.610.32-200 106475		3 off 	
	350	61	80	DS6-340-75K-MX	20.610.32-350 221161		2 off 	
	400	70	80	DS6-340-90K-MX	20.610.32-400 106476		3 off 	
	500	72	80	DS6-340-110K-MX	20.610.32-500 221163		2 off 	

	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Fuse bases						
For semiconductor fuses						
	80	20.282.20-... 20.189.20-...	21.189.01 232064		5 off	
	80	20.6xx.32-...	21.313.02 232076		2 off	

HPL09009EN

	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Terminal cover, knockout, no UL/CSA approval						
For box terminal ¹⁾						
	–	NZM1, PN1, N1 DS6-340-22K...55K-MX	NZM1-XKSFA 100780		1 off 	UL/CSA certification not required
Cover²⁾						
	–	NZM2, PN2, NS2 DS6-340-75K...110K	NZM2-XKSA 260038		1 off 	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking UL File No. E31593 UL CCN DIHS CSA File No. 22086 CSA Class No. 1432-01 NA Certification UL Listed, CSA certified Suitable for Refer to main component information
Terminal cover¹⁾						
	–	NZM2, PN2, N(S)2 DS6-340-75K...110K	NZM2-XKSFA 104640		1 off 	UL/CSA certification not required
IP2X protection against contact with a finger						
For box terminal ³⁾						
	–	NZM2, PN2, N(S)2 DS6-340-75K...110K	NZM2-XIPK 266773		1 off 	UL/CSA certification not required
IP2X protection against contact with a finger						
For cover NZM2-XKSA or NZM2 or NZM2...(C)NA und N(S)2...NA ⁴⁾						
	–	NZM2, PN2, N(S)2	NZM2-XIPA 266777		1 off 	UL/CSA certification not required

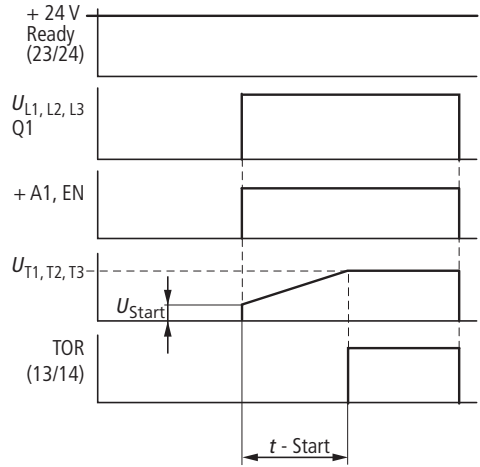
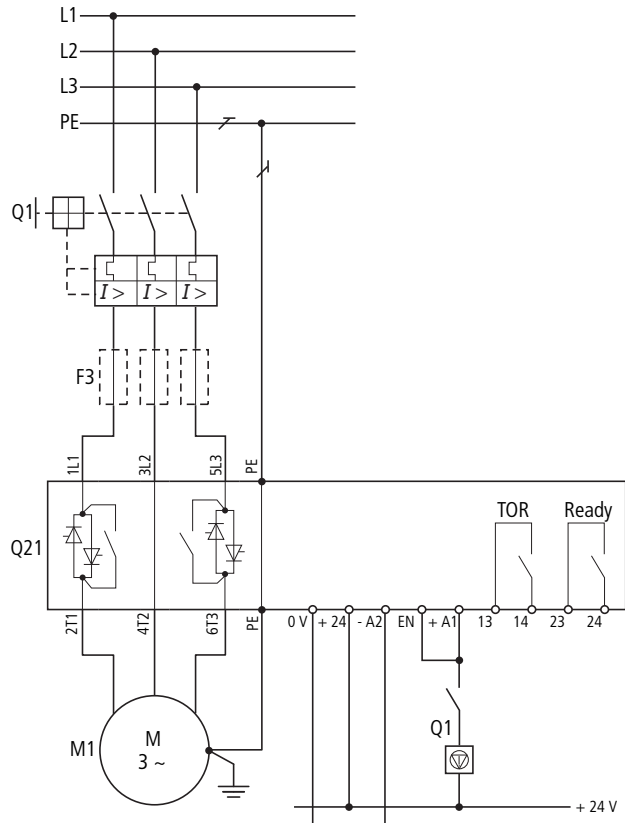
Notes

- 1) Type contains parts for a terminal located at top or bottom for 3 or 4-pole switches.
Increased protection against direct contact (simplified finger protection).
- 2) Type contains parts for a terminal located at top or bottom for 3 pole switches.
Protection against direct contact where cable lugs, busbars or tunnel terminals are used.
When using insulated conductor material to protection type IP1X.
- 3) Type contains parts for a terminal located at top or bottom for 3 pole switches.
Increased protection against direct contact to IP2X.
Protection when reaching into the cable connection area with the connection of cables in the box terminal.
With two conductors max cross-section 25 mm² or AWG4.
Cannot be combined with NZM-XSTK control circuit terminal.
- 4) Type contains parts for a terminal located at top or bottom for 3 or 4-pole switches.
Increased protection against direct contact to IP2X.
When mounting NZM2..-(C)NA or NZM...-NA the following applies:
With two conductors max cross-section 25 mm² or AWG4.

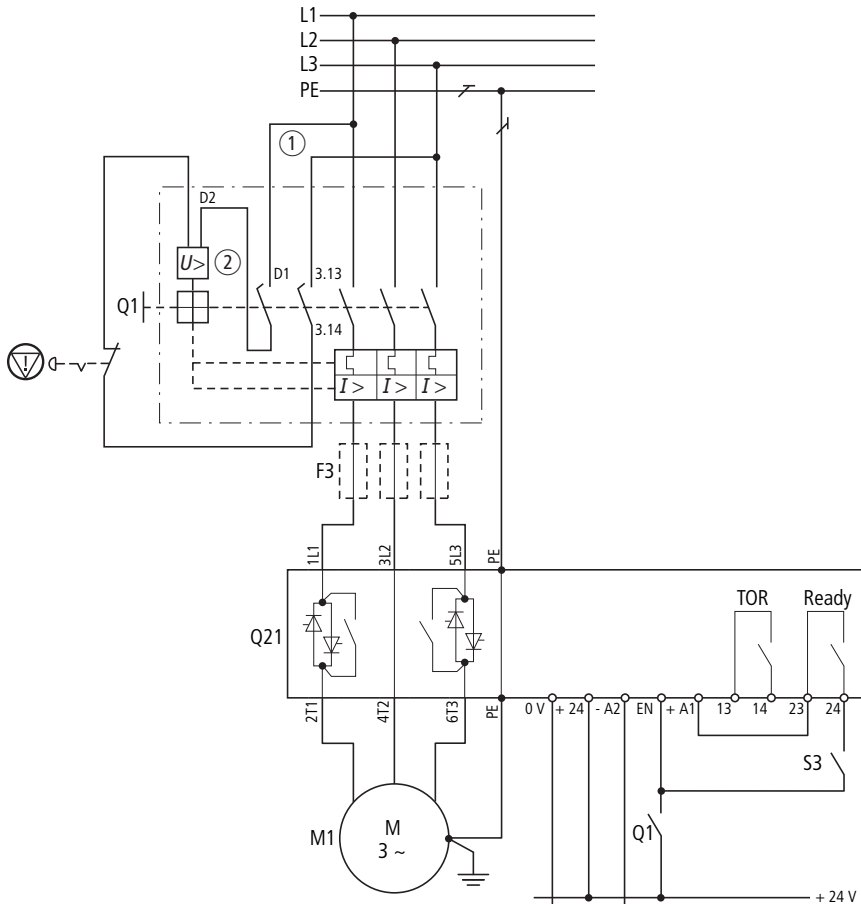


Standard connection

Direct soft start



Soft starters and main switches with EMERGENCY STOP function according to IEC/EN 60204-1 and VDE 0113-1



Q1: NZM1, NZM2

① Control circuit terminal

② Undervoltage releases with early-make auxiliary contacts

3 AC, 230 V

NZM1-XUHIV208-240AC

NZM2/3-XUHIV208-240AC

3 AC, 400 V

NZM1-XUHIV380-440AC

NZM2/3-XUHIV380-440AC

⊖ = Emergency switching off

Assigned motor rating for		Rated operational current ¹⁾		Part no. Soft starters	Soft starter function			Semiconductor fuse (optional, in addition to the protective devices for type "1" coordination, required for type "2" coordination) ⁵⁾	
400 V	480 V	Device	Motor		Cable protection ²⁾	Mains contactor (optional) ³⁾	Overload relays ⁴⁾	Fuses	Fuse holders
P	P	I _e	I _e		Type "1" coordination			Number x Part no.	Number x Part no.
KW	HP	A	A						
Soft starters for three-phase mains connection, low operating frequency, (5 s, 3 x I_e, 10 Starts/h)									
18.5	25	41	36	DS6-340-22K-MX	NZMN1-M40 / PKZM4-40	DILM40	ZB65-40+ZB65-XEZ	2 x 20.282.20-100	3 x 21.189.01
22	30	41	41	DS6-340-22K-MX	NZMN1-M50 / PKZM4-50	DILM50	ZB65-40+ZB65-XEZ	3 x 20.282.20-100	3 x 21.189.01
30	40	55	55	DS6-340-30K-MX	NZMN1-M63 / PKZM4-58	DILM65	ZB65-57+ZB65-XEZ	3 x 20.282.20-125	3 x 21.189.01
37	50	68	68	DS6-340-37K-MX	NZMN1-M80	DILM80	ZB150-100/KK	3 x 20.610.32-200	3 x 21.313.02
45	60	81	81	DS6-340-45K-MX	NZMN1-M100	DILM90	ZB150-100/KK	3 x 20.610.32-200	3 x 21.313.02
55	75	99	99	DS6-340-55K-MX	NZMN1-M100	DILM115	ZB150-125/KK	3 x 20.610.32-200	3 x 21.313.02
75	100	134	134	DS6-340-75K-MX	NZMN2-M160	DILM150	ZB150-150/KK	3 x 20.610.32-350	3 x 21.313.02
90	125	161	160	DS6-340-90K-MX	NZMN2-M200	DILM185	Z5-160/FF250	3 x 20.610.32-400	3 x 21.313.02
110	150	196	196	DS6-340-110K-MX	NZMN2-M200	DILM225	Z5-160/FF250	3 x 20.610.32-500	3 x 21.313.02

Notes

- ¹⁾ Rated operational current based on the load cycle specified here.
- ²⁾ Used to specify the circuit-breaker required for the specified load cycle. For other switching cycles (operating frequency, overcurrent, overcurrent time, duty factor), this value changes and must be modified accordingly. The same applies to higher motor currents.
- ³⁾ A mains contactor is not required. Disconnection characteristics in accordance with VDE can only be ensured with the specified circuit-breaker.
- ⁴⁾ An external overload relay is required if the main contacts are not to be disconnected in the event of an overload and a controlled soft stop is desired instead.
- ⁵⁾ The superfast semiconductor fuses protect the soft starter from short circuits on the motor side. This cannot prevent damage caused by voltage peaks (e.g. caused by a lightning strike).



			DS6-340-22K-MX	DS6-340-30K-MX	DS6-340-37K-MX
General					
Standards			IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2
Approvals			–	–	–
Climatic proofing			Damp heat, constant, according to IEC 60068-2-78, damp heat, cyclic, according to IEC 60068-2-10		
Ambient temperature	°C		0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise
Ambient temperature storage	°C		-25 - 55	-25 - 55	-25 - 55
Installation altitude	m		0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m
Mounting position			Vertical	Vertical	Vertical
Protection type (power terminals)			IP20	IP20	IP20
Protection against direct contact			Finger- and back-of-hand proof		
Overvoltage category/pollution degree			II/2	II/2	II/2
Mechanical shock resistance			8 g/11 ms	8 g/11 ms	8 g/11 ms
Vibration resistance to EN 60721-3-2	g		2M2	2M2	2M2
Average heat dissipation with nominal load cycle	W		7	10	13
Dimensions (W x H x D)	mm		93 x 175 x 139	93 x 175 x 139	93 x 175 x 139
Radio interference level			A1	A1	A1
Weight	kg		1.8	1.8	1.8
Main contacts					
Rated operating voltage	U _e	V AC	230 - 460	230 - 460	230 - 460
Mains frequency		Hz	50/60	50/60	50/60
Rated operational current					
Motor load (AC-53)	I _e	A	41	55	68
Assigned motor rating (standard connection)					
230 V	P	kW	11	15	15
400 V	P	kW	22	30	37
480 V	P	HP	30	40	50
Overload cycle to IEC/EN 60947-4-2					
AC-53			41 A: AC-53a: 3 - 5; 75 - 10	55 A: AC-53a: 3 - 5; 75 - 10	68 A: AC-53a: 3 - 5; 75 - 10
Terminal capacity					
Power cables					
Solid		mm ²	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)
Flexible with ferrule		mm ²	–	–	–
Stranded		mm ²	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)
Solid or stranded		AWG	1 x (12 - 2/0)	1 x (12 - 2/0)	1 x (12 - 2/0)
Flat conductor					
	min.	mm	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8
	max.	mm	9 x 9 x 0.9	9 x 9 x 0.9	9 x 9 x 0.9
Tightening torque		Nm	–	–	–
Control cables					
Solid		mm ²	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)
Flexible with ferrule		mm ²	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)
Stranded		mm ²	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)
Solid or stranded		AWG	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)
Flat conductor			–	–	–
Tightening torque		Nm	0.4	0.4	0.4
Screwdriver		mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5

DS6-340-45K-MX	DS6-340-55K-MX	DS6-340-75K-MX	DS6-340-90K-MX	DS6-340-110K-MX
IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2	IEC/EN 60947-4-2
–	–	–	–	–
Damp heat, constant, according to IEC 60068-2-78, damp heat, cyclic, according to IEC 60068-2-10				
0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise	0 - +40, up to 60 at 1 % derating per Kelvin temperature rise
-25 - 55	-25 - 55	-25 - 55	-25 - 55	-25 - 55
0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m	0 - 1000, above that 1 % derating per 100 m, to max. 2000 m
Vertical	Vertical	Vertical	Vertical	Vertical
IP20	IP20	IP20	IP20	IP20
Finger- and back-of-hand proof				
II/2	II/2	II/2	II/2	II/2
8 g/11 ms	8 g/11 ms	8 g/11 ms	8 g/11 ms	8 g/11 ms
2M2	2M2	2M2	2M2	2M2
18	25	24	30	42
93 x 175 x 139	93 x 175 x 139	108 x 215 x 178	108 x 215 x 178	108 x 215 x 178
A1	A1	A1	A1	A1
1.8	1.8	3.7	3.7	3.7
230 - 460	230 - 460	230 - 460	230 - 460	230 - 460
50/60	50/60	50/60	50/60	50/60
81	99	134	160	196
22	30	30	45	55
45	55	75	90	110
60	75	100	125	150
81 A: AC-53a: 3 - 5; 75 - 10	99 A: AC-53a: 3 - 5; 75 - 10	135 A: AC-53a: 3 - 5; 75 - 10	160 A: AC-53a: 3 - 5; 75 - 10	200 A: AC-53a: 3 - 5; 75 - 10
1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)
–	–	–	–	–
1 x (25 - 70) 2 x (6 - 25)	1 x (25 - 70) 2 x (6 - 25)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)	1 x (4 - 185) 2 x (4 - 70)
1 x (12 - 2/0)	1 x (12 - 2/0)	1 x (12 - 350 kcmil) 2 x (12 - 00)	1 x (12 - 350 kcmil) 2 x (12 - 00)	1 x (12 - 350 kcmil) 2 x (12 - 00)
2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8	2 x 9 x 0.8
9 x 9 x 0.9	9 x 9 x 0.9	10 x 16 x 0.8	10 x 16 x 0.8	10 x 16 x 0.8
–	–	–	–	–
1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)	1 x (0.5 - 2.5) 2 x (0.5 - 1.0)
1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)	1 x (0.5 - 1.5) 2 x (0.5 - 0.75)
1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)	1 x (0.5 - 1.5) 2 x (0.5 - 1.0)
1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)	1 x (21 - 14) 2 x (21 - 18)
–	–	–	–	–
0.4	0.4	0.4	0.4	0.4
0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5

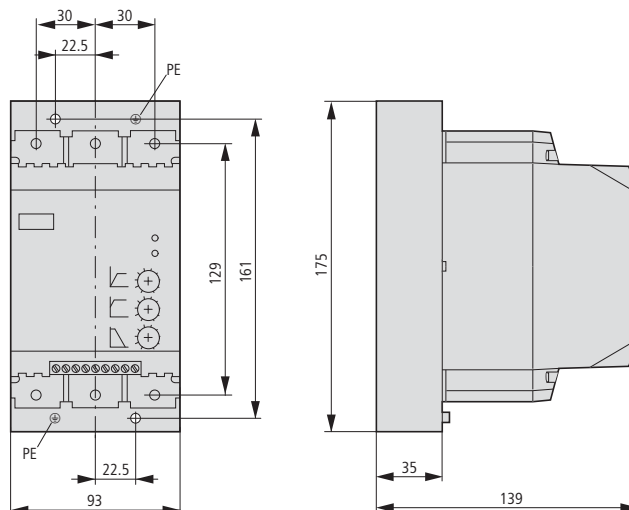


			DS6-340-22K-MX	DS6-340-30K-MX	DS6-340-37K-MX
Power section					
Rated impulse withstand voltage 1.2 μs/50 μs (pulse rise time/decay time according to IEC/EN 60947-2 and -3) Applies for control circuit/power section/enclosure	U _{imp}	kV	4	4	4
Rated insulation voltage	U _i	V AC	500	500	500
Short-circuit rating					
Type "1" of coordination at AC-53a: 3...5 : 75...10			NZMN1-M50/PKZM4-50	NZMN1-M63/PKZM4-58	NZMN1-M80
Type "2" of coordination (in addition to the fuses for type of coordination "1")			3 x 20.282.20-100	3 x 20.282.20-125	3 x 20.610.32-200
Fuse base (number x Part no.)			3 x 21.189.01	3 x 21.189.01	3 x 21.313.02
Control circuit					
Controller supply voltage					
Voltage	V		+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %
Current consumption					
Current consumption at 24 V DC	mA		35	35	35
Current consumption in operation at 24 V DC	mA		65	65	65
Current consumption at peak load (close bypass) at 24 V DC			600/50 ms	600/50 ms	600/50 ms
Control voltage					
DC operated	V DC		+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %
Current consumption at 24 V DC	mA		14	14	14
Pick-up voltage					
DC operated	V DC		+17.3 - 27	+17.3 - 27	+17.3 - 27
Drop-out voltage					
DC operated	V DC		0 - 3	0 - 3	0 - 3
Pick-up time					
DC operated	ms		250	250	250
Drop-out time					
DC operated	ms		190	190	190
Relay outputs					
Number (top of ramp)			2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)
Voltage	V AC		250	250	250
Current	A		3	3	3
Soft start function					
Ramp times					
Acceleration time	s		1 - 30	1 - 30	1 - 30
Deceleration time	s		0 - 30	0 - 30	0 - 30
Start voltage (= switch-off voltage)	%		30 - 100	30 - 100	30 - 100
Voltage reduction at stop	%		8	8	8
Torque-free time when changing direction of rotation	ms		-	-	-



Dimensions

DS6-340-22K-MX
 DS6-340-30K-MX
 DS6-340-37K-MX
 DS6-340-45K-MX
 DS6-340-55K-MX

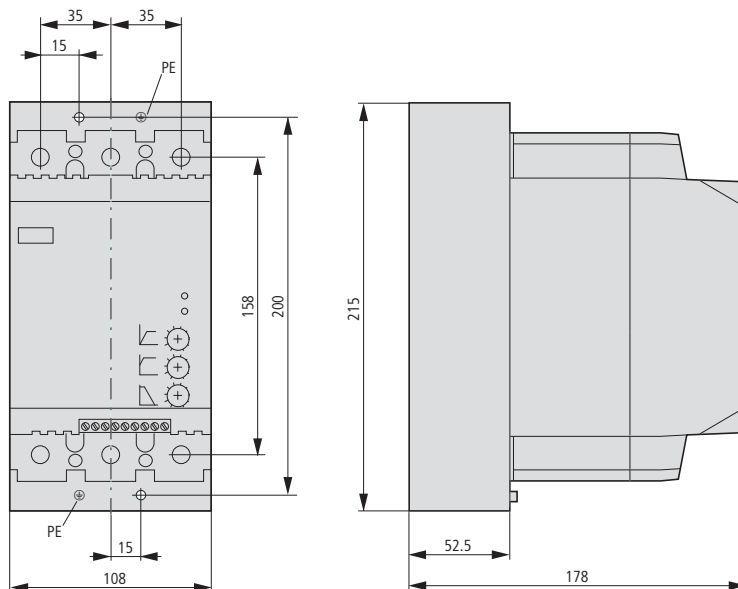


DS6-340-45K-MX	DS6-340-55K-MX	DS6-340-75K-MX	DS6-340-90K-MX	DS6-340-110K-MX
4	4	4	4	4
500	500	500	500	500
NZMN1-M100 3 x 20.610.32-200	NZMN1-M100 3 x 20.610.32-200	NZMN2-M160 3 x 20.610.32-350	NZMN2-M200 3 x 20.610.32-400	NZMN2-M200 3 x 20.610.20-500
3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02
+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %	+24 DC +10 %/-15 %
35	35	35	35	35
65	65	65	65	65
600/50 ms	600/50 ms	600/50 ms	600/50 ms	600/50 ms
+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %	+24 +10 %/-15 %
14	14	14	14	14
+17.3 - 27	+17.3 - 27	+17.3 - 27	+17.3 - 27	+17.3 - 27
0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
250	250	250	250	250
190	190	190	190	190
2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)	2 (TOR, Ready)
250	250	250	250	250
3	3	3	3	3
1 - 30	1 - 30	1 - 30	1 - 30	1 - 30
0 - 30	0 - 30	0 - 30	0 - 30	0 - 30
30 - 100	30 - 100	30 - 100	30 - 100	30 - 100
8	8	8	8	8
-	-	-	-	-



Dimensions

DS6-340-75K-MX
DS6-340-90K-MX
DS6-340-110K-MX



DS7

DS7 soft starters with SmartWire-Darwin	1
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DS7 soft starters in frame size 1 for assigned motor current up to 12 A	2
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DS7 soft starters in frame size 2 for assigned motor current up to 32 A	3
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DS7-FAN-32 device fan	4
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SmartWire-Darwin gateway	5
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SmartWire-Darwin external device plug	6
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SmartWire-Darwin ribbon cable	7
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Motor plug for tool-less plug connection	9
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PKZM0-XDM wiring set for tool-less plug connection	11
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PKZM0-XDM wiring set	13
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DS7

Description



Application

DS7 soft starter series are two-phase controlled soft starters used to soft start applications with a normal operating frequency and a rating range from 3 to 200 A (1.1 to 110 kW with a 400 V line voltage). Starting transients and DC components during startup are effectively suppressed and guarantee even motor starting.

The special actuation method (asymmetric trigger control) used for the soft start function prevents DC components (Moeller patent) that would otherwise normally be produced with two-phase controlled soft starters. This eliminates the formation of an elliptical rotary field that would cause the motor to accelerate in a non-uniform manner and lengthen its run-up time unnecessarily, making the smooth-running behavior of a DS7 soft starter comparable to that of a three-phase controlled soft starter.

Features

- The ramp time can be adjusted within a range of 1 to 30 s (for starting) or 0 to 30 s (for stopping) with a potentiometer.
- The start voltage (or start torque) can be adjusted within a range of 30 to 100 percent of the line voltage with a potentiometer.
- Significant reduction in switch-on current, achieved with a short soft start ramp time (min. 1 s) for lamp and heating loads.
- Internal bypass relay in DS7-340 models: switches on automatically after the end of the ramp, bypassing the internal thyristors.
- This makes it possible to comply with radio interference level B without any additional measures.
- The motor's thermal load is smaller than it would be without asymmetric trigger control.
- Designed specifically for long cables.

Functions

Typical applications for DS7 soft starter series are:

- Pump drives: soft starting three-phase motors prevents fluid hammers. The mechanical load on the entire system is decreased, increasing its durability.
- Fan drives: soft starting keeps fan belts from slipping, preventing premature wear. This lowers operating costs and extends the system's lifespan.
- Conveyor belts: conveyor belts start running smoothly, instead of starting with a jolt. This ensures that any goods being conveyed do not topple over. Mechanical damage to the belt itself is avoided, making it more durable.

Documentation

Surface mounting and standard mounting procedures are described in the corresponding installation instructions and in the manual.

Installation instructions

Instructional leaflet 8250-2541: For devices with frame size 1 (up to 12 A motor rating)

Instructional leaflet 8250-2542: For devices with frame size 2 (up to 32 A motor rating)

Instructional leaflet 8250-2543: For devices with frame sizes 3 and 4 (up to 200 A motor rating)

Manual

AWB 8250-1634

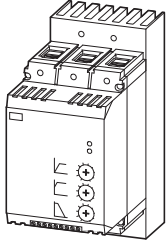

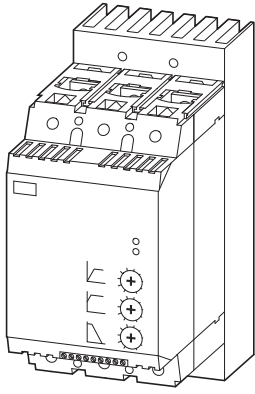
You can download the documentation for the DS7 soft starters from the Internet:

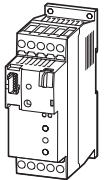

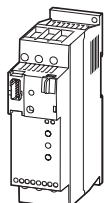
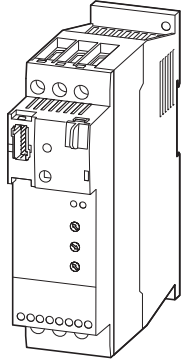
www.moeller.net/support

Ordering








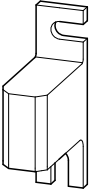






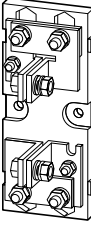

	Rated operational current	Assigned motor rating at		Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	Device (AC-53)	400 V	480 V				
	I _e	P	P				
	A	kW	HP				
DS7 soft starters							
Soft starters for three-phase loads, mains supply voltage 230 – 480 V AC (50/60 Hz) Rated control circuit voltage U _c : 24 V AC/DC							
	4	1.5	2	DS7-340SX004N0-N 134847		1 off	Product Standards IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05 CE marking Request filed for UL and CSA NA Certification Request filed for UL and CSA Suitable for Branch circuits Max. Voltage Rating 480 V Degree of Protection IP20; UL/CSA Part no. 1
	7	3	3	DS7-340SX007N0-N 134849			
	9	4	5	DS7-340SX009N0-N 134910			
	12	5.5	7.5	DS7-340SX012N0-N 134911			
	16	7.5	10	DS7-340SX016N0-N 134912			
	24	11	15	DS7-340SX024N0-N 134913			
	32	15	20	DS7-340SX032N0-N 134914			
	41	22	30	DS7-340SX041N0-N 134916			
	55	30	40	DS7-340SX055N0-N 134917			
	70	37	50	DS7-340SX070N0-N 134918			
	81	45	60	DS7-340SX081N0-N 134919			
	100	55	75	DS7-340SX100N0-N 134920			
	135	75	100	DS7-340SX135N0-N 134921			
	160	90	125	DS7-340SX160N0-N 134922			
	200	110	150	DS7-340SX200N0-N 134923			
Rated control circuit voltage U_c: 110/230 V AC							
	4	1.5	2	DS7-342SX004N0-N 134925		1 off	Product Standards IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CSA-C22.2 No 14-05 CE marking Request filed for UL and CSA NA Certification Request filed for UL and CSA Suitable for Branch circuits Max. Voltage Rating 480 V Degree of Protection IP20; UL/CSA Part no. 1
	7	3	3	DS7-342SX007N0-N 134927			
	9	4	5	DS7-342SX009N0-N 134928			
	12	5.5	7.5	DS7-342SX012N0-N 134929			
	16	7.5	10	DS7-342SX016N0-N 134930			
	24	11	15	DS7-342SX024N0-N 134931			
	32	15	20	DS7-342SX032N0-N 134932			




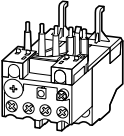

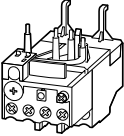




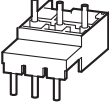



Rated operational current Device (AC-53) I _e A	Assigned motor rating at		Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
	400 V	480 V				
	P	P				
	kW	HP				
	41	22	30	DS7-342SX041N0-N 134934	1 off 	Product Standards IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CE marking Request filed for UL and CSA NA Certification Suitable for Max. Voltage Rating Degree of Protection Branch circuits 480 V IP20; UL/CSA Part no. 1
	55	30	40	DS7-342SX055N0-N 134935		
	70	37	50	DS7-342SX070N0-N 134936		
	81	45	60	DS7-342SX081N0-N 134937		
	100	55	75	DS7-342SX100N0-N 134938		
	135	75	100	DS7-342SX135N0-N 134939		
	160	90	125	DS7-342SX160N0-N 134940		
	200	110	150	DS7-342SX200N0-N 134941		

Rated control circuit voltage U _c : 24 VDC, for SmartWire-Darwin				Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America
Rated operational current	Assigned motor rating at	400 V	480 V				
	P	P					
	kW	HP					
	4	1.5	2	DS7-34DSX004N0-D 134943	1 off 	Product Standards IEC/EN 60947-4-2; GB 14048.6; UL 508; CSA-C22.2 No 0-M91; CE marking Request filed for UL and CSA NA Certification Suitable for Max. Voltage Rating Degree of Protection Branch circuits 480 V IP20; UL/CSA Part no. 1	
	7	3	3	DS7-34DSX007N0-D 134945			
	9	4	5	DS7-34DSX009N0-D 134946			
	12	5.5	7.5	DS7-34DSX012N0-D 134947			
	16	7.5	10	DS7-34DSX016N0-D 134948			
	24	11	15	DS7-34DSX024N0-D 134949			
	32	15	20	DS7-34DSX032N0-D 134950			
	41	22	30	DS7-34DSX041N0-D 134952			
	55	30	40	DS7-34DSX055N0-D 134953			
	70	37	50	DS7-34DSX070N0-D 134954			
	81	45	60	DS7-34DSX081N0-D 134955			
	100	55	75	DS7-34DSX100N0-D 134956			
	135	75	100	DS7-34DSX135N0-D 134957			
	160	90	125	DS7-34DSX160N0-D 134958			
	200	110	150	DS7-34DSX200N0-D 134959			











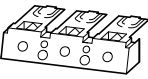

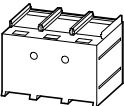

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Rated operational current A	Maximum power loss P _v W	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Accessories							
Superfast semiconductor fuses							
16	5	10 x 38	DS7-34...SX004N0-...	50.179.06-16 232077		10 off 	Product Standards UL 248-13 CE marking UL File No. E180276 UL CCN JFHR2 CSA File No. UL report applies to both US and Canada CSA Class No. JFHR8 NA Certification UL Recognized, certified by UL for use in Canada Max. Voltage Rating 660 V
25	7	22 x 58	DS7-34...SX007N0-...	50.140.06-25 138284		1 off 	
32	9	80	DS7-34...SX009N0-... DS7-34...SX012N0-...	20.282.20-32 138285		1 off 	
50	15	22 x 58	DS7-34...SX016N0-...	50.140.06-50 232079		10 off 	
63	16	22 x 58	DS7-34...SX024N0-...	50.140.06-63 232080		10 off 	
80	18	22 x 58	DS7-34...SX032N0-...	50.140.06-80 232081		10 off 	
Fuse links							
	100	22	80	DS7-34...SX041N0-...	20.282.20-100 106654	6 off 	Product Standards UL 248-13 CE marking UL File No. E180276 UL CCN JFHR2 CSA File No. UL report applies to both US and Canada CSA Class No. JFHR8 NA Certification UL Recognized, certified by UL for use in Canada Max. Voltage Rating 660 V
	125	24	80	DS7-34...SX055N0-...	20.282.20-125 232087	6 off 	
	200	44	80	DS7-34...SX070N0-... DS7-34...SX081N0-... DS7-34...SX100N0-...	20.610.32-200 106475	3 off 	
	350	61	80	DS7-34...SX135N0-...	20.610.32-350 221161	2 off 	
	400	70	80	DS7-34...SX160N0-...	20.610.32-400 106476	3 off 	
	500	72	80	DS7-34...SX200N0-...	20.610.32-500 221163	2 off 	
Fuse bases							
	-	-	10 x 38	50.179.06-...	51.063.04 232082	12 off 	Product Standards UL 512; CE marking UL File No. E186970 UL CCN IZLT2
	-	-	22 x 58	50.140.06-...	51.060.04 232084	6 off	
	-	-	80	20.282.20-... 20.189.20-...	21.189.01 232064	5 off	
	-	-	80	20.6xx.32-... 20.6...32-...	21.313.02 232076	2 off	









For use with	Part no. Article no.	Price See price list	Std. pack	Information relevant for export to North America 
Overload relays				
	DS7-34...SX004...	ZB12-4 278438	1 off 	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: -
	DS7-34...SX007...	ZB12-10 278440		
	DS7-34...SX009...	ZB12-12 278441		
	DS7-34...SX012...	ZB12-12 278441		
	DS7-34...SX016...	ZB32-16 278452	1 off 	
	DS7-34...SX024...	ZB32-24 278453		
	DS7-34...SX032...	ZB32-32 278454		
PKZ-DS7 wiring set				
	DS7-34...SX004...	PKZM0-XDM12 283149	1 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No. E36332 UL CCN NLRV CSA File No. 12528 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified
	DS7-34...SX007...			
DS7-34...SX009...				
DS7-34...SX012...				
				
Electric contact module				
	DS7-34...SX016... DS7-34...SX024... DS7-34...SX032...	PKZM0-XM32DE 239349	5 off 	Product Standards UL 508; CSA-C22.2 No. 14; IEC60947-4-1; CE marking UL File No. E36332 UL CCN NLRV CSA File No. 12528 CSA Class No. 3211-05 NA Certification UL Listed, CSA certified
Motor feeder plug				
	DS7-34...SX004... DS7-34...SX007... DS7-34...SX009... DS7-34...SX012...	DILM12-XMCP/T 121770	1 off 	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking NA Certification Request filed for UL and CSA
Busbar adapter				
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	BBA0L-25 142526	1 off	-
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N... PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	BBA0L-32 142527	1 off	
Top-hat rail adapter				
Consists of: 45 mm wide adapter plate				
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N...	PKZM0-XC45L 142529	1 off	
	PKZM0, PKE + DS7...004N... PKZM0, PKE + DS7...007N... PKZM0, PKE + DS7...009N... PKZM0, PKE + DS7...012N... PKZM0, PKE + DS7...016N... PKZM0, PKE + DS7...024N... PKZM0, PKE + DS7...032N...	PKZM0-XC45L/2 142570	1 off	

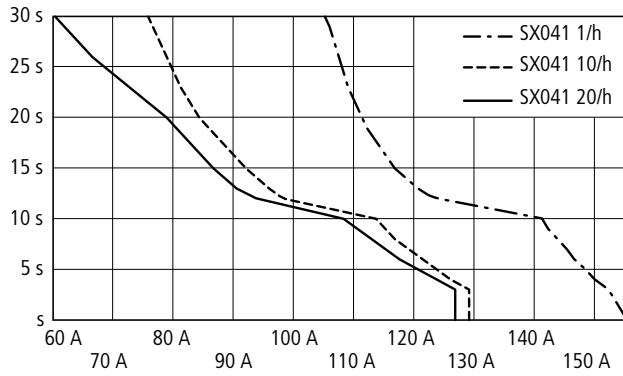
HPL09023EN

For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America 
Three-phase commoning links					
For the DS7's primary side, protected against accidental contact, short-circuit proof, $U_e = 690\text{ V}$, $I_u = 35\text{ A}$, can be lengthened with rotated mounting					
	DS7-34...SX004... DS7-34...SX007...	DILM12-XDSB0/3 240084	5 off 	Suitable for 3 DS7 soft starters Length 135 mm	Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. NLRV UL CCN CSA File No. 012528 CSA Class No. 2411-03 NA Certification UL Listed, CSA certified
	DS7-34...SX009... DS7-34...SX012...	DILM12-XDSB0/4 240085	5 off 	Suitable for 4 DS7 soft starters Length 180 mm	
		DILM12-XDSB0/5 240086	5 off 	Suitable for 5 DS7 soft starters Length 225 mm	
Incoming connection block					
	DS7-34...SX004... DS7-34...SX007... DS7-34...SX009... DS7-34...SX012...	DILM12-XEK 240083	5 off 		Product Standards IEC/EN 60947-4-1; UL 508; CSA-C22.2 No. 14-05; CE marking E36332 UL File No. NLRV UL CCN CSA File No. 012528 CSA Class No. 2411-03 NA Certification UL Listed, CSA certified
Terminal cover					
Knockout, no UL/CSA approval for box terminal					
	DS7-34...SX041... DS7-34...SX055... DS7-34...SX070... DS7-34...SX081... DS7-34...SX100...	NZM1-XKSFA 100780	1 off 	Type contains parts for a terminal located at top or bottom for 3 pole switches. Increased protection against accidental contact (simplified protection against contact with a finger).	UL/CSA certification not required
Terminal cover					
knockout					
	NZM2, PN2, N(S)2 DS6-340-75K...110K DS7-34...SX135... DS7-34...SX160... DS7-34...SX200...	NZM2-XKSFA 104640	1 off 	Type contains parts for a terminal located at top or bottom for 3 pole switches. Protection against accidental contact increased to IP2X. Protection when reaching into the cable connection area with the connection of cables in the box terminal. With two conductors max cross-section 22 mm ² or AWG4. Cannot be combined with NZM-XSTK control circuit terminal.	UL/CSA certification not required
Cover					
	DS7-34...SX135... DS7-34...SX160... DS7-34...SX200...	NZM2-XKSA 260038	1 off 	Type contains parts for a terminal located at top or bottom for 3 pole switches. Protection against direct contact where cable lugs, busbars or tunnel terminals are used. When using insulated conductor material to protection type IP1X.	Product Standards UL489; CSA-C22.2 No. 5-09; IEC60947, CE marking E31593 UL File No. DIHS UL CCN CSA File No. 22086 CSA Class No. 1432-01 NA Certification UL Listed, CSA certified Refer to main component information Suitable for

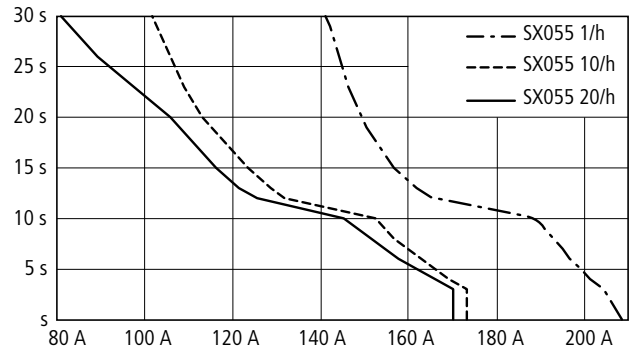


For use with	Part no. Article no.	Price See price list	Std. pack	Notes	Information relevant for export to North America 
IP2X protection against contact with a finger					
For box terminal 	DS7-34...SX135... DS7-34...SX160... DS7-34...SX200...	NZM2-XIPK 266773	1 off 	Type contains parts for a terminal located at top or bottom for 3 pole switches. Increased protection against direct contact to IP2X. Protection when reaching into the cable connection area with the connection of cables in the box terminal. With two conductors max cross-section 25 mm ² or AWG4. Cannot be combined with NZM-XSTK control circuit terminal.	UL/CSA certification not required
IP2X protection against contact with a finger					
for NZM2-XKSA cover 	DS7-34...SX135... DS7-34...SX160... DS7-34...SX200...	NZM2-XIPA 266777	1 off 		UL/CSA certification not required
Mounting kit					
When using covers NZM1-XKSFA and NZM2-XKSA	DS7-34xSX041N0-x DS7-34xSX055N0-x DS7-34xSX070N0-x DS7-34xSX081N0-x DS7-34xSX100N0-x DS7-34xSX135N0-x DS7-34xSX160N0-x DS7-34xSX200N0-x	DE6-MNT-NZM 107323	1 off		
Equipment fan					
For increasing the load cycle (more starts per hour or longer-lasting starting current)	DS7-34...SX004... DS7-34...SX007... DS7-34...SX009... DS7-34...SX012... DS7-34...SX016... DS7-34...SX024... DS7-34...SX032...	DS7-FAN-032 135553	1 off 		NA Certification Request filed for UL and CSA

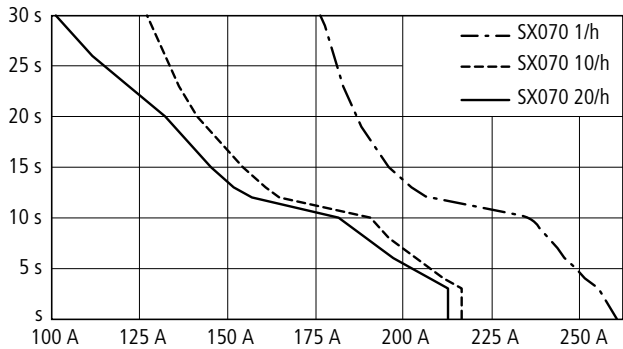
DS7-34...SX041...



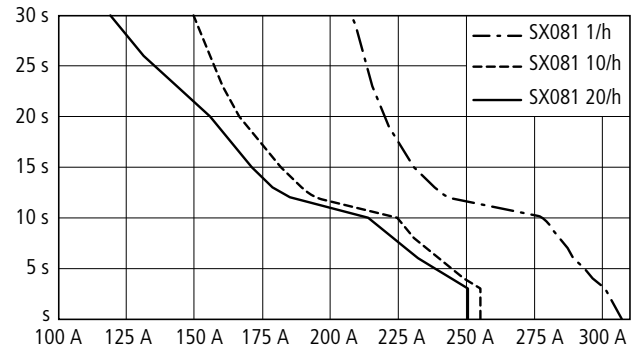
DS7-34...SX055...



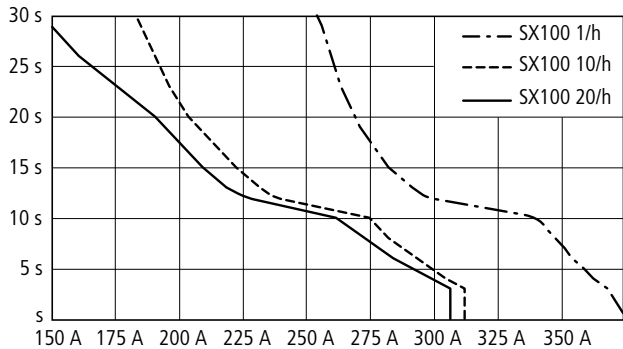
DS7-34...SX070...



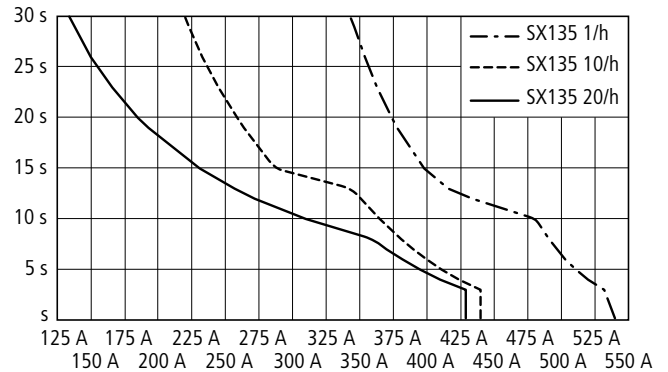
DS7-34...SX081...



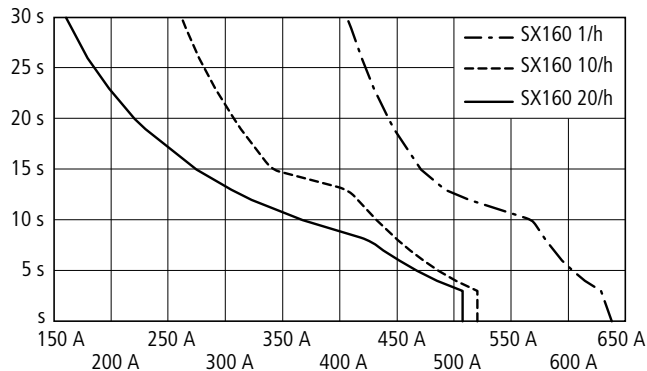
DS7-34...SX100...



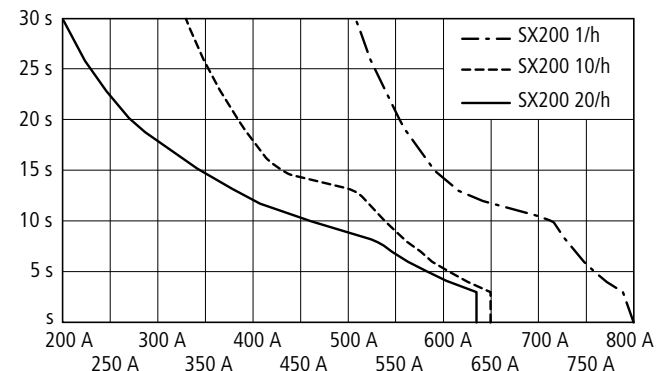
DS7-34...SX135...




DS7-34...SX160...

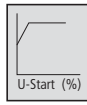
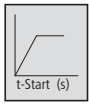
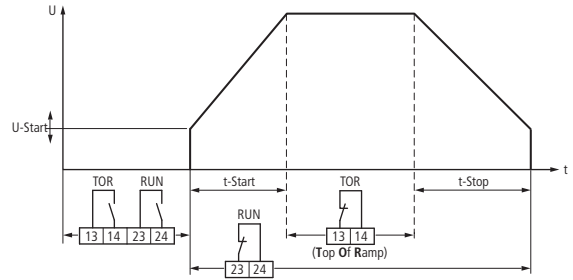


DS7-34...SX200...



Potentiometer settings

U	I		I_{min}	U_{min}
250 V ~	0.2 A	(R)	10 mA	250 V ~
30 V H	0.7 A	(L) (AC11)	100 mA	5 V H



t-Start (s)

U-Start %

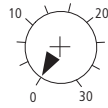
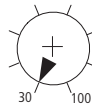
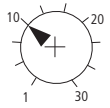
t-Stop (s)

J → 0

~10

~30

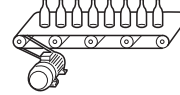
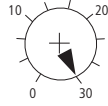
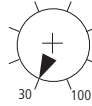
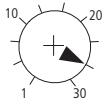
0



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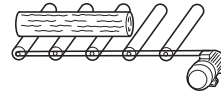
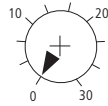
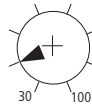
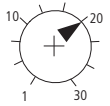
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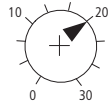
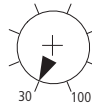
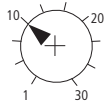
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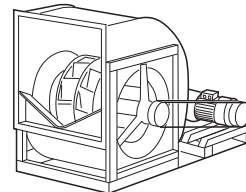
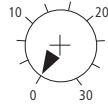
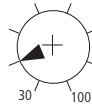
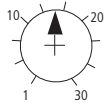
~20



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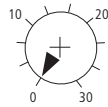
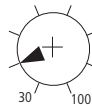
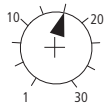
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~18

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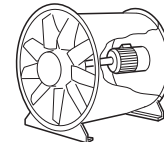
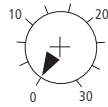
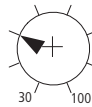
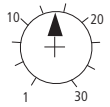


J → ∞
→ DS7 > P_{Motor}

~15

~50

0

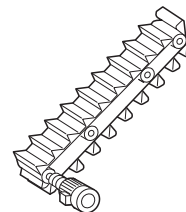
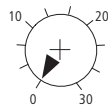
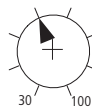
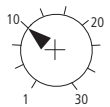


→ DS7 > P_{Motor}

~10

~60

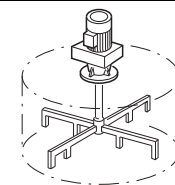
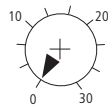
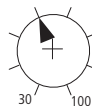
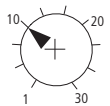
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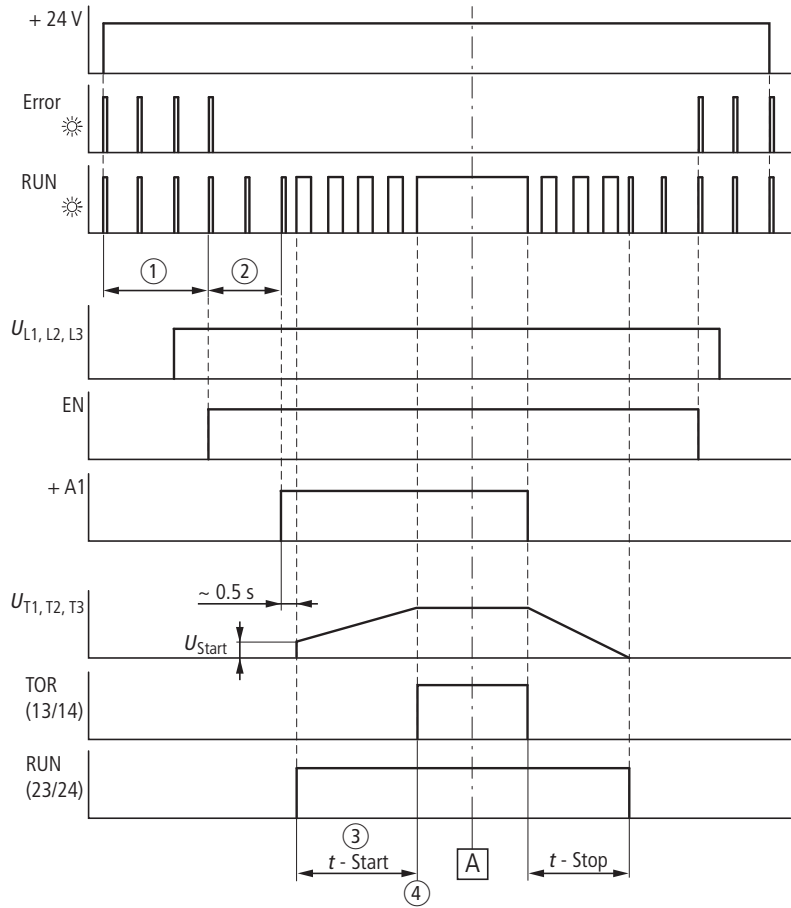
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0



→ DS7 > P_{Motor}

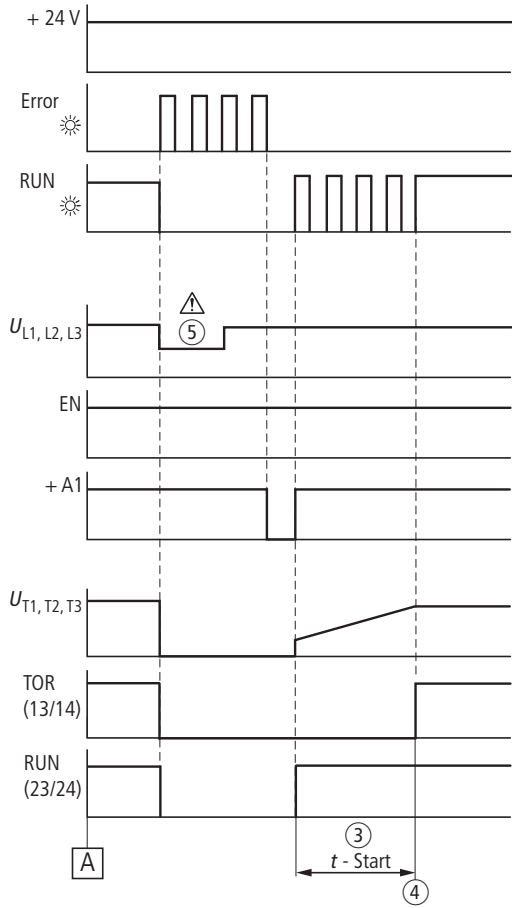
Operation



RUN-LED green
Error-LED red

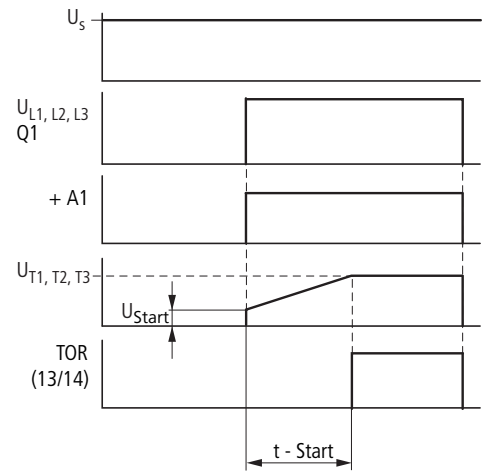
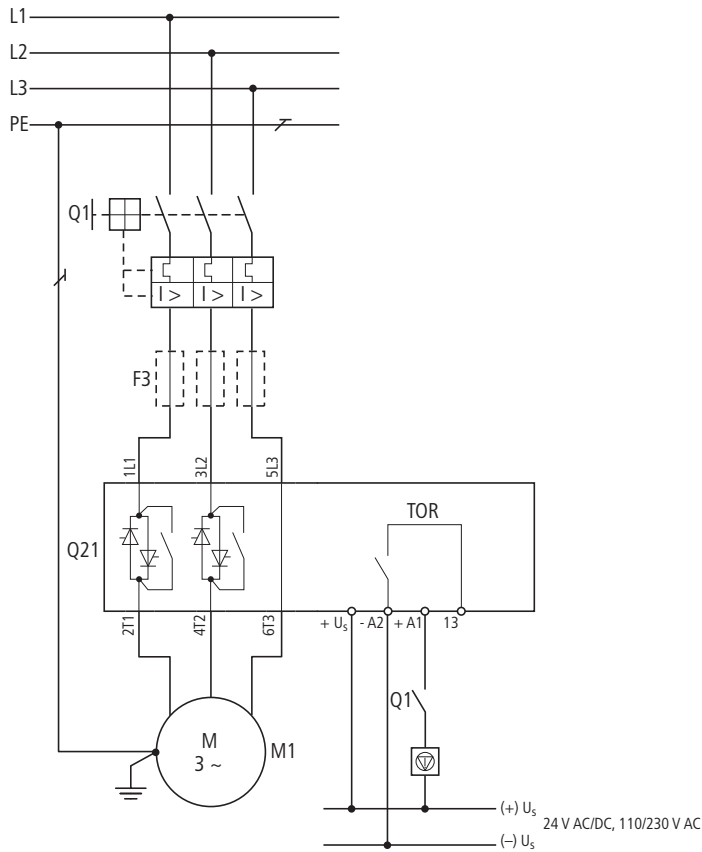
- ① Initialization
- ② Ready for operation
- ③ In ramp
- ④ Top of ramp reached
- ⑤ Fault – One phase drops out

Fault



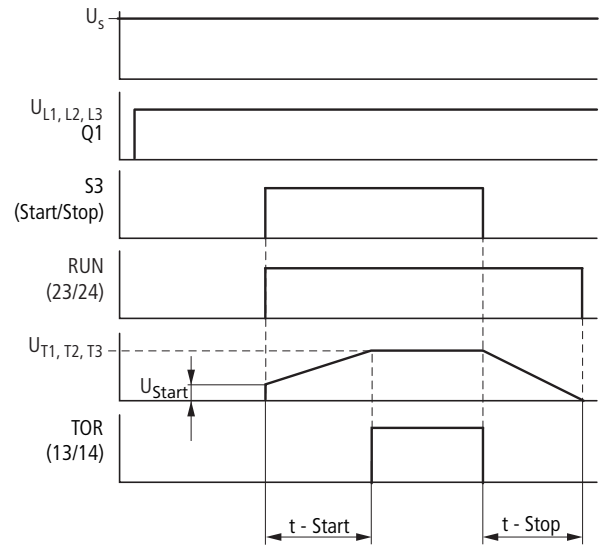
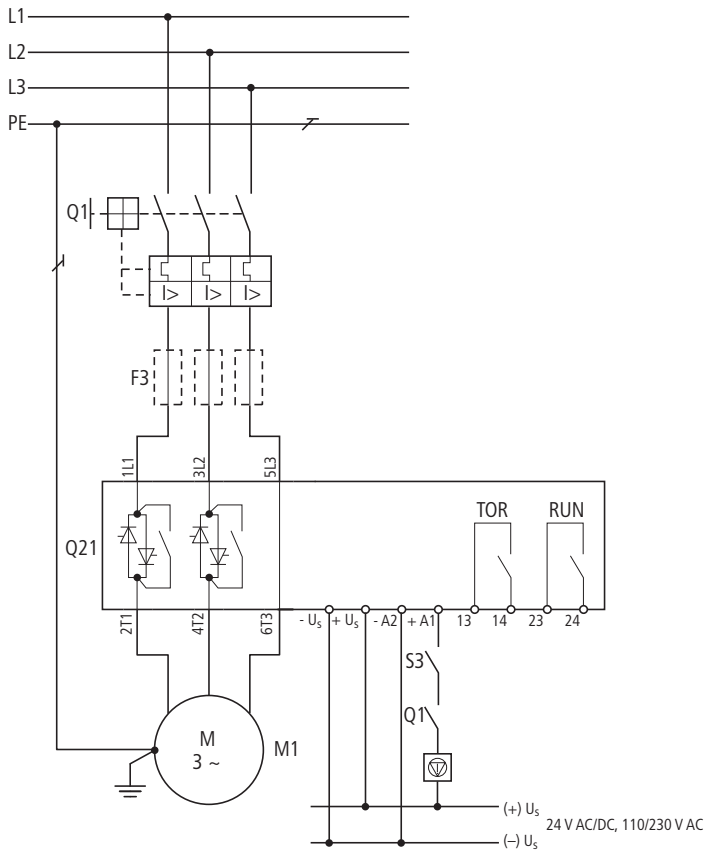
Standard connection

up to 12 A




Standard connection

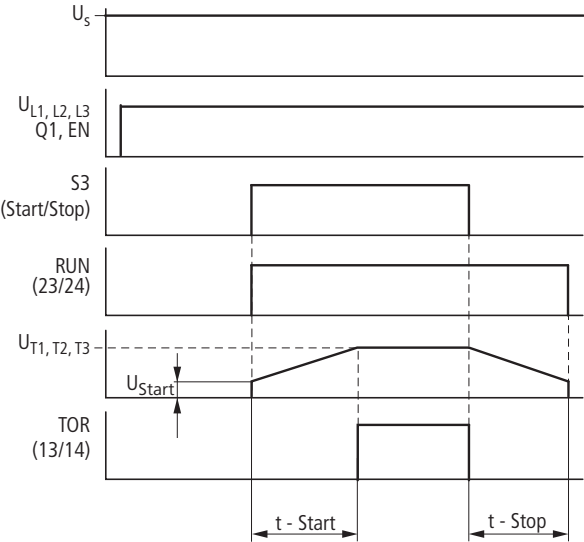
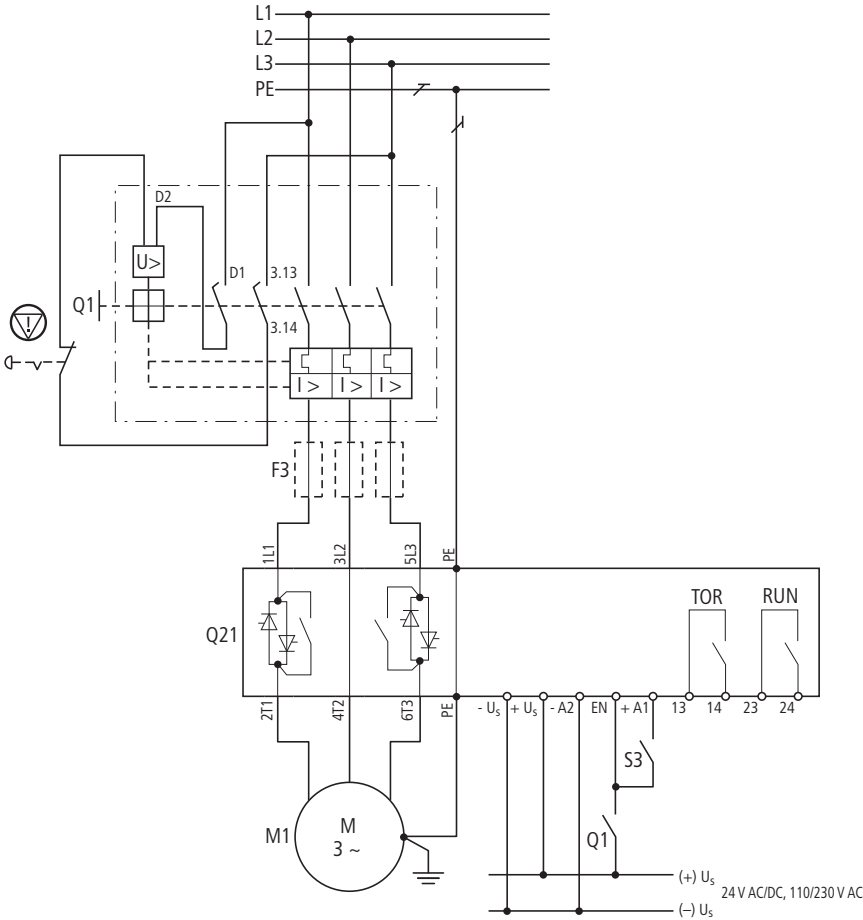
up to 32 A



**Standard connection
 over 32 A**

With Emergency switching off function according to IEC/EN 60 204-1 and VDE 0113 Part 1

-  = Emergency switching off
- ① Control circuit terminal
- ② Undervoltage release with early-make auxiliary contact



Assigned Motor rating at		Rated operational current ¹⁾			Part no. Soft starters (device to be selected)	Soft starter function Cable protection ²⁾ Type "1" coordination
400 V P kWh	480 V P HP	Motor I_e A	Soft starters I_e A	Cable		
					Soft starters for three-phase mains connection, low operating frequency (5 s, 3 x I_e, 10 starts/h)	
1.5	2	3.6	4		DS7-34xSX004N0-x	PKZM0-4 (+ CL-PKZ0)
3	3	6.6	7		DS7-34xSX007N0-x	PKZM0-10 (+ CL-PKZ0)
4	5	8.5	9		DS7-34xSX009N0-x	PKZM0-10 (+ CL-PKZ0)
5.5	7.5	11.3	12		DS7-34xSX012N0-x	PKZM0-12 (+ CL-PKZ0)
7.5	10	15.2	16		DS7-34xSX016N0-x	PKZM0-16 (+ CL-PKZ0)
11	15	21.7	24		DS7-34xSX024N0-x	PKZM0-25 (+ CL-PKZ0)
15	20	29.3	32		DS7-34xSX032N0-x	PKZM0-32 (+ CL-PKZ0)
22	25	41	41		DS7-34xSX041N0-x	NZMN1-M50 / PKZM4-50
30	30	55	55		DS7-34xSX055N0-x	NZMN1-M63 / PKZM4-58
37	40	68	70		DS7-34xSX070N0-x	NZMN1-M80
45	50	81	81		DS7-34xSX081N0-x	NZMN1-M100
55	60	99	100		DS7-34xSX100N0-x	NZMN1-M100
75	75	134	135		DS7-34xSX135N0-x	NZMN2-M160
90	100	160	160		DS7-34xSX160N0-x	NZMN2-M200
110	125	196	200		DS7-34xSX200N0-x	NZMN2-M200

Notes

¹⁾ Rated operational current based on the load cycle specified here.

²⁾ Indicates the circuit-breaker required for the indicated load cycle. At different duty cycles (operating frequency, overcurrent, overcurrent time, duty factor), this value changes and must then be adapted accordingly.

³⁾ An external overload relay is required if the main contacts are not to be disconnected in the event of an overload and a controlled soft stop is desired instead.

⁴⁾ A mains contactor is not required. Disconnection characteristics in accordance with VDE can only be ensured with the specified circuit-breaker.

⁵⁾ The superfast semiconductor fuses protect the soft starters from motor-side short-circuits. This can not, however, prevent damage caused by voltage peaks, for example through lightning strike.

Soft starter function with soft stop in case of overload		Mains contactor	Semiconductor protection (optional, fuse required for type 2 coordination in addition to cable protection for type 1 coordination) ⁵⁾	
Cable protection ²⁾ Type "1" coordination	Overload relays ³⁾	optional ⁴⁾	Fuses Number x Part no.	Fuse holders Number x Part no.
PKM0-4 (+ CL-PKZ0)	ZB12-4	DILM7	3 × 50.179.06-16	3 × 51.060.04
PKM0-10 (+ CL-PKZ0)	ZB12-10	DILM9	3 × 50.140.06-25	3 × 51.060.04
PKM0-10 (+ CL-PKZ0)	ZB12-10	DILM9	3 × 20.282.20-32	3 × 21.189.01
PKM0-12 (+ CL-PKZ0)	ZB12-12	DILM12	3 × 20.282.20-32	3 × 21.189.01
PZM0-16 (+ CL-PKZ0)	ZB32-16	DILM17	3 × 50.140.06-50	3 × 51.060.04
PZM0-25 (+ CL-PKZ0)	ZB32-24	DILM25	3 × 50.140.06-63	3 × 51.060.04
PZM0-32 (+ CL-PKZ0)	ZB32-32	DILM32	3 × 50.140.06-80	3 × 51.060.04
NZMN1-M50 / PKZM4-50	ZB65-40+ZB65-XEZ	DILM50	3 × 50.140.06-80	3 × 21.189.01
NZMN1-M63 / PKZM4-58	ZB65-57+ZB65-XEZ	DILM65	3 × 20.282.20-125	3 × 21.189.01
NZMN1-M80	ZB150-70/KK	DILM80	3 × 20.610.32-200	3 × 21.313.02
NZMN1-M100	ZB150-100/KK	DILM95	3 × 20.610.32-200	3 × 21.313.02
NZMN1-M100	ZB150-100/KK	DILM115	3 × 20.610.32-200	3 × 21.313.02
NZMN2-M160	ZB150-150/KK	DILM150	3 × 20.610.32-350	3 × 21.313.02
NZMN2-M200	Z5-160/FF250	DILM185	3 × 20.610.32-400	3 × 21.313.02
NZMN2-M200	Z5-220/FF250	DILM225	3 × 20.610.32-500	3 × 21.313.02



				DS7-340SX004	DS7-340SX007	DS7-340SX009	DS7-340SX012	
General								
Standards				IEC/EN 60 947-4-2				
Climatic proofing				Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3				
Ambient temperature		°C		0...40, up to 60 °C at 1 % derating per Kelvin temperature rise				
Ambient temperature storage		°C		-25 - +55				
Installation altitude	Higher installation altitude upon request			0...1000 m, above that 1 % derating per 100 m, up to 2000 m				
Mounting position				Vertical				
Protection type				IP20				
	Protection type applies to the front and operator control and operating elements. Protection type from all sides is IP00.			Protection type IP40 can be achieved on all sides with covers from the NZM range.				
Protection against direct contact				Finger- and back-of-hand proof				
Overvoltage category/pollution degree				II/2				
Mechanical shock resistance				8 g/11 ms				
Vibration resistance to EN 60721-3-2				2M2				
Average heat dissipation with nominal load cycle		W		0.2	0.35	0.45	0.6	
Dimensions (W x H x D)		mm		45 x 130 x 95				
Radio interference level				B				
Weight		kg		0.35	0.35	0.35	0.35	
Main contacts								
Rated operational voltage		V AC		230 - 460				
Mains frequency		Hz		50/60				
Rated operational current	AC-53 (motor loads)	I _e	A	4	7	9	12	
Assigned motor rating	230 V	P	kWh	0.75	1.5	2.2	3	
	400 V	P	kWh	1.5	3	4	5.5	
	480 V	P	HP	2	3	5	7.5	
Overload cycle to EN 60947-4-2								
	AC-53a (int. bypass)	For AC-53a:3-5:75-10	A	4	7	9	12	
Terminal capacity								
Power cable (box terminal)	Solid		mm ²	1 x (0.75 - 4); 2 x (0.75 - 2.5)				
	Flexible with ferrule		mm ²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)				
	Stranded		mm ²	-	-	-	-	
	Solid or stranded		AWG	18 - 10				
	Flat conductor		min, mm max, mm	-	-	-	-	
	Tightening torque		Nm	1.2	1.2	1.2	1.2	
Control cables	Solid		mm ²	1 x (0.75 - 4); 2 x (0.75 - 2.5)				
	Flexible with ferrule		mm ²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)				
	Stranded		mm ²	-	-	-	-	
	Solid or stranded		AWG	18 - 10				
	Tightening torque		Nm	1.2	1.2	1.2	1.2	
	Screwdriver (flat blade)		mm	0.8 x 5.5; 1 x 6				
Power section								
Rated impulse withstand voltage		U _{imp}	1.2/50 μs	kV	4	4	4	4
Rated insulation voltage		U _i		V	500	500	500	500
Short-circuit rating								
	Type "1" coordination	For AC-53a:3-5:75-10			PKZM0-4 (+ CL-PKZO)	PKZM0-10 (+ CL-PKZO)	PKZM0-10 (+ CL-PKZO)	PKZM0-12 (+ CL-PKZO)
	Type "2" coordination (in addition to fuses for type "1" of coordination)				3 x 50.179.06-16	3 x 50.140.06-25	3 x 20.282.20-32	3 x 20.282.20-32
	Fuse holders				3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 51.060.04
Control circuit								
Controller supply voltage	Voltage		U _s	V	24 V AC/DC + 10 % / - 15 %			
	Current consumption at no load 24 V DC			mA	-	-	-	-
	Current consumption in operation at 24 V DC			mA	-	-	-	-
	Current consumption at peak load (close bypass) at 24 V DC			mA/ms	-	-	-	-
Control voltage range	AC operated				24 V AC/DC + 10 % / - 15 %			
	Current consumption at 230 V DC			mA	-	-	-	-
Pick-up voltage	DC operated			V DC	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27
	AC operated			V AC	-	-	-	-
Drop-out voltage	DC operated			V DC	0 - +3	0 - +3	0 - +3	0 - +3
	AC operated			V AC	-	-	-	-
Pick-up time	AC operated			ms	-	-	-	-
Drop-out time	AC operated			ms	-	-	-	-
Relay outputs	Number				1 (TOR)			
	Voltage range			V AC	250			
	Current range			A	1 A, AC-1			
Soft start functions								
Ramp times	Acceleration			s	1 - 30			
	Deceleration			s	0 - 30			
Start voltage (= switch-off voltage)					30 % - 100 %			
Voltage reduction at stop					8 %			

DS7-340SX016	DS7-340SX024	DS7-340SX032	DS7-340SX041	DS7-340SX055	DS7-340SX070	DS7-340SX081	DS7-340SX100	DS7-340SX135	DS7-340SX160	DS7-340SX200
IEC/EN 60 947-4-2										
Damp heat, cyclic, to DIN IEC Part 68 2-10,										
Damp heat, constant, to DIN IEC 68 Part 2-3										
0...40, up to 60 °C at 1 % derating per Kelvin temperature rise										
-25 - +55										
0...1000 m, above that 1 % derating per 100 m, up to 2000 m										
Vertical										
IP20										
Protection type IP40 can be achieved on all sides with covers from the NZM range.										
Finger- and back-of-hand proof										
II/2										
8 g/11 ms										
2M2										
0.8	1.1	1.5	7	10	13	18	25	24	30	42
45 x 150 x 118										
B										
0.4	0.4	0.4	1.8	1.8	1.8	1.8	1.8	3.7	3.7	3.7
230 - 460										
50/60										
16	24	32	41	55	70	81	100	135	160	200
4	5.5	7.5	11	15	15	22	30	30	45	55
7.5	11	15	22	30	37	45	55	75	90	110
10	15	20	30	40	50	60	75	100	125	150
16	24	32	41	55	70	81	100	135	160	200
1 x (0.75 - 16); 2 x (0.75 - 10)			1 x (25 - 70); 2 x (6 - 25)				1 x (4 - 185); 2 x (4 - 70)			
1 x (0.75 - 16); 2 x (0.75 - 10)			-				-			
1 x 16			1 x (25 - 70); 2 x (6 - 25)				1 x (4 - 185); 2 x (4 - 70)			
18 - 6			1 x (12 - 2/0)				1 x (12 - 350 kcmil); 2 x (12 - 00)			
-			2 x 9 x 0.8				2 x 9 x 0.8			
-			9 x 9 x 0.8				10 x 16 x 0.8			
3			-				-			
1 x (0.5 - 2.5); 2 x (0.5 - 1.0)			-				-			
1 x (0.5 - 1.5); 2 x (0.5 - 0.75)			-				-			
1 x (0.5 - 1.5); 2 x (0.5 - 1.0)			-				-			
1 x (21 - 14); 2 x (21 - 18)			-				-			
1.2	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.6 x 3.5										
4	4	4	4	4	4	4	4	4	4	4
500	500	500	500	500	500	500	500	500	500	500
PKZM0-16 (+ CL-PKZ0)	PKZM0-25 (+ CL-PKZ0)	PKZM0-32 (+ CL-PKZ0)	NZMN1-M50/ PKZM4-50	NZMN1-M63/ PKZM4-58	NZMN1-M80	NZMN1-M100	NZMN1-M100	NZMN2-M160	NZMN2-M200	NZMN2-M200
3 x	3 x	3 x	3 x	3 x	3 x	3 x	3 x	3 x	3 x	3 x
50.140.06-50	50.140.06-63	50.140.06-80	20.282.20-100	20.282.20-125	20.610.32-200	20.610.32-200	20.610.32-200	20.610.32-350	20.610.32-400	20.610.32-500
3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 21.189.01	3 x 21.189.01	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02	3 x 21.313.02
24 V AC/DC + 10 % / - 15 %										
-	-	-	35	35	35	35	35	35	35	35
-	-	-	65	65	65	65	65	65	65	65
-	-	-	600/50	600/50	600/50	600/50	600/50	600/50	600/50	600/50
24 V AC/DC + 10 % / - 15 %										
-	-	-	14	14	14	14	14	14	14	14
+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27
-	-	-	-	-	-	-	-	-	-	-
0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3	0 - +3
-	-	-	-	-	-	-	-	-	-	-
-	-	-	250	250	250	250	250	250	250	250
-	-	-	190	190	190	190	190	190	190	190
2 (TOR)										
250										
1 A, AC-1			3 A, AC-1							
1 - 30										
0 - 30										
30 % - 100 %										
8 %										



				DS7-342SX004	DS7-342SX007	DS7-342SX009	DS7-342SX012	
General								
Standards				IEC/EN 60 947-4-2				
Climatic proofing				Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3				
Ambient temperature		°C		0...40, up to 60 °C at 1 % derating per Kelvin temperature rise				
Ambient temperature storage		°C		-25 - +55				
Installation altitude	Higher installation altitude upon request			0...1000 m, above that 1 % derating per 100 m, up to 2000 m				
Mounting position				Vertical				
Protection type				IP20				
	Protection type applies to the front and operator control and operating elements. Protection type from all sides is IP00.			Protection type IP40 can be achieved on all sides with covers from the NZM range.				
Protection against direct contact				Finger- and back-of-hand proof				
Overvoltage category/pollution degree				II/2				
Mechanical shock resistance				8 g/11 ms				
Vibration resistance to EN 60721-3-2				2M2				
Average heat dissipation with nominal load cycle		W		0.2	0.35	0.45	0.6	
Dimensions (W x H x D)		mm		45 x 130 x 95				
Radio interference level				B				
Weight		kg		0.4	0.4	0.4	0.4	
Main contacts								
Rated operational voltage		V AC		230 - 460				
Mains frequency		Hz		50/60				
Rated operational current	AC-53 (motor loads)	I _e	A	4	7	9	12	
Assigned motor rating	230 V	P	kWh	0.75	1.5	2.2	3	
	400 V	P	kWh	1.5	3	4	5.5	
	480 V	P	HP	2	3	5	7.5	
Overload cycle to EN 60947-4-2								
	AC-53a (int. bypass)	For AC-53a:3-5:75-10	A	4	7	9	12	
Terminal capacity								
Power cable (box terminal)	Solid		mm ²	1 x (0.75 - 4); 2 x (0.75 - 2.5)				
	Flexible with ferrule		mm ²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)				
	Stranded		mm ²	-	-	-	-	
	Solid or stranded		AWG	18 - 10				
	Flat conductor		min, mm	-	-	-	-	
			max, mm	-	-	-	-	
	Tightening torque		Nm	1.2	1.2	1.2	1.2	
Control cables	Solid		mm ²	1 x (0.75 - 4); 2 x (0.75 - 2.5)				
	Flexible with ferrule		mm ²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)				
	Stranded		mm ²	-	-	-	-	
	Solid or stranded		AWG	18 - 10				
	Tightening torque		Nm	1.2	1.2	1.2	1.2	
	Screwdriver (flat blade)		mm	0.8 x 5.5; 1 x 6				
Power section								
Rated impulse withstand voltage		U _{imp}	1.2/50 μs kV	4	4	4	4	
Rated insulation voltage		U _i	V	500	500	500	500	
Short-circuit rating								
Type "1" coordination	For AC-53a:3-5:75-10			PKZM0-4 (+ CL-PKZO)	PKZM0-10 (+ CL-PKZO)	PKZM0-10 (+ CL-PKZO)	PKZM0-12 (+ CL-PKZO)	
Type "2" coordination (in addition to fuses for type "1" of coordination)				3 x 50.179.06-16	3 x 50.140.06-25	3 x 20.282.20-32	3 x 20.282.20-32	
Fuse holders				3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	3 x 51.060.04	
Control circuit								
Controller supply voltage	Voltage	U _s	V	120 -15 % - 230 +10 %				
	Current consumption at no load 24 V DC		mA	-	-	-	-	
	Current consumption in operation at 24 V DC		mA	-	-	-	-	
	Current consumption at peak load (close bypass) at 24 V DC		mA/ms	-	-	-	-	
Control voltage range	AC operated			120 -15 % - 230 +10 %				
	Current consumption at 230 V DC		mA	-	-	-	-	
Pick-up voltage	DC operated		V DC	-	-	-	-	
	AC operated		V AC	120 -15 %				
Drop-out voltage	DC operated		V DC	-	-	-	-	
	AC operated		V AC	-	-	-	-	
Pick-up time	AC operated		ms	-	-	-	-	
Drop-out time	AC operated		ms	-	-	-	-	
Relay outputs	Number			1 (TOR)				
	Voltage range		V AC	250				
	Current range		A	3 A, AC1				
Soft start functions								
Ramp times	Acceleration		s	1 - 30				
	Deceleration		s	0 - 30				
Start voltage (= switch-off voltage)				30 % - 92 %				
Voltage reduction at stop				8 %				

DS7-342SX016	DS7-342SX024	DS7-342SX032	DS7-342SX041	DS7-342SX055	DS7-342SX070	DS7-342SX081	DS7-342SX100	DS7-342SX135	DS7-342SX160	DS7-342SX200	
IEC/EN 60 947-4-2											
Damp heat, cyclic, to DIN IEC Part 68 2-10,											
Damp heat, constant, to DIN IEC 68 Part 2-3											
0...40, up to 60 °C at 1 % derating per Kelvin temperature rise											
-25 - +55 °C											
0...1000 m, above that 1 % derating per 100 m, up to 2000 m											
Vertical											
IP20											
Protection type IP40 can be achieved on all sides with covers from the NZM range.											
Finger- and back-of-hand proof											
II/2											
8 g/11 ms											
2M2											
0.8	1.1	1.5	7	10	13	18	25	24	30	42	
45 x 150 x 118											
B											
0.45	0.45	0.45	1.8	1.8	1.8	1.8	1.8	3.7	3.7	3.7	
230 - 460											
50/60											
16	24	30	41	55	70	81	100	135	160	200	
4	5.5	7.5	11	15	15	22	30	30	45	55	
7.5	11	15	22	30	37	45	55	75	90	110	
10	15	20	30	40	50	60	75	100	125	150	
16	24	30	41	55	70	81	100	135	160	200	
1 x (0.75 - 16); 2 x (0.75 - 10)			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)			
1 x (0.75 - 16); 2 x (0.75 - 10)			-					-			
1 x 16			1 x (25 - 70); 2 x (6 - 25)					1 x (4 - 185); 2 x (4 - 70)			
18 - 6			1 x (12 - 2/0)					1 x (12 - 350 kcmil); 2 x (12 - 00)			
-			2 x 9 x 0.8					2 x 9 x 0.8			
-			9 x 9 x 0.8					10 x 16 x 0.8			
3			-					-			
1 x (0.5 - 2.5); 2 x (0.5 - 1.0)			-					-			
1 x (0.5 - 1.5); 2 x (0.5 - 0.75)			-					-			
1 x (0.5 - 1.5); 2 x (0.5 - 1.0)			-					-			
1 x (21 - 14); 2 x (21 - 18)			-					-			
1.2	1.2	1.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
0.8 x 5.5; 1 x 6			0.6 x 3.5								
4	4	4	4	4	4	4	4	4	4	4	
500	500	500	500	500	500	500	500	500	500	500	
PKZM0-16 (+ CL-PKZ0)	PKZM0-25 (+ CL-PKZ0)	PKZM0-32 (+ CL-PKZ0)	NZMN1-M50/ PKZM4-50	NZMN1-M63/ PKZM4-58	NZMN1-M80	NZMN1-M100	NZMN1-M100	NZMN2-M160	NZMN2-M200	NZMN2-M200	
3 x 50.140.06-50 3 x 51.060.04	3 x 50.140.06-63 3 x 51.060.04	3 x 50.140.06-80 3 x 51.060.04	3 x 20.282.20-100 3 x 21.189.01	3 x 20.282.20-125 3 x 21.189.01	3 x 20.610.32-200 3 x 21.313.02	3 x 20.610.32-200 3 x 21.313.02	3 x 20.610.32-200 3 x 21.313.02	3 x 20.610.32-350 3 x 21.313.02	3 x 20.610.32-400 3 x 21.313.02	3 x 20.610.32-500 3 x 21.313.02	
120 -15 % - 230 +10 %											
-	-	-	35	35	35	35	35	35	35	35	
-	-	-	65	65	65	65	65	65	65	65	
-	-	-	600/50	600/50	600/50	600/50	600/50	600/50	600/50	600/50	
120 -15 % - 230 +10 %											
-	-	-	14	14	14	14	14	14	14	14	
-	-	-	-	-	-	-	-	-	-	-	
120 -15 %											
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	250	250	250	250	250	250	250	250	
-	-	-	190	190	190	190	190	190	190	190	
2 (TOR)											
250											
3 A, AC1											
1 - 30											
0 - 30											
30 % - 92 %											
8 %											



				DS7-34DSX004	DS7-34DSX007	DS7-34DSX009	DS7-34DSX012	
General								
Standards				IEC/EN 60 947-4-2				
Climatic proofing				Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3				
Ambient temperature				°C 0...40, up to 60 °C at 1 % derating per Kelvin temperature rise				
Ambient temperature storage				°C -25 - +55 °C				
Installation altitude Higher installation altitude upon request				0...1000 m, above that 1 % derating per 100 m, up to 2000 m				
Mounting position				Vertical				
Protection type				IP20				
Protection type applies to the front and operator control and operating elements. Protection type from all sides is IP00.				Protection type IP40 can be achieved on all sides with covers from the NZM range.				
Protection against direct contact				Finger- and back-of-hand proof				
Overvoltage category/pollution degree				II/2				
Mechanical shock resistance				8 g/11 ms				
Vibration resistance to EN 60721-3-2				2M2				
Average heat dissipation with nominal load cycle				W	0.2	0.35	0.45	0.6
Dimensions (W x H x D)				mm 45 x 135 x 95				
Radio interference level				B				
Weight				kg	0.41	0.41	0.41	0.41
Main contacts								
Rated operational voltage				V AC	230 - 460			
Mains frequency				Hz	50/60			
Rated operational current AC-53 (motor loads)				I _e A	4	7	9	12
Assigned motor rating 230 V				P kWh	0.75	1.5	2.2	3
400 V				P kWh	1.5	3	4	5.5
480 V				P HP	2	3	5	7.5
Overload cycle to EN 60947-4-2								
AC-53a (int. bypass) For AC-53a:3-5:75-10				A	4	7	9	12
Terminal capacity								
Power cable (box terminal) Solid				mm ²	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
Flexible with ferrule				mm ²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
Stranded				mm ²	-			
Solid or stranded				AWG	18 - 10			
Flat conductor				min, mm	-			
				max, mm	-			
Tightening torque				Nm	1.2	1.2	1.2	1.2
Control cables Solid				mm ²	1 x (0.75 - 4); 2 x (0.75 - 2.5)			
Flexible with ferrule				mm ²	1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			
Stranded				mm ²	-			
Solid or stranded				AWG	18 - 10			
Tightening torque				Nm	1.2	1.2	1.2	1.2
Screwdriver (flat blade)				mm	0.8 x 5.5; 1 x 6			
Power section								
Rated impulse withstand voltage				U _{imp} 1.2/50 μs kV	4	4	4	4
Rated insulation voltage				U _i V	500	500	500	500
Short-circuit rating								
Type "1" coordination For AC-53a:3-5:75-10					PKZM0-4 (+ CL-PKZO)	PKZM0-10 (+ CL-PKZO)	PKZM0-10 (+ CL-PKZO)	PKZM0-12 (+ CL-PKZO)
Type "2" coordination (in addition to fuses for type "1" of coordination)					3 x 50.179.06-16	3 x 50.179.06-25	3 x 20.282.20-32	3 x 20.282.20-32
Fuse holders					3 x 51.060.04	3 x 51.060.04	3 x 21.189.01	3 x 21.189.01
Control circuit								
Controller supply voltage Voltage				U _s V	+24 V AC/DC +10 %/-15 %			
Current consumption at no load 24 V DC				mA	-			
Current consumption in operation at 24 V DC				mA	-			
Current consumption at peak load (close bypass) at 24 V DC				mA/ms	-			
Control voltage range AC operated				24 +10 %/-15 %				
Current consumption at 230 V DC				mA	-			
Pick-up voltage DC operated				V DC	+17.3 - +27	+17.3 - +27	+17.3 - +27	+17.3 - +27
AC operated				V AC	-			
Drop-out voltage DC operated				V DC	0 - +3	0 - +3	0 - +3	0 - +3
AC operated				V AC	-			
Pick-up time DC operated				ms	-			
Drop-out time DC operated				ms	-			
Relay outputs Number				1 (TOR)				
Voltage range				V AC	250			
Current range				A	3 A, AC1			
Soft start functions								
Ramp times Acceleration				s	1 - 30			
Deceleration				s	0 - 30			
Start voltage (= switch-off voltage)				30 % - 92 %				
Voltage reduction at stop				8 %				

DS7-34DSX016	DS7-34DSX024	DS7-34DSX032	DS7-34DSX041	DS7-34DSX055	DS7-34DSX070	DS7-34DSX081	DS7-34DSX100	DS7-34DSX135	DS7-34DSX160	DS7-34DSX200
IEC/EN 60 947-4-2										
Damp heat, cyclic, to DIN IEC Part 68 2-10, Damp heat, constant, to DIN IEC 68 Part 2-3										
0...40, up to 60 °C at 1 % derating per Kelvin temperature rise										
-25 - +55 °C										
0...1000 m, above that 1 % derating per 100 m, up to 2000 m										
Vertical										
IP20										
Protection type IP40 can be achieved on all sides with covers from the NZM range.										
Finger- and back-of-hand proof										
II/2										
8 g/11 ms										
2M2										
0.8	1.1	1.5	7	10	13	18	25	24	30	42
45 x 150 x 118										
B										
0.41	0.46	0.46	1.8	1.8	1.8	1.8	1.8	3.7	3.7	3.7
230 - 460										
50/60										
16	24	30	41	55	70	81	100	135	160	200
4	5.5	7.5	11	15	15	22	30	30	45	55
7.5	11	15	22	30	37	45	55	75	90	110
10	15	20	30	40	50	60	75	100	125	150
16	24	30	41	55	70	81	100	135	160	200
1 x (0.75 - 16); 2 x (0.75 - 10)			1 x (25 - 70); 2 x (6 - 25)				1 x (4 - 185); 2 x (4 - 70)			
1 x (0.75 - 16); 2 x (0.75 - 10)			-				-			
1 x 16			1 x (25 - 70); 2 x (6 - 25)				1 x (4 - 185); 2 x (4 - 70)			
18 - 6			1 x (12 - 2/0)				1 x (12 - 350 kcmil); 2 x (12 - 00)			
-			2 x 9 x 0.8				2 x 9 x 0.8			
-			9 x 9 x 0.8				10 x 16 x 0.8			
3			-				-			
1 x (0.75 - 4); 2 x (0.75 - 4)			1 x (0.5 - 2.5); 2 x (0.5 - 1.0)				1 x (0.5 - 2.5); 2 x (0.5 - 1.0)			
1 x (0.75 - 2.5); 2 x (0.75 - 2.5)			1 x (0.5 - 1.5); 2 x (0.5 - 0.75)				1 x (0.5 - 1.5); 2 x (0.5 - 0.75)			
-			1 x (0.5 - 1.5); 2 x (0.5 - 1.0)				1 x (0.5 - 1.5); 2 x (0.5 - 1.0)			
18 - 14			1 x (21 - 14); 2 x (21 - 18)				1 x (21 - 14); 2 x (21 - 18)			
1.2			0.4				0.4			
0.6 x 3.5; 1 x 6			0.6 x 3.5				0.6 x 3.5			
4	4	4	4	4	4	4	4	4	4	4
500	500	500	500	500	500	500	500	500	500	500
PKZM0-16 (+ CL-PKZ0)	PKZM0-25 (+ CL-PKZ0)	PKZM0-32 (+ CL-PKZ0)	NZMN1-M50/ PKZM4-50	NZMN1-M63/ PKZM4-58	NZMN1-M80	NZMN1-M100	NZMN1-M100	NZMN2-M160	NZMN2-M200	NZMN2-M200
3 x 50.140.06-50 3 x 51.060.04	3 x 50.140.06-63 3 x 51.060.04	3 x 50.140.06-80 3 x 51.060.04	3 x 20.282.20-100 3 x 21.189.01	3 x 20.282.20-125 3 x 21.189.01	3 x 20.610.32-200 3 x 21.313.02	3 x 20.610.32-200 3 x 21.313.02	3 x 20.610.32-200 3 x 21.313.02	3 x 20.610.32-350 3 x 21.313.02	3 x 20.610.32-400 3 x 21.313.02	3 x 20.610.32-500 3 x 21.313.02
+24 V AC/DC +10 %/-15 %										
-			35				35			
-			65				65			
-			600/50				600/50			
24 +10 %/-15 %										
-			14				14			
+17.3 - +27			+17.3 - +27				+17.3 - +27			
-			-				-			
0 - +3			0 - +3				0 - +3			
-			-				-			
-			250				250			
-			190				190			
2 (TOR, Ready)										
250										
3 A, AC1										
1 - 30										
0 - 30										
30 % - 92 %										
8 %										



Dimensions

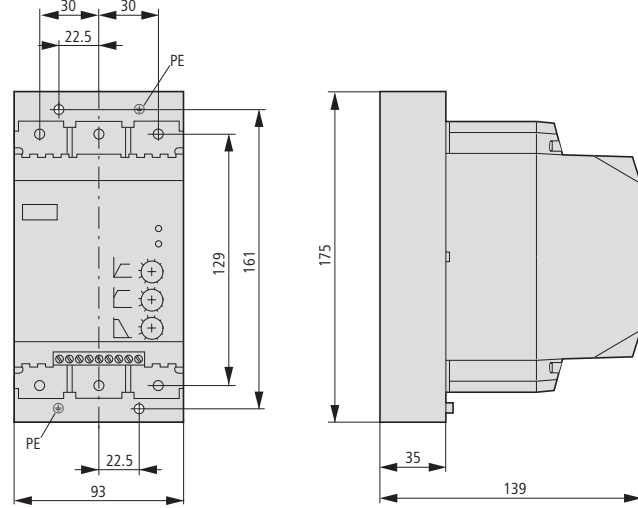
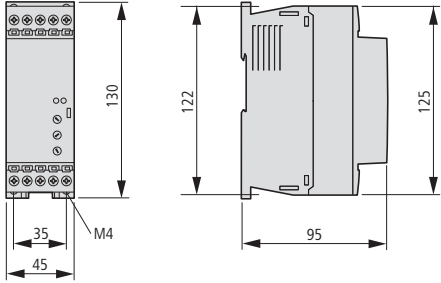
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 DS7-340SX007N0-N
 DS7-340SX009N0-N
 DS7-340SX012N0-N

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 DS7-342SX007N0-N
 DS7-342SX009N0-N
 DS7-342SX012N0-N

DS7-340SX041N0-N
 DS7-340SX055N0-N
 DS7-340SX070N0-N
 DS7-340SX081N0-N
 DS7-340SX100N0-N

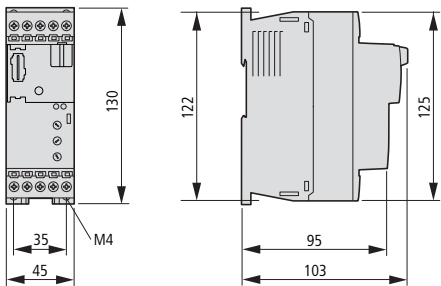
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 DS7-342SX070N0-N
 DS7-342SX081N0-N
 DS7-342SX100N0-N

DS7-34DSX041N0-D
 DS7-34DSX055N0-D
 DS7-34DSX070N0-D
 DS7-34DSX081N0-D
 DS7-34DSX100N0-D



DS7-34DSX004N0-D
 DS7-34DSX007N0-D

DS7-34DSX009N0-D
 DS7-34DSX012N0-D



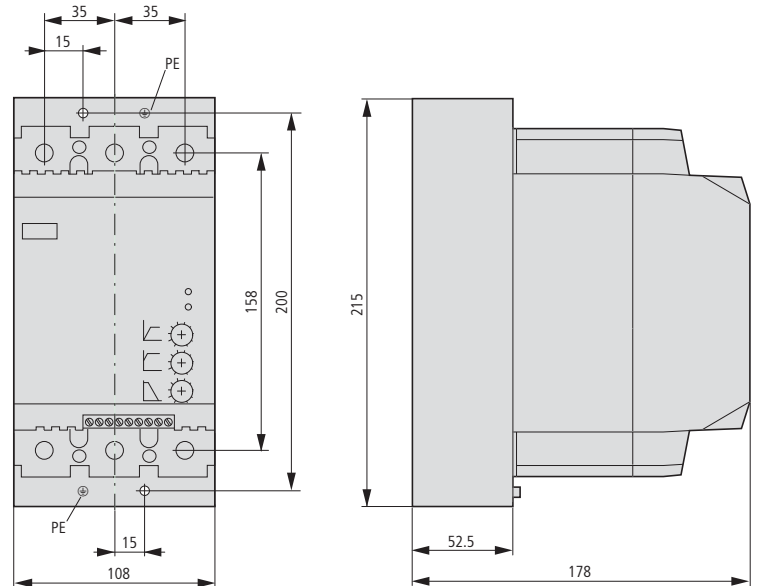
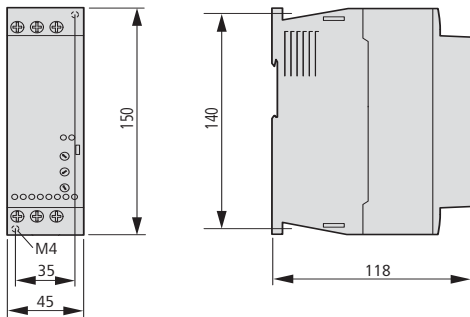
DS7-340SX016N0-N
 DS7-340SX024N0-N
 DS7-340SX032N0-N

DS7-342SX016N0-N
 DS7-342SX024N0-N
 DS7-342SX032N0-N

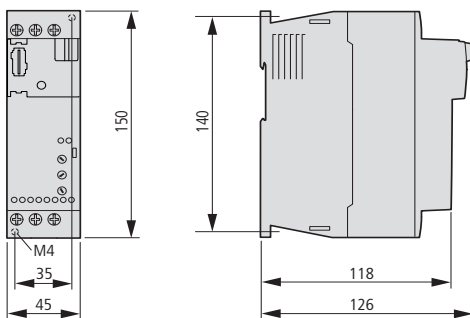
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 DS7-342SX160N0-N
 DS7-342SX200N0-N

DS7-340SX135N0-N
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 DS7-340SX200N0-N

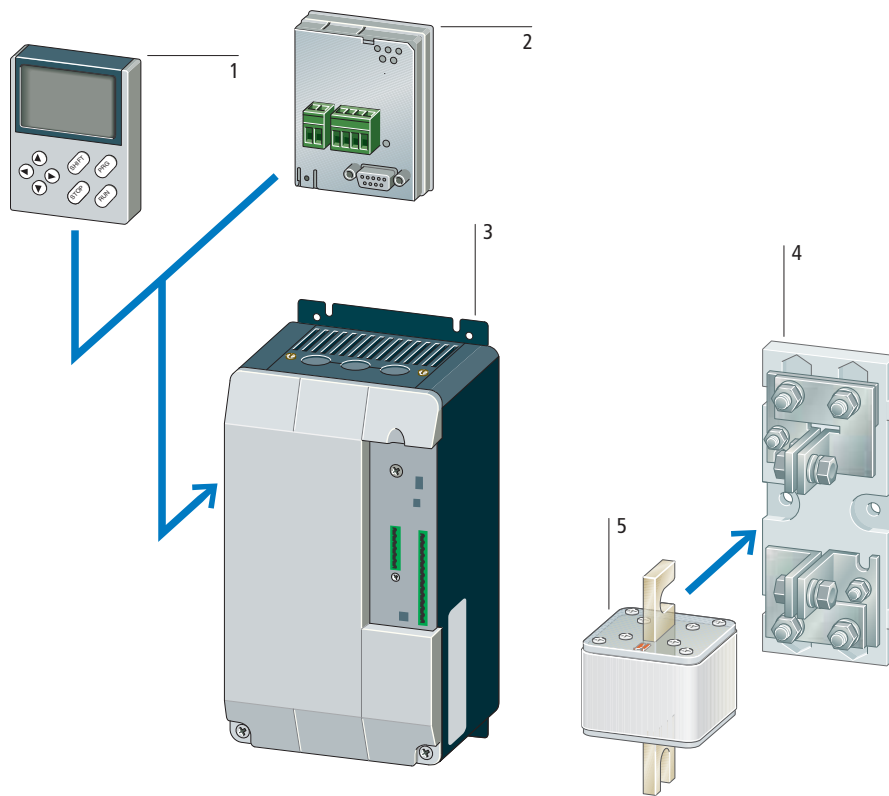
DS7-34DSX135N0-D
 DS7-34DSX160N0-D
 DS7-34DSX200N0-D



DS7-34DSX016N0-D
 DS7-34DSX024N0-D
 DS7-34DSX032N0-D



System overview



Basic devices

DM4 soft starter 3

Soft starters for three-phase AC motors

Assigned motor rating:

- From 7.5 to 500 kW for in-line terminal type (before load, standard)
- 11 to 900 kW for Delta terminal type (In-Delta)

Rated operating voltage:
230 to 480 V

10 programmed standard applications allow direct operation; parameter set selection through rotary switch.

Ramp time adjustable from 1 to 255 s

Energy-saving function optimizes efficiency and power factor.

Adjustable current limitation prevents high starting current.

Controller operation for 3-phase resistive and inductive loads from 16 to 900 A (400 V)

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/43

Add-on functions

DE4-KEY-2 keypad 1

Pluggable on DM4 soft starters, with 8 function keys and plain text display; Language can be selected (German/English)

Ordering data → Page 9/44

Communication modules 2

DE4-COM-2X

RS 485/RS 232 serial interface

DE4-NET-DP2

PROFIBUS DP interface

Ordering data → Page 9/44

Superfast semiconductor fuses 5

Fuses for the protection of semiconductors, optionally for direct installation in DM4 soft starters or for external surface mounting.

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/45

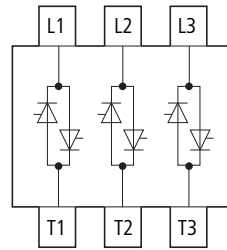
Fuse bases 4

For external surface mounting of the superfast semiconductor fuse.

Selection data → Engineering - Assigned switching and protective devices.

Ordering data → Page 9/8

Description



Operation as three-phase soft starter

DM4 soft starter series are soft starters for standard three-phase asynchronous motors. They round off Eaton's soft starter range with devices meant for more demanding applications. With a power range (assigned motor rating) starting with 7.5 kW, DM4 soft starters are also suitable for demanding automation tasks.

Their terminal type determines the rating range:

- Inline terminal type (upstream of load = standard): 7.5 to 500 kW at 400 V.
- Delta terminal type: 11 to 900 kW at 400 V, each phase of the soft starter being connected in series with the individual motor windings (6 lines required, motor delta connected only).

Features

- Current limitation
- High overload withstand capability
- Large rating range up to 500 kW (or 900 kW in delta terminal type)
- Predefined parameter sets can be selected for standard applications
- All parameters also individually adjustable
- Keypad with plain text display (optional)
- Programmable relay and analog outputs
- Networkable
- Voltage controller function (generalized phase control) can be implemented for each software changeover.

Typical applications as soft starter

- Pump drives: pressure surges are prevented through soft starting. The mechanical load on the whole plant is reduced and the plant components' service life increases.
- Fan drives and compressors: The soft start prevents belt slippage and premature wear. This in turn lowers the operating costs and increases the durability of the plant.
- Conveyors: Instead of starting with a jolt, the conveyor starts up gently and the transported goods do not fall over. The mechanical stress on the conveyor is reduced and its lifespan increased.
- Circular and ribbon saws: The current limitation at startup prevents current peaks. This results in energy savings and reduced electricity bills.
- Agitators, mixers, mills, crushers: the same advantages described above.

Operation as three-phase controller

The DM4 devices can be changed over with the software to three-phase controller operation. The rating range is 16 to 900 A at 400 V (standard connection only, in-line connection possible). They can be operated in pure controller mode or with a closed-loop control circuit.

The units each have two analog inputs for setpoint/actual values and an additional built-in current feedback loop.

Note: A keypad or the serial interface and PC software are required to configure controller operation.

Typical applications as three-phase controller

- Heater loads: Continuous temperature regulation reduces thermal and mechanical load on heating elements to increase their lifespan.
- Lighting control systems: Gentle switching on of lamps reduce current consumption in cold state. Utilization of the lamps' ideal operating point reduces their current consumption at the same light emission and extends their lifespan. This results in energy savings and reduced electricity bills.
- Ozone generators: Regulation of high-voltage transformers.

Documentation

You can download the documentation for the soft starters from the Internet: www.moeller.net/support

Installation instructions

AWA8250-1704 (for devices within a rating range from 7.5 to 37 kW)
AWA8250-1751 (for devices within a rating range from 45 to 75 kW)
AWA8250-1752 (for devices within a rating range from 90 to 200 kW)
AWA8250-1783 (for devices within a rating range from 250 to 500 kW)

Manuals

AWB8250-1341
("Hardware and engineering")
AWB8250-1346
("Design of soft starters")

Description



Part no. overview

DE4-KEY-2

Keypad

Application

The DM4 soft starters are factory set for the most common applications. For various standard applications, parameter sets can be selected via an application selector switch. There is no longer a need for manual setting for different applications and its associated risk of errors. The preset application parameter sets can also be selected via an optional keypad with plain text display. With the keypad, all parameters can be viewed, edited and adapted for specific applications. The keypad is also required for reprogramming the soft starter's digital or analog inputs and outputs. Interface modules can be used as an alternative to the keypad. The soft starters can be interfaced with a PLC via PROFIBUS-DP. Assigning parameters via the PLC offers the same range of functions as are possible via the keypad.

Documentation

For a detailed description, see the documentation: AWB8240-1344. The documentation is available on the Internet at: www.moeller.net/support

Part no. overview

DE4-COM-2X

RS 232C/RS 485 serial interface

Application

The DE4-COM-2X plug-in communication module contains RS 232C and RS 485 serial interfaces for direct connection to a PC (point-to-point connection). It can be used with DM4 soft starters.

Function

The DE4-COM-2X module can be plugged in and removed during operation. It provides direct access to all parameters. The drive can be controlled and monitored from the PC. Status and alarm messages are displayed.

Features

The DE4-COM-2X module receives its power from the basic device or from an external DC supply (+24 V, max. 80 mA) through two plug-in screw terminals.

RS232C interface

- 9-pole SUB-D plug
- Pin 2 (Rx/D), pin 3 (Tx/D), pin 5 (GND)
- Point-to-point connection
- Max. cable length: 15 m
- Maximum data transfer rate: 19200 Bit/s

RS485 interface

- 4 pole plug-in screw terminals
- Network topology: in-line
- Max. cable length: 1200 m
- Maximum data transfer rate: 19200 Bit/s

Notes

The PS416-ZBK-210 serial interface cable for connecting the serial interface with a PC must be ordered separately.

Documentation

For a detailed description, see manual AWB823-1279D/GB/F. This documentation is not supplied with the device. You can download it from our website: www.moeller.net/support



Part no. overview

DE4-NET-DP2

PROFIBUS DP fieldbus module

Application

The plug-in DE4-NET-DP2 communication module is used for direct connection to the PROFIBUS DP fieldbus (DIN 19245 Part 1 and 3). It can be used with DM4 soft starters.

Function

The DE4-NET-DP2 module can be plugged in and removed during operation. It provides direct access to all parameters. The drive (slave) can be controlled and monitored via the PLC (master). Status and alarm messages are displayed.

Features

The DE4-NET-DP2 module receives its power from the basic device or from an external DC supply (+24 V, max. 60 mA) through two plug-in screw terminals.

Model:

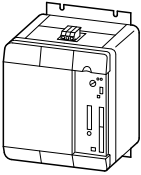


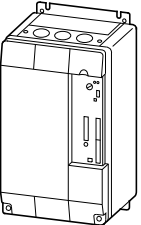


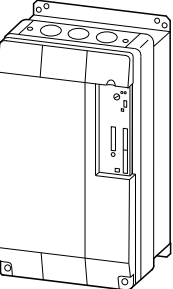


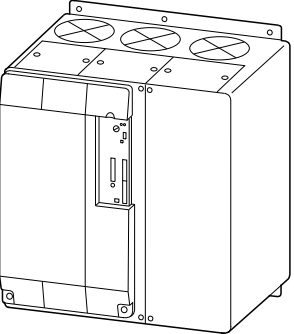


- 9-pole SUB-D plug
- Network topology: PROFIBUS-DP line
- Max. cable length: 1200 m at 93.7 kBaud, 25 m at 12000 Baud

Documentation

For a detailed description, see the documentation: AWB8240-1398-EN. This documentation is not supplied with the device. You can download it from our website: www.moeller.net/support

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Ordering

	Mains supply voltage (50/60 Hz)	Rated operational current (AC 53)	Assigned motor rating		Part no. Article no.	Price See price list	Std. pack
	U_{LN}		400 V, In-Line terminal type	400 V, Delta terminal type			
	V AC	I_e A	kW	kW			
Soft starters up to 37/55 kW at 400 V							
	190-520	16	7	11	DM4-340-7K5 207897		1 off  
	190-520	23	11	15	DM4-340-11K 207898		
	190-520	30	15	22	DM4-340-15K 207899		
	190-520	44	22	37	DM4-340-22K 207900		
	190-520	59	30	55	DM4-340-30K 207901		
	190-520	72	37	55	DM4-340-37K 207902		
Soft starters up to 75/132 kW at 400 V							
	190-520	85	45	75	DM4-340-45K 207903		1 off  
	190-520	105	55	90	DM4-340-55K 207904		
	190-520	146	75	132	DM4-340-75K 207905		
Soft starters up to 200/315 kW at 400 V							
	190-520	174	90	160	DM4-340-90K 207906		1 off  
	190-520	202	110	160	DM4-340-110K 207907		
	190-520	242	132	200	DM4-340-132K 207908		
	190-520	300	160	250	DM4-340-160K 207909		
	190-520	370	200	315	DM4-340-200K 207910		
Soft starters up to 500/900 kW at 400 V							
	190-520	500	250	400	DM4-340-250K 207911		1 off  
	190-520	600	315	560	DM4-340-315K 207912		
	190-520	750	400	750	DM4-340-400K 207913		
	190-520	900	500	900	DM4-340-500K 207914		

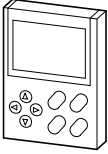

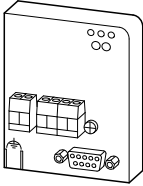
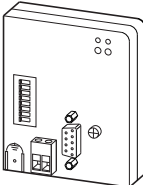

Notes

Information relevant for export to North America

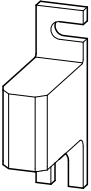










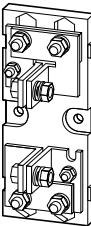


Assigned motor rating data applies for in-line/in-delta terminal type, tripping class 10.

Product Standards	IEC/EN 60947-4-2; UL 508; cUL 508 CE marking
UL File No.	E208760
UL CCN	NMFT
CSA File No.	UL report applies to both US and Canada
CSA Class No.	NMFT7
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	480 V
Degree of Protection	IP20; UL/CSA Type 1

Description	For use with	Part no. Article no.	Price See price list	Std. pack
Keypad				
 <p>Allows matching of all of the soft starter's parameters for any application and drive control through the keypad. Connection to DM4 soft starters through simple plugging/pulling, also during operation. With non-volatile memory for parameters; parameter sets can be transferred between soft starters for series applications. Two-line plain text display. Operating status signalling through status symbols.</p>	DM4	DE4-KEY-2 211291		1 off 
RS 232C/RS 485 serial interface				
Module with RS 232C and RS 485 serial interfaces for direct connection to a PLC or a PC				
	RS 232C: 9-pin SUB-D plug RS 485: plug-in screw terminals PS416-ZBK-210 serial interface cable required	DM4	DE4-COM-2X 085028	1 off
-	For connecting the programming PC to the CPU card via the RS232C interface	DE4-COM-2X PS416-CPU-...	PS416-ZBK-210 051751	1 off
PROFIBUS DP communication module				
Module for direct connection to the PROFIBUS DP fieldbus				
	All parameters can be addressed and transferred. Connection through 9-pin SUB-D plug	DM4	DE4-NET-DP2 230240	1 off
Information relevant for export to North America 	UL File No. UL CCN CSA File No. CSA Class No. NA Certification Suitable for Degree of Protection	E172143 NMMS UL report applies to both US and Canada NMMS7 UL Listed, certified by UL for use in Canada Branch circuits IP20; UL/CSA Type 2		

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	Rated operational current A	Maximum power loss P _v W	Frame size/ inside micrometer mm	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Superfast semiconductor fuses								
Fuse links								
	40	10	80	DM4-340-7K5	20.282.20-40 232085		6 off 	-
	80	18	80	DM4-340-11K DM4-340-15K	20.282.20-80 232086		6 off 	-
	125	24	80	DM4-340-22K DM4-340-30K	20.282.20-125 232087		6 off 	-
	200	44	80	DM4-340-37K DM4-340-45K	20.610.32-200 106475		3 off 	-
	350	61	80	DM4-340-55K DM4-340-75K	20.610.32-350 221161		2 off 	-
	450	70	80	DM4-340-90K DM4-340-110K	20.610.32-450 221162		2 off 	Mounted internally
	500	72	80	DM4-340-132K DM4-340-160K	20.610.32-500 221163		2 off 	
	630	80	80	DM4-340-200K	20.610.32-630 221164		3 off 	
	900	120	80	DM4-340-250K DM4-340-315K	20.630.32-900 221165		2 off 	
	1250	147	80	DM4-340-400K DM4-340-500K	20.630.32-1250 221166		2 off 	
Fuse base for semiconductor fuses								
	-	-	80	20.282.20-... 20.189.20-...	21.189.01 232064		5 off	-
	-	-	80	20.6xx.32-...	21.313.02 232076		2 off	-

Information relevant for export to North America

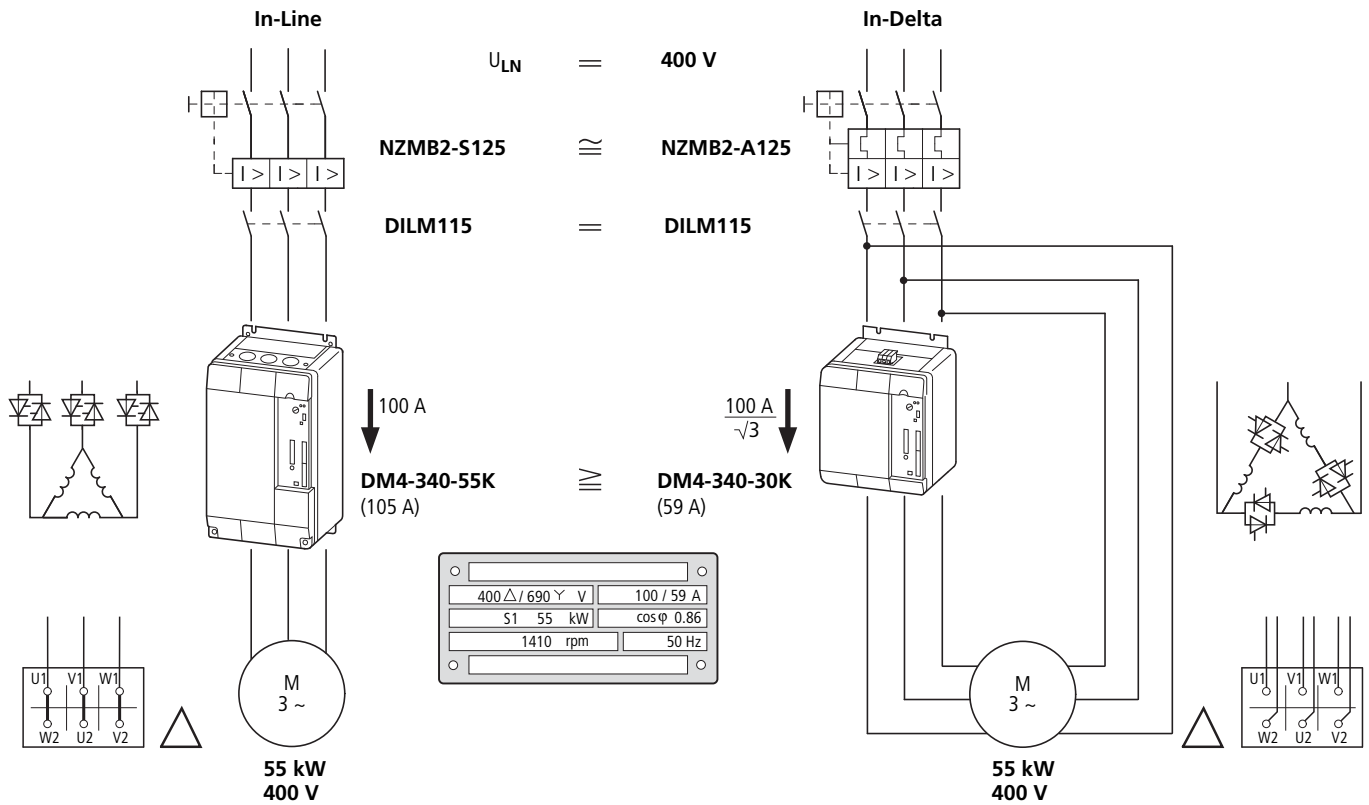


Product Standards UL 248-13 CE marking
 UL File No. E180276
 UL CCN JFHR2
 CSA File No. UL report applies to both US and Canada
 CSA Class No. JFHR8
 NA Certification UL Recognized, certified by UL for use in Canada
 Max. Voltage Rating 660V



Engineering

In-line/in-delta connection



Soft starters are normally connected directly in series with the motor (so-called "in-line connection"). DM4 series soft starters also allow for operation in a so-called in-delta connection.

Advantages of an in-delta connection in comparison to an in-line connection:

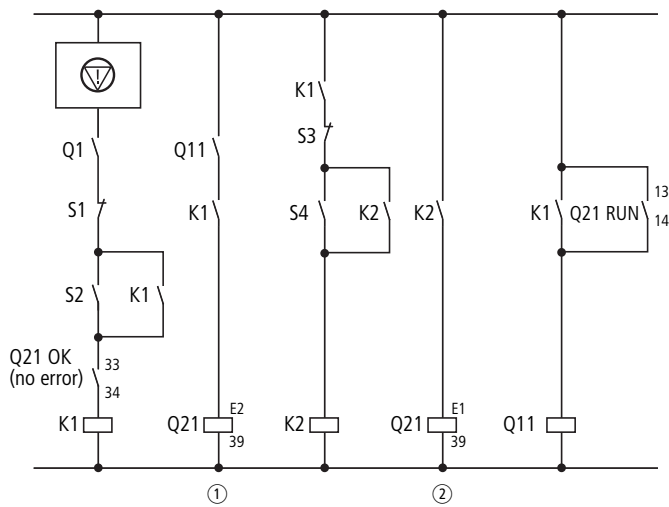
- In-delta connections are more cost-effective, since the soft starter only has to be designed for 58 percent (= $1/\sqrt{3}$) of the rated operational current.

Disadvantages of an in-delta connection in comparison to an in-line connection:

- The motor must be connected with six conductors, similar to the star-delta connection.
- The DM4 soft starter's overload protection is active only in one line, so that additional motor protection must be fitted in the parallel phase or in the supply cable.

Soft starters with separate mains contactor

Actuation



= Emergency switching off

S1: Off (uncontrolled deceleration)

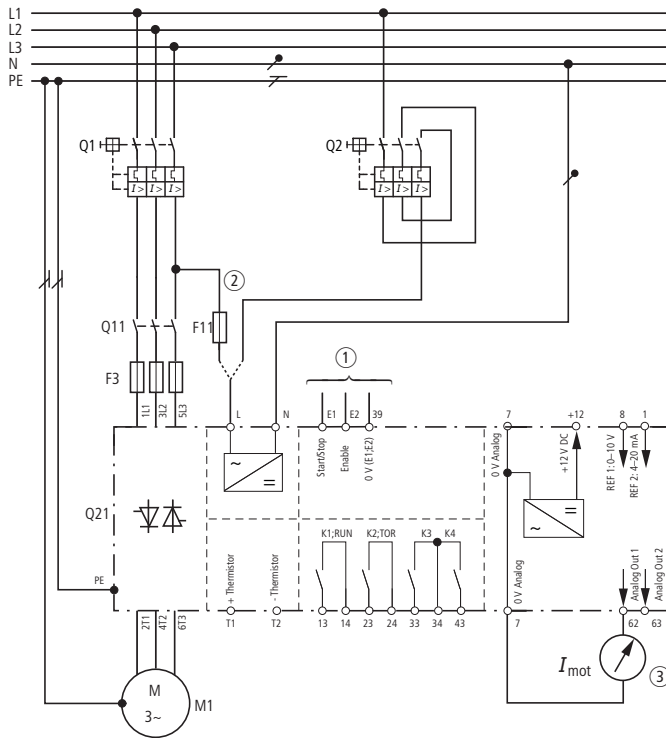
S2: On

S3: Soft stop (deceleration ramp)

S4: Soft start

① Enable

② Soft start/Soft stop



① See actuation

② Control voltage through Q1 and F11 or through Q2

③ Motor current indication

E1: Start/stop

E2: Enable

T1: + Thermistor

T3: - Thermistor



DM4

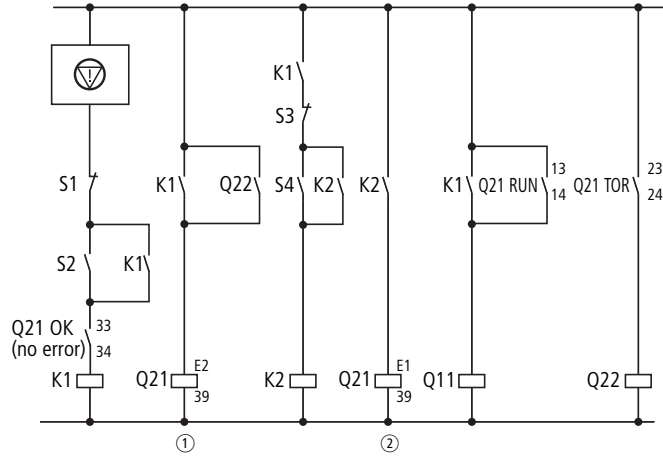
Bypass circuit

After the run-up (full mains voltage reached) the DM4 soft starter actuates the bypass contactor. The motor is then directly connected with the mains.

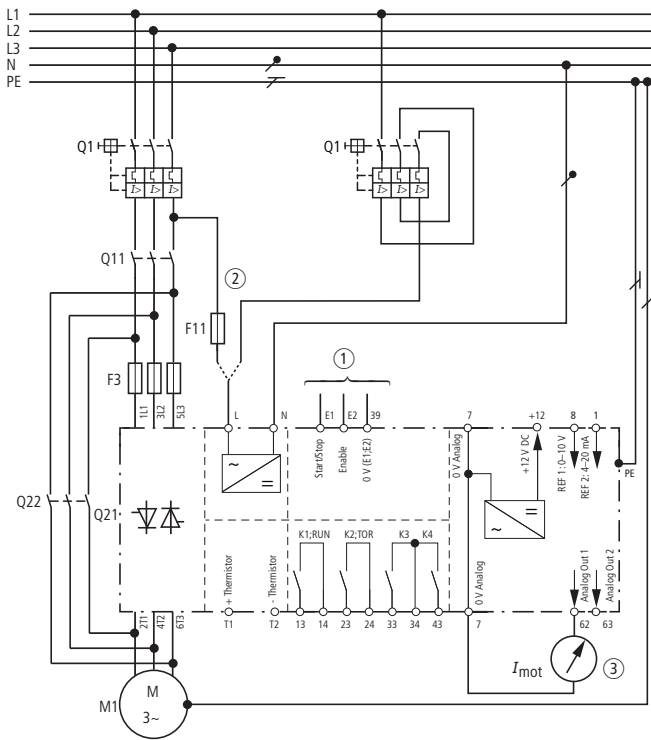
Advantages:

- The soft starter's power loss is reduced to the no-load power loss.
- The limit values of radio interference class "B" are maintained.

Actuation



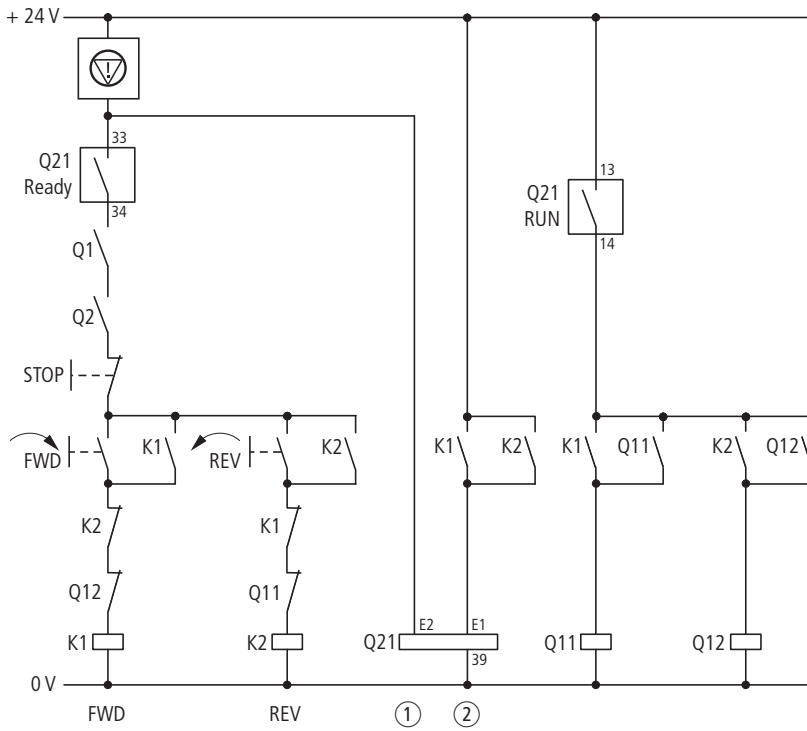
- ⊲ = Emergency switching off
- S1: Off (uncontrolled deceleration)
- S2: On
- ① Enable
- ② Soft start/Soft stop



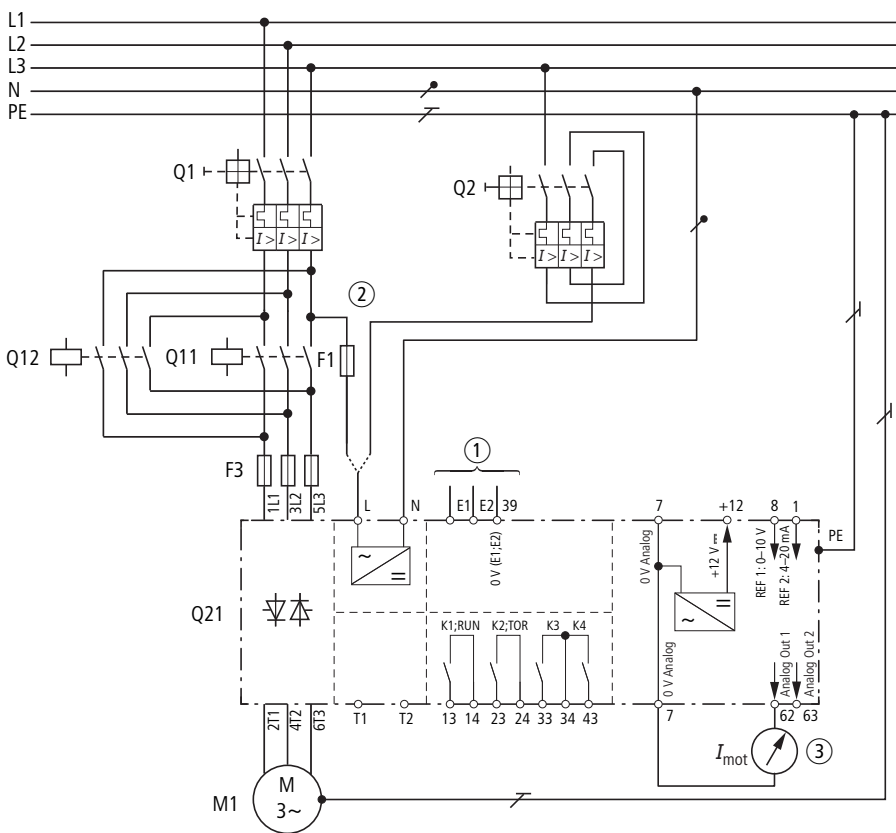
- ① See actuation
- ② Control voltage through Q1 and F11 or through Q2
- ③ Motor current indication
- E1: Start/stop
- E2: Enable
- T1: + Thermistor
- T2: - Thermistor

Soft starters with reversing circuit

Actuation



- = Emergency switching off
- S1: Off (uncontrolled deceleration)
- S2: On
- ① Enable
- ② Soft start/Soft stop



- ① See actuation
- ② Control voltage through Q1 and F11 or through Q2
- ③ Motor current indication
- E1: Start/stop
- E2: Enable



Engineering

Assigned motor rating at		Rated operational current ²⁾			Part no. ¹⁾ Soft starters	Soft starter function		
400 V	480 V	Device	Motor	Cable ³⁾		Cable protection ⁴⁾	Mains contactor (optional) ⁴⁾	Overload relay ⁵⁾⁷⁾
P	P	I _e	I _e	I _e ²⁾				
kW	HP	A	A	A				
Soft starter for three-phase mains connection, short start-up time, Tripping CLASS 10 (15 s, 3.5 x I_e)								
"In-line" terminal type (upstream of load, standard)								
7.5	10	16	15.2	16	DM4-340-7K5	PKM0-16 (+ CL-PKZ0)	DILM17	ZB32-16 (+ZB32-XEZ)
11	15	22	21.7	23	DM4-340-11K	PKM0-25 (+ CL-PKZ0)	DILM25	ZB32-24 (+ZB32-XEZ)
15	20	30	29.3	30	DM4-340-15K	PKM0-32 (+ CL-PKZ0)	DILM32	ZB32-32 (+ZB32-XEZ)
22	30	44	41	44	DM4-340-22K	PKZM4-50 (+ CL-PKZ0)	DILM50	ZB65-57 (+ZB65-XEZ)
30	40	59	55	59	DM4-340-30K	PKZM4-63 (+ CL-PKZ0)	DILM65	ZB65-65 (+ZB65-XEZ)
37	50	72	68	72	DM4-340-37K	NZMN1-S80	DILM80	ZB150-100/KK
45	60	85	81	85	DM4-340-45K	NZMN1-S100	DILM95	ZB150-100/KK
55	75	105	99	105	DM4-340-55K	NZMN2-S125	DILM115	ZB150-125/KK
75	100	146	134	146	DM4-340-75K	NZMN2-S160	DILM150	ZB150-150/KK
90	125	174	161	174	DM4-340-90K	NZMN2-S200	DILM185	Z5-220/FF6
110	150	202	196	202	DM4-340-110K	NZMN2-ME220	DILM225	Z5-220/FF6
132	200	242	231	242	DM4-340-132K	NZMN3-ME3506)	DILM250	ZW7-290
160	250	300	279	300	DM4-340-160K	NZMN3-ME3506)	DILM300	ZW7-400
200	300	370	349	370	DM4-340-200K	NZMN3-ME350/...-ME450 ⁶⁾	DILM400	ZW7-400
250	400	500	437	500	DM4-340-250K	NZMN3-ME450/...-ME550 ⁶⁾	DILM500	ZW7-540
315	500	600	544	600	DM4-340-315K	NZMN3-ME550/...-ME875 ⁶⁾	DILM580/750 ¹²⁾	ZW7-630
400	600	750	683	750	DM4-340-400K	NZMN3-ME875	DILM750	ZEV (+ZEV-XSW-820)
500	750	900	860	900	DM4-340-500K	NZMN3-ME875/...-ME1400 ⁹⁾	DILM1000	–
"In-Delta" terminal type (in series with each motor winding)								
11	15	16	21.7	21.7	DM4-340-7K5	PKM0-25 (+ CL-PKZ0)	DILM25	ZB32-16 (+EZ00)
15	20	22	29.3	29.3	DM4-340-11K	PKM0-32 (+ CL-PKZ0)	DILM32	ZB32-24 (+EZ00)
22	25	30	41	41	DM4-340-15K	PKM0-50 (+ CL-PKZ0)	DILM50	ZB32-32 (+EZ1)
30	30	44	55	55	DM4-340-22K	PKM0-58 (+ CL-PKZ0)	DILM65	ZB65-57 (+EZ1)
37	40	44	68	68		NZMN1-S80	DILM80	ZB65-57 (+EZ1)
45	50	59	81	81	DM4-340-30K	NZMN1-S100	DILM95	ZB65-65 (+EZ1)
55	60	59	99	99		NZMN1-S100	DILM115	ZB65-65 (+EZ1)
75	75	85	134	134	DM4-340-45K	NZMN2-S160	DILM150	ZB150-100/KK
90	100	105	161	161	DM4-340-55K	NZMN2-S200 ⁶⁾	DILM185	ZB150-125/KK
110	125	146	196	196	DM4-340-75K	NZMN2-ME220 ⁶⁾	DILM225	ZB150-150/KK
132	200	146	231	231		NZMN3-ME350 ⁶⁾	DILM250	ZB150-150/KK
160	250	174	279	279	DM4-340-90K	NZMN3-ME350 ⁶⁾	DILM300	Z5-220/FF6
200	300	242	349	349	DM4-340-132K	NZMN3-ME350 ⁶⁾	DILM400	ZW7-290
250	400	300	437	437	DM4-340-160K	NZMN3-ME450 ⁶⁾	DILM500	ZW7-400
315	500	370	544	544	DM4-340-200K	NZMN3-ME550 ⁶⁾	DILM580	ZW7-400
400	600	500	683	683	DM4-340-250K	NZMN4-ME875 ⁶⁾	DILM750	ZW7-540
500	750	600	860	860	DM4-340-315K	NZMN4-ME875 ⁶⁾	DILM1000	ZW7-630
560		600	960	960		NZMN4-ME1400 ⁶⁾	DILM1000	ZW7-630
750		750	1280	1280	DM4-340-400K	NZMN4-ME1400(+NZM4-XR...) ⁶⁾		ZEV (+ZEV-XSW-820)
900		900	1540	1540	DM4-340-500K	IZMB2-U2000 ⁸⁾		–

Notes

- At a different operating cycle, the r.m.s. current changes so that a higher-rated device may have to be used. The switching and protective elements are always dimensioned for the following operating cycles (no bypass for any operating cycle):
 - Devices DM4-340-7K5 to DM4-340-90K: each 10 switching operations per hour, continuous operation.
 - Devices DM4-340-110K and DM4-340-132K: each 10 switching operations per hour with at least 3 minutes no-load pause before each start.
 - Devices from DM4-340-160K: each 3 switching operations per hour with at least 8 minutes no-load pause before each start. For all other switching cycles or when a bypass is used, the effective rating changes and a different device is therefore required.
 - The rated operational current (device) must be greater than the motor current (in-line operation) indicated on the motor's nameplate or motor current/ $\sqrt{3}$ (delta operation).
- Rated operational current relative to the specified load cycle.
- Used to specify the current for which the supply cable must be dimensioned with the given operation and motor current. For higher motor currents and for other operations (operating frequency, overcurrent, overcurrent time, duty factor), the current value changes and must be modified accordingly.

Bypass contactor (optional) ¹⁰⁾	Circuit-breakers Controller supply	Semiconductor fuse (optional, in addition to the protective devices for type "1" coordination, required for type "2" coordination)	
		Fuses Number x Part no.	Fuse holders Number x Part no.
DILM7	PKZM0-0,16	3 x 20.282.20-40	3 x 21.189.01
DILM7	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
DILM7	PKZM0-0,16	3 x 20.282.20-40	3 x 21.189.01
DILM7	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02



- 4) In the case of motors with the same rating but with a higher current than the one specified, a switch/contacter with greater specifications must be used if necessary. The motor current is decisive in this case.
- 5) If the soft starter remains continually live, it can also act as overload relay.
For delta connection, set overload relay to the value motor current/√3.
- 6) Overload trip block set to $t_r = \infty$
- 7) In delta connection, the overload relay is connected in series with the motor winding (set to value motor current/√3).
To use IZM as "contactor", accessories are required I (see chapter 5). In that case, the recommended circuits may not apply since different contacts may have to be assigned depending on the selected accessories.
- 8) If the rated operational current is utilized fully, the switch or contactor with greater specifications must be used.
The bypass is dimensioned according to AC-1. If the bypass has to be opened immediately in the event of an emergency stop, it must be dimensioned according to AC-3.
- 9) The bypass is dimensioned according to AC-1. If the bypass has to be opened immediately in the event of an emergency stop, it must be dimensioned according to AC-3.
- 10) In this case, the contactors in the "Mains contactor" column must be used.

Assigned motor rating at		Rated operational current ²⁾			Part no. ¹⁾ Soft starters	Soft starter function		
400 V	480 V	Device	Motor	Cable ³⁾		Cable protection	Mains contactor (optional) ⁴⁾	Overload relay ⁵⁾⁷⁾
P	P	I _e	I _e	I _e ²⁾				
kW	HP	A	A	A				
Soft starters for three-phase mains connection, long start-up time								
Tripping class CLASS 10 (15 s, 3.5 x I_e)								
"In-line" terminal type (upstream of load, standard)								
7.5	10	22	15.2	21	DM4-340-11K	PKM0-25 (+ CL-PKZ0)	DILM17	ZB32-16 (+ZB32-XEZ)
11	15	30	21.7	31	DM4-340-15K	PKM0-32 (+ CL-PKZ0)	DILM25	ZB32-24 (+ZB32-XEZ)
15	20	44	29.3	41	DM4-340-22K	PKZM4-58 (+ CL-PKZ0)	DILM32	ZB32-32 (+ZB32-XEZ)
22	30	59	41	58	DM4-340-30K	PKZM4-58 (+ CL-PKZ0)	DILM50	ZB65-57 (+ZB65-XEZ)
30	40	72	55	78	DM4-340-37K	NZMN1-ME90 ⁶⁾	DILM65	ZB65-65 (+ZB65-XEZ)
37	50	85	68	96	DM4-340-45K	NZMN1-ME90 ⁶⁾	DILM80	ZEV + ZEV-XSW-145
45	60	105	81	114	DM4-340-55K	NZMN1-ME90 ⁶⁾	DILM95	ZEV + ZEV-XSW-145
55	75	146	99	140	DM4-340-75K	NZMN2-ME140 ⁶⁾	DILM115	ZEV + ZEV-XSW-145
75	100	174	134	189	DM4-340-90K	NZMN2-ME140 ⁶⁾	DILM150	ZEV + ZEV-XSW-145
90	125	202	161	227	DM4-340-110K	NZMN2-ME220 ⁶⁾	DILM185	ZEV + ZEV-XSW-820
110	150	242	196	276	DM4-340-132K	NZMN2-ME220 ⁶⁾	DILM225	ZEV + ZEV-XSW-820
132	200	300	231	326	DM4-340-160K	NZMN3-ME350 ⁶⁾	DILM250	ZEV + ZEV-XSW-820
160	250	370	279	393	DM4-340-200K	NZMN3-ME350 ⁶⁾	DILM300	ZEV + ZEV-XSW-820
200	300	500	349	492	DM4-340-250K	NZMN3-ME350 ⁶⁾	DILM400	ZEV + ZEV-XSW-820
250	400	600	437	616	DM4-340-315K	NZMN3-ME450 ⁶⁾	DILM500	ZEV + ZEV-XSW-820
315	500	750	544	767	DM4-340-400K	NZMN3-ME550 ⁶⁾	DILM580	ZEV + ZEV-XSW-820
400	600	900	683	963	DM4-340-500K	NZMN3-ME875 ⁶⁾	DILM750	ZEV + ZEV-XSW-820
"In-Delta" terminal type (in series with each motor winding)								
11	15	16	21.7	31	DM4-340-7K5	PKM0-32 (+ CL-PKZ0)	DILM25	ZEV + ZEV-XSW-25
15	20	30	29.3	41	DM4-340-15K	PKZM4-58 (+ CL-PKZ0)	DILM32	ZEV + ZEV-XSW-65
22	25	44	41	58	DM4-340-22K	PKZM4-58 (+ CL-PKZ0)	DILM50	ZEV + ZEV-XSW-65
30	30	59	55	78	DM4-340-30K	NZMN1-ME90 ⁶⁾	DILM65	ZEV + ZEV-XSW-65
37	40	59	68	96		NZMN1-ME90 ⁶⁾	DILM80	ZEV + ZEV-XSW-145
45	50	72	81	114	DM4-340-37K	NZMN1-ME90 ⁶⁾	DILM95	ZEV + ZEV-XSW-145
55	60	85	99	140	DM4-340-45K	NZMN2-ME140 ⁶⁾	DILM115	ZEV + ZEV-XSW-145
75	75	105	134	189	DM4-340-55K	NZMN2-ME140 ⁶⁾	DILM150	ZEV + ZEV-XSW-145
90	100	146	161	227	DM4-340-75K	NZMN2-ME220 ⁶⁾	DILM185	ZEV + ZEV-XSW-820
110	125	174	196	276	DM4-340-90K	NZMN2-ME220 ⁶⁾	DILM225	ZEV + ZEV-XSW-820
132	200	174	231	326		NZMN3-ME350 ⁶⁾	DILM250	ZEV + ZEV-XSW-820
160	250	202	279	393	DM4-340-110K	NZMN3-ME350 ⁶⁾	DILM300	ZEV + ZEV-XSW-820
200	300	300	349	492	DM4-340-160K	NZMN3-ME350 ⁶⁾	DILM400	ZEV + ZEV-XSW-820
250	400	370	437	616	DM4-340-200K	NZMN3-ME450 ⁶⁾	DILM500	ZEV + ZEV-XSW-820
315	500	500	544	767	DM4-340-250K	NZMN3-ME550 ⁶⁾	DILM580	ZEV + ZEV-XSW-820
400	600	600	683	963	DM4-340-315K	NZMN3-ME875 ⁶⁾	DILM750	ZEV + ZEV-XSW-820
500	750	750	860	1213	DM4-340-400K	NZMN3-ME875 ⁶⁾	DILM1000	ZEV + ZEV-XSW-820
560		900	960	1354	DM4-340-500K	NZMN4-ME1400 ⁶⁾	DILM1000	ZEV + ZEV-XSW-820

Notes

- At a different operating cycle, the r.m.s. current changes so that a higher-rated device may have to be used. The switching and protective elements are always dimensioned for the following operating cycles (no bypass for any operating cycle):
 - Devices DM4-340-7K5 to DM4-340-90K: each 10 switching operations per hour, continuous operation.
 - Devices DM4-340-110K and DM4-340-132K: each 10 switching operations per hour with at least 3 minutes no-load pause before each start.
 - Devices from DM4-340-160K: each 3 switching operations per hour with at least 8 minutes no-load pause before each start. For all other switching cycles or when a bypass is used, the effective rating changes and a different device is therefore required.
 - The rated operational current (device) must be greater than the motor current (in-line operation) indicated on the motor's nameplate ("in-line" operation) or motor current/√3 (delta operation).
- Rated operational current relative to the specified load cycle
- Used to specify the current for which the supply cable must be dimensioned with the given operation and motor current. For higher motor currents and for other operations (operating frequency, overcurrent, overcurrent time, duty factor), the current value changes and must be modified accordingly.

Bypass contactor (optional) ¹⁰⁾	Circuit-breakers Controller supply	Semiconductor fuse (optional, in addition to the protective devices for type "1" coordination, required for type "2" coordination)	
		Fuses Number x Part no.	Fuse holders Number x Part no.
DILM7	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM115	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
DILM7	PKZM0-0,16	3 x 20.282.20-40	3 x 21.189.01
DILM17	PKZM0-0,16	3 x 20.282.20-80	3 x 21.189.01
DILM25	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM40	PKZM0-0,16	3 x 20.282.20-125	3 x 21.189.01
DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
DILM65	PKZM0-0,16	3 x 20.189.20-200	3 x 21.189.01
DILM95	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-350	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM150	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-450	3 x 21.313.02
DILM185	PKZM0-0,16	3 x 20.610.32-500	3 x 21.313.02
DILM225	PKZM0-0,16	3 x 20.610.32-630	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM400	PKZM0-1.6	3 x 20.630.32-900	3 x 21.313.02
DILM500	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02
DILM580	PKZM0-1.6	3 x 20.630.32-1250	3 x 21.313.02

- 4) In the case of motors with the same rating but with a higher current than the one specified, a switch/contactor with greater specifications must be used if necessary. The motor current is decisive in this case.
- 5) If the soft starter remains continually live, it can also act as overload relay. For delta connection, set overload relay to the value motor current/ $\sqrt{3}$.
- 6) Overload trip block set to $t_r = \infty$
- 7) In delta connection, the overload relay is connected in series with the motor winding (set to value motor current/ $\sqrt{3}$).
- 8) To use IZM as "contactor", accessories are required I (see chapter 5). In that case, the recommended circuits may not apply since different contacts may have to be assigned depending on the selected accessories.
- 9) The bypass is dimensioned according to AC-1. If the bypass has to be opened immediately in the event of an emergency stop, it must be dimensioned according to AC-3.
- 10) In this case, the contactors in the "Mains contactor" column must be used.



			DM4-340-7K5	DM4-340-11K	DM4-340-15K	DM4-340-22K
General						
Standards			IEC/EN 60947-4-2			
Approvals			UL, cUL	UL, cUL	UL, cUL	UL, cUL
Climatic proofing			Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30			
Ambient temperature		°C	0 - +40, to 60 with a reduction of I _e of 2 % per °C			
Ambient temperature storage		°C	-25 - 60	-25 - 60	-25 - 60	-25 - 60
Installation altitude		m	0 - 1000, to 2000 m with a current reduction of 1 % per 100 m			
Mounting position			Vertical	Vertical	Vertical	Vertical
Protection type			IP20	IP20	IP20	IP20
Protection against direct contact			Finger- and back-of-hand proof			
Pollution degree			2	2	2	2
Power loss of rated operational current I _e		W	50	63	91	120
Dimensions (W x H x D)		mm	222 x 290 x 195	222 x 290 x 195	222 x 290 x 195	222 x 290 x 195
Weight		kg	6.7	6.7	6.7	6.7
Main contacts						
Rated operating voltage	U _e	V AC	230 - 460	230 - 460	230 - 460	230 - 460
Rated insulation voltage	U _i	V AC	460	460	460	460
Mains frequency		Hz	50/60	50/60	50/60	50/60
Control section power supply	U _c	V AC	110/230	110/230	110/230	110/230
Rated operational current						
Motor load (AC-53)	I _e	A	16	23	30	44
Assigned motor rating (standard connection)						
230 V	P	kW	4	5.5	7.5	11
400V	P	kW	7.5	11	15	22
480 V	P	HP	10	15	20	30
Phase current						
In-delta terminal type		A	27	39	51	76
Assigned motor rating (in-delta terminal type)						
230 V		kW	7.5	11	15	22
400 V		kW	11	15	22	37
480 V		HP	20	25	30	50
Overload cycle to IEC/EN 60947-4-2						
AC-53a (without bypass)			16 A: AC-53a: 3-35: 99-10	23 A: AC-53a: 3-35: 99-10	30 A: AC-53a: 3-35: 99-10	44 A: AC-53a: 3-35: 99-10
Short-circuit rating						
Type "1" of coordination			PKZM0-16	PKZM0-25	PKZ2/ZM-32	NZM7-63N
Type "2" of coordination additionally			20.282.20-40	20.282.20-80	20.282.20-80	20.282.20-125

DM4-340-30K	DM4-340-37K	DM4-340-45K	DM4-340-55K	DM4-340-75K	DM4-340-90K
IEC/EN 60947-4-2					
UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL
Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30					
0 - +40, to 60 with a reduction of I _e of 2 % per °C					
-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60
0 - 1000, to 2000 m with a current reduction of 1 % per 100 m					
Vertical	Vertical	Vertical	Vertical	Vertical	Vertical
IP20	IP20	IP20	IP20	IP20	IP20
Finger- and back-of-hand proof					
2	2	2	2	2	2
152	190	227	276	380	452
222 x 290 x 195	222 x 290 x 195	222 x 420 x 195	222 x 420 x 195	222 x 420 x 195	520 x 338 x 248
6.7	6.7	15	15	15	15.7
230 - 460	230 - 460	230 - 460	230 - 460	230 - 460	230 - 460
460	460	460	460	460	460
50/60	50/60	50/60	50/60	50/60	50/60
110/230	110/230	110/230	110/230	110/230	110/230
59	72	85	105	146	174
15	18.5	22	30	37	45
30	37	45	55	75	90
40	50	60	75	100	125
102	124	147	181	252	301
30	37	45	55	75	90
55	55	75	90	132	160
75	100	100	150	200	250
59 A: AC-53a: 3-35: 99-10	72 A: AC-53a: 3-35: 99-10	85 A: AC-53a: 3-35: 99-10	105 A: AC-53a: 3-35: 99-10	146 A: AC-53a: 3-35: 99-10	174 A: AC-53a: 3-35: 99-10
NZM7-63N	NZM7-80N	NZM7-100N	NZM7-100N	NZM7-160N	NZM7-200N
20.282.20-125	20.189.20-200	20.189.20-200	20.610.32-350	20.610.32-350	20.610.32-450



			DM4-340-7K5	DM4-340-11K	DM4-340-15K	DM4-340-22K
Terminal capacity						
Power cables						
Connection			–	–	–	–
Solid		mm ²	1 x (1.5 - 16) 2 x (1 - 4)	1 x (1.5 - 16) 2 x (1 - 4)	1 x (1.5 - 16) 2 x (1 - 4)	1 x (1.5 - 16) 2 x (1 - 4)
Flexible with ferrule		mm ²	1 x (1 - 16) 2 x (1 - 4)	1 x (1 - 16) 2 x (1 - 4)	1 x (1 - 16) 2 x (1 - 4)	1 x (1 - 16) 2 x (1 - 4)
Flexible with cable lug		mm ²	–	–	–	–
Stranded		mm ²	1 x (2.5 - 25) 2 x (2.5 - 4)	1 x (2.5 - 25) 2 x (2.5 - 4)	1 x (2.5 - 25) 2 x (2.5 - 4)	1 x (2.5 - 25) 2 x (2.5 - 4)
Stranded with cable lug		mm ²	–	–	–	–
Solid or stranded		AWG	12 - 4	12 - 4	12 - 4	12 - 4
Flat conductor	Number of layers x width x thickness	mm	–	–	–	–
Busbar	Width	mm	–	–	–	–
Tightening torque		Nm	2	2	2	2
Screwdriver (PZ: Pozidriv)		mm	0.8 x 4	0.8 x 4	0.8 x 4	0.8 x 4
Control cables						
Solid		mm ²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Flexible with ferrule		mm ²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Stranded		mm ²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Solid or stranded		AWG	22 - 12	22 - 12	22 - 12	22 - 12
Tightening torque		Nm	0.5	0.5	0.5	0.5
Screwdriver		mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Control circuit						
Current consumption						
Digital inputs						
24 V DC		mA	0.45	0.45	0.45	0.45
230 V AC		mA	4.5	4.5	4.5	4.5
Analog inputs						
0 - 10 V		mA	1	1	1	1
Pick-up voltage						
DC operated		V DC	24 - 230	24 - 230	24 - 230	24 - 230
AC operated		V AC	24 - 230	24 - 230	24 - 230	24 - 230
Drop-out voltage						
DC operated		V DC	0 - 3	0 - 3	0 - 3	0 - 3
AC operated		V AC	0 - 3	0 - 3	0 - 3	0 - 3
Programmable relay outputs						
Quantity			4	4	4	4
Max. voltage		V AC	250	250	250	250
Max. current AC-11		A	3	3	3	3
Programmable analog outputs						
Quantity			2	2	2	2
Voltage range		V DC	0 - 10	0 - 10	0 - 10	0 - 10
Current carrying capacity		mA	10	10	10	10
Programmable analog inputs						
Ref 1		V DC	0 - 10	0 - 10	0 - 10	0 - 10
Ref 2		mA	4 - 20	4 - 20	4 - 20	4 - 20
Soft start function						
Ramp times						
Acceleration time		s	1 - 255	1 - 255	1 - 255	1 - 255
Deceleration time		s	0 - 255	0 - 255	0 - 255	0 - 255
Start voltage		%	10 - 60	10 - 60	10 - 60	10 - 60
Voltage reduction at stop		%	0 - 100	0 - 100	0 - 100	0 - 100
Kick-start						
Voltage		%	60 - 90	60 - 90	60 - 90	60 - 90
Duration						
50 Hz		ms	100 - 400	100 - 400	100 - 400	100 - 400
60 Hz		ms	166 - 664	166 - 664	166 - 664	166 - 664
Current limitation			(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e

DM4-340-30K	DM4-340-37K	DM4-340-45K	DM4-340-55K	DM4-340-75K	DM4-340-90K
–	–	M8 bolt for cable lug	–	–	–
1 x (4 - 35) 2 x (4 - 10)	1 x (4 - 35) 2 x (4 - 10)	–	–	–	–
1 x (6 - 35) 2 x (6 - 10)	1 x (6 - 35) 2 x (6 - 10)	–	–	–	–
–	–	35 - 95	35 - 95	35 - 95	35 - 95
1 x (10 - 50) 2 x 10	1 x (10 - 50) 2 x 10	–	–	–	–
–	–	50 - 120	50 - 120	50 - 120	50 - 120
10 - 1	10 - 1	1 - 0 250 MCM	1 - 0 250 MCM	1 - 0 250 MCM	1 - 0 250 MCM
–	–	6 x 16 x 0.8	6 x 16 x 0.8	6 x 16 x 0.8	2 x (6 x 16 x 0.8)
–	–	–	–	–	2 x (20 x 6)
3	3	12	12	12	12
1.2 x 6.5	1.2 x 6.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
22 - 12	22 - 12	22 - 12	22 - 12	22 - 12	22 - 12
0.5	0.5	0.5	0.5	0.5	0.5
0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
0.45	0.45	0.45	0.45	0.45	0.45
4.5	4.5	4.5	4.5	4.5	4.5
1	1	1	1	1	1
24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
24 - 230	24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
0 - 3	0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
4	4	4	4	4	4
250	250	250	250	250	250
3	3	3	3	3	3
2	2	2	2	2	2
0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
10	10	10	10	10	10
0 - 10	0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
4 - 20	4 - 20	4 - 20	4 - 20	4 - 20	4 - 20
1 - 255	1 - 255	1 - 255	1 - 255	1 - 255	1 - 255
0 - 255	0 - 255	0 - 255	0 - 255	0 - 255	0 - 255
10 - 60	10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
0 - 100	0 - 100	0 - 100	0 - 100	0 - 100	0 - 100
60 - 90	60 - 90	60 - 90	60 - 90	60 - 90	60 - 90
100 - 400	100 - 400	100 - 400	100 - 400	100 - 400	100 - 400
166 - 664	166 - 664	166 - 664	166 - 664	166 - 664	166 - 664
(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e



				DM4-340-110K	DM4-340-132K	DM4-340-160K
General						
Standards				IEC/EN 60947-4-2		
Approvals				UL, cUL	UL, cUL	UL, cUL
Climatic proofing				Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30		
Ambient temperature		°C		0 - +40, to 60 with a reduction of I _e of 2 % per C		
Ambient temperature storage		°C		-25 - 60	-25 - 60	-25 - 60
Installation altitude		m		0 - 1000, to 2000 m with a current consumption of 1% per 100 m		
Mounting position				Vertical	Vertical	Vertical
Protection type				IP20	IP20	IP20
Protection against direct contact				Finger- and back-of-hand proof		
Pollution degree				2	2	2
Power loss at rated operational current I _e		W		545	662	795
Dimensions (W x H x D)		mm		338 x 520 x 248	338 x 520 x 248	338 x 520 x 248
Weight		kg		15.7	22	22
Main contacts						
Rated operating voltage	U _e	V AC		230 - 460	230 - 460	230 - 460
Rated insulation voltage	U _i	V AC		460	460	460
Mains frequency		Hz		50/60	50/60	50/60
Control section power supply	U _C	V AC		110/230	110/230	110/230
Rated operational current						
Motor load (AC-53)	I _e	A		202	242	300
Assigned motor rating (standard connection)						
230 V	P	kW		55	75	90
400V	P	kW		110	132	160
480 V	P	HP		150	200	250
Phase current						
In-delta terminal type		A		349	419	519
Assigned motor rating (in-delta terminal type)						
230 V		kW		110	132	160
400 V		kW		160	200	250
480 V		HP		250	350	400
Overload cycle to IEC/EN 60947-4-2						
AC-53a (without bypass)				202 A: AC-53a: 3-35: 60-10	242 A: AC-53a: 3-35: 60-10	300 A: AC-53a: 3-35: 60-3
Short-circuit rating						
Type "1" of coordination				NZM7-200N	NZM7-250N	NZM10-400N/ZM-400
Type "2" of coordination additionally				20.610.32-450	20.610.32-500	20.610.32-500

DM4

DM4-340-200K	DM4-340-250K	DM4-340-315K	DM4-340-400K	DM4-340-500K
IEC/EN 60947-4-2				
UL, cUL	UL, cUL	UL, cUL	UL, cUL	UL, cUL
Damp heat, constant, according to IEC 60068-2-78; Damp heat, cyclic, according to IEC 60068-2-30				
0 - +40, to 60 with a reduction of I _e of 2 % per °C				
-25 - 60	-25 - 60	-25 - 60	-25 - 60	-25 - 60
0 - 1000, to 2000 m with a current consumption of 1% per 100 m				
Vertical	Vertical	Vertical	Vertical	Vertical
IP20	IP20	IP20	IP20	IP20
Finger- and back-of-hand proof				
2	2	2	2	2
925	1371	1705	2106	2775
338 x 520 x 248	640 x 610 x 375	640 x 610 x 375	640 x 610 x 375	640 x 610 x 375
22	56	65	72	72
230 - 460	230 - 460	230 - 460	230 - 460	230 - 460
460	460	460	460	460
50/60	50/60	50/60	50/60	50/60
110/230	110/230	110/230	110/230	110/230
370	500	600	750	900
110	132	160	200	250
200	250	315	400	500
300	400	500	600	750
640	866	1039	1299	1558
200	250	315	400	500
315	400	560	750	900
500	600	850	1100	1300
370 A: AC-53a: 3-35: 60-3	500 A: AC-53a: 3-35: 60-3	600 A: AC-53a: 3-35: 60-3	750 A: AC-53a: 3-35: 60-3	900 A: AC-53a: 3-35: 60-3
NZM10-400N/ZM-400	NZM10-630N/ZM-630	NZM10-630N/ZM-630	NZM14-800S	NZM14-1000S
20.610.32-630	20.610.32-900	20.610.32-900	20.610.32-1250	20.610.32-1250



		DM4-340-110K	DM4-340-132K	DM4-340-160K
Terminal capacity				
Power cables				
Connection		M8 bolt for cable lug		
Solid	mm ²	–	–	–
Flexible with ferrule	mm ²	–	–	–
Flexible with cable lug	mm ²	2 x (35 - 95)	2 x (35 - 95)	2 x (35 - 95)
Stranded	mm ²	–	–	–
Stranded with cable lug	mm ²	2 x (50 - 120)	2 x (50 - 120)	2 x (50 - 120)
Solid or stranded	AWG	2 x 1/0 2 x 250 MCM	2 x 1/0 2 x 250 MCM	2 x 1/0 2 x 250 MCM
Flat conductor (number of layers x width x thickness)	mm	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)
Busbar (width)	mm	2 x (20 x 6)	2 x (20 x 6)	2 x (20 x 6)
Tightening torque	Nm	12	12	12
Screwdriver (PZ: Pozidriv)	mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Control cables				
Solid	mm ²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Flexible with ferrule	mm ²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Stranded	mm ²	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
Solid or stranded	AWG	22 - 12	22 - 12	22 - 12
Tightening torque	Nm	0.5	0.5	0.5
Screwdriver	mm	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Control circuit				
Current consumption				
Digital inputs				
24 V DC	mA	0.45	0.45	0.45
230 V AC	mA	4.5	4.5	4.5
Analog inputs				
0 - 10 V	mA	1	1	1
Pick-up voltage				
DC operated	V DC	24 - 230	24 - 230	24 - 230
AC operated	V AC	24 - 230	24 - 230	24 - 230
Drop-out voltage				
DC operated	V DC	0 - 3	0 - 3	0 - 3
AC operated	V AC	0 - 3	0 - 3	0 - 3
Programmable relay outputs				
Quantity		4	4	4
Max. voltage	V AC	250	250	250
Max. current AC-11	A	3	3	3
Programmable analog outputs				
Quantity		2	2	2
Voltage range	V DC	0 - 10	0 - 10	0 - 10
Current carrying capacity	mA	10	10	10
Programmable analog inputs				
Ref 1	V DC	0 - 10	0 - 10	0 - 10
Ref 2	mA	4 - 20	4 - 20	4 - 20
Soft start function				
Ramp times				
Acceleration time	s	1 - 255	1 - 255	1 - 255
Deceleration time	s	0 - 255	0 - 255	0 - 255
Start voltage	%	10 - 60	10 - 60	10 - 60
Voltage reduction at stop	%	0 - 100	0 - 100	0 - 100
Kick-start				
Voltage	%	60 - 90	60 - 90	60 - 90
Duration				
50 Hz	ms	100 - 400	100 - 400	100 - 400
60 Hz	ms	166 - 664	166 - 664	166 - 664
Current limitation		(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e

DM4-340-200K	DM4-340-250K	DM4-340-315K	DM4-340-400K	DM4-340-500K
M8 bolt for cable lug	2 x screws M12 for cable lug	2 x screws M12 for cable lug	2 x screws M12 for busbar connection	2 x screws M12 for cable lug
–	–	–	–	–
–	–	–	–	–
2 x (35 - 95)	2 x (50 - 240)	2 x (50 - 240)	–	–
–	–	–	–	–
2 x (50 - 120)	2 x (70 - 240)	2 x (70 - 240)	–	–
2 x 1/0 2 x 250 MCM	2 x 2/0 2 x 500 MCM	2 x 2/0 2 x 500 MCM	–	–
2 x (6 x 16 x 0.8)	2 x (10 x 21 x 1)	2 x (10 x 21 x 1)	–	–
2 x (20 x 6)	21 x 20	21 x 20	45 x 20 60 x 10 80 x 10	45 x 20 60 x 10 80 x 10
12	24	24	24	24
0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)	1 x (0.75 - 2.5)
22 - 12	22 - 12	22 - 12	22 - 12	22 - 12
0.5	0.5	0.5	0.5	0.5
0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
0.45	0.45	0.45	0.45	0.45
4.5	4.5	4.5	4.5	4.5
1	1	1	1	1
24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
24 - 230	24 - 230	24 - 230	24 - 230	24 - 230
0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
0 - 3	0 - 3	0 - 3	0 - 3	0 - 3
4	4	4	4	4
250	250	250	250	250
3	3	3	3	3
2	2	2	2	2
0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
10	10	10	10	10
0 - 10	0 - 10	0 - 10	0 - 10	0 - 10
4 - 20	4 - 20	4 - 20	4 - 20	4 - 20
1 - 255	1 - 255	1 - 255	1 - 255	1 - 255
0 - 255	0 - 255	0 - 255	0 - 255	0 - 255
10 - 60	10 - 60	10 - 60	10 - 60	10 - 60
0 - 100	0 - 100	0 - 100	0 - 100	0 - 100
60 - 90	60 - 90	60 - 90	60 - 90	60 - 90
100 - 400	100 - 400	100 - 400	100 - 400	100 - 400
166 - 664	166 - 664	166 - 664	166 - 664	166 - 664
(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e	(0.5 - 8) x I _e



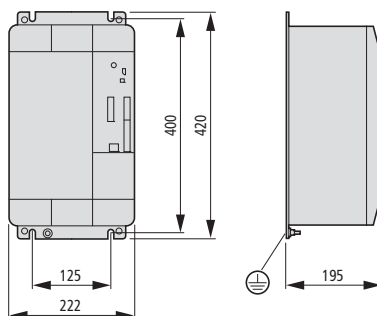
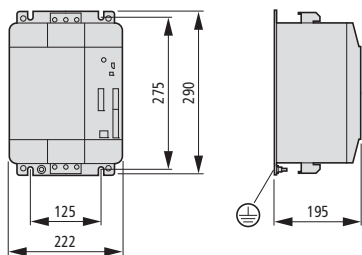
Dimensions

Soft starters

DM4-340-7K5
DM4-340-11K
DM4-340-15K

DM4-340-22K
DM4-340-30K
DM4-340-37K

DM4-340-45K
DM4-340-55K
DM4-340-75K

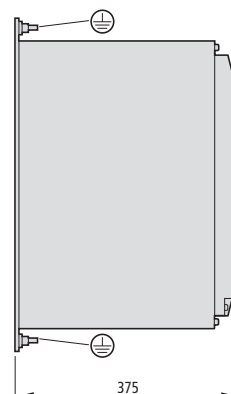
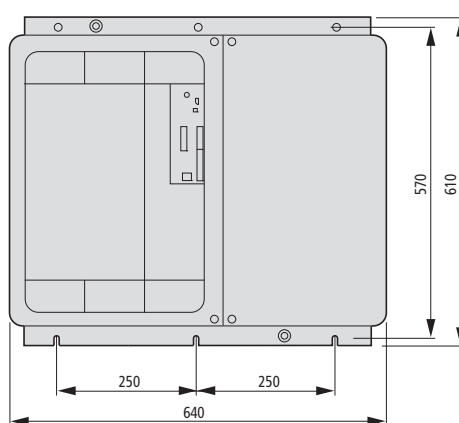
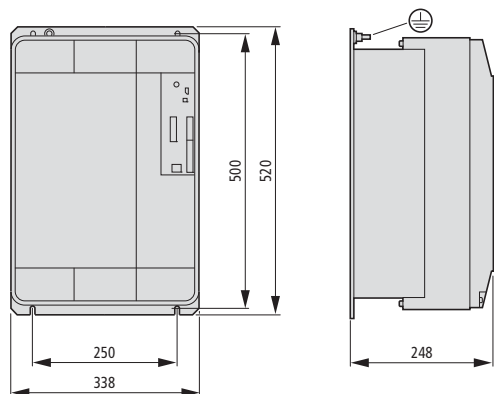


DM4-340-90K
DM4-340-110K
DM4-340-132K

DM4-340-160K
DM4-340-200K

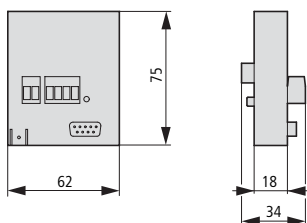
DM4-340-250K
DM4-340-315K

DM4-340-400K
DM4-340-500K



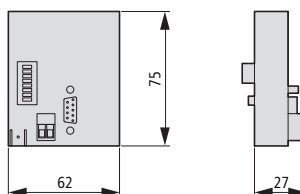
RS 232C/RS 485 serial interface

DE4-COM-2X



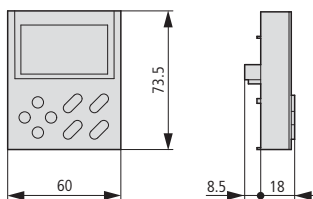
PROFIBUS DP fieldbus connection

DE4-NET-DP2



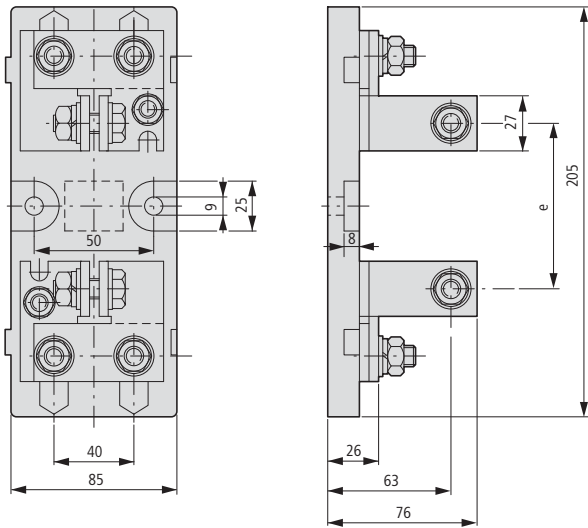
LCD keypad for DM4

DE4-KEY-2

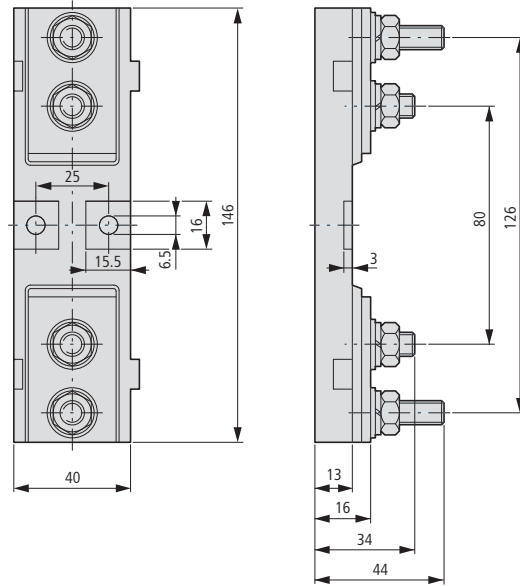


Fuse base

21.313.02

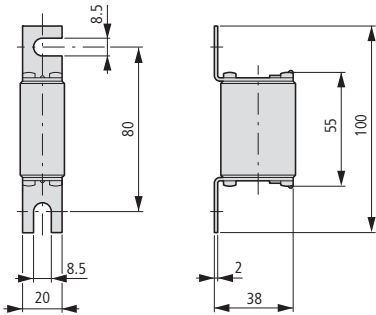


21.189.01

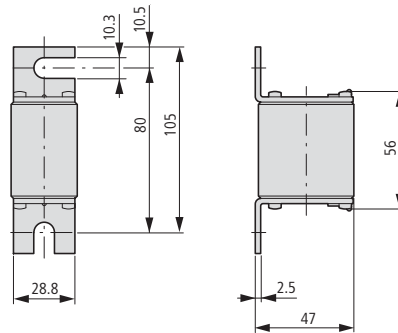


Fuses

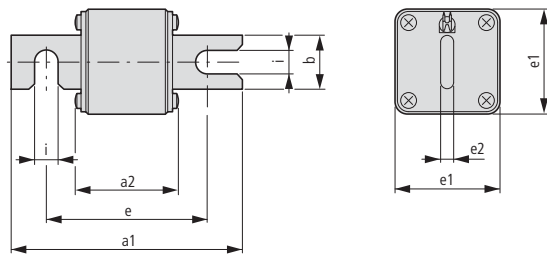
20.282.20...



20.189.20...

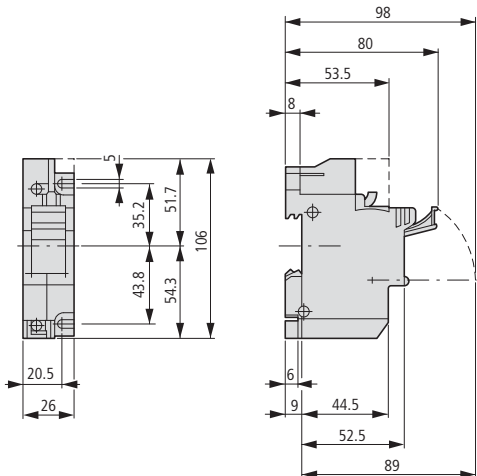


20.6x0.20



Part no.	a1	a2	b	e	e1	e2	l
20.610.32-200	109	47.5	26	76	51	6	11
20.610.32-350	109	47.5	26	76	51	6	11
20.610.32-450	109	47.5	26	76	51	6	11
20.610.32-500	109	47.5	26	76	51	6	11
20.610.32-630	109	47.5	26	76	51	6	11
20.610.32-900	109	49	35	76	73	6	11
20.610.32-1250	109	49	35	76	73	6	11

51.060.04





Frequency inverters M-Max™, H-Max™

Frequency inverters permit the continuously variable speed control of three-phase asynchronous motors, by converting a one- or three-phase alternating current of specific frequency and voltage amplitudes into a three-phase alternating current with variable voltage amplitude.

The M-Max™ and H-Max™ device series find universal application:

Device series M-Max™ is preferred in machinery construction; device series H-Max™ is primarily used in heating, ventilation and air conditioning (HVAC).



Frequency inverters M-Max™

Output voltage with sinusoidal evaluated Pulse-Width Modulation (PWM) for voltage/frequency control (U/f control) and voltage-steered vector control

MMX...-N...: Compact construction type in three sizes, protection type IP20

MMX...-F...: Compact construction type in three sizes, protection type IP20, with internal radio interference suppression filter (EMC)

MMX12..., MMX32...: Nominal current 1.7 – 9.6 A with 230 V single phase mains connection, assigned motor power 0.25 – 2.2 kW (230 V) → Page 10/5

MMX34...: Nominal current 1.3 – 14 A with 400 V three-phase mains connection, assigned motor power 0.37 – 7.5 kW (400 V) → Page 10/7

Frequency inverters H-Max™

Output voltage with sinusoidal evaluated Pulse-Width Modulation (PWM) for voltage / frequency control (U/f control) and sensorless flow vector control

HMX...-1-B: Compact construction type in five sizes, protection type IP21, with internal radio interference suppression filter (EMC) and intermediate circuit choke

HMX...-2-B: Compact construction type in six sizes, protection type IP54, with internal radio interference suppression filter (EMC) and intermediate circuit choke

HMX32...: Nominal current 3.7 – 310 A with 230 V three-phase mains connection, assigned motor power 0.75 – 90 kW (230 V) → Page 10/10

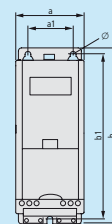
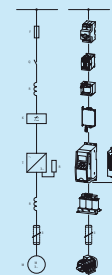
HMX34...: Nominal current 3.4 – 310 A with 400 V three-phase mains connection, assigned motor power 1.1 – 60 kW (400 V) → Page 10/12



Eaton After Sales Service

Extended warranty for authorized commissioning
→ Chapter 22

Frequency inverters



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System overview

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Description

Frequency inverter H-Max™	10/9
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Ordering

Frequency inverter H-Max™	10/10
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Description

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Mains chokes, motor chokes	10/16

Ordering

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Technical data

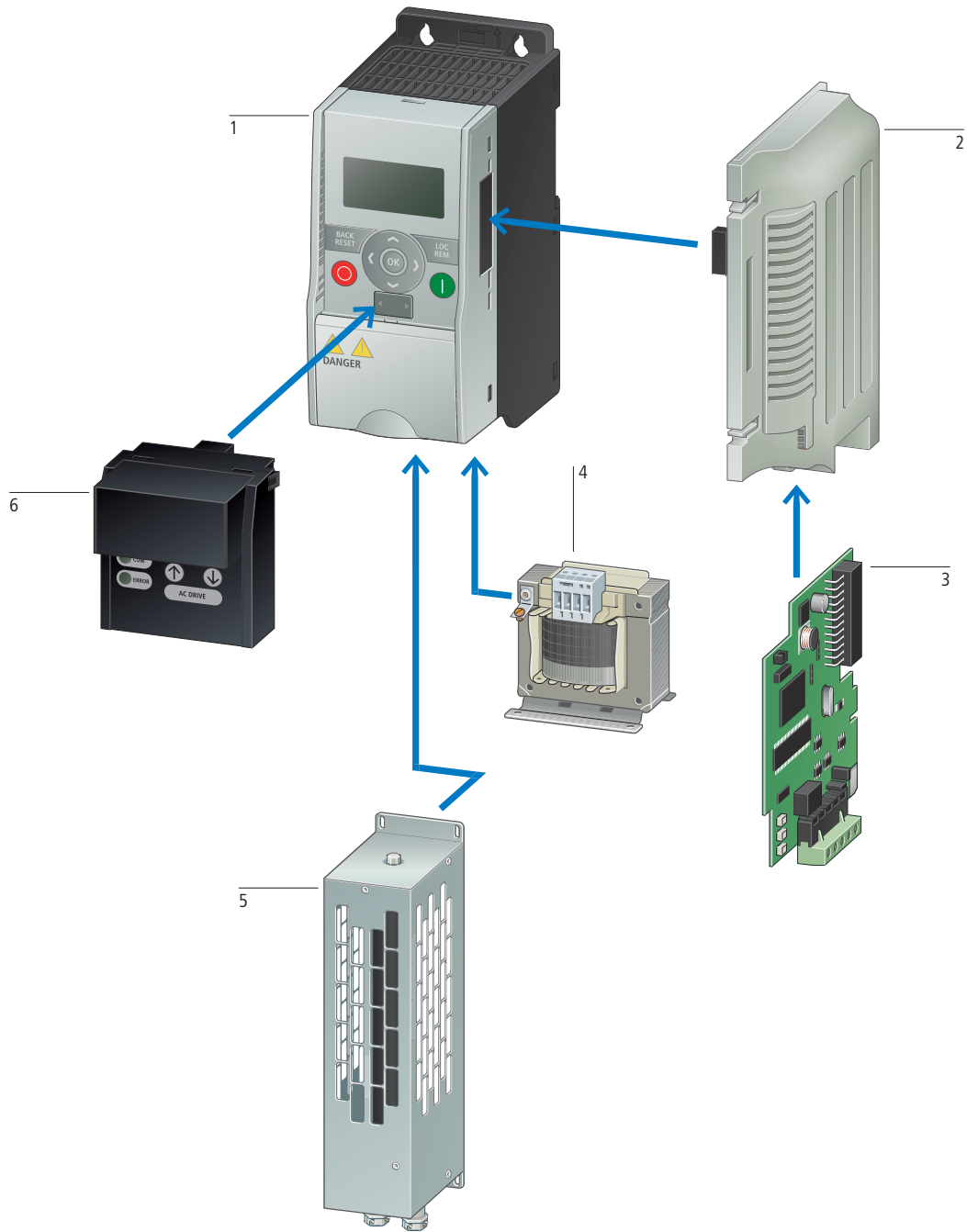
Frequency inverter M-Max™	10/32
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System overview



Basic device

Frequency inverters	1
MMX12...	
Mains: single-phase, 230/240 V	
Assigned motor rating from 0.25 up to 2.2 kW (230 V)	
→ Page 10/5	
MMX32...	
Mains: 3-phase, 230/240 V	
Assigned motor rating from 0.25 up to 2.2 kW (230 V)	
→ Page 10/6	
MMX34...	
Mains: 3-phase, 400/480 V	
Assigned motor rating from 0.37 up to 7.5 kW (400 V)	
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System accessories

Communication module	3
Versions	
• CANopen fieldbus connection	
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Mounting frame	2
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Accessories

Mains chokes	4
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Motor chokes	4
→ Page 10/21	
Braking resistor	5
→ Page 10/17	

Description



Application

The frequency inverters of the M-Max™ series allow a continuously variable speed control of three-phase asynchronous motors. They are specially suited for applications in which ease of handling and cost-effectiveness have a high priority. The characteristics-controlled voltage/frequency (U/f) control already allows a wide range of applications even with the default settings: from simple pump and fan drives, standard packaging applications to the operation of multiple motors in horizontal transportation and conveying.

With sensorless vector control, an individual drive can also be used in demanding applications, in which a high torque and concentricity in the lower speed range are vital, such as in the plastics and metal industries, the textile, paper and printing industries or in crane and elevator systems.

Rated operational currents from 1.4 to 21 A allow the operation of standard four-pole asynchronous motors in an assigned rating range of:

- 0.25 to 2.2 kW at 230 V (single-phase mains connection),
- 0.25 to 2.2 kW at 230 V (three-phase mains connection),
- 0.37 to 7.5 kW at 400 V (three-phase mains connection).

Features

- Compact design through state-of-the-art IGBT modules
- Integrated radio interference suppression filter (EMC)
- Keypad with backlit LCD display
- 6 digital inputs (24 V DC) for sink- and source-type control
- 2 relays (1 changeover contact, 1 normally open contact, 230 V)
- 1 transistor output (N/O or N/C, 48 V DC)
- 2 analog inputs (0 to +10 V, 4 to 20 mA), selectable and scaleable
- 1 analog output (0 to +10 V), scaleable
- 1 serial interface (RS485, Modbus RTU)
- Built-in braking transistor with size MMX34...
- Optional fieldbus connection (CANopen, PROFIBUS-DP, DeviceNet)
- User-friendly commissioning through fast configuration and application menu
- Compliance with global standards to CE, UL, c-UL and c-Tick

Functions

A comprehensive range of protection functions allow safe operation and the protection of frequency inverter, motor and application. They offer protection against:

- Overcurrent, ground fault
- Overload (electronic motor protection)
- Overtemperature
- Overvoltage, undervoltage

Further functions are:

- Restart inhibit
- U/f control or sensorless vector control
- Double starting current and 1.5 times overcurrent
- PID controller
- Sequence control
- Braking control (DC braking)
- 8 fixed frequencies
- Electronic motor potentiometer
- Logic function (AND, OR, XOR)
- Upper and lower frequency and current limits
- Frequency hopping (frequency masking)
- DC braking before start and up to motor standstill
- 2 parameter sets

Documentation

An instructional leaflet and a CD are included with each frequency inverter of the M-Max™ series.

The instructional leaflet is a quick guide with illustrations and notes in 23 languages about the correct handling, mounting and electrical connection of the device. The CD contains the instructional leaflet as well as the Hardware and Engineering manual in several languages.

The current documentation is also available for download from www.moeller.net/support



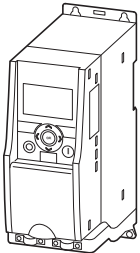




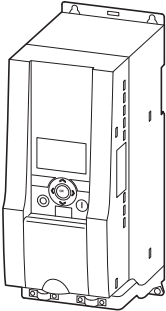
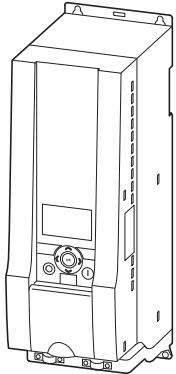
	MMX12...	MMX32...	MMX34...
Rated operational voltage U_e	230 V	230 V	400 V
System configuration			
1 AC 208 V - 15 % ... 240 V + 10 %	●	-	-
3 AC 208 V - 15 % ... 240 V + 10 %	-	●	-
3 AC 380 V - 15 % ... 480 V + 10 %	-	-	●
Mains frequency	50/60 Hz ±10 %	50/60 Hz ±10 %	50/60 Hz ±10 %
Rated operational current I_e	1.7 - 9.6 A ¹⁾	1.7 - 11 A ¹⁾	1.3 - 14 A ¹⁾
Rated operational current	100 % I_e , continuous current at max. +50 °C	100 % I_e , continuous current at max. +50 °C	100 % I_e , continuous current at max. +50 °C
Starting current	200 % I_e for 2 s every 20 s	200 % I_e for 2 s every 20 s	200 % I_e for 2 s every 20 s
Overload current	150 % I_e for 60 s every 600 s	150 % I_e for 60 s every 600 s	150 % I_e for 60 s every 600 s
Assigned motor rating at rated operational voltage U_{LN}	0.25 - 2.2 kW ¹⁾	0.25 - 2.2 kW ¹⁾	0.37 - 7.5 kW ¹⁾
Operating temperature	-10 - +50 °C	-10 - +50 °C	-10 - +50 °C
Operating mode	U/f control, sensorless vector control	U/f control, sensorless vector control	U/f control, sensorless vector control
Pulse frequency (sinusoidal PWM)	1 - 16 kHz (default settings: 6 kHz)	1 - 16 kHz (default settings: 6 kHz)	1 - 16 kHz (default settings: 6 kHz)
Output voltage	0 - U_{LN} V	0 - U_{LN} V	0 - U_{LN} V
Output frequency	0 - 50 Hz (default settings: 50 Hz)	0 - 50 Hz (default settings: 50 Hz)	0 - 50 Hz (default settings: 50 Hz)
Radio interference suppression filter (EMC)			
Internal	● (for MMX...F...)	● (for MMX...F...)	● (for MMX...F...)
Optional	● (for MMX...N...)	● (for MMX...N...)	● (for MMX...N...)
DC link choke	-	-	-
Protection type			
IP20	●	●	●
IP21/NEMA1	● (optional)	● (optional)	● (optional)
IP54	-	-	-
Keypad	●	●	●
Display	LCD, 7 segment	LCD, 7 segment	LCD, 7 segment
Communication interface			
Internal	RS485, Modbus RTU, system interface	RS485, Modbus RTU, system interface	RS485, Modbus RTU, system interface
Optional	CANopen or PROFIBUS-DP	CANopen or PROFIBUS-DP	CANopen or PROFIBUS-DP
Control signal terminals			
Digital input	6 (max. +30 V DC, $R_i > 12$ kΩ)	6 (max. +30 V DC, $R_i > 12$ kΩ)	6 (max. +30 V DC, $R_i > 12$ kΩ)
Digital output	1 (max. 48 V DC, max. 50 mA)	1 (max. 48 V DC, max. 50 mA)	1 (max. 48 V DC, max. 50 mA)
Analog input	2 (0 - +10 V, 4 - 20 mA)	2 (0 - +10 V, 4 - 20 mA)	2 (0 - +10 V, 4 - 20 mA)
Analog output	1 (0 - +10 V, max. 10 mA)	1 (0 - +10 V, max. 10 mA)	1 (0 - +10 V, max. 10 mA)
Relays	2 (1 normally open contact, 1 change-over contact, 250 V, max. 2 A)	2 (1 normally open contact, 1 change-over contact, 250 V, max. 2 A)	2 (1 normally open contact, 1 change-over contact, 250 V, max. 2 A)
PID controller	●	●	●
Internal brake chopper	-	-	● (from 3.3 A rated operational current I_e)
Production quality	RoHS, ISO 9001	RoHS, ISO 9001	RoHS, ISO 9001
Product standard, regulation	IEC61800-3, UL508C	IEC61800-3, UL508C	IEC61800-3, UL508C
Approval, Certification	CE, UL, cUL, c-Tick	CE, UL, cUL, c-Tick	CE, UL, cUL, c-Tick

Notes

¹⁾ The principle here is that the range is not covered by a single device but by the entire device group.

For specific data of the individual performance values → Ordering

Ordering

	Rated operational current frequency inverter ¹⁾	Assigned motor rating (50/60 Hz) ²⁾	Rated operational current motor	With internal radio interference suppression filter	Price See price list	Std. pack	Without internal radio interference suppression filter	Price See price list	Std. pack
	I_e A	P kW	I_e A	Part no. Article no.			Part no. Article no.		
Rated operational voltage 1 AC 230 V									
	1.7	0.25	1.4	MMX12AA1D7F0-0 121363	1 off  		MMX12AA1D7N0-0 122660	1 off  	
	2.4	0.37	2	MMX12AA2D4F0-0 121364			MMX12AA2D4N0-0 122661		
	2.8	0.55	2.7	MMX12AA2D8F0-0 121365			MMX12AA2D8N0-0 122662		
	3.7	0.75	3.2	MMX12AA3D7F0-0 121366			MMX12AA3D7N0-0 122663		
	4.8	1.1	4.6	MMX12AA4D8F0-0 121367			MMX12AA4D8N0-0 122664		
	7	1.5	6.3	MMX12AA7D0F0-0 121368			MMX12AA7D0N0-0 122665		
	9.6	2.2	8.7	MMX12AA9D6F0-0 121369			MMX12AA9D6N0-0 122666		

Notes

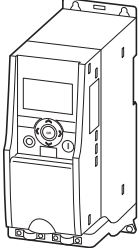




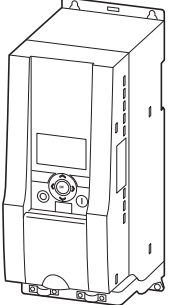
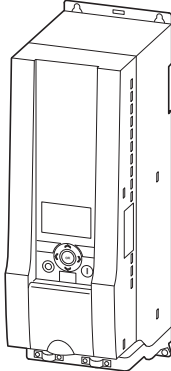
¹⁾ Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +50 °C

²⁾ Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America



Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
UL File No.	E134360
UL CCN	NMMS, NMMS7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	3211-06
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	1~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20; optionally UL/CSA NEMA 1

	Rated operational current frequency inverter ¹⁾	Assigned motor rating (50/60 Hz) ²⁾	Rated operational current motor	With internal radio interference suppression filter	Price See price list	Std. pack	Without internal radio interference suppression filter	Price See price list	Std. pack
	I_e A	P kW	I_e A	Part no. Article no.			Part no. Article no.		
Rated operational voltage 3 AC 230 V									
	1.7	0.25	1.4	MMX32AA1D7F0-0 121390		1 off  	MMX32AA1D7N0-0 122667		1 off  
	2.4	0.37	2	MMX32AA2D4F0-0 121391			MMX32AA2D4N0-0 122668		
	2.8	0.55	2.7	MMX32AA2D8F0-0 121392			MMX32AA2D8N0-0 122669		
	3.7	0.75	3.2	MMX32AA3D7F0-0 121393			MMX32AA3D7N0-0 122670		
	4.8	1.1	4.6	MMX32AA4D8F0-0 121394			MMX32AA4D8N0-0 122671		
	7	1.5	6.3	MMX32AA7D0F0-0 121395			MMX32AA7D0N0-0 122672		
	9.6	2.2	8.7	MMX32AA011F0-0 121396			MMX32AA011N0-0 122673		

Notes

¹⁾ Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +50 °C

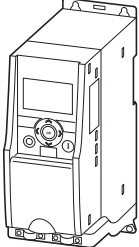




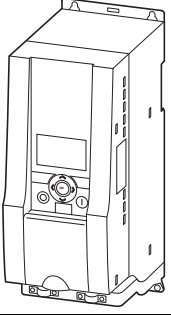
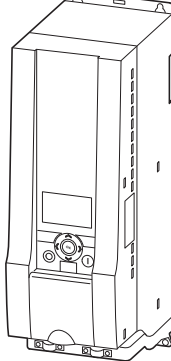
²⁾ Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America



Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
UL File No.	E134360
UL CCN	NMMS, NMMS7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	3211-06
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	1~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20; optionally UL/CSA NEMA 1

HPL10007EN

	Rated operational current frequency inverter ¹⁾	Assigned motor rating (50/60 Hz) ²⁾	Rated operational current motor	With internal radio interference suppression filter	Price See price list	Std. pack	Without internal radio interference suppression filter	Price See price list	Std. pack						
	I_e A	P kW	I_e A	Part no. Article no.			Part no. Article no.								
Rated operational voltage 3 AC 400 V															
	1.3	0.37	1.1	MMX34AA1D3F0-0 121397	1 off  	MMX34AA1D3N0-0 122674	1 off  	MMX34AA1D9N0-0 122675	MMX34AA2D4N0-0 122676						
	1.9	0.55	1.5	MMX34AA1D9F0-0 121398											
	2.4	0.75	1.9	MMX34AA2D4F0-0 121399											
	3.3	1.1	2.6	MMX34AA3D3F0-0 121400					MMX34AA3D3N0-0 122677		MMX34AA4D3N0-0 122678	MMX34AA5D6N0-0 122679			
	4.3	1.5	3.6	MMX34AA4D3F0-0 121401											
	5.6	2.2	5	MMX34AA5D6F0-0 121402											
	7.6	3	6.6	MMX34AA7D6F0-0 121403								MMX34AA7D6N0-0 122680		MMX34AA9D0N0-0 122681	MMX34AA012N0-0 122682
	9	4	8.5	MMX34AA9D0F0-0 121404											
	12	5.5	11.3	MMX34AA012F0-0 121405											
	14	7.5	15.2	MMX34AA014F0-0 122684											MMX34AA014N0-0 122683

Notes

¹⁾ Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +50 °C

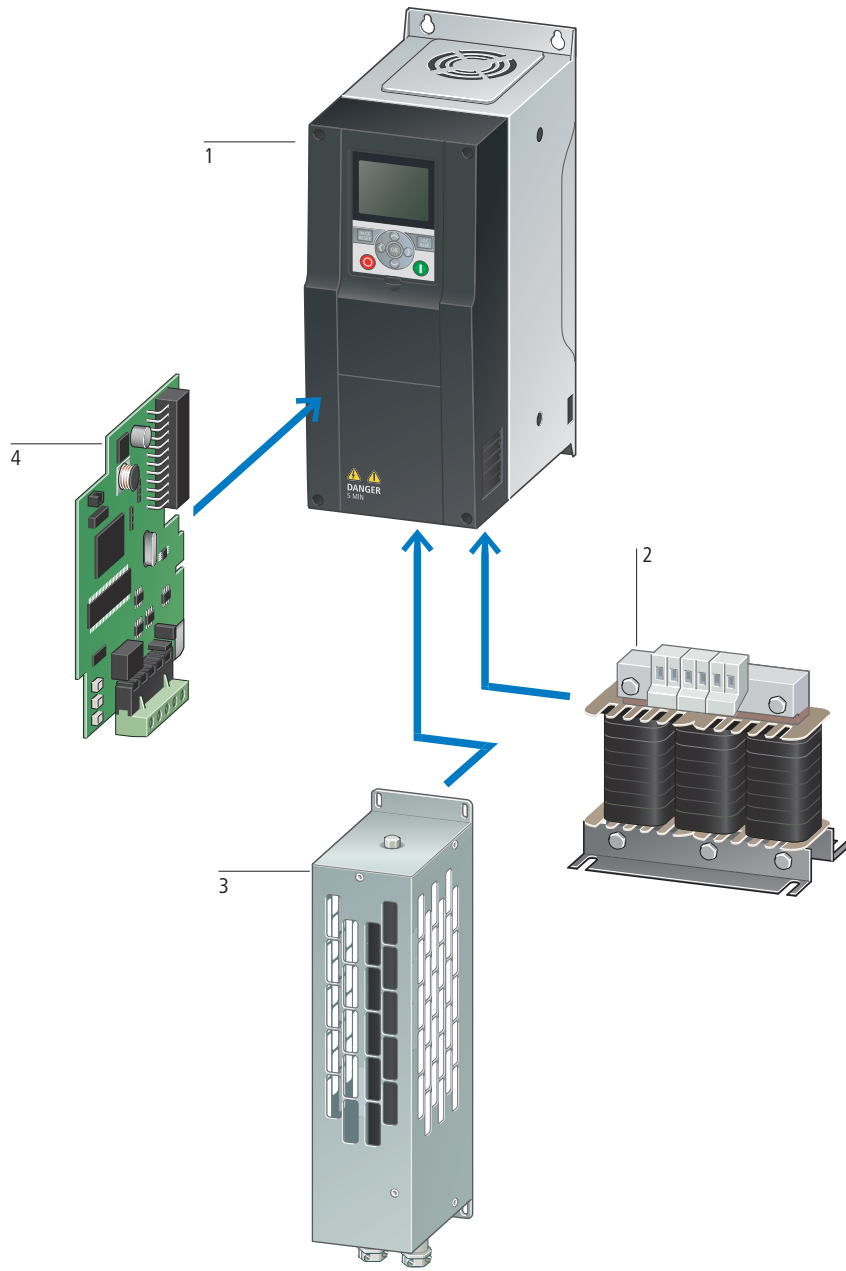
²⁾ Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America



Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
UL File No.	E134360
UL CCN	NMMS, NMMS7
CSA File No.	UL report applies to both US and Canada
CSA Class No.	3211-06
NA Certification	UL Listed, certified by UL for use in Canada
Suitable for	Branch circuits
Max. Voltage Rating	1~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP20; optionally UL/CSA NEMA 1

System overview



Basic device

Frequency inverters	1
HMX32...	
Mains: 3-phase, 230/240 V	
Assigned motor rating from 0.75 to 90 kW (230 V)	
→ Page 10/10	
HMX34...	
Mains: 3-phase, 400/480 V	
Assigned motor rating from 1.1 to 160 kW (400 V)	
→ Page 10/12	

System accessories

Communication module	4
Versions	
• CANopen fieldbus connection	
• PROFIBUS DP fieldbus connection	
• DeviceNet fieldbus connection	
→ Page 10/18	

Accessories

Motor chokes	2
→ Page 10/21	
Braking resistor	3
→ Page 10/17	

Description



Application

H-Max™ frequency inverters are specially suitable for continuously variable speed control of three-phase asynchronous motors in heating, ventilation and air conditioning (HVAC) applications. A comprehensive range of control and function modules allow an automatic changeover in applications with several motors, cascade and bypass controllers and direct control of non-stabilized motors.

The devices of the H-Max™ series support energy-optimized applications with fluid flow machines (pumps, fans). They allow the PID controllers to maintain a constant conveying pressure in booster stations regardless of throughput. A fire control ensures reliable operation of pumps in sprinkler systems.

The network protocols relevant for HVAC applications – BACNet and Modbus – are included onboard as standard in two versions (RS485, Ethernet).

With this comprehensive range of setting options, ease of handling is important. The frequency inverters are preset for the assigned motor rating and can be taken into operation without any parameterization required. A clear, comprehensive graphic display shows all relevant drive parameters. Two enclosure versions with IP21 and IP54 protection types are available for individual installation.

For the operation of standard three-phase asynchronous motors the devices supply rated operational currents of 3.4 to 310 A for assigned shaft ratings of:

- 0.75 to 90 kW at 230 V (three-phase mains connection),
- 1.1 to 160 kW at 400 V (three-phase mains connection).

Features

- Compact design through state-of-the-art IGBT modules
- Integrated radio interference suppression filter (EMC)
- Integrated DC link choke
- Plug-in keypad with backlit graphic LCD display
- 6 digital inputs (24 V DC) for sink- and source-type control
- 3 relays (2 changeover contacts, 1 N/O, 230 V) on a plug-in card, can be replaced with other relay configurations or additional digital and analog inputs and outputs
- 2 analog inputs (0 to +10 V, 4 to 20 mA), selectable and scaleable
- 1 analog output (0 to +10 V), scaleable
- 1 serial interface (RS485, Modbus RTU)
- Internal braking transistor
- 2 slots for optional fieldbus connection (CANopen, PROFIBUS-DP, DeviceNet, LonWorks)
- User-friendly commissioning through fast configuration and application menu
- Compliance with global standards to CE, UL, c-UL and c-Tick

Functions

A comprehensive range of protection functions allow safe operation and the protection of frequency inverter, motor and application. They offer protection against:

- Overcurrent, ground fault
- Overload (electronic motor protection), underload, dry running
- Overtemperature
- Overvoltage, undervoltage

Further functions are:

- Flying restart circuit
- Thermistor protection
- Restart interlock, automatic restart
- Actual/reference value monitoring
- U/f control or sensorless vector control
- Double starting current and 1.1 times overcurrent
- 2 PID controllers
- Sequencing, multi-motor and bypass control, cascading
- Fire control
- Automatic sleep and wake-up function
- Timer function (day/time control)
- Braking control
- DC braking before start and up to motor standstill
- 8 fixed frequencies
- Electronic motor potentiometer
- Logic function (AND, OR, XOR)
- Upper and lower frequency and current limits
- Frequency hopping (frequency masking)
- 2 parameter sets

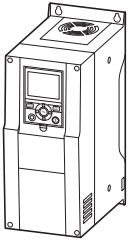




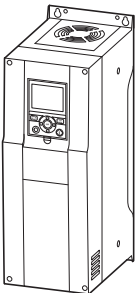




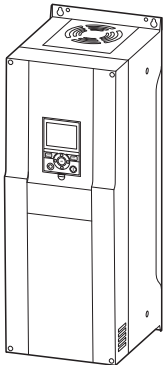


Documentation

An instructional leaflet and a CD are included with each frequency inverter of the H-Max™ series.

The instructional leaflet is a quick guide with illustrations and notes in 23 languages about the correct handling, mounting and electrical connection of the device. The CD contains the instructional leaflet as well as the Hardware and Engineering manual in several languages. The current documentation is also available for download from www.moeller.net/support



Ordering

	Rated operational current of frequency inverter ¹⁾	Assigned motor rating (50/60 Hz) ²⁾	Rated operational current motor	Part no. Article no.	Price See price list	Std. pack	Part no. Article no.	Price See price list	Std. pack
	I _e A	P kW	I _e A						
Rated operational voltage 3 AC 230 V									
	3.7	0.55	2.7	HMX32AG3D721-B 127151		1 off  	HMX32AG3D722-B 127170		1 off  
	4.8	0.75	3.2	HMX32AG4D821-B 127152			HMX32AG4D822-B 127171		
	6.6	1.1	4.6	HMX32AG6D621-B 127153			HMX32AG6D622-B 127172		
	8	1.5	6.3	HMX32AG8D021-B 127154			HMX32AG8D022-B 127173		
	11	2.2	8.7	HMX32AG01121-B 127155			HMX32AG01122-B 127174		
	12.5	3	11.5	HMX32AG01221-B 127156		1 off  	HMX32AG01222-B 127175		1 off  
	18	4	14.8	HMX32AG01821-B 127157			HMX32AG01822-B 127176		
	24.2	5.5	19.6	HMX32AG02421-B 127158			HMX32AG02422-B 127177		
	31	7.5	26.4	HMX32AG03121-B 127159			HMX32AG03122-B 127178		
		48	11	38	HMX32AG04821-B 127160			1 off  	
62		15	51	HMX32AG06221-B 127161		HMX32AG06222-B 127180			

Notes





¹⁾ Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +40 °C

²⁾ Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America



Product Standards	UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
NA Certification	Request filed for UL and CSA
Suitable for	Branch circuits
Max. Voltage Rating	3~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
Degree of Protection	IEC: IP21; UL/CSA NEMA 1

Rated operational current of frequency inverter ¹⁾	Assigned motor rating (50/60 Hz) ²⁾	Rated operational current motor	With internal radio interference suppression filter, protection type IP21			With internal radio interference suppression filter, protection type IP54		
			Part no. Article no.	Price See price list	Std. pack	Part no. Article no.	Price See price list	Std. pack
I _e A	P kW	I _e A						
Rated operational voltage 3 AC 230 V								
77	18.5	63	HMX32AG07721-B 127162		1 off  	HMX32AG07722-B 127181		1 off  
88	22	71	HMX32AG08821-B 127163			HMX32AG08822-B 127182		
106	30	96	HMX32AG10621-B 127164			HMX32AG10622-B 127183		
143	45	117	HMX32AG14321-B 127165			HMX32AG14322-B 127184		
170	45	141	HMX32AG17021-B 127166			HMX32AG17022-B 127185		
208	55	173	HMX32AG20821-B 127167			HMX32AG20822-B 127186		
261	75	233	HMX32AG26121-B 127168			HMX32AG26122-B 127187		
310	90	279	HMX32AG31021-B 127169			HMX32AG31022-B 127188		

Notes

¹⁾ Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +40 °C

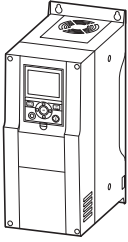


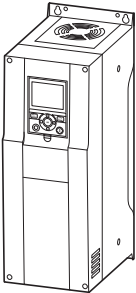
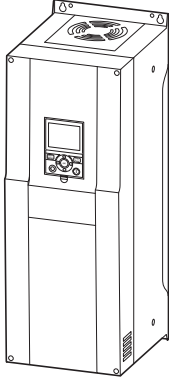
²⁾ Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

Information relevant for export to North America



Product Standards UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
 NA Certification Request filed for UL and CSA
 Suitable for Branch circuits
 Max. Voltage Rating 3~ 240 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
 Degree of Protection IEC: IP21; UL/CSA NEMA 1



	Rated operational current of frequency inverter ¹⁾	Assigned motor rating (50/60 Hz) ²⁾	Rated operational current Motor	Part no. Article no.	Price See price list	With integrated radio interference suppression filter Protection type IP21	Part no. Article no.	Price See price list	With integrated radio interference suppression filter Protection type IP54	Std. pack
	I _e A	P kWh	I _e A							
Rated operational voltage 3 AC 400 V										
	3.4	1.1	2.1	HMX34AG3D421-B 126928			HMX34AG3D422-B 126958			1 off  
	4.8	1.5	3.6	HMX34AG4D821-B 126929			HMX34AG4D822-B 126959			
	5.6	2.2	5	HMX34AG5D621-B 126940			HMX34AG5D622-B 126960			
	8	3	6.6	HMX34AG8D021-B 126941			HMX34AG8D022-B 126961			
	9.6	4	8.5	HMX34AG9D621-B 126942			HMX34AG9D622-B 126962			
	12	5.5	11.3	HMX34AG01221-B 126943			HMX34AG01222-B 126963			
	16	7.5	15.2	HMX34AG01621-B 126944			HMX34AG01622-B 126964			
	23	11	21.7	HMX34AG02321-B 126945			HMX34AG02322-B 126965			
	31	15	29.3	HMX34AG03121-B 126946			HMX34AG03122-B 126966			
	38	18.5	36	HMX34AG03821-B 126947			HMX34AG03822-B 126967			
	46	22	41	HMX34AG04621-B 126948			HMX34AG04622-B 126968			
	61	30	55	HMX34AG06121-B 126949			HMX34AG06122-B 126969			
	72	37	68	HMX34AG07221-B 126950			HMX34AG07222-B 126970			
	87	45	81	HMX34AG08721-B 126951			HMX34AG08722-B 126971			
	105	55	99	HMX34AG10521-B 126952			HMX34AG10522-B 126972			
	140	75	134	HMX34AG14021-B 126953			HMX34AG14022-B 126973			
	170	90	161	HMX34AG17021-B 126954			HMX34AG17022-B 126974			
	205	110	196	HMX34AG20521-B 126955			HMX34AG20522-B 126975			
261	132	231	HMX34AG26121-B 126956			HMX34AG26122-B 126976				
310	160	279	HMX34AG31021-B 126957			HMX34AG31022-B 126977				

Notes

¹⁾ Rated operational current at an operating frequency of 6 kHz and an ambient temperature of +40 °C

²⁾ Assigned motor rating for normal internally and externally ventilated four-pole, three-phase asynchronous motors with 1500 rpm (at 50 Hz) or 1800 rpm (at 60 Hz)

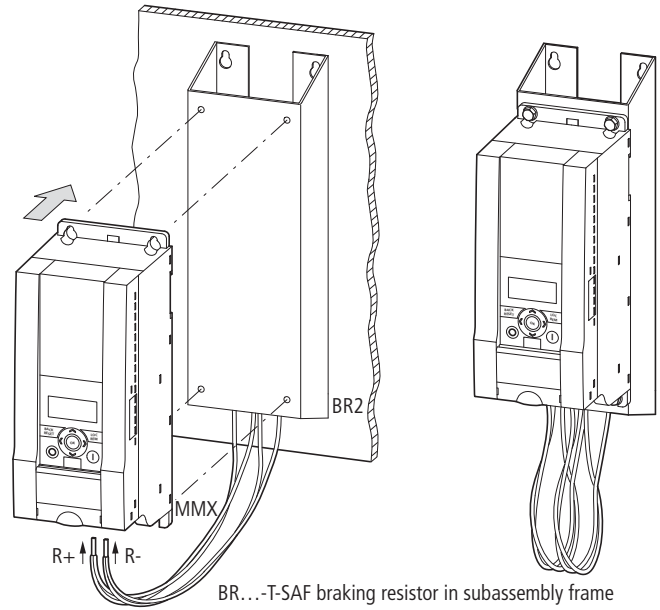
Information relevant for export to North America



Product Standards
NA Certification
Suitable for
Max. Voltage Rating
Degree of Protection

UL 508C; CSA-C22.2 No. 14; IEC/EN61800-3; IEC/EN61800-5; CE marking
Request filed for UL and CSA
Branch circuits
3~ 480 V AC IEC: TN-S UL/CSA: "Y" (Solidly Grounded Wey)
IEC: IP21; UL/CSA NEMA 1

Description



Type overview

BR1...-T-PF, BR3...-T-PF

Braking resistors

Application

An external braking resistor is required for braking larger moments of inertia or for prolonged regenerative operation. This converts the motor's mechanical braking energy into heat.

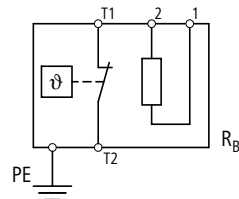
Features

These resistors are built into a perforated metal sheet enclosure and equipped with a thermostatic circuit-breaker (230 V, 1 A, AC-1). The enclosures are made of galvanized sheet metal and are open at the bottom. They fulfil protection type IP65 only in their fitted state.

With a combination of several series- and parallel-connected resistors, a higher braking power can be achieved. The braking resistors can be connected directly to the brake choppers of MMX34... frequency inverters.

Function

The frequency inverter's built-in braking transistor automatically switches in the connected braking resistor as soon as the internal DC link voltage exceeds the switching threshold. This prevents excessive voltages on the internal DC link, which would otherwise cause an overvoltage fault message and the frequency inverter's pulse inhibitor to be set. The drive then coasts to a halt uncontrolled.



Documentation

The documentation can also be obtained on the Internet from: www.moeller.net/support

Type overview

BR2..., BR2...-T-SAF

Braking resistors

Features

BR2... is a short-circuit proof, intrinsically safe braking resistor in an anodized aluminum enclosure with protection type IP65 and without a thermostat.



Note: When used according to UL directives, the rating data for continuous braking and the maximum pulse performance must be reduced by 25%.

Caution: The surface temperature can exceed 100 °C!

- BR2...-T-SAF is a combination of several braking resistors BR2... braking resistors with a thermostat. They are built into a subassembly frame for the M-Max™ frequency inverters.
- BR1...-T-PF is a braking resistor or a combination of several braking resistors with a thermostat. It is installed in an encapsulated enclosure with protection type IP54 and protected against accidental contact.
- BR3...-T-PF is a braking resistor in a steel mesh design with a thermostat. It is installed in an encapsulated enclosure with protection type IP54 and protected against accidental contact.
- ...-T = with a thermostat
- ...-SAF = subassembly frame
- ...-PF = protection frame (protects against accidental contact)





Type overview

MMX-COM-PC

PC connection for the frequency inverters of M-Max™ series

Application

MMX-COM-PC allows communication and data transfer between a frequency inverter and a PC.

The parameters can also be copied directly between frequency inverters of the same device series without a PC connection. If a battery (9 V block) is fitted, mains power supply is also not required for this.

Features

The MMX-COM-PC communication module is plugged in at the front of M-Max™ frequency inverters.

The connection cable included as standard (length: 3.2 m) with an isolated interface converter allows connection to a PC with a USB port. This communication module can help increase data security and cut commissioning and maintenance times:

- Online parameterization and monitoring display (oscilloscope) on a PC; on a connected printer parameter lists and monitor displays can also be printed out
- Upload and download of all parameters
- Parameter backup and comparison
- Parameter copy function (e.g. for series machines or for device replacement)

Documentation

Instructional leaflet AWA8240-2428 (included as standard with each card)
Documentation available for download at www.moeller.net/support

Type overview

XMX-NET-DN-A

DeviceNet fieldbus connection for the frequency inverters of the M-Max™ and H-Max™ series

Application

XMX-NET-DN-A allows the connection as slave of the M-Max™ and H-Max™ frequency inverters to the standard DeviceNet field bus.

The fieldbus connection is implemented via pluggable 5-pole screw terminals with the XMX-NET-PS-A and a 9-pole SUB-D connector with the XMX-NET-PD-A.

Features

On the H-Max™ frequency inverters, interface card XMX-NET-DN-A is slotted into the housing.

On M-Max™ frequency inverters, mounting frame MMX-NET-XA is required. Here the interface card is connected via a plug-in connector on the right side of the frequency inverter.

Technical data:

- Communication protocol: CAN
- Data transfer: ODVA 2.0 compliant
- Transfer rate (adjustable): 125, 250 and 500 Kbit/s
- Maximum cable length, depending on transfer rate: 125 Kbits/s → 500 m, 250 Kbits/s → 250 m, 500 Kbit/s → 100 m
- Network supply: 11 to 25 V DC, 28 mA (typical), peak inrush current 125 mA
- Addressing (adjustable): to 64 (nodes)
- Status indication via LEDs

Documentation

Documentation available for download at www.moeller.net/support



CANopen

Type overview

XMN-NET-CO-A

CANopen connection for the frequency inverters of the M-Max™ and H-Max™ series

Application

XMN-NET-CO-A allows the connection as slave of the M-Max™ and H-Max™ frequency inverters to the standard CANopen field bus. They are connected to the field bus through 5-pole screw terminals.

Features

On the H-Max™ frequency inverters, the XMN-NET-CO-A interface card is slotted into the housing.

On M-Max™ frequency inverters, mounting frame MMX-NET-XA is required. Here the interface card is connected via a plug-in connector on the right side of the frequency inverter.

Technical data:

- Communications protocol: CiA DS-301,
- CiA-DSP-402
- Data transfer: CAN (ISO 11898)
- Transfer rate (adjustable): 10 Kbits/s up to 1 Mbit/s
- Maximum cable length, depending on transfer rate (without amplifier):
- 30 m up to 2.5 km
- Addressing (adjustable): 1 - 127
- Status indication via LEDs

Documentation

Instructional leaflet AWA8240-2426 (included as standard with each card)
Manual AWB8240-1632
Documentation available for download at www.moeller.net/support

Type overview

XMN-NET-PD-A, XMN-NET-PS-A

PROFIBUS-DP connection for the frequency inverters of the M-Max™ and H-Max™ series

Application

XMN-NET-DP-... allows the connection as slave of the M-Max™ and H-Max™ frequency inverters to the standard PROFIBUS-DP field bus. The XMN-NET-PS-A is connected to the field bus through 5-pole plug-in screw terminals and XMN-NET-PD-A through a 9-pin Sub-D connector.

Features

On the H-Max™ frequency inverters, the XMN-NET-DP-... interface card is slotted into the housing.

On M-Max™ frequency inverters, mounting frame MMX-NET-XA is required. Here the interface card is connected via a plug-in connector on the right side of the frequency inverter.

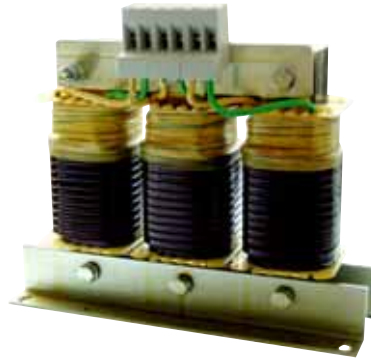
Technical data:

- Communication protocol: Profidrive (PROFIBUS profile for variable-speed drives)
- Data transfer: RS485, half-duplex
- PPO type: 1, 2, 3, 4, 5
- Transfer rate (adjustable): 9.6 Kbits/s up to 12 Mbit/s
- Maximum cable length, depending on transfer rate (without amplifier): 100 m up to 1.2 km
- Addressing (adjustable): 2 - 126
- Status indication via LEDs

Documentation

Instructional leaflet AWA8240-2427 (included as standard with each card)
Documentation available for download at www.moeller.net/support





Type overview

DEX-LN1...

Mains chokes, single-phase

DEX-LN3...

Mains chokes, three-phase

Application

Mains chokes (also called mains chokes) are connected in series on the mains side of electronic devices, such as frequency inverters.

Features

The DEX-LN... line reactors are vacuum-impregnated. Their air gaps are therefore bridged with a low-fatigue, metallic and magnetically neutral connection, which reduces noise emission.

Note: Because of the flux distribution caused by their physical design, motor chokes should be installed at a distance of at least 50 mm from metal parts and adjacent subassemblies.

Functions

Mains chokes attenuate any current harmonics and peaks and limit the starting current (internal DC link capacitors). Through the reduction of current harmonics, the r.m.s. value of the absorbed current can be reduced by up to 30 percent. In addition, mains chokes permit a short-circuit voltage to the mains (u_k value) of about four percent, which is often required. Mains chokes also extend the lifespan of components (rectifier diodes, DC link capacitors) in devices with an input-side internal DC link (frequency inverters, USPs).

Documentation

Every line reactor is supplied with an instructional leaflet (AWA 8240-1711). The documentation is also available for download from www.moeller.net/support

Type overview

DEX-LM3...

Motor chokes, three-phase

Application

Motor chokes are connected in series to the output of frequency inverters.

Features

The DEX-LM3... motor chokes are vacuum-impregnated. Their air gaps are therefore bridged with a low-fatigue, metallic and magnetically neutral connection, which reduces noise emission.

Motor chokes have larger dimensions than comparable mains chokes with the same rated operational current.

Note: Because of the flux distribution caused by their physical design, motor chokes should be installed at a distance of at least 50 mm from metal parts and adjacent subassemblies.

Functions

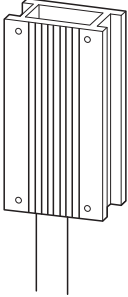
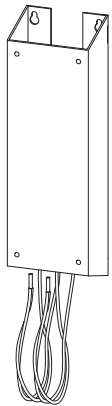
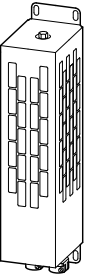
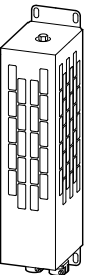
Motor chokes reduce the edge gradient of the output voltage ($du/dt < 500$ V/ms) of a frequency inverter. They also reduce the motor's noise emission and heat generation. Through the use of motor chokes the permissible motor cable length can be increased to up to 200 meters. When operating several motors in parallel at the output of a single frequency inverter, the use of motor chokes is recommended, as they attenuate the high capacitive reactive currents.

Documentation

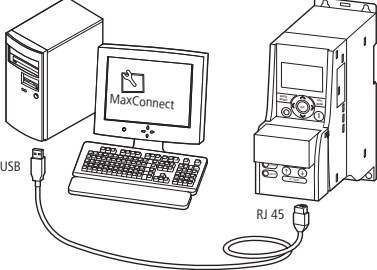
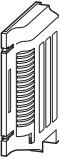
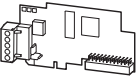
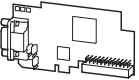
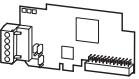

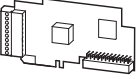
Every motor choke is supplied with an instructional leaflet (AWA 8240-1711). The documentation is also available for download from www.moeller.net/support

HPL10017EN


BR...

	Braking resistance	Continuous braking power	For use with	Part no. Article no.	Price See price list	Std. pack
	R Ω	P _{DB} W				
Braking resistors						
Protection type IP65						
Short-circuit proof, intrinsically safe braking resistor in anodized aluminum enclosure, with thermostat						
	47	240	MMX34...	BR2047240 140434		1 off
	60	200	MMX34...	BR2060200 140433		1 off
Short-circuit proof, intrinsically safe braking resistor with thermostat, with mounting frame for base (footprint) mounting						
	36	400	MMX34...	BR2036400-T-SAF 140437		1 off
	47	240	MMX34...	BR2047240-T-SAF 140436		
	60	200	MMX34...	BR2060200-T-SAF 140435		
	65	400	MMX34...	BR2065400-T-SAF 140438		
	75	480	MMX34...	BR2075480-T-SAF 140439		
Protection type IP54						
	36	2450	MMX34...	BR30362K4-T-PF 141325		1 off
	36	2800	MMX34...	BR30362K8-T-PF 141326		
	36	3600	MMX34...	BR30363K6-T-PF 141327		
Protection type IP54						
	36	500	MMX34...	BR1036500-T-PF 141323		1 off
	36	1000	MMX34...	BR10361K0-T-PF 141324		
	56	300	MMX34...	BR1056300-T-PF 141320		
	56	800	MMX34...	BR1056800-T-PF 141321		
	56	1000	MMX34...	BR10561K0-T-PF 141322		

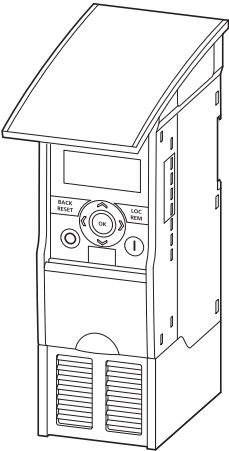


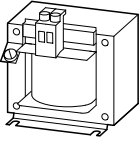
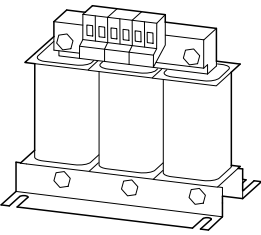
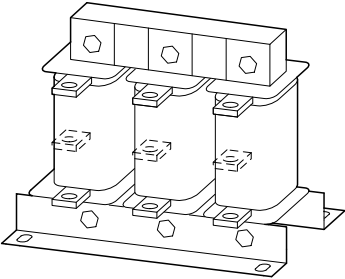
			Part no. Article no.	Price See price list	Std. pack	Notes	
Interface cards							
For use with MMX...							
PC connection (USB/RJ45) for the frequency inverters of M-Max series			MMX-COM-PC 121406		1 off		
<ul style="list-style-type: none"> With 3.2 m connection cable and interface converter Data transfer with PC software and copy function (retentive memory) between MMX... frequency inverters 							
							
			MMX-NET-XA 134510		1 off	Mounting frame for side connection to M-Max™ frequency inverters	
For use with MMX... und HMX...			Description	Part no. Article no.	Price See price list	Std. pack	Notes
Fieldbus connection							
	CANopen	Connection through plug-in screw terminals The interface card is slotted into the device.	XXM-NET-CO-A 134511		1 off	Mounting frame MMX-NET-XA required for M-Max™	
	PROFIBUS-DP (Screw terminal)	Connection through plug-in screw terminals The interface card is slotted into the device.	XXM-NET-PS-A 136556				
	PROFIBUS-DP (Sub D)	Connection through Sub-D plug The interface card is slotted into the device.	XXM-NET-PD-A 136557				
	PROFINET	The interface card is slotted into the device.	XXM-NET-PN-A 138237				
	DeviceNet	The interface card is slotted into the device.	XXM-NET-DN-A 136558				
	LON	The interface card is slotted into the device.	XXM-NET-LO-A 138238				
Plug-in modules							
For use with HMX...							
	Digital I/O card	6 digital input (24 V DC) 6 digital outputs (transistor, 24 - 48 V DC) 24 V supply	XXM-IO-B1-A 138239		1 off	-	
	Relay/thermistor card	1 relay (changeover contact, N/O/NC, 250 V, 2 A) 1 relay (normally open contact, N/O, 250 V, 2 A) 1 thermistor input	XXM-IO-B2-A 138240				
	Analog I/O card	1 analog input (0 -+ 10 V, 4 - 20 mA) 2 analog outputs (0 -+ 10 V, 4 - 20 mA)	XXM-IO-B4-A 138241				
	Relay card	3 relays (normally open contact, N/O, 250 V, 2 A)	XXM-IO-B5-A 138242				
	PT100 card	3 PT 100 thermistor inputs 24 V supply	XXM-IO-B8-A 138243				
	Digital input/relay card	1 relay (normally open contact, N/O, 250 V, 2 A) 5 digital inputs (42 - 240 V AC)	XXM-IO-B9-A 138244				
	Output card	1 relay (normally open contact, N/O, 250 V, 2 A) 1 digital output (transistor, 24 - 48 V DC) 1 analog output (0 -+ 10 V, 4 - 20 mA)	XXM-IO-BF-A 138245				

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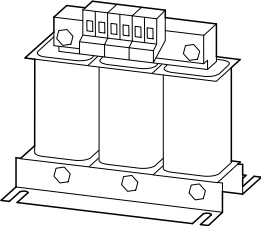
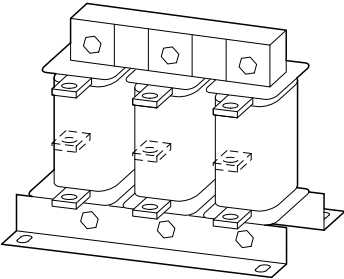
Input current I_{LN} A	For use with	Part no. Article no.	Price See price list	Std. pack	Notes
Radio interference suppression filters, single-phase					
Maximum mains voltage U_{LN} : 240 + 10 % V (50/60 Hz)					
9	MMX12AA1D7... MMX12AA2D4... MMX12AA2D8... MMX12AA3D7...	MMX-LZ1-009 138231		1 off	For mounting next to or underneath the MMX... for size FS1
15	MMX12AA4D8... MMX12AA7D0...	MMX-LZ1-015 138232		1 off	For mounting next to or underneath the MMX... for size FS2
17	MMX12AA9D6...	MMX-LZ1-017 138233		1 off	For mounting next to or underneath the MMX... for size FS3
Radio interference suppression filters, three-phase					
Maximum mains voltage U_{LN} : 480 + 10 % V (50/60 Hz)					
	6	MMX32AA1D7... MMX32AA2D4... MMX32AA2D8... MMX32AA3D7... MMX34AA1D3... MMX34AA1D9... MMX34AA2D4... MMX34AA3D3...	MMX-LZ3-006 138234	1 off	For mounting next to or underneath the MMX... for size FS1
	9	MMX32AA4D8... MMX32AA7D0... MMX34AA4D3... MMX34AA5D6...	MMX-LZ3-009 138235	1 off	For mounting next to or underneath the MMX... for size FS2
	22	MMX32AA9D6... MMX34AA7D6... MMX34AA9D0... MMX34AA012... MMX34AA014...	MMX-LZ3-020 138236	1 off	For mounting next to or underneath the MMX... for size FS3



	For use with	Part no. Article no.	Price See price list	Std. pack
Enclosure accessories				
Increased protection type IP21/NEMA 1, two-part enclosure cover with cable retention clip for EMC-conformant connection				
	For size FS1	MMX12AA1D7... MMX12AA2D4... MMX12AA2D8... MMX32AA1D7... MMX32AA2D4... MMX32AA2D8... MMX34AA1D3... MMX34AA1D9... MMX34AA2D4...	MMX-IP21-FS1 121407	1 off
	For size FS2	MMX12AA3D7... MMX12AA4D8... MMX12AA7D0... MMX32AA3D7... MMX32AA4D8... MMX32AA7D0... MMX34AA3D3... MMX34AA4D3... MMX34AA5D6...	MMX-IP21-FS2 121408	1 off
	For size FS3	MMX12AA9D6... MMX32AA9D6... MMX34AA7D6... MMX34AA9D0... MMX34AA012... MMX34AA014...	MMX-IP21-FS3 121409	1 off

	Rated operational current I_e A	Inductance L mH	Max. heat dissipation P_v W	Part no. Article no.	Price See price list	Std. pack
Mains chokes, single-phase						
Max. permissible mains voltage: 260 V +0 % (50/60 Hz)						
	5.8	5.05	9	DEX-LN1-006 269490		1 off
	8.6	3.41	11	DEX-LN1-009 269495		
	13	2.25	12	DEX-LN1-013 269496		
	18	1.63	17	DEX-LN1-018 269497		
	24	1.22	20	DEX-LN1-024 269498		
Mains chokes, three-phase						
Max. permissible mains voltage: 550 V +0 % (50/60 Hz)						
	3.9	7.51	17	DEX-LN3-004 269500		1 off
	6	4.9	19	DEX-LN3-006 269501		
	10	2.94	33	DEX-LN3-010 269502		
	16	1.84	44	DEX-LN3-016 269503		
	25	1.18	57	DEX-LN3-025 269504		
	40	0.64	59	DEX-LN3-040 269505		
	50	0.37	58	DEX-LN3-050 269506		1 off
	60	0.31	60	DEX-LN3-060 269507		
	80	0.23	86	DEX-LN3-080 269508		
	100	0.18	101	DEX-LN3-100 269509		
	120	0.15	100	DEX-LN3-120 269510		
	160	0.11	140	DEX-LN3-160 269511		
	200	0.09	154	DEX-LN3-200 269512		
	250	0.07	155	DEX-LN3-250 269513		
	300	0.06	169	DEX-LN3-300 269514		

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	Rated operational current	Inductance	Max. heat dissipation at 12 kHz	Part no. Article no.	Price See price list	Std. pack
	I_e A	L mH	P_v W			
Motor chokes, three-phase						
Max. permissible mains voltage: 750 V +0 % (50/60 Hz)						
	5	2	24	DEX-LM3-005 269538		1 off
	8	4.1	54	DEX-LM3-008 269539		
	11	3	71	DEX-LM3-011 269541		
	16	1.5	78	DEX-LM3-016 269542		
	35	1	116	DEX-LM3-035 269543		
	50	0.6	168	DEX-LM3-050 269544		
	63	0.5	193	DEX-LM3-063 269545		
	80	0.5	206	DEX-LM3-080 269546		
	100	0.45	294	DEX-LM3-100 269547		
	150	0.35	424	DEX-LM3-150 269548		
	180	0.3	498	DEX-LM3-180 269549		
	220	0.2	517	DEX-LM3-220 269560		
	260	0.15	520	DEX-LM3-260 269561		



10/22 Frequency inverters

Key to part numbers

Series MMX

MMX32AA1D7F0-0 (example)

MMX	3	2	A	A	1D7	F	0	-	0
MMX	1	2	A	A	Variable code	F	0	-	0
	3	4				N			

MMX = Product family M-Max™

Number of phases

- 1 = Single-phase mains supply
- 3 = Three-phase mains supply

Voltage class

- 2 = 200 V (208 V -15 % to 240 V +10 %)
- 4 = 400 V (380 V -15 % to 480 V +10 %)

Version

- A = Software version

Display unit

- A = Display unit built-in

Rated operational current (in amperes)

- xDy = x,y A (digital; e.g. 1D7 = 1.7 A)
- 0xy = xy A

Radio interference suppression filters

- F = with integrated radio interference suppression filter (C2)
- N = without radio interference suppression filter

Protection type

- 0 = IP20 = NEMA 0

Optional module

- 0 = no module built in

Series HMX

HMX34AG3D421-B (example)

HMX	3	4	A	G	3D4	2	1	-	B
HMX	3	2	A	G	Variable code	2	1	-	B
		4					2		

HMX = Product family H-Max™

Number of phases

- 3 = Three-phase mains supply

Voltage class

- 2 = 200 V (208 V -15 % to 240 V +10 %)
- 4 = 400 V (380 V -15 % to 480 V +10 %)

Version

- A = Software version

Display unit

- G = Graphics

Rated operational current (in amperes)

- xDy = x,y A (digital; e.g. 3D4 = 3.4 A)
- xyz = xyz A

Radio interference suppression filter (built-in)

- 2 = C2

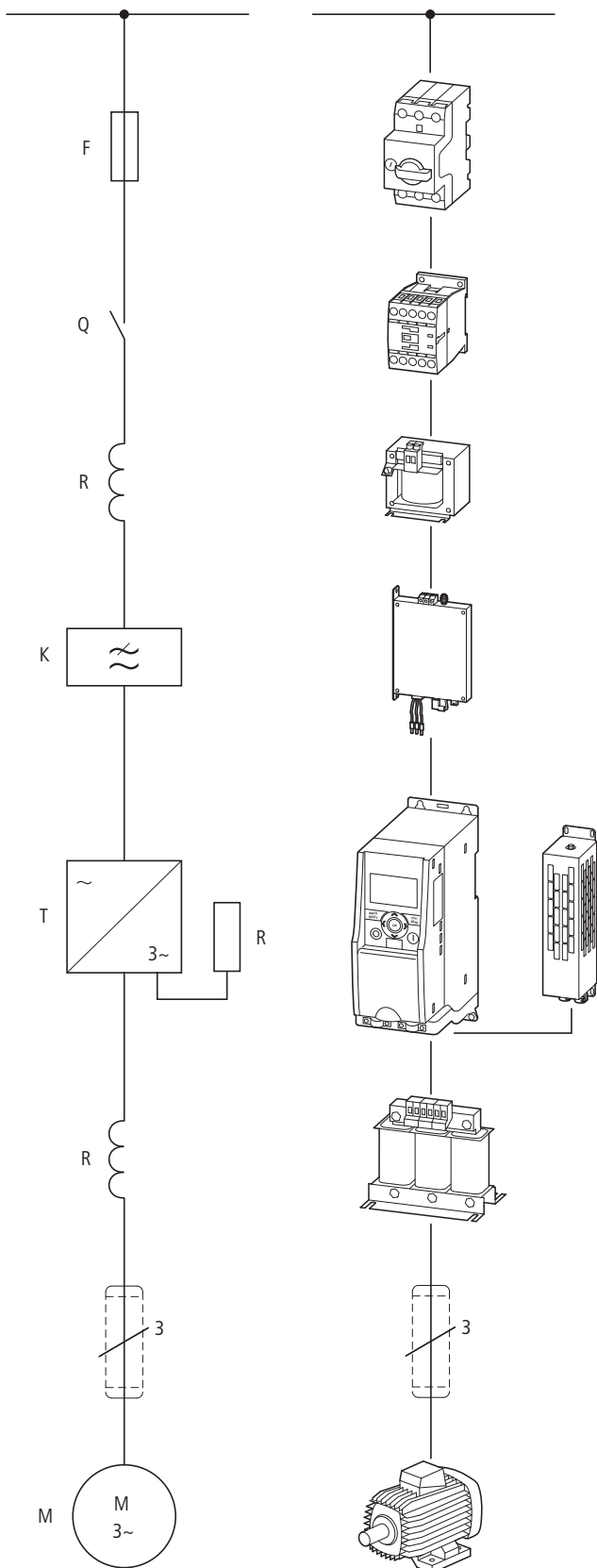
Protection type

- 1 = IP21 = NEMA 1
- 2 = IP54 = NEMA 2

Brake chopper

- B = Built-in brake chopper

Engineering



Item designations
 F = fuses and circuit-breakers
 Q = controlled switching within energy flow (contactors, circuit-breakers)
 R = limitation (reactors, chokes, resistors)
 K = radio interference suppression filters
 T = frequency inverters
 M = motors

Frequency inverters can be connected without limitation to AC supply systems with a grounded star point (TN and TT networks).

Fuses (circuit-breakers) allow the protection of lines and electrical apparatus.
 For personnel protection AC/DC-sensitive residual current devices (RCD Type B) are required in addition.

Contactors are used to switch mains voltage on and off.

Mains chokes attenuate any current harmonics and peaks and limit the inrush current (internal DC link capacitors).

Radio interference suppression filters attenuate high-frequency electromagnetic emissions from devices. They ensure that the EMC limit values for conducted interference specified in the applicable product standards are maintained (frequency inverters).

Frequency inverters allow a continuously variable speed control of three-phase motors.

A braking resistor convert the frequency inverter's regenerative braking energy into heat.
 The frequency inverter must be equipped with a brake chopper, which connects the braking resistor parallel to the internal DC link.

Motor chokes

- Compensate the capacitive reactive currents,
- Reduce current ripple and the motor's current change noise,
- Attenuate the retroaction on parallel connection of several motors.

Sine-wave filters

- Smoothen the output voltage sinusoidally,
- Reduce motor noise through du/dt reduction, and thereby increase the motor insulation's lifespan,
- Reduce the leakage currents to allow better motor performance at improved EMC values.

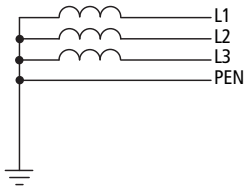
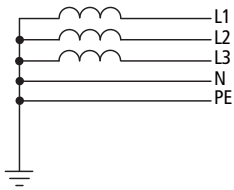
Shielded motor cables attenuate emitted and conducted high-frequency emissions within the limit values specified in the applicable product standard (EMC).

Three-phase asynchronous motor (standard motor)



Electrical mains connection

M-Max™ and H-Max™ frequency inverters can be connected and operated on star-point-grounded AC mains (according to IEC 60364) without limitation.



Connection and operation on asymmetrically grounded networks, such as phase-grounded delta (USA) or non-grounded or high-resistance-grounded (> 30 Ω) IT systems is permitted with limitations. In these networks only frequency inverters

Supply voltage U_{LN} of the utility company	Motor voltage according to UL 508 C	Consumer voltage, rated value for the motors
120 V	110 - 120 V	115 V
240 V	220 - 240 V	230 V
480 V	440 - 480 V	460 V
600 V	550 - 600 V	575 V

The wide tolerance band of the frequency inverters of the M-Max™ and H-Max™ series takes all known deviations from the standardized rated operational voltages worldwide into account (IEC 60038):

230 V: 208 V -15% - 240 V +10%

400 V: 380 V -15% - 480 V +10%

The permissible frequency range is 50 Hz -10% - 60 Hz +10%.

Safety and switching

The mains-side components are assigned according to the frequency inverter's input-side rated operational current I_{LN} and utilization category AC-1.

Fuses, circuit-breakers and conductor cross-sections must meet the national and regional requirements and the required approvals at the point of operation.

For fire prevention and the protection of persons and domestic animals from excessive contact voltages residual-current devices (RCD) must be used. In combination with a frequency inverter only AC/DC sensitive RCDs (Type B) must be used.

Identification on the residual-current circuit-breakers

AC/DC sensitive (RCD, type B)



With frequency-controlled power drive systems (PDS), leakage currents to ground occur. The main causes are external capacitances between the phases of the motor cable, the motor cable shielding, Y capacitors in the

without integrated radio interference suppression filters (EMC) must be used. On devices with integrated radio interference suppression filter the filter's ground connection must be disconnected.

The standardized rated operational voltages of the utility companies fulfill the following conditions at the point of transfer to the consumer:

- Maximum deviation from the rated voltage (U_{LN}): $\pm 10\%$
- Maximum deviation in the voltage symmetry: $\pm 3\%$
- Maximum deviation from the rated frequency: $\pm 4\%$

Regarding the lower voltage value ($U_{LN} - 10\%$) of the mains voltage, a further voltage drop of 4 percent in the consumer networks is permissible.

The power supply voltage at the consumer must have a value of $U_{LN} - 14\%$.

In ring-operated mesh networks (such as in the EU) the standardized consumer voltages (230/400/690 V) are identical with the utility company's supply voltages. In star networks (for example in North America/USA), the stated consumer voltages take the voltage drop from the utility company's infeed point to the last consumer into account.

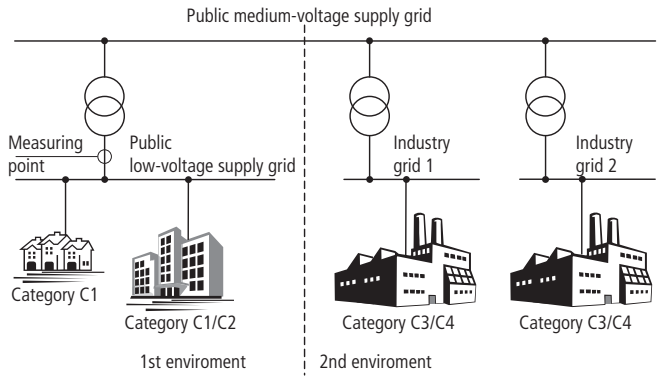
frequency inverter and radio interference suppression filters and grounding measures at the motor's site of operation. These leakage currents can exceed 3.5 mA and require increased grounding of the PDS according to EN 50178 (ground conductor cross-section $\geq 10 \text{ mm}^2$).

EMC measures

Frequency inverters work with fast electronic switches (IGBT) in the inverter. This can cause radio interference in a PDS, which, in turn, can adversely affect nearby electronic equipment. To provide protection from this high-frequency interference, these should be spatially separated and shielded from frequency-controlled PDS.

In Europe, adherence to the EMC Directive is mandatory. The EMC product standard for power drive systems (PDS) is IEC/EN 61800-3. This standard covers the complete drive system, from mains infeed to the motor.

Both versions of the frequency inverters of the M-Max™ and H-Max™ series (with built-in and external radio interference suppression filter) fulfill the requirements of the EMC product standard for residential areas (first environment), and therefore also for the higher limit values in industrial areas (second environment).



Frequency inverters

The frequency inverter is an electronic apparatus for controlling variable-speed drives with three-phase motors. It is intended for installation in a machine or for assembly with other components to a machine or plant. The main components of a modern compact frequency inverter are a power section and a control section. Example: M-Max™ series. The frequency inverter's control section contains a centrally controlling microprocessor, through which all variable values that occur in the frequency inverter are influenced. These values and all control functions are represented as parameters. The functional control of the frequency inverter and the output values in the power section (such as frequency, voltage and current) can be adjusted through:

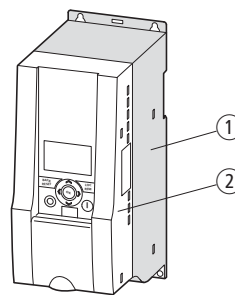
- control terminals (I/O) with analog and digital (binary) inputs,
- a keypad with function keys and display,
- serial interfaces (bus) with RS485 (Modbus RTU) and optional field bus connections (CANopen, PROFIBUS-DP, etc.) and an optional PC connection.

Internal open and closed-loop control circuits monitor all variable values in the frequency inverter and automatically switch the process off if a quantity value reaches a dangerous level.

The power section of a static and compact frequency generally consists of three subgroups:

- Rectifier (A),
- Internal DC link (B),
- Inverter module (C).

The devices of the H-Max™ series contain a brake chopper as standard. Depending on their rating, some devices of the M-Max™ series also contain a brake chopper.

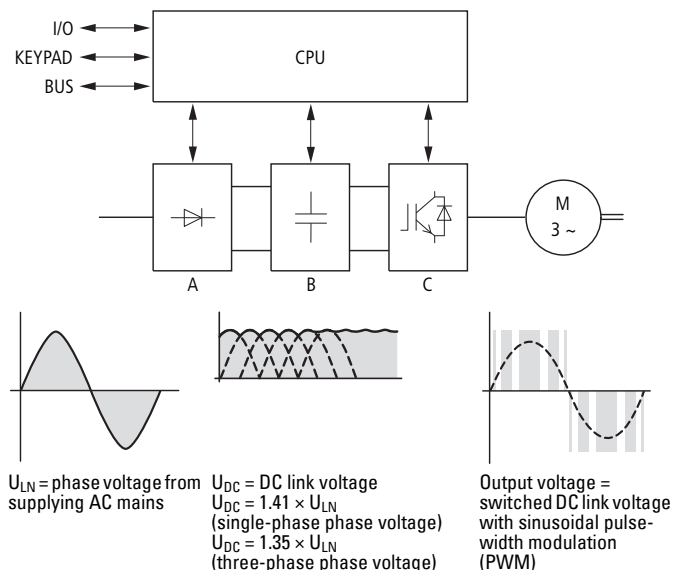


① Power section with:

- A = Rectifier
- B = Internal DC link
- C = Inverter module

② Control section with:

- I/O = analog and binary inputs and outputs
- KEYPAD = keypad with display
- BUS = serial interfaces (RS485, field bus, PC interface)



U_{LN} = phase voltage from supplying AC mains

U_{DC} = DC link voltage
 $U_{DC} = 1.41 \times U_{LN}$ (single-phase phase voltage)
 $U_{DC} = 1.35 \times U_{LN}$ (three-phase phase voltage)

Output voltage = switched DC link voltage with sinusoidal pulse-width modulation (PWM)

Block diagram with main components of a frequency inverter

Modulation

The IGBTs in the inverter of the M-Max™ and H-Max™ frequency inverters are controlled with sinusoidal pulse-width modulation (PWM). Two control methods are possible:

- Voltage/frequency (U/f) control,
- Sensorless vector control (speed control).

Voltage/frequency control is the best-known and most commonly used method. A simple characteristic curve (linear or square) defines the motor's rotating field frequency and the corresponding three-phase line-to-line voltage of the motor is selected so that the motor is neither over magnetized nor under magnetized.

The main fields of application of U/f control are:

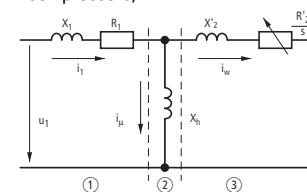
- Pump and fan drives,
- Horizontal conveying and transportation systems,
- Drives with several motors (parallel operation of several motors at the output of a frequency inverter).

In **sensorless vector control** the magnetic fields of the stator and rotor windings are aligned so as to oppose each other. With asynchronous motors the magnetic flux in the rotor must be described in an electronic model of the motor. This requires the physical parameters on the motor's rating plate to be entered.

In vector operation the frequency inverter can control only one motor. A parallel operation of several motors is not possible here. The exact calculation of the phase voltages at the frequency inverter's output, however, improves the motor's operational behavior. The motor also heats up less in the lower speed range. The field-oriented vector control results in a significant improvement in the drive dynamics as well as optimizing performance; it also increases the range of possible applications.

The main applications of sensorless vector control are:

- Material processing machines,
- compressors,



- ① Stator winding
- ② Air gap
- ③ Transformed rotor winding

Simplified equivalent circuit diagram with associated current vectors

Explanation:
 EMC = electromagnetic compatibility
 IGBT = insulated-gate bipolar transistor
 PDS = power drive system
 RCD = residual-current device

Technical information about the braking resistors:

The stated ratings P_{DB} of the braking resistors apply to continuous operation. In short-time operation these values can be increased through multiplication with the type-specific power factor according to the following formula:

$$P_{max} \leq (P_{DB} \times 100\%) \div DF [\%]$$

P_{max} = max. pulse rating

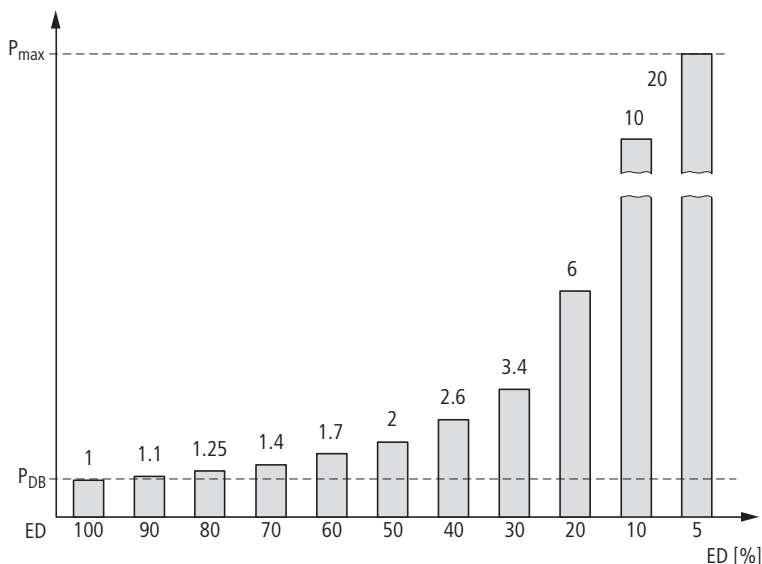
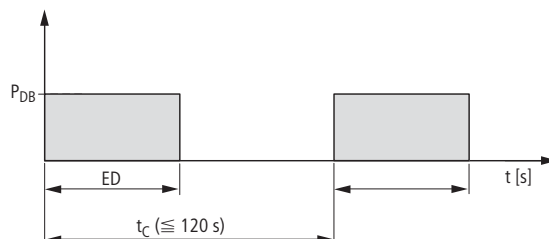
P_{DB} = continuous rating at a duty factor of 100 %

DF = duty factor

t_c = cycle time (max. 120 seconds)

The duty factor is given in percent (%) and is calculated with the following formula:

$$DF [\%] = (ED \times 100\%) \div t_c$$

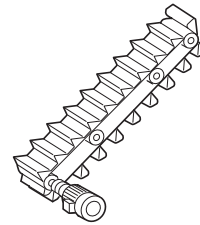
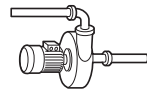
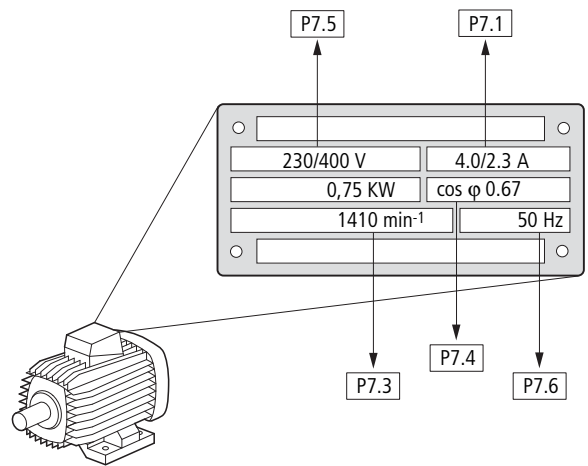


Connecting example for a 0.75 kW motor with the rating plate illustrated here

By default, the M-Max™ frequency inverters are configured so that they can be operated immediately without configuration when connected to the assigned motor rating.

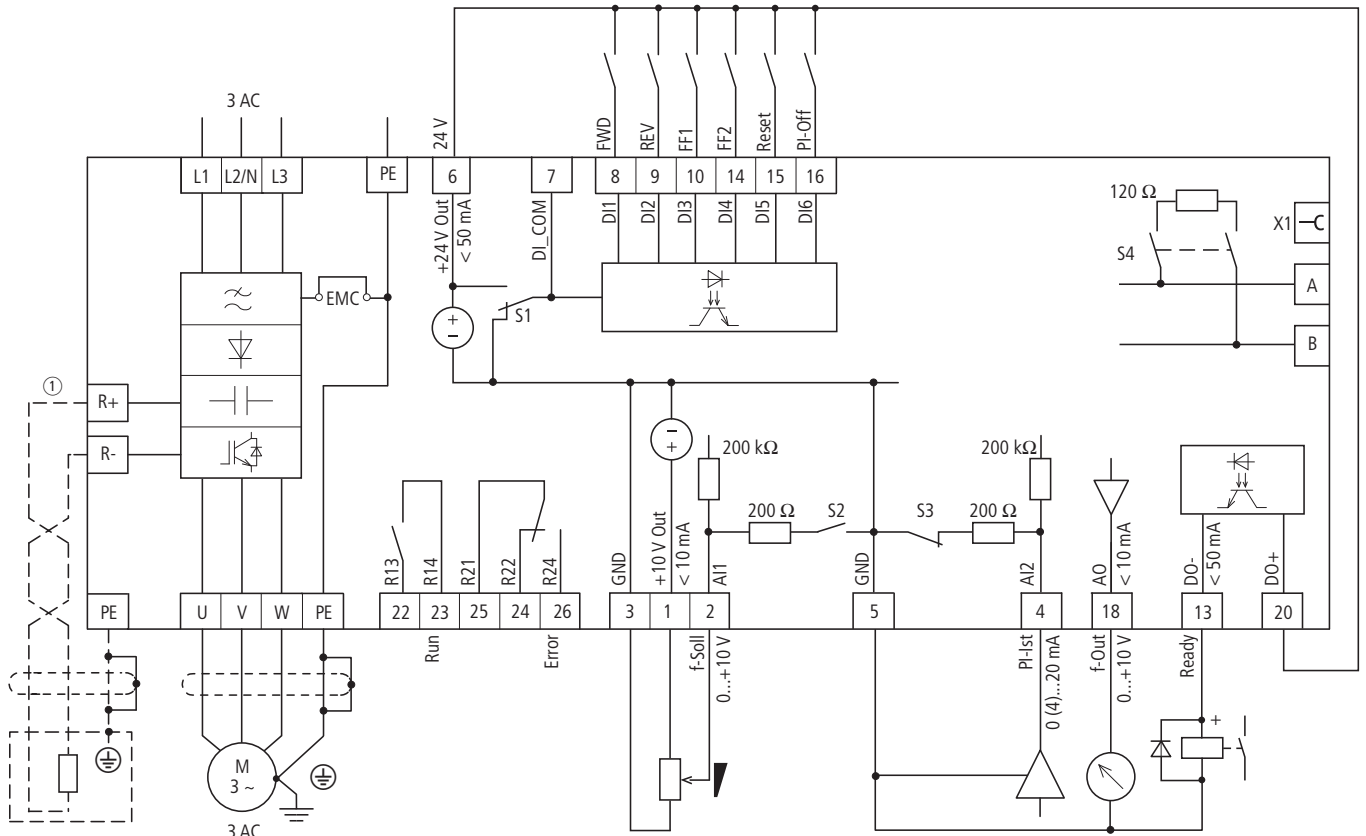
To ensure an optimum operational behavior, the data on the motor's rating label should be entered in the frequency inverter (electrical image).

The following example shows the parameters for quick configuration with the selected drive-specific parameters for four standard applications.



Parameters	Basic (Standard drive)	Pump drive	Fan drive	Feed unit (high load)	Designation
P1.1	1 = Only quick configuration parameters	1 = Only quick configuration parameters	1 = Only quick configuration parameters	1 = Only quick configuration parameters	Parameter range
P1.2	0 = Basic	1 = Pump drive	2 = Fan drive	3 = Feed unit (High load)	Application
P 1.3	0 = EU	0 = EU	0 = EU	0 = EU	Default settings country-specific (EU/USA)
P6.1	1 = Control signal terminals (I/O) (Input/Output)	1 = Control signal terminals (I/O) (Input/Output)	1 = Control signal terminals (I/O) (Input/Output)	1 = Control signal terminals (I/O) (Input/Output)	Control level
P6.2	3 = AI1 (analog setpoint value 1)	3 = AI1 (analog setpoint value 1)	3 = AI1 (analog setpoint value 1)	3 = AI1 (analog setpoint value 1)	Setpoint input (0 - 10 V) terminal 2
P6.3	0.00 Hz	20.00 Hz	20.00 Hz	0.00 Hz	Minimum frequency
P6.4	50.00 Hz	50.00 Hz	50.00 Hz	50.00 Hz	Maximum frequency
P6.5	3.0 s	5.0 s	20.0 s	1.0 s	Acceleration time (acc1)
P6.6	3.0 s	5.0 s	20.0 s	1.0 s	Deceleration time (dec1)
P 6.7	0 = Ramp (Acceleration)	0 = Ramp (Acceleration)	0 = Ramp (Acceleration)	0 = Ramp (Acceleration)	Start function
P6.8	0 = Free coasting	1 = Ramp (deceleration)	0 = Free coasting	0 = Free coasting	Stop function
P7.1	I_e	I_e	I_e	I_e	Motor, rated operational current ²⁾
P7.3	1440 rpm	1440 rpm	1440 rpm	1440 rpm	Motor, rated speed (rpm) ²⁾
P7.4	0.85	0.85	0.85	0.85	Power factor of the motor (cos φ) ²⁾
P7.5	230/400 V ¹⁾	230/400 V ¹⁾	230/400 V ¹⁾	230/400 V ¹⁾	Motor, rated operational voltage
P7.6	50.00 Hz	50.00 Hz	50.00 Hz	50.00 Hz	Motor, rated frequency
P11.7	0 = Deactivated	0 = Deactivated	0 = Deactivated	1 = Enabled	Torque increase
M1.1	0.00 Hz	0.00 Hz	0.00 Hz	0.00 Hz	Output frequency

Notes ¹⁾ 230 V = MMX12... MMX32...; 400 V = MMX34...
²⁾ Depending on output



Block diagram MMX32 and MMX34

Terminals R+ and R- for external braking resistor (optional), only with MMX34...4D3..., MMX34...5D6..., MMX34...7D6..., MMX34...9D0, MMX34...012... and MMX34...014...

The control signal terminals have the following default assignment

- 2: AI1: f-Soll = frequency reference value (0 - +10 V)
 - 4: AI2: PI-Ist = PID controller actual value (Process variable, 4 - 20 mA)
 - 8: DI1: FWD = enable forward (clockwise rotating field)
 - 9: DI2: REV = enable reverse (counterclockwise rotating field)
 - 10: DI3: FF1 = Fixed frequency 1
 - 13: DO-: Ready = Ready for operation (transistor output with voltage of terminal 20)
 - 14: DI4: FF2 = Fixed frequency 2
 - 15: DI5: Reset = Error message acknowledge
 - 16: DI6: PI-Off = PID controller disabled
 - 18: AO: f-Out = output frequency to motor (0 - +10 V)
 - 20: DO+: input voltage for transistor output
- 22/23: R13/R14: RUN = run signal (relay)
 24/25/26: R21/R22/R24: Error = error message (relay)

The function of the digital inputs and outputs, and the scaling of the analog inputs and outputs are defined with parameters. These are described in manual AWB8230-1603.



Part no.		Motor	Frequency inverters			Mains supply
With internal radio interference suppression filter	Without internal radio interference suppression filter	Assigned motor rating (U _{LN} , 50/60 Hz)	Motor current ¹⁾	Rated operational current Frequency inverters	Mains current Without mains choke	Short-circuit and cable protection (fuse) ²⁾
		P kW	I _e A	I _e A	I _{LN} A	
MMX12... frequency inverters						
Single-phase mains connection (1 AC 230 V/240 V)						
MMX12AA1D7F0-0	MMX12AA1D7N0-0	0.25	1.4	1.7	4.2	FAZ-B10/1N
MMX12AA2D4F0-0	MMX12AA2D4N0-0	0.37	2	2.4	5.7	FAZ-B10/1N
MMX12AA2D8F0-0	MMX12AA2D8N0-0	0.55	2.7	2.8	6.6	FAZ-B10/1N
MMX12AA3D7F0-0	MMX12AA3D7N0-0	0.75	3.2	3.7	8.3	FAZ-B10/1N
MMX12AA4D8F0-0	MMX12AA4D8N0-0	1.1	4.6	4.8	11.2	FAZ-B20/1N
MMX12AA7D0F0-0	MMX12AA7D0N0-0	1.5	6.3	7	14.1	FAZ-B20/1N
MMX12AA9D6F0-0	MMX12AA9D6N0-0	2.2	8.7	9.6	15.8	FAZ-B32/1N
MMX32... frequency inverters						
Three-phase mains connection (3 AC 230 V/240 V)						
MMX32AA1D7F0-0	MMX32AA1D7N0-0	0.25	1.4	1.7	2.7	FAZ-B6/3
MMX32AA2D4F0-0	MMX32AA2D4N0-0	0.37	2	2.4	3.5	FAZ-B6/3
MMX32AA2D8F0-0	MMX32AA2D8N0-0	0.55	2.7	2.8	3.8	FAZ-B6/3
MMX32AA3D7F0-0	MMX32AA3D7N0-0	0.75	3.2	3.7	4.3	FAZ-B6/3
MMX32AA4D8F0-0	MMX32AA4D8N0-0	1.1	4.6	4.8	6.8	FAZ-B10/3
MMX32AA7D0F0-0	MMX32AA7D0N0-0	1.5	6.3	7	8.4	FAZ-B10/3
MMX32AA011F0-0	MMX32AA011N0-0	2.2	8.7	11	13.4	FAZ-B20/3
MMX34... frequency inverters						
Three-phase mains connection (3 AC 400 V/480 V)						
MMX34AA1D3F0-0	MMX34AA1D3N0-0	0.37	1.1	1.3	2.2	FAZ-B6/3
MMX34AA1D9F0-0	MMX34AA1D9N0-0	0.55	1.5	1.9	2.8	FAZ-B6/3
MMX34AA2D4F0-0	MMX34AA2D4N0-0	0.75	1.9	2.4	3.2	FAZ-B6/3
MMX34AA3D3F0-0	MMX34AA3D3N0-0	1.1	2.6	3.3	4	FAZ-B6/3
MMX34AA4D3F0-0	MMX34AA4D3N0-0	1.5	3.6	4.3	5.6	FAZ-B10/3
MMX34AA5D6F0-0	MMX34AA5D6N0-0	2.2	5	5.6	7.3	FAZ-B10/3
MMX34AA7D6F0-0	MMX34AA7D6N0-0	3	6.6	7.6	9.6	FAZ-B20/3
MMX34AA9D0F0-0	MMX34AA9D0N0-0	4	8.5	9	11.5	FAZ-B20/3
MMX34AA012F0-0	MMX34AA012N0-0	5.5	11.3	12	14.9	FAZ-B20/3
MMX34AA014F0-0	MMX34AA014N0-0	7.5 ⁴⁾	15.2 ⁴⁾	14 ⁴⁾	18.7	FAZ-B25/3

Notes

All data apply at an ambient air temperature of up to +50 °C.

- 1) The rated motor currents apply to normal internally and surface-cooled three-phase motors with 1500 rpm at 50 Hz or 1800 rpm at 60 Hz.
- 2) If a frequency inverter is operated without mains chokes, current peaks can occur when mains power is applied. This can cause the FAZ-B... to trip prematurely.
Remedy: fit a mains choke upstream or use an FAZ-C...
- 3) Instead of PKM0, PKZM0 can also be used.
- 4) Reduced rated operational data: Ambient air temperature up to +40 °C, operating frequency up to 4 kHz, mounting distance at sides (left and right) > 10 mm

cable protection FAZ, PKM, PKZM → chapter 7, 19

DIL mains contactor → chapter 5

Mains chokes DEX-LN... → Page 10/20

Radio interference suppression filters MMX-LZ... → Page 10/19

DEX-LM3-... motor chokes → Page 10/21

Sinusoidal filters SFB400/... please enquire

Short-circuit and cable protection (fuse)	Mains contactor	Mains contactor with parallel connector (main current-paths) ³⁾	Mains choke	Radio interference suppression filters (only for part nos. MMX...N...)	Motor connection	
					Motor chokes	Sine-wave filters
–	DILM7	DILEM+P1DILEM	DEX-LN1-006	MMX-LZ1-009	DEX-LM3-005	SFB400/4
–	DILM7	DILEM+P1DILEM	DEX-LN1-006	MMX-LZ1-009	DEX-LM3-005	SFB400/4
–	DILM7	DILEM+P1DILEM	DEX-LN1-009	MMX-LZ1-009	DEX-LM3-005	SFB400/4
–	DILM7	DILEM+P1DILEM	DEX-LN1-009	MMX-LZ1-009	DEX-LM3-005	SFB400/4
–	DILM7	–	DEX-LN1-013	MMX-LZ1-015	DEX-LM3-005	SFB400/10
–	DILM7	–	DEX-LN1-018	MMX-LZ1-015	DEX-LM3-008	SFB400/10
–	DILM7	–	DEX-LN1-018	MMX-LZ1-017	DEX-LM3-011	SFB400/10
PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	–	DEX-LN3-006	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-10	DILEM	–	DEX-LN3-010	MMX-LZ3-009	DEX-LM3-005	SFB400/10
PKM0-10	DILEM	–	DEX-LN3-010	MMX-LZ3-009	DEX-LM3-008	SFB400/10
PKM0-20	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-011	SFB400/10
PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	–	DEX-LN3-004	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	–	DEX-LN3-006	MMX-LZ3-006	DEX-LM3-005	SFB400/4
PKM0-10	DILEM	–	DEX-LN3-006	MMX-LZ3-009	DEX-LM3-005	SFB400/4
PKM0-10	DILEM	–	DEX-LN3-010	MMX-LZ3-009	DEX-LM3-008	SFB400/10
PKM0-20	DILEM	–	DEX-LN3-010	MMX-LZ3-020	DEX-LM3-008	SFB400/10
PKM0-20	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-011	SFB400/10
PKM0-20	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-016	SFB400/16.5
PKM0-25	DILM7	–	DEX-LN3-016	MMX-LZ3-020	DEX-LM3-016	SFB400/16.5



Engineering

Part no.		Motor		Frequency inverters	
Protection type IP21	Protection type IP54	Assigned motor rating (U_{LN} , 50/60 Hz)	Motor current ¹⁾	Rated operational current Frequency inverters	Mains current (DC link choke)
		P kW	I_e A	I_e A	I_{LN} A
HMX32... frequency inverters					
Three-phase mains connection (3 AC 230 V/240 V)					
HMX32AG3D721-B	HMX32AG3D722-B	0.75	3.2	3.7	
HMX32AG4D821-B	HMX32AG4D822-B	1.1	4.6	4.8	
HMX32AG6D621-B	HMX32AG6D622-B	1.5	6.3	6.6	
HMX32AG8D021-B	HMX32AG8D022-B	1.5	6.3	8	
HMX32AG01121-B	HMX32AG01122-B	2.2	8.7	11	
HMX32AG01221-B	HMX32AG01222-B	3	11.5	12.5	
HMX32AG01821-B	HMX32AG01822-B	4	14.8	18	
HMX32AG02421-B	HMX32AG02422-B	5.5	19.6	24.2	
HMX32AG03121-B	HMX32AG03122-B	7.5	26.4	31	
HMX32AG04821-B	HMX32AG04822-B	11	38	48	
HMX32AG06221-B	HMX32AG06222-B	15	51	62	
HMX32AG07721-B	HMX32AG07722-B	18.5	63	77	
HMX32AG08821-B	HMX32AG08822-B	22	71	88	
HMX32AG10621-B	HMX32AG10622-B	30	96	106	
HMX32AG14321-B	HMX32AG14322-B	37	117	143	
HMX32AG17021-B	HMX32AG17022-B	45	141	170	
HMX32AG20521-B	HMX32AG20522-B	55	173	208	
HMX32AG26121-B	HMX32AG26122-B	75	233	261	
HMX32AG31021-B	HMX32AG31022-B	90	279	310	
HMX34... frequency inverters					
Three-phase mains connection (3 AC 400 V/480 V)					
HMX34AG3D421-B	HMX34AG3D422-B	1.1	2.6	3.4	
HMX34AG4D821-B	HMX34AG4D822-B	1.5	3.6	4.8	
HMX34AG5D621-B	HMX34AG5D622-B	2.2	5	5.6	
HMX34AG8D021-B	HMX34AG8D022-B	3	6.6	8	
HMX34AG9D621-B	HMX34AG9D622-B	4	8.5	9.6	
HMX34AG01221-B	HMX34AG01222-B	5.5	11.3	12	
HMX34AG01621-B	HMX34AG01622-B	7.5	15.2	16	
HMX34AG02321-B	HMX34AG02322-B	11	21.7	23	
HMX34AG03121-B	HMX34AG03122-B	15	29.3	31	
HMX34AG03821-B	HMX34AG03822-B	18.5	36	38	
HMX34AG04621-B	HMX34AG04622-B	22	41	46	
HMX34AG06121-B	HMX34AG06122-B	30	55	61	
HMX34AG07221-B	HMX34AG07222-B	37	68	72	
HMX34AG08721-B	HMX34AG08722-B	45	81	87	
HMX34AG10521-B	HMX34AG10522-B	55	99	105	
HMX34AG14021-B	HMX34AG14022-B	75	134	140	
HMX34AG17021-B	HMX34AG17022-B	90	161	170	
HMX34AG20521-B	HMX34AG20522-B	110	196	205	
HMX34AG26121-B	HMX34AG26122-B	132	231	261	
HMX34AG31021-B	HMX34AG31022-B	160	279	310	

Notes

All data apply at an ambient air temperature of up to +40 °C.

- 1) The rated motor currents apply to normal internally and surface-cooled three-phase motors with 1500 rpm at 50 Hz or 1800 rpm at 60 Hz.
- 2) At motor currents above 100 A use frame size DEX-LM3-150.

DIL mains contactor → chapter 5

DEX-LM3-... motor chokes → Page 10/21

SFB400/... sine-wave filters please enquire

Mains supply		Motor connection	
Short-circuit and line protection (fuse) ²⁾	Mains contactor	Motor chokes	Sine-wave filters
PKM0-6,3	DILEM	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	DEX-LM3-005	SFB400/4
PKM0-10	DILEM	DEX-LM3-008	SFB400/10
PKM0-10	DILEM	DEX-LM3-008	SFB400/10
PKM0-16	DILM7	DEX-LM3-011	SFB400/16.5
PKM0-16	DILM7	DEX-LM3-016	SFB400/16.5
PKM0-25	DILM7	DEX-LM3-035	SFB400/32
PKM0-32	DILM17	DEX-LM3-035	SFB400/32
PKM4-40	DILM17	DEX-LM3-035	SFB400/32
PKM4-50	DILM40	DEX-LM3-050	SFB400/48
PKM4-63	DILM50	DEX-LM3-063	SFB400/115
NZM...1-A80	DILM65	DEX-LM3-080	SFB400/115
NZM...1-A100	DILM80	DEX-LM3-100	SFB400/115
NZM...1-A125	DILM95	DEX-LM3-100 ²⁾	SFB400/115
NZM...1-A160	DILM150	DEX-LM3-150	SFB400/150
NZM...2-A200	DILM170	DEX-LM3-180	SFB400/180
NZM...2-A250	DILM185	DEX-LM3-220	SFB400/250
NZM...3-AE400	DILM185	DEX-LM3-260	SFB400/440
NZM...3-AE400	DILM250	Please enquire	SFB400/440
PKM0-6,3	DILEM	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	DEX-LM3-005	SFB400/4
PKM0-6,3	DILEM	DEX-LM3-008	SFB400/10
PKM0-10	DILEM	DEX-LM3-008	SFB400/10
PKM0-10	DILEM	DEX-LM3-011	SFB400/10
PKM0-16	DILM7	DEX-LM3-016	SFB400/16.5
PKM0-16	DILM7	DEX-LM3-016	SFB400/16.5
PKM0-25	DILM7	DEX-LM3-035	SFB400/23.5
PKM0-32	DILM17	DEX-LM3-035	SFB400/32
PKM4-40	DILM17	DEX-LM3-050	SFB400/37
PKM4-50	DILM40	DEX-LM3-050	SFB400/48
PKM4-63	DILM50	DEX-LM3-063	SFB400/115
NZM...1-A80	DILM65	DEX-LM3-080	SFB400/115
NZM...1-A100	DILM80	DEX-LM3-100	SFB400/115
NZM...1-A125	DILM95	DEX-LM3-100 ²⁾	SFB400/115
NZM...1-A160	DILM150	DEX-LM3-150	SFB400/150
NZM...2-A200	DILM170	DEX-LM3-180	SFB400/180
NZM...2-A250	DILM185	DEX-LM3-220	SFB400/250
NZM...3-AE400	DILM185	DEX-LM3-260	SFB400/440
NZM...3-AE400	DILM250	Please enquire	SFB400/440



Technical data

MMX12...

			MMX...1D7...	MMX...2D4...
Power side (primary side)				
Number of phases			1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)
Mains connection voltage	U _{LN}			
IEC (50/60Hz)		V	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %
UL/CSA (45 - 66 Hz ±0 %)		V	177 - 264 ±0 %	177 - 264 ±0 %
Rated operational voltage	U _e	V	230	230
Rated operational current	I _e	A	1.7	2.4
Input current	I _{LN}	A	4.2	5.7
Overload current for 60 s every 600 s at 50 °C		A	2.6	3.6
Starting current for 2 s every 20 s at 50 °C		A	3.4	4.8
Maximum leakage current to ground (PE) without motor	I _{PE}	mA	15.4	15.4
Apparent power at rated operation 230 V		kVA	0.68	0.96
Apparent power at rated operation 240 V		kVA	0.71	0.99
Assigned motor rating (230 V)	P	kWh	0.25	0.37
Assigned motor rating (230 V)	P	HP	1/3 ¹⁾	1/2
Braking torque				
Standard			Max. 30 % M _N	Max. 30 % M _N
DC braking			Max. 100 % of rated operational current I _e , adjustable	
Pulse frequency	f _{PWM}	kHz	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)
Heat dissipation at rated operational current I _e	P _V	W	17.9	24.6
Efficiency	η		0.93	0.93
Fan (built into device, temperature-controlled)			•	•
Frame size			FS1	FS1
Weight	m	kg	0.55	0.55

Notes

¹⁾ Not a standardized output

MMX32...

			MMX...1D7...	MMX...2D4...
Power side (primary side):				
Number of phases			3 (L1, L2, L3)	3 (L1, L2, L3)
Mains connection voltage	U _{LN}	U _{LN}		
IEC (50/60Hz)			208 -15 % - 240 +10 %	208 -15 % - 240 +10 %
UL/CSA (45 - 66 Hz ±0 %)			177 - 264 ±0 %	177 - 264 ±0 %
Rated operational voltage	U _e	U _e	230	230
Rated operational current	I _e	I _e	1.7	2.4
Input current	I _{LN}	I _{LN}	2.7	3.5
Overload current for 60 s every 600 s at 50 °C			2.6	3.6
Starting current for 2 s every 20 s at 50 °C			3.4	4.8
Maximum leakage current to ground (PE) without motor		I _{PE}	8.6	8.6
Apparent power at rated operation 230 V			0.68	0.96
Apparent power at rated operation 240 V			0.71	0.99
Assigned motor rating (230 V)		P	0.25	0.37
Assigned motor rating (230 V)		P	1/3 ¹⁾	1/2
Braking torque				
Standard			Max. 30 % M _N	Max. 30 % M _N
DC braking			Max. 100 % of rated operational current I _e , adjustable	
Pulse frequency		f _{PWM}	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)
Heat dissipation at rated operational current I _e		P _V	17.4	23.7
Efficiency	η	η	0.93	0.94
Fan (built into device, temperature-controlled)			•	•
Frame size			FS1	FS1
Weight		m	0.55	0.55

Notes

¹⁾ Guide value, not a standardized output

MMX...2D8...	MMX...3D7...	MMX...4D8...	MMX...7D0...	MMX...9D6...
1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)	1 (L and N) or 2 (e.g. L1 and L2)
208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %
177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %
230	230	230	230	230
2.8	3.7	4.8	7	9.6
6.6	8.3	11.2	14.1	15.8
4.2	5.6	7.2	10.4	14.4
5.6	7.4	9.6	14	19.2
15.4	11.8	11.8	11.8	24.4
1.12	1.47	1.91	2.79	3.82
1.16	1.54	1.99	2.91	3.99
0.55	0.75	1.1	1.5	2.2
1/2	3/4	1.0	2.0	3.0
Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N
Max. 100 % of rated operational current I _e , adjustable				
6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)
29.2	40.2	49.6	66.8	78.1
0.95	0.95	0.95	0.96	0.96
•	•	•	•	•
FS1	FS2	FS2	FS2	FS3
0.55	0.70	0.70	0.70	0.99



MMX...2D8...	MMX...3D7...	MMX...4D8...	MMX...7D0...	MMX... 011...
3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)
208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %	208 -15 % - 240 +10 %
177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %	177 - 264 ±0 %
230	230	230	230	230
2.8	3.7	4.8	7	11
3.8	4.3	6.8	8.4	13.4
4.2	5.6	7.2	10.4	14.4
5.6	7.4	9.6	14	19.2
8.6	16.1	16.1	16.1	8.6
1.12	1.47	1.91	2.79	3.82
1.16	1.54	1.99	2.91	3.99
0.55	0.75	1.1	1.5	2.2
1/2	3/4	1.0	2.0	3.0
Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N
Max. 100 % of rated operational current I _e , adjustable				
6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)
28.3	37.9	48.4	63.8	84.0
0.95	0.95	0.96	0.96	0.96
•	•	•	•	•
FS1	FS2	FS2	FS2	FS3
0.55	0.70	0.70	0.70	0.99

			MMX...1D3...	MMX...1D9...	MMX...2D4...
Power side (primary side):					
Number of phases			3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)
Mains connection voltage	U_{LN}				
IEC (50/60Hz)		V	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %
UL/CSA (45 - 66 Hz ± 0 %)		V	323 - 528 ± 0 %	323 - 528 ± 0 %	323 - 528 ± 0 %
Rated operational voltage	U_e	V	400	400	400
Rated operational current	I_e	A	1.3	1.9	2.4
Input current	I_{LN}	A	2.2	2.8	3.2
Overload current for 60 s every 600 s at 50 °C		A	2.0	2.9	3.6
Starting current for 2 s every 20 s at 50 °C		A	2.6	3.8	4.8
Maximum leakage current to ground (PE) without motor	I_{PE}	mA	45.1	45.1	45.1
Apparent power at rated operation 400 V		kVA	0.9	1.32	1.66
Apparent power at rated operation 480 V		kVA	1.08	1.56	2.00
Assigned motor (400 V)	P	kWh	0.37	0.55	0.75
Assigned motor rating (460 V)	P	HP	1/2	3/4	1
Braking torque					
Standard			Max. 30 % M_N	Max. 30 % M_N	Max. 30 % M_N
DC braking			Max. 100 % of rated operational current I_e , adjustable	Max. 100 % of rated operational current I_e , adjustable	Max. 100 % of rated operational current I_e , adjustable
Brake chopper with external braking resistor					
Minimum braking resistance	R_B	Ω			
Closing ripple for braking transistor	U_{DC}	V DC			
Pulse frequency	f_{PWM}	kHz	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)
Heat dissipation at rated operational current I_e	P_V	W	21.7	29.7	31.7
Efficiency	η		0.94	0.95	0.95
Fan (built into device, temperature-controlled)			•	•	•
Frame size			FS1	FS1	FS1
Weight	m	kg	0.55	0.55	0.55

Notes

¹⁾ The rated operational data of the MMX34AA014... is limited to 4 kHz at a maximum ambient air temperature of +40 °C.

²⁾ Assigned motor rating with reduced load torque (about -10 %)

³⁾ Guide value, not a standardized output

MMX...3D3...	MMX...4D3...	MMX...5D6...	MMX...7D6...	MMX...9D0...	MMX...012...	MMX...014...
3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)	3 (L1, L2, L3)
380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %	380 -15 % - 480 +10 %
323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %	323 - 528 ±0 %
400	400	400	400	400	400	400
3.3	4.3	5.6	7.6	9.0	12.0	21.0
4.0	5.6	7.3	9.6	11.5	14.9	18.7
5.0	6.5	8.4	11.4	13.5	18.0	21.0
6.6	8.6	11.2	15.2	18.0	24.0	28.0
25.1	25.1	25.1	24.9	24.9	24.9	24.9
2.29	2.98	3.88	5.27	6.24	8.32	9.70
2.74	3.57	4.66	6.32	7.48	9.98	11.64
1.10	1.50	2.20	3.00	4.00	5.50	7.50 ²⁾
1-1/2	2	3	4 ³⁾	5	7-1/2	10
Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N	Max. 30 % M _N
Max. 100 % of rated operational current I _e , adjustable	Max. 100 % of rated operational current I _e , adjustable	Max. 100 % of rated operational current I _e , adjustable	Max. 100 % of rated operational current I _e , adjustable	Max. 100 % of rated operational current I _e , adjustable	Max. 100 % of rated operational current I _e , adjustable	Max. 100 % of rated operational current I _e , adjustable
Max. 100 % of rated operational current I _e with external braking resistor	Max. 100 % of rated operational current I _e with external braking resistor	Max. 100 % of rated operational current I _e with external braking resistor	Max. 100 % of rated operational current I _e with external braking resistor	Max. 100 % of rated operational current I _e with external braking resistor	Max. 100 % of rated operational current I _e with external braking resistor	Max. 100 % of rated operational current I _e with external braking resistor
55	55	55	35	35	35	35
765	765	765	765	765	765	765
6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	6 (adjustable 1 – 16)	1 - 4, adjustable
51.5	66.4	88.3	116.9	136.2	185.1	223.7
0.95	0.96	0.96	0.96	0.97	0.97	0.97
•	•	•	•	•	•	•
FS2	FS2	FS2	FS3	FS3	FS3	FS3
0.70	0.70	0.70	0.99	0.99	0.99	0.99



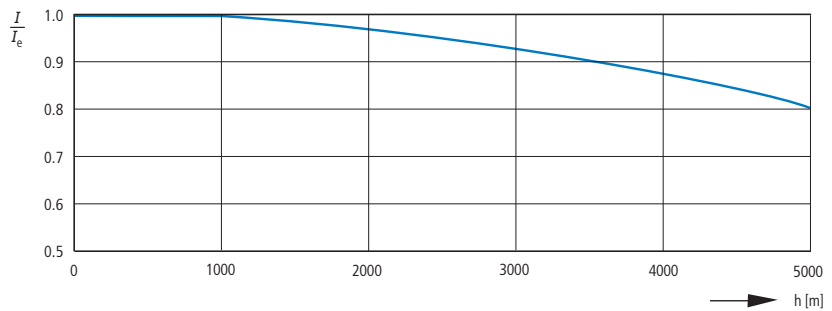
Technical data

			Mains chokes DEX-LN1-...	Mains chokes DEX-LN3-...	DEX-LM3-... motor chokes
General					
Standards			IEC/EN 61558-2-20-2000, VDE 0570 Part 2-20/04-2001, UL, CSA	IEC/EN 61558-2-20-2000, VDE 0570 Part 2-20/04-2001, UL, CSA	IEC/EN 61558-2-20-2000, VDE 0570 Part 2-20/04-2001, UL, CSA
Operating temperature	θ	°C	-25 – +40, up to 70 with current reduction (see note)	-25 – +40, up to 70 with current reduction (see note)	-25 – +40, up to 70 with current reduction (see note)
Storage temperature	θ	°C	-25 - +85	-25 - +85	-25 - +85
Mechanical shock resistance			11 ms ² /15 g, 3 impacts	11 ms ² /15 g, 3 impacts	11 ms ² /15 g, 3 impacts
Resistance to vibration		g	1 (0 - 150 Hz)	1 (0 - 150 Hz)	1 (0 - 150 Hz)
Vibration			0.35 mm at 10 - 55 Hz	0.35 mm at 10 - 55 Hz	0.35 mm at 10 - 55 Hz
Pollution degree			1 (VDE 0160)	1 (VDE 0160)	1 (VDE 0160)
Installation altitude	H	m	0 – 1000 above seal level, up to 5000 with current reduction (see note)	0 – 1000 above seal level, up to 5000 with current reduction (see note)	0 – 1000 above seal level, up to 5000 with current reduction (see note)
Mounting position			Standing vertically, suspended horizontally	Standing vertically, suspended horizontally	Standing vertically, suspended horizontally
Free surrounding areas			< 50	< 50	< 50
Degree of protection (terminals)			IP20	IP20 to 40 A IP00 from 50 A	IP20 up to 50 A IP00 from 63 A
Rated duty factor		% DF	100	100	100
Overload cycle			1.5 x I _e for 60 s every 600 s	1.5 x I _e for 60 s every 600 s	1.5 x I _e for 60 s every 600 s (< 24 A) 1.2 x I _e for 60 s every 600 s (> 24 A)
Weight	m	kg	0.7 - 2	1.5 - 20.6	1.5 - 45
Electrical data					
Rated operational voltage	U _e	V AC	230/240	400/480	230/400/460/575
Max. supply voltage	U _L	V AC	260 +0 %	550 +0 %	750 +0 %
Operating frequency	f	Hz	50/60	50/60	0 - 200
Insulation class			B	B	B (100 A) F (150 A)
Electrical connection					
Terminations			●	● (≤ 40 A)	● (≤ 40 A)
Connection lugs			–	● (≥ 50 A)	● (≥ 63 A)
PE stud			●	●	●

Notes

All rated operational data is based on an ambient air temperature of +40 °C. An ambient air temperature of +50 °C results in a derating of 4 percent.

The derating due to altitude relates to the rated operational current, I_e.



DEX-LN..., DEX-LM3...

Part no.	Rated operating current	Inductance L mH	Maximum heat dissipation P _v W	Cu factor ¹⁾	Voltage drop u _k %	Connection Terminal/connection lug		Bore hole mm	Pick-up Nm
	I _e A					mm ²	AWG		

Mains chokes, single-phase, rated operational voltage 1 AC 230 V, 50 Hz

DEX-LN1-006	5.8	5.05	9	0.09	4	4	20 - 10	–	0.8
DEX-LN1-009	8.6	3.41	11	0.11	4	4	20 - 10	–	0.8
DEX-LN1-013	13	2.25	12	0.18	4	4	20 - 10	–	0.8
DEX-LN1-018	18	1.63	17	0.27	4	4	20 - 10	–	0.8
DEX-LN1-024	24	1.22	20	0.33	4	4	20 - 10	–	0.8

Mains chokes, three-phase, rated operational voltage 3 AC 400 V, 50 Hz

DEX-LN3-004	3.9	7.51	17	0.25	4	4	20 - 10	–	0.8
DEX-LN3-006	6	4.9	19	0.34	4	4	20 - 10	–	0.8
DEX-LN3-010	10	2.94	33	0.45	4	4	20 - 10	–	0.8
DEX-LN3-016	16	1.84	44	0.53	4	4	20 - 10	–	0.8
DEX-LN3-025	25	1.18	57	0.90	4	4	20 - 10	–	0.8
DEX-LN3-040	40	0.64	59	0.91	2.5	10	20 - 6	–	1.5
DEX-LN3-050	50	0.37	58	1.08	2.5		Cu 15 x 2	7	3
DEX-LN3-060	60	0.31	60	1.51	2.5		Cu 15 x 2	7	3
DEX-LN3-080	80	0.23	86	1.67	2.5		Cu 20 x 3	9	6
DEX-LN3-100	100	0.18	101	1.68	2.5		Cu 20 x 3	9	6
DEX-LN3-120	120	0.15	100	2.26	2.5		Cu 25 x 5	11	10
DEX-LN3-160	160	0.11	140	2.35	2.5		Cu 25 x 5	11	10
DEX-LN3-200	200	0.09	154	3.81	2.5		Cu 25 x 5	11	10
DEX-LN3-250	250	0.07	155	4.26	0		Cu 40 x 5	14	15.5
DEX-LN3-300	300	0.06	169	4.28	2.5		Cu 40 x 5	14	15.5

Part no.	Rated operating current I _e A	Inductance L mH	Maximum heat dissipation P _v W	Max. heat dissipation (pulse frequency)			Cu factor ¹⁾	Connection Terminal/connection lug		Bore hole mm	Pick-up Nm
				P _v (3 kHz) W	P _v (5 kHz) W	P _v (12 kHz) W		mm ²	AWG		

Motor chokes, three-phase, rated operational voltage 3 AC 400 V, max. 200 Hz

DEX-LM3-005	5	2	24	12	14	24	0.29	4	20 - 10	–	0.8
DEX-LM3-008	8	4.1	54	32	46	54	1.09	4	20 - 10	–	0.8
DEX-LM3-011	11	3	71	45	66	71	1.23	4	20 - 10	–	0.8
DEX-LM3-016	16	1.5	78	50	75	78	0.88	4	20 - 10	–	0.8
DEX-LM3-035	35	1	116	75	114	116	2.30	4	20 - 10	–	0.8
DEX-LM3-050	50	0.6	168	110	157	168	3.60	10	20 - 6	–	1.5
DEX-LM3-063	63	0.5	193	130	190	193	3.01		Cu 15 x 2	7	3
DEX-LM3-080	80	0.5	206	132	206	206	5.88		Cu 20 x 3	9	6
DEX-LM3-100	100	0.45	294	177	279	294	10.10		Cu 20 x 3	9	6
DEX-LM3-150	150	0.35	424	293	418	424	8.22		Cu 25 x 5	11	10
DEX-LM3-180	180	0.3	498	418	439	498	14.75		Cu 25 x 5	11	10
DEX-LM3-220	220	0.2	517	344	512	517	11.37		Cu 40 x 5	14	15.5
DEX-LM3-260	260	0.15	520	358	526	520	11.10		Cu 40 x 5	14	15.5

Notes

¹⁾ For material price surcharge → Chapter General information



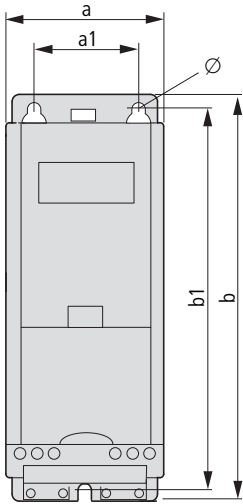
Dimensions

MMX12AA1D7...
MMX12AA2D4...
MMX12AA2D8...
MMX32AA1D7...
MMX32AA2D4...
MMX32AA2D8...
MMX34AA1D3...
MMX34AA1D9...
MMX34AA2D4...

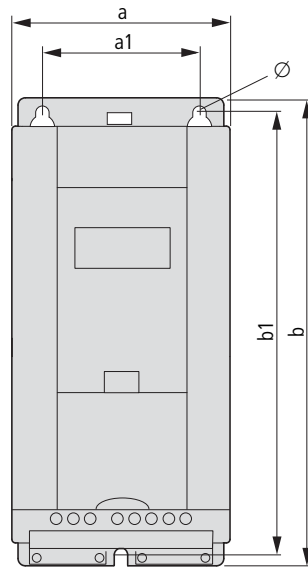
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MMX12AA4D8...
MMX12AA7D0...
MMX32AA3D7...
MMX32AA4D8...
MMX32AA7D0...
MMX34AA3D3...
MMX34AA4D3...
MMX34AA5D6...

MMX12AA7D0...
MMX32AA011...
MMX34AA7D6...
MMX34AA9D0...
MMX34AA012...
MMX34AA014...

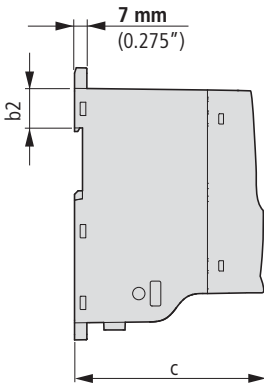
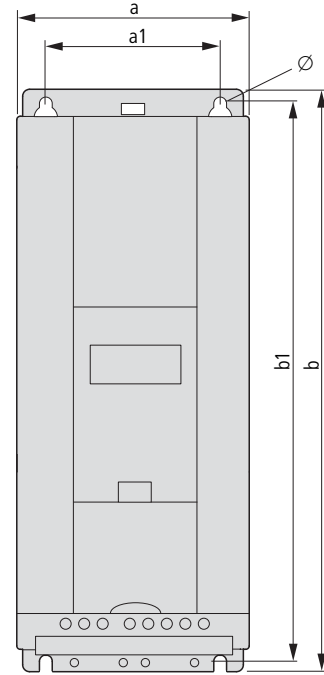
FS1



FS2



FS3



1 mm = 0.0394 inches
1 inch (1") = 25.4 mm

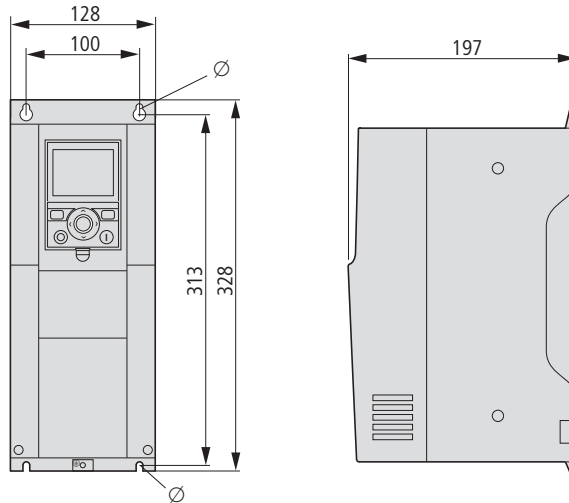
Part no.	a	a1	b	b1	b2	c	∅	Weight	Frame size
	mm	mm	mm	mm	mm	mm	mm	kg	
MMX12AA1D7...	66	38	160	147	32	102	4.5	0.55	FS1
MMX12AA2D4...	66	38	160	147	32	102	4.5	0.55	FS1
MMX12AA2D8...	66	38	160	147	32	102	4.5	0.55	FS1
MMX12AA3D7...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX12AA4D8...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX12AA7D0...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX12AA9D6...	100	75	253	242	34	112	5.5	0.99	FS3
MMX32AA1D7...	66	38	160	147	32	102	4.5	0.55	FS1
MMX32AA2D4...	66	38	160	147	32	102	4.5	0.55	FS1
MMX32AA2D8...	66	38	160	147	32	102	4.5	0.55	FS1
MMX32AA3D7...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX32AA4D8...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX32AA7D0...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX32AA011...	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA1D3...	66	38	160	147	32	102	4.5	0.55	FS1
MMX34AA1D9...	66	38	160	147	32	102	4.5	0.55	FS1
MMX34AA2D4...	66	38	160	147	32	102	4.5	0.55	FS1
MMX34AA3D3...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX34AA4D3...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX34AA5D6...	90	62.5	195	182	32	105	5.5	0.7	FS2
MMX34AA7D6...	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA9D0...	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA012...	100	75	253	242	34	112	5.5	0.99	FS3
MMX34AA014...	100	75	253	242	34	112	5.5	0.99	FS3

FS = frame size

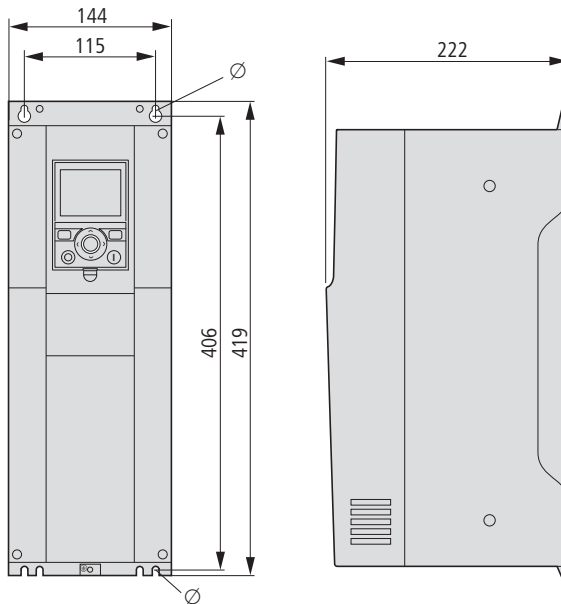
Dimensions

Frequency inverters

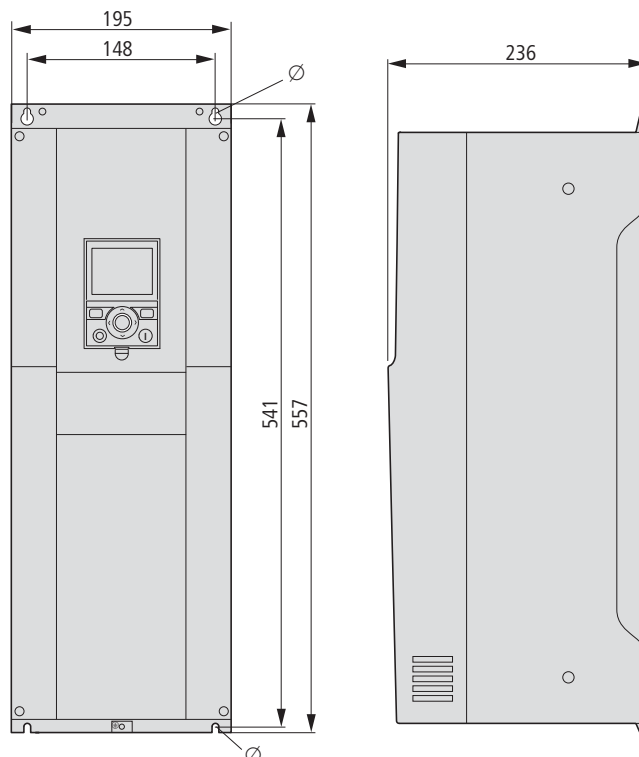
- | | |
|----------------|----------------|
| HMX32AG3D721-B | HMX34AG3D421-B |
| HMX32AG4D821-B | HMX34AG4D821-B |
| HMX32AG6D621-B | HMX34AG5D621-B |
| HMX32AG8D021-B | HMX34AG8D021-B |
| HMX32AG01121-B | HMX34AG9D621-B |
| HMX32AG01221-B | HMX34AG01221-B |
| HMX32AG3D722-B | HMX34AG3D422-B |
| HMX32AG4D822-B | HMX34AG4D822-B |
| HMX32AG6D622-B | HMX34AG5D622-B |
| HMX32AG8D022-B | HMX34AG8D022-B |
| HMX32AG01122-B | HMX34AG9D622-B |
| HMX32AG01222-B | HMX34AG01222-B |



- | | |
|----------------|----------------|
| HMX32AG01821-B | HMX34AG01621-B |
| HMX32AG02421-B | HMX34AG02321-B |
| HMX32AG03121-B | HMX34AG03121-B |
| HMX32AG01822-B | HMX34AG01622-B |
| HMX32AG02422-B | HMX34AG02322-B |
| HMX32AG03122-B | HMX34AG03122-B |



- | | |
|----------------|----------------|
| HMX32AG04821-B | HMX34AG03821-B |
| HMX32AG06221-B | HMX34AG04621-B |
| HMX32AG04822-B | HMX34AG06121-B |
| HMX32AG06222-B | HMX34AG03822-B |
| | HMX34AG04622-B |
| | HMX34AG06122-B |



10/40 Frequency inverters

HMX...

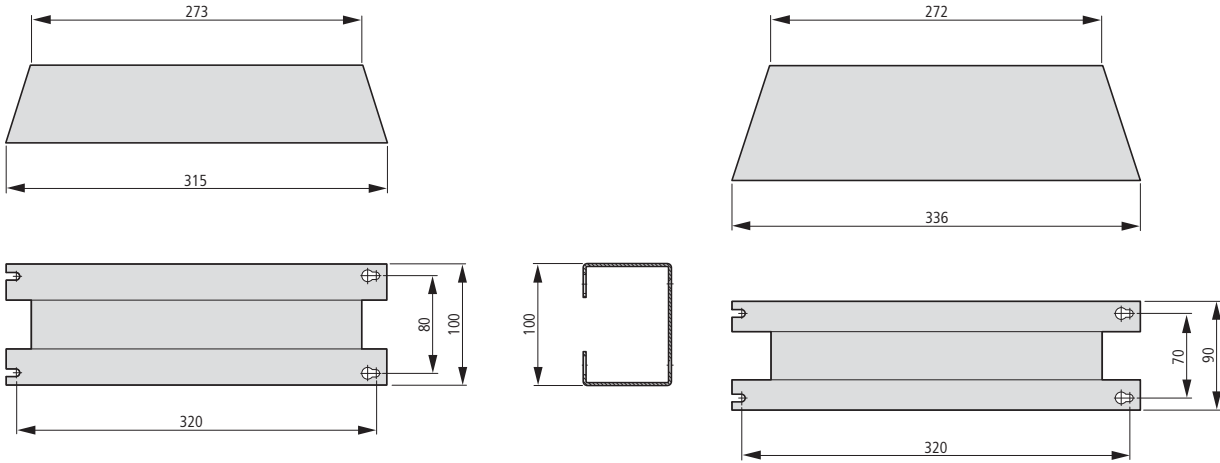
Part no.	a mm	a1 mm	b mm	b1 mm	c mm	Ø mm	Weight kg	Frame size FS
HMX32AG011...	128	100	328	313	197	7	6	FS4
HMX32AG012...	128	100	328	313	197	7	6	FS4
HMX32AG018...	144	115	419	406	222	7	10	FS5
HMX32AG024...	144	115	419	406	222	7	10	FS5
HMX32AG031...	144	115	419	406	222	7	10	FS5
HMX32AG048...	195	148	557	541	236	9	20	FS6
HMX32AG062...	195	148	557	541	236	9	20	FS6
HMX32AG077...	234		660		266		37.5	FS7
HMX32AG088...	234		660		266		37.5	FS7
HMX32AG106...	234		660		266		37.5	FS7
HMX32AG143...	290		966		350		70	FS8
HMX32AG170...	290		966		350		70	FS8
HMX32AG208...	290		966		350		70	FS8
HMX32AG261...	480		1150		372		108	FS9
HMX32AG310...	480		1150		372		108	FS9
HMX32AG3D7...	128	100	328	313	197	7	6	FS4
HMX32AG4D8...	128	100	328	313	197	7	6	FS4
HMX32AG6D6...	128	100	328	313	197	7	6	FS4
HMX32AG8D0...	128	100	328	313	197	7	6	FS4
HMX34AG012...	128	100	328	313	197	7	6	FS4
HMX34AG016...	144	115	419	406	222	7	10	FS5
HMX34AG023...	144	115	419	406	222	7	10	FS5
HMX34AG031...	144	115	419	406	222	7	10	FS5
HMX34AG038...	195	148	557	541	236	9	20	FS6
HMX34AG046...	195	148	557	541	236	9	20	FS6
HMX34AG061...	195	148	557	541	236	9	20	FS6
HMX34AG077...	234		660		266		37.5	FS7
HMX34AG088...	234		660		266		37.5	FS7
HMX34AG106...	234		660		266		37.5	FS7
HMX34AG140...	290		966		350		70	FS8
HMX34AG170...	290		966		350		70	FS8
HMX34AG205...	290		966		350		70	FS8
HMX34AG261...	480		1150		372		108	FS9
HMX34AG310...	480		1150		372		108	FS9
HMX34AG3D4...	128	100	328	313	197	7	6	FS4
HMX34AG4D8...	128	100	328	313	197	7	6	FS4
HMX34AG5D6...	128	100	328	313	197	7	6	FS4
HMX34AG8D0...	128	100	328	313	197	7	6	FS4
HMX34AG9D6...	128	100	328	313	197	7	6	FS4

FS = frame size

BR2...-T-SAF, BR1...-T-PF, BR3...-T-PF; MMX-COM-PC

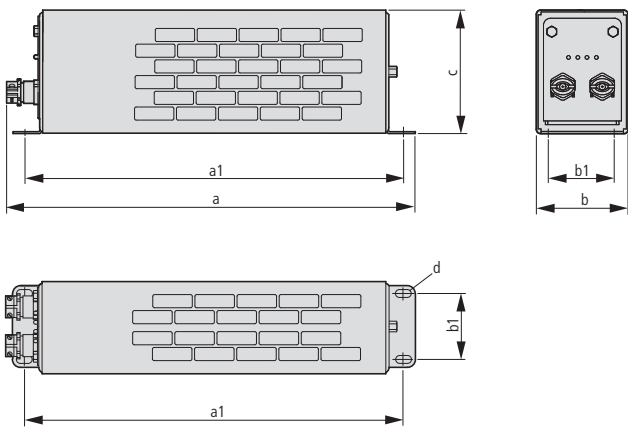
Braking resistors

- BR2036400-T-SAF
- BR2047240-T-SAF
- BR2060200-T-SAF
- BR2065400-T-SAF
- BR2075480-T-SAF



Braking resistors

- BR10361K0-T-PF
- BR10561K0-T-PF
- BR1036500-T-PF
- BR1056300-T-PF
- BR1056800-T-PF
- BR30362K4-T-PF
- BR30362K8-T-PF
- BR30363K6-T-PF

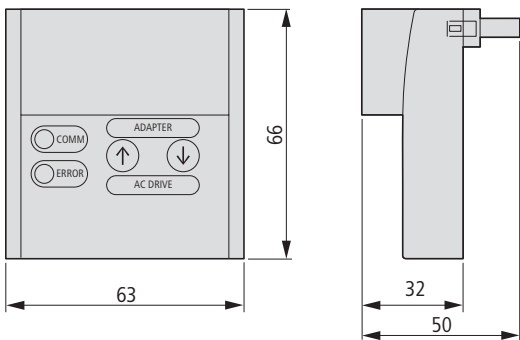


Part no.	a mm	a1 mm	b mm	b1 mm	c mm	d mm
BR10361K0-T-PF	445	428	140	120	120	6 x 12
BR10561K0-T-PF	445	428	140	120	120	6 x 12
BR1036500-T-PF	445	428	95	70	95	6 x 12
BR1056300-T-PF	335	328	95	70	95	6 x 12
BR1056800-T-PF	395	378	140	120	120	6 x 12
BR30362K4-T-PF	485	380	326	300	301	9
BR30362K8-T-PF	485	380	326	300	301	9
BR30363K6-T-PF	485	380	326	300	301	9

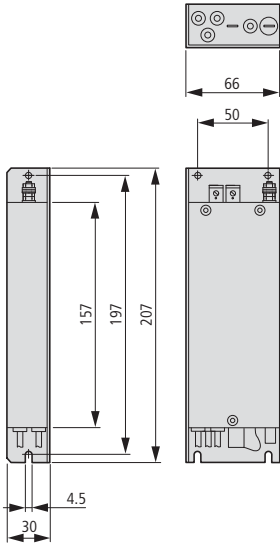


PC interfacing

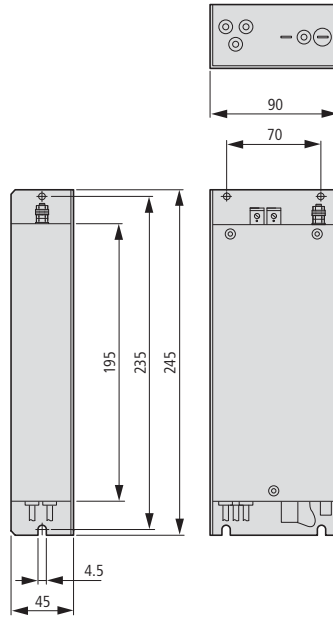
MMX-COM-PC



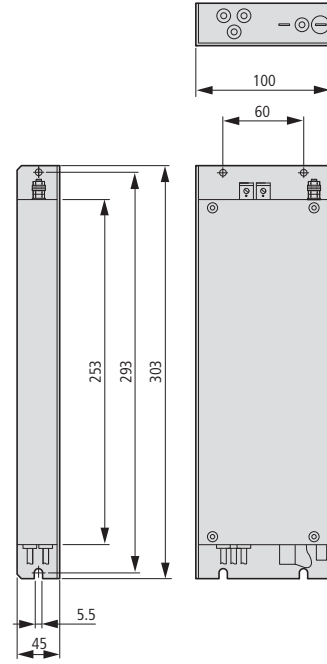
MMX-LZ1-009



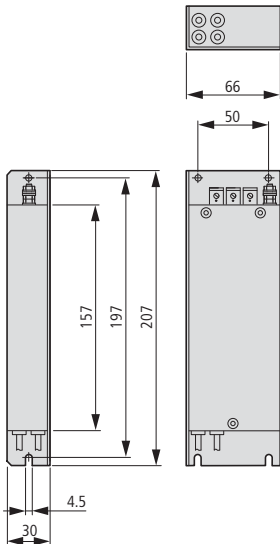
MMX-LZ1-015



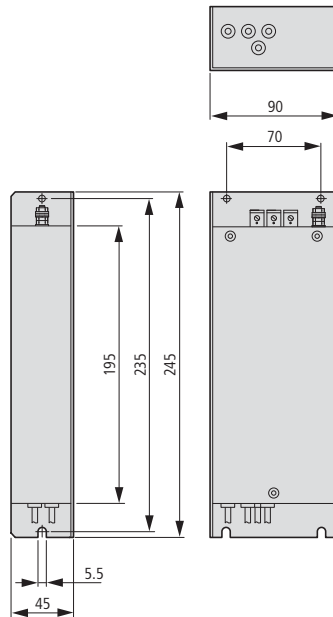
MMX-LZ1-017



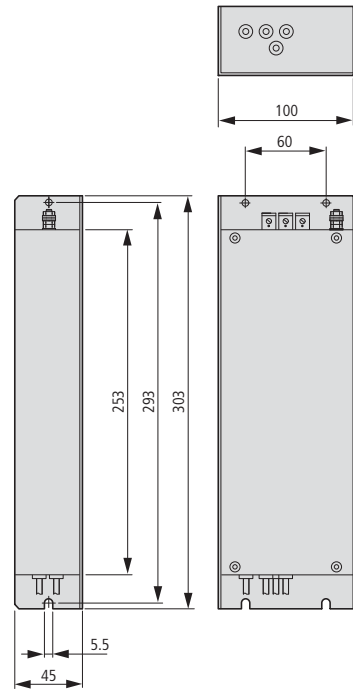
MMX-LZ3-006



MMX-LZ3-009

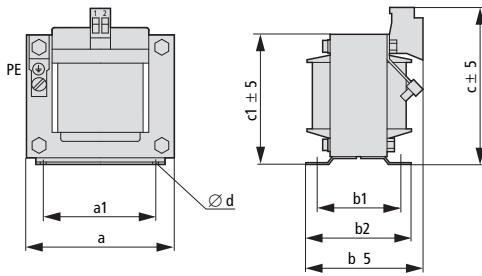


MMX-LZ3-020



Mains chokes

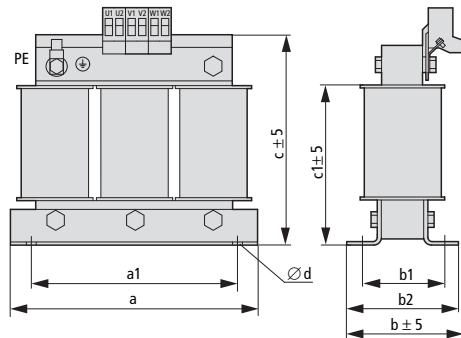
DEX-LN1-...



Part no.	a mm	a1 mm	b mm	b1 mm	b2 mm	c mm	c1 mm	Ød mm	Weight kg
DEX-LN1-006	66	50	71	44	55	80	61	4.5 x 8	0.7
DEX-LN1-009	66	50	71	44	55	80	61	4.5 x 8	0.7
DEX-LN1-013	84	64	67	47	60	90	75	4.8 x 8	1.5
DEX-LN1-018	84	64	90	70	83	90	75	4.8 x 8	1.5
DEX-LN1-024	84	64	67	47	60	90	75	4.8 x 8	2

Mains chokes/motor chokes

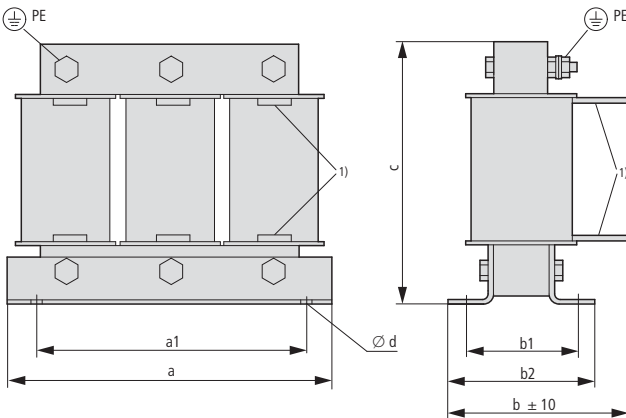
DEX-LN3-..., DEX-LM3-...



Part no.	a mm	a1 mm	b mm	b1 mm	b2 mm	c mm	c1 mm	Ød mm	Weight kg
DEX-LN3-004	115	100	66	50	66	118	84	5 x 10	1.5
DEX-LN3-006	115	100	66	50	66	118	84	5 x 10	1.5
DEX-LN3-010	140	125	61	50	61	138	105	5 x 10	2.2
DEX-LN3-016	140	125	71	50	71	138	105	5 x 10	2.9
DEX-LN3-025	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LN3-040	195	175	104	50	76.5	188	134	8 x 13	4.8
DEX-LM3-005	115	100	66	50	66	118	84	5 x 10	1.5
DEX-LM3-008	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LM3-011	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LM3-016	195	175	104	50	76.5	175	134	8 x 13	4.8
DEX-LM3-035	220	200	132	75	101.5	195	160	8 x 13	7.3
DEX-LM3-050	270	250	106	75	96	228	198	8 x 13	12.3

Mains chokes/motor chokes

DEX-LN3-..., DEX-LM3-...



Part no.	a mm	a1 mm	b mm	b1 mm	b2 mm	c ²⁾ mm	Ød mm	Weight kg
DEX-LN3-050	195	175	105	75	91.5	132 ± 5	8 x 13	5.9
DEX-LN3-060	195	175	105	75	91.5	132 ± 5	8 x 13	5.9
DEX-LN3-080	220	200	110	50	81.5	160 ± 5	8 x 13	7.3
DEX-LN3-100	220	200	130	75	101.5	160 ± 5	8 x 13	10.2
DEX-LN3-120	220	200	130	75	101.5	160 ± 5	8 x 13	10.2
DEX-LN3-160	270	250	125	75	96	200 ± 5	8 x 13	12.3
DEX-LN3-200	270	250	155	100	120	202 ± 5	8 x 13	14.9
DEX-LN3-250	270	250	155	100	125	210 ± 5	10 x 18	20.6
DEX-LN3-300	270	250	155	100	125	210 ± 5	10 x 18	20.6
DEX-LM3-063	270	250	155	100	120	202 ± 10	8 x 13	14.9
DEX-LM3-080	270	250	155	100	125	210 ± 10	10 x 18	20.6
DEX-LM3-100	384	350	215	100	130	258 ± 30	12 x 20	31
DEX-LM3-150	384	350	260	150	180	258 ± 30	12 x 20	45
DEX-LM3-180	384	350	260	150	180	258 ± 30	12 x 20	45
DEX-LM3-220	384	350	260	150	180	258 ± 30	12 x 20	45
DEX-LM3-260	384	350	260	150	180	258 ± 30	12 x 20	45

¹⁾ The position of connection lugs U2-V2-W2 depends on the coil material and can deviate from the position illustrated here.

²⁾ Tolerance depending on air gap