Motor starter combinations

Depending on the combination of motor-protective circuit-breaker and contactor a motor starter can be coordination type “1” or type “2”. With both types the possible short-circuit is safely interrupted. The maximum operational continuity is obtained by starters with type “2” coordination as they can be directly re-switched on after the cause of the short-circuit has been removed.

Motor starter combinations
Motor starters up to 1000 A

Tested coordination type “1” and “2” starters offer the highest safety

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xStart Motorstarters
Complete DOL or reversing starters up to 32 A

- Pre-mounted starters minimise the wiring time.
- "Plug & Play" with starters on busbar adapters
- Suitable design for high value systems

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easyConnect SmartWire
Plug-in control wiring system

- SmartWire replaces the control wiring and the I/O level in the PLC
- The use of standard devices from the xStart range guarantees a high flexibility and reduces stock costs
- The use of wiring links eliminates wiring errors

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***Conditions for fulfilling type “1” coordination (IEC/EN 60947-4-1)**

- The stated short-circuit current I_q must be safely interrupted.
- In the event of a short-circuit, the starter must not present a danger to persons and equipment.
- The starter does not have to be usable for continued use without repairs or parts replacements.
- Damage to the starter or its components is permissible.

Conditions for fulfilling type “2” coordination (IEC/EN 60947-4-1)

- The stated short-circuit current I_q must be safely interrupted.
- In the event of a short-circuit, the starter must not present a danger to persons and equipment.
- The starter must be suitable for continued use.
- No damage may occur to the starter – with the exception of welding of the contactor contacts – provided they can be easily separated (e.g. with a screwdriver) without any significant deformation.

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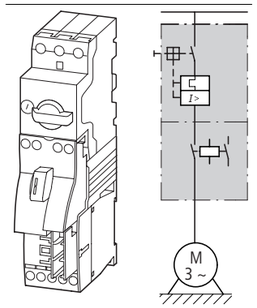
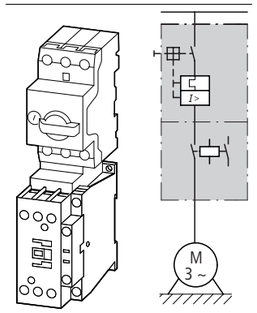
Contact sequence	Motor ratings: Motor rating AC-3 380 V 400 V 415 V *P* kW	Motor ratings: Rated operational current 400 V I_e A	Motor ratings: Rated short-circuit current 380 – 415 V I_q kA	Setting range: Overload releases I_r A	Setting range: Short-circuit releases I_{rm} A	Coord.	Motor starter actuating voltage 230 V 50 Hz: Part no. Article no.	Price see price list	Motor starter actuating voltage 24 V DC: Part no. Article no.	Price see price list	Std. pack	Motor-protective circuit-breakers Part no.	Contactor Part no.	DOL starter wiring set Mechanical connection element and electrical electric contact module Part no.	Notes
Complete devices MSC-D															
	0.06	0.21	150	0.16… 0.25	3.5	„1", „2"	**MSC-D-0,25-M7(230V50HZ)** 281925		**MSC-D-0,25-M7(24VDC)** 283154		1 off	PKZM0-0,25	DILM7-...	PKZM0-XDM12	The direct-on-line starter (complete unit) consists of a PKZM0 motor-protective circuit-breaker and a DILM contactor. With the adapter-less 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 up to 2.5mm external diameter or 4 conductors up to 3.5mm 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 PKZ and contactor is established with electrical contact modules. When using the auxiliary contacts DILA-XHIT...(→ 5/29) the plug-in electrical connector can be removed without removing the front mounting auxiliary contacts.
	0.09	0.31	150	0.25…0.4	5.6		**MSC-D-0,4-M7(230V50HZ)** 281926		**MSC-D-0,4-M7(24VDC)** 283155			PKZM0-0,4			
	0.12 0.18	0.41 0.6	150	0.4…0.63	8.82		**MSC-D-0,63-M7(230V50HZ)** 281927		**MSC-D-0,63-M7(24VDC)** 283156			PKZM0-0,63			
	0.25	0.8	150	0.63…1	14		**MSC-D-1-M7(230V50HZ)** 281929		**MSC-D-1-M7(24VDC)** 283158			PKZM0-1			
	0.37 0.55	1.1 1.5	150	1…1.6	22.4		**MSC-D-1,6-M7(230V50HZ)** 283140		**MSC-D-1,6-M7(24VDC)** 283159			PKZM0-1,6			
	0.75	1.9	150	1.6…2.5	35		**MSC-D-2,5-M7(230V50HZ)** 283142		**MSC-D-2,5-M7(24VDC)** 283161			PKZM0-2,5			
	1.1 1.5	2.6 3.6	150	2.5…4	56		**MSC-D-4-M7(230V50HZ)** 283143		**MSC-D-4-M7(24VDC)** 283162			PKZM0-4			
	2.2	5	150	4…6.3	88.2		**MSC-D-6,3-M7(230V50HZ)** 283145		**MSC-D-6,3-M7(24VDC)** 283164			PKZM0-6,3			
	3	6.6	150	6.3…10	140	„1"	**MSC-D-10-M7(230V50HZ)** 283146		**MSC-D-10-M7(24VDC)** 283165			PKZM0-10			
	4	8.5	150	6.3…10	140		**MSC-D-10-M9(230V50HZ)** 283147		**MSC-D-10-M9(24VDC)** 283166			PKZM0-10	DILM9-...		
	5.5	11.3	50	8…12	168		**MSC-D-12-M12(230V50HZ)** 283148		**MSC-D-12-M12(24VDC)** 283167			PKZM0-12	DILM12-...		
	7.5	15.2	50	10…16	224		**MSC-D-16-M15(230V50HZ)** 100414		**MSC-D-16-M15(24VDC)** 100415			PKZM0-16	DILM15-...		
	3 4	6.6 8.5	50	6.3…10	140	„1", „2"	**MSC-D-10-M17(230V50HZ)** 101045		**MSC-D-10-M17(24VDC)** 101047		1 off	PKZM0-10	DILM17-...	PKZM0-XDM32	
	5.5	11.3	50	8…12	168		**MSC-D-12-M17(230V50HZ)** 101046		**MSC-D-12-M17(24VDC)** 101048			PKZM0-12	DILM17-...		
	7.5	15.2	50	10…16	224		**MSC-D-16-M17(230V50HZ)** 283150		**MSC-D-16-M17(24VDC)** 283168			PKZM0-16	DILM17-...		
	11	21.7	50	20…25	350		**MSC-D-25-M25(230V50HZ)** 283151		**MSC-D-25-M25(24VDC)** 283169			PKZM0-25	DILM25-...		
	15	29.3	50	25…32	448		**MSC-D-32-M32(230V50HZ)** 283152		**MSC-D-32-M32(24VDC)** 283170			PKZM0-32	DILM32-...		

Further information **Page**

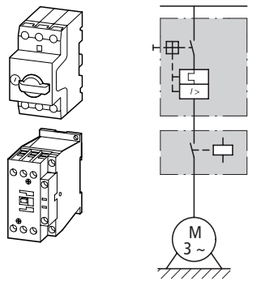
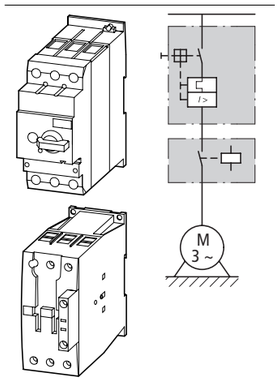
Technical data PKZM0	→ Chapter 8
Accessories PKZ	→ 8/8
Technical data DILM	→ Chapter 5
DILM accessories	→ 5/42

Motor ratings						Setting range		Coord.
Motor rating		Rated operational current 400 V	Rated operational current 500 V	Rated short-circuit current 380 – 415 V	Rated short-circuit current 500 V	Overload releases	Short-circuit releases	
AC-3								
380 V 400 V 415 V	500 V							
P	P	I_e	I_e	I_q	I_q	I_r	I_{rm}	
kW	kW	A	A	kA	kA	A	A	
PKZ2 compact starters								
0.18 0.25	0.25 0.37	0.8	0.6 0.9	100	100	0.6…1	8…14	„1"
0.37 0.55	0.55 0.75	1.1 1.5	1.2 1.5	100	100	1…1.6	14…22	
0.75	1.1	1.9	2.1	100	100	1.6…2.4	20…35	
1.1 1.5	1.5	2.65 3.6	2.9	100	100	2.4…4	35…55	
2.2	2.2 3	5	4 5.3	100	100	4…6	50…80	
3 4	4 5.5	6.6 8.5	6.8 9	100	7	6…10	80…140	
5.5 7.5	7.5	11.3 15.2	12.1	100	7	10…16	130…220	
11	11 15	21.7	17.4 23.4	30	7	16…25	200…350	
15	18.5	29.3	28.9	30	7	24…32	275…425	
18.5	22	36	33	30	7	32…40	350…500	
PKZ2 high-capacity compact starters								
0.18 0.25	0.25 0.37	0.8	0.6 0.9	100	100	0.6…1	8…14	„2"
0.37 0.55	0.55 0.75	1.1 1.5	1.2 1.5	100	100	1…1.6	14…22	
0.75	1.1	1.9	2.1	100	100	1.6…2.4	20…35	
1.1 1.5	1.5	2.6 3.6	2.9	100	100	2.4…4	35…55	
2.2	2.2 3	5	4 5.3	100	100	4…6	50…80	
3 4	4 5.5	6.6	6.8 9	100	100	6…10	80…140	
5.5 7.5	7.5	11.3 15.2	12.1	100	100	10…16	130…220	
11	11 15	21.7	17.4 23.4	100	100	16…25	200…350	
15	18.5	29.3	28.9	100	100	24…32	275…425	
18.5	22	36	33	100	100	32…40	350…500	

Part no. Article no.	Price see price list	Std. pack	Notes
PKZ2/ZM-1/SE1A/11(230V50HZ) 063364		1 off	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 as two IEC/EN 60715 conform top-hat rails. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
PKZ2/ZM-1,6/SE1A/11(230V50HZ) 063372			
PKZ2/ZM-2,4/SE1A/11(230V50HZ) 063382			
PKZ2/ZM-4/SE1A/11(230V50HZ) 063392			
PKZ2/ZM-6/SE1A/11(230V50HZ) 063402			
PKZ2/ZM-10/SE1A/11(230V50HZ) 063412			
PKZ2/ZM-16/SE1A/11(230V50HZ) 063422			
PKZ2/ZM-25/SE1A/11(230V50HZ) 063432			
PKZ2/ZM-32/SE1A/11(230V50HZ) 063442			
PKZ2/ZM-40/SE1A/11(230V50HZ) 063452			
PKZ2/ZM-1/S(230V50HZ) 063472		1 off	The high-capacity compact starter consists of a motor-protective circuit-breaker 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 as two IEC/EN 60715 conform top-hat rails. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
PKZ2/ZM-1,6/S(230V50HZ) 063482			
PKZ2/ZM-2,4/S(230V50HZ) 063492			
PKZ2/ZM-4/S(230V50HZ) 063502			
PKZ2/ZM-6/S(230V50HZ) 063512			
PKZ2/ZM-10/S(230V50HZ) 063522			
PKZ2/ZM-16/S(230V50HZ) 063532			
PKZ2/ZM-25/S(230V50HZ) 063542			
PKZ2/ZM-32/S(230V50HZ) 063552			
PKZ2/ZM-40/S(230V50HZ) 063562			

Motor data AC-3 380 V 400 V 415 V P kW	500 V P kW	Rated operating current 400 V I_e A	500 V I_e A	Rated short-circuit current 380 … 415 V I_q kA	500 V I_q kA	Setting range Overload release I_r A	Short-circuit release I_{rm} A
PKZ2 high-capacity compact starters with and without manual reset, type "2" coordination							
0,18	0,25	0,6	0,6	100	100	0,6 – 1	8 – 14
0,25	0,37	0,8	0,9	100	100		
0,37	0,55	1,1	1,2	100	100	1 – 1,6	14 – 22
0,55	0,75	1,5	1,5	100	100		
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	–	100	–		
2,2	2,2	5	4,0	100	100	4 – 6	50 – 80
–	3	–	5,3	–	100		
3	4	6,6	6,8	100	100	6 – 10	80 – 140
4	5,5	8,5	9	100	100		
5,5	7,5	11,3	12,1	100	100	10 – 16	130 – 220
7,5	–	15,2	–	100	–		
11	11	21,7	17,4	100	100	16 – 25	200 – 350
–	15	–	23,4	–	100		
15	18,5	29,3	28,9	100	100	24 – 32	275 – 425
18,5	22	36	33	100	100	32 – 40	350 – 500

Basic unit Part no.	Trip block Part no.	Price Sum of module prices AC standard coil	Std. pack	Notes
PKZ2/S(230V50HZ) 063572	**ZMR-1-PKZ2** 033950		1 off	The motor-starter combinations consists of the motor-protective circuit-breakers and high-capacity contact modules which have matching profiles. They conform to IEC/EN 60947-4-1 or. VDE 0660 part 102. I_q = rated conditional short-circuit current. The combinations can be operated with or without manual reset. In the Manual position, the combination is blocked against automatic restarting. It must be reset locally. In the Auto position, the combination automatically switches on again when the bimetallic elements have cooled down.
PKZ2/S(230V50HZ) 063572	**ZMR-1,6-PKZ2** 033952			
PKZ2/S(230V50HZ) 063572	**ZMR-2.4-PKZ2** 033955			
PKZ2/S(230V50HZ) 063572	**ZMR-4-PKZ2** 033957			
PKZ2/S(230V50HZ) 063572	**ZMR-6-PKZ2** 033966			
PKZ2/S(230V50HZ) 063572	**ZMR-10-PKZ2** 033967			
PKZ2/S(230V50HZ) 063572	**ZMR-16-PKZ2** 033968			
PKZ2/S(230V50HZ) 063572	**ZMR-25-PKZ2** 033969			
PKZ2/S(230V50HZ) 063572	**ZMR-32-PKZ2** 033973			
PKZ2/S(230V50HZ) 063572	**ZMR-40-PKZ2** 033975			

	Motor ratings				Setting range		Motor-protective circuit-breakers Part no.	Contactor type "1" coordination	Contactor type "2" coordination	Notes
	Motor rating AC-3 380 V 400 V 415 V	Rated operational current 400 V	Rated short-circuit current 380 – 415 V, Type "1" coordination	Rated short-circuit current 380 – 415 V, Type "2" coordination	Overload releases	Short-circuit releases				
	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	**PKZM0-0,25**	DILM7-...(...)	DILM7-...(...)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
	0.09	0.31	150	50	0.25…0.4	5.6	**PKZM0-0,4**	DILM7-...(...)	DILM7-...(...)	
	0.12	0.41	150	50	0.4…0.63	8.82	**PKZM0-0,63**	DILM7-...(...)	DILM7-...(...)	
	0.18	0.6	150	50	0.4…0.63	8.82	**PKZM0-0,63**	DILM7-...(...)	DILM7-...(...)	
	0.25	0.8	150	50	0.63…1	14	**PKZM0-1**	DILM7-...(...)	DILM7-...(...)	
	0.37	1.1	150	50	1…1.6	22.4	**PKZM0-1,6**	DILM7-...(...)	DILM7-...(...)	
	0.55	1.5	150	50	1…1.6	22.4	**PKZM0-1,6**	DILM7-...(...)	DILM7-...(...)	
	0.75	1.9	150	50	1.6…2.5	35	**PKZM0-2,5**	DILM7-...(...)	DILM7-...(...)	
	1.1	2.6	150	50	2.5…4	56	**PKZM0-4**	DILM7-...(...)	DILM7-...(...)	
	1.5	3.6	150	50	2.5…4	56	**PKZM0-4**	DILM7-...(...)	DILM7-...(...)	
	2.2	5	150	50	4…6.3	88.2	**PKZM0-6,3**	DILM7-...(...)	DILM7-...(...)	
	3	6.6	150	50	6.3…10	140	**PKZM0-10**	DILM9-...(...)	DILM17-...(...)	
	4	8.5	150	50	6.3…10	140	**PKZM0-10**	DILM9-...(...)	DILM17-...(...)	
	–	11.3	50	50	8…12	168	**PKZM0-12**	DILM12-...(...)	DILM17-...(...)	
	7.5	15.2	50	50	10…16	224	**PKZM0-16**	DILM17-...(...)	DILM17-...(...)	
	11	21.7	50	50	20…25	350	**PKZM0-25**	DILM25-...(...)	DILM25-...(...)	
	–	29.3	50	50	25…32	448	**PKZM0-32**	DILM32-...(...)	DILM32-...(...)	
Modules PKZM4 and DILM										
	5.5	11.3	50	50	10…16	224	**PKZM4-16**	DILM17-...(...)	DILM17-...(...)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
	7.5	15.2	50	50	10…16	224	**PKZM4-16**	DILM17-...(...)	DILM17-...(...)	
	11	21.7	50	50	20…25	350	**PKZM4-25**	DILM25-...(...)	DILM25-...(...)	
	15	29.3	50	50	25…32	448	**PKZM4-32**	DILM32-...(...)	DILM32-...(...)	
	18.5	36	50	50	32…40	560	**PKZM4-40**	DILM40(...)	DILM40(...)	
	22	41	50	50	40…50	700	**PKZM4-50**	DILM50(...)	DILM50(...)	
	30	55	50	50	50…58	812	**PKZM4-58**	DILM65(...)	DILM65(...)	
	34	63	50	50	55…65	882	**PKZM4-63**	DILM65(...)	DILM65(...)	

For further information

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Accessories PKZ	→ 8/8
Technical data DILM	→ Chapter 5
Further actuating voltages	→ 5/53
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For further information

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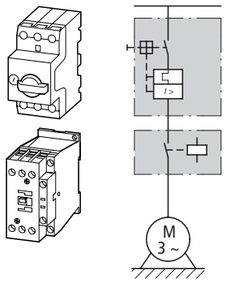
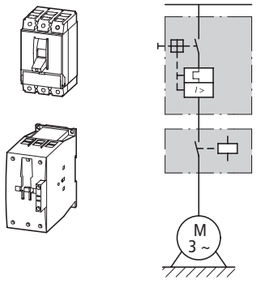
Accessories PKZ	→ 8/8
Technical data DILM	→ Chapter 5
Further actuating voltages	→ 5/54
DILM accessories	→ 5/42

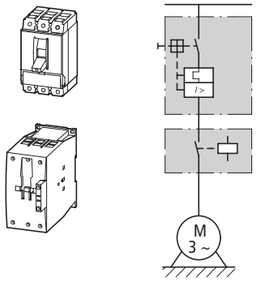
	Motor ratings			Setting range	
	Motor rating	Rated operational current 500 V	Rated short-circuit current 500 V	Overload releases	Short-circuit releases
	AC-3				
	500 V				
	P	I_e	I_q	I_r	I_{rm}
	kW	A	kA	A	A
Modules PKZM0 and DILM					
	0.06	0.17	100	0.16…0.25	3.5
	0.09 0.12	0.25 0.33	100 100	0.25…0.4	5.6
	0.18	0.48	100	0.4…0.63	8.8
	0.25 0.37	0.7 0.9	100 100	0.63…1	14
	0.55 0.75	1.2 1.5	100 100	1…1.6	22
	1.1	2.1	100	1.6…2.5	35
	1.5	2.9	100	2.5…4	56
	2.2 3	4 5.3	42 42	4…6.3	88
	4 5.5	6.8 9	42 42	6.3…10	140
	6.5	10.6	42	8…12	168
	7.5	12.1	15	10…16	224
	11	17.4	6	16…20	280
	15	23.4	6	20…25	350
	18.5	28.9	6	25…32	448

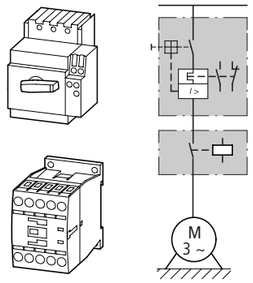
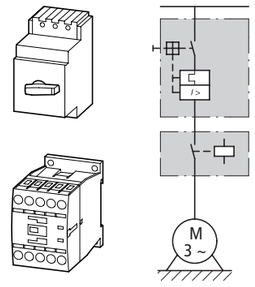
Note concerning the product

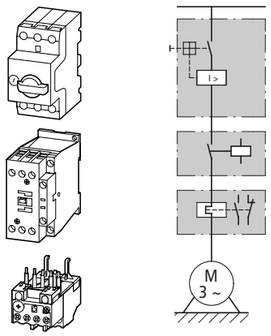
1) With CL-PKZ0, I_q = 15 kA.

Motor-protective circuit-breakers Part no.	**Contactor** type "1" coordination Part. no.	**Notes**
PKZM0-0,25	DILM7-…(…)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
PKZM0-0,4	DILM7-…(…)	
PKZM0-0,63	DILM7-…(…)	
PKZM0-1	DILM7-…(…)	**For further information** **Page**
PKZM0-1,6	DILM7-…(…)	Technical data PKZM0 → Chapter 8
PKZM0-2,5	DILM7-…(…)	Accessories PKZ → 8/8
PKZM0-4	DILM7-…(…)	Technical data DILM → Chapter 5
PKZM0-6,3	DILM7-…(…)	Further actuating voltages → 5/53
PKZM0-10	DILM9-…(…)	DILM accessories → 5/42
PKZM0-12	DILM12-…(…)	
PKZM0-16	DILM17-…(…)	
PKZM0-20[1]	DILM25-…(…)	
PKZM0-25[1]	DILM25-…(…)	
PKZM0-32[1]	DILM32-…(…)	

	Motor ratings			**Setting range**		**Circuit-breakers**	**Contactor** type "1" coordination	**Contactor** type "2" coordination	**Notes**
	Motor rating	Rated operational current AC-3 400 V	Rated short-circuit current 400/415 V	Overload releases	Short-circuit releases	Part no.	Part no.	Part no.	
	AC-3 380 V 400 V 415 V								
	P	I_e	I_q	I_r	I_{rm}				
	kW	A	kA	A	A				
Modules NZM and DILM									
	15	29.3	50	25…32	320…448	**NZMN1-M32**	DILM40(…)	DILM80(…)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
	18.5	36	50	32…40	320…560	**NZMN1-M40**	DILM40(…)	DILM80(…)	
	22	41	50	40…50	400…700	**NZMN1-M50**	DILM50(…)	DILM80(…)	
	30	55	50	50…63	504…882	**NZMN1-M63**	DILM65(…)	DILM80(…)	
	37	68	50	63…80	640…1120	**NZMN1-M80**	DILM80(…)	DILM80(…)	
	45 55	81 99	50	80…100	800…1250	**NZMN1-M100**	DILM95(…) DILM115(…)	DILM95(…) DILM115(…)	
	75	134	50	125…160	1280…2240	**NZMN2-M160**	DILM150(…)	DILM80(…)	
	90 110	161 196	50	160…200	1600…2500	**NZMN2-M200**	DILM185/22(…) DILM225/22(…)	DILM185/22(…) DILM225/22(…)	
	132 160 200	231 279 349	50	175…350	350…4900	**NZMN3-ME350**	DILM250/22(…) DILM300/22(…) DILM400/22(…)	DILM250/22(…) DILM300/22(…) DILM400/22(…)	
	250	437	50	225…450	450…6300	**NZMN3-ME450**	DILM500/22(…)	DILM500/22(…)	
	315	544	50	275…550	550…7700	**NZMN4-ME550**	DILM580/22(…)		
	400 450 500	683 750 820	50	438…875	875…12250	**NZMN4-ME875**	DILM650/22(…) DILM750/22(…) DILM820/22(…)		
	560	947	50	700…1400	1400…19600	**NZMN4-ME1400**	DILM1000/22(…)		
	22	41	100	40…50	400…700	**NZMH2-M50**	DILM80(…)	DILM80(…)	
	30	55	100	50…63	504…882	**NZMH2-M63**	DILM80(…)	DILM80(…)	
	37	68	100	63…80	640…1120	**NZMH2-M80**	DILM80(…)	DILM80(…)	
	45	81	100	80…100	800…1250	**NZMH2-M100**	DILM95(…)	DILM95(…)	
	55	100	100	100…125	1000…1750	**NZMH2-M125**	DILM115(…)	DILM115(…)	
	75	134	100	125…160	1280…2240	**NZMH2-M160**	DILM150(…)	DILM80(…)	
	30 37 45	55 68 81	100	45…90	90…1260	**NZMH2-ME90**	DILM80(…) DILM80(…) DILM95(…)	DILM80(…)	
	55 75	100 134	100	70…140	140…1960	**NZMH2-ME140**	DILM115(…) DILM150(…)	DILM115(…) DILM80(…)	

	Motor ratings				**Setting range**		**Circuit-breakers**	**Contactor** type "1" coordination	Contactor type "2" coordination	**Notes**
	Motor rating	Rated operational current		750 V DC	Overload releases	Short-circuit release				
	AC-3 500 V DC	500 V	525 V							
	P	I_e	I_e	I_q	I_r	I_i				
	kW	A	A	kA	A	A				
Modules NZM and DILM										
	11	17.4	17	50	16…20	350…350	**NZMH2-M20**	DILM40(…)	DILM80(…)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
	15	23.4	22.5	50	20…25	350…350	**NZMH2-M25**	DILM40(…)	DILM80(…)	
	18.5	28.9	28	50	25…32	320…448	**NZMH2-M32**	DILM40(…)	DILM80(…)	
	22	33	32	50	30…40	320…560	**NZMH2-M40**	DILM40(…)	DILM80(…)	
	30	44	43	50	40…50	400…700	**NZMH2-M50**	DILM80(…)	DILM80(…)	
	37	54	54	50	50…63	504…882	**NZMH2-M63**	DILM80(…)	DILM80(…)	
	45 55	65 79	64 78	50	63…80	640…1120	**NZMH2-M80**	DILM80(…)	DILM80(…)	
	75	107	106	50	100…125	1000…1750	**NZMH2-M125**	DILM115(…)	DILM115(…)	
	90	129	127	50	125…160	1280…2240	**NZMH2-M160**	DILM150(…)	DILM80(…)	
	30 37 45 55	44 54 65 79	43 54 64 78	50	45…90	90…1260	**NZMH2-ME90**	DILM80(…)	DILM80(…)	
	75 90	107 129	106 127	50	70…140	140…1960	**NZMH2-ME140**	DILM115(…) DILM150(…)	DILM115(…) DILM80(…)	

	Motor data			Setting range		Basic unit	Trip block	Contactors type "1" coordination	Contactors type "2" coordination	Notes
	AC-3 380 V 400 V 415 V	Rated operational current 400 V	Rated short-circuit current 380 – 415 V	Overload releases	Short-circuit release, non-delayed	Part no.	Part no.	Part no.	Part no.	
	P kW	I_e A	I_q kA	I_r A	I_{rm} A			For increase to I_q = 100 kA		
PKZ2 and DILM modules, with and without manual reset										
	0.12	0.41	100	0.4 – 0.6	5 – 8	**PKZ2**	**ZMR-0.6-PKZ2**	**DILM7(...)**	**DILM7(...)**	The motor-starter combination consists of motor-protective circuit-breaker and contactor modules. They conform to IEC/EN 60947-4-1 or. VDE 0660 part 102. I_q = rated conditional short-circuit current. The combinations can be operated with or without manual reset. In the Manual position, the combination is blocked against automatic restarting. They must be reset locally. In the Auto position, the combination automatically switches on again when the bimetallic elements have cooled down.
	0.18	0.6	100	0.6 – 1	8 – 14	**PKZ2**	**ZMR-1-PKZ2**	**DILM7(...)**	**DILM7(...)**	
	0.25	0.8	100	0.6 – 1	8 – 14	**PKZ2**	**ZMR-1-PKZ2**	**DILM7(...)**	**DILM7(...)**	
	0.37	1.1	100	1 – 1.6	14 – 22	**PKZ2**	**ZMR-1.6-PKZ2**	**DILM7(...)**	**DILM7(...)**	
	0.55	1.5	100	1 – 1.6	14 – 22	**PKZ2**	**ZMR-1.6-PKZ2**	**DILM7(...)**	**DILM7(...)**	
	0.75	1.9	100	1.6 – 2.4	20 – 35	**PKZ2**	**ZMR-2.4-PKZ2**	**DILM7(...)**	**DILM17(...)**	
	1.1	2.6	100	2.4 – 4	35 – 55	**PKZ2**	**ZMR-4-PKZ2**	**DILM7(...)**	**DILM17(...)**	
	1.5	3.6	100	2.4 – 4	35 – 55	**PKZ2**	**ZMR-4-PKZ2**	**DILM7(...)**	**DILM17(...)**	
	2.2	5.0	100	4 – 6	50 – 80	**PKZ2**	**ZMR-6-PKZ2**	**DILM7(...)**	**DILM17(...)**	
	3	6.6	100	6 – 10	80 – 140	**PKZ2**	**ZMR-10-PKZ2**	**DILM17(...)**	**DILM17(...)**	
	4	8.5	100	6 – 10	80 – 140	**PKZ2**	**ZMR-10-PKZ2**	**DILM17(...)**	**DILM17(...)**	
	5.5	11.3	100	10 – 16	130 – 220	**PKZ2**	**ZMR-16-PKZ2**	**DILM17(...)**	**DILM17(...)**	
	7.5	15.2	100	10 – 16	130 – 220	**PKZ2**	**ZMR-16-PKZ2**	**DILM17(...)**	**DILM17(...)**	
	11	21.7	30	16 – 25	200 – 350	**PKZ2**	**ZMR-25-PKZ2**	**DILM25(...)**	**DILM40(...)**	
	15	29.3	30	24 – 32	275 – 425	**PKZ2**	**ZMR-32-PKZ2**	**DILM32(...)**	**DILM40(...)**	
	18.5	36	30	32 – 40	350 – 500	**PKZ2**	**ZMR-40-PKZ2**	**DILM40(...)**	**DILM40(...)**	
PKZ2 and DILM modules										
	0.12	0.41	100	0.4 – 0.6	5 – 8	**PKZ2/ZM-0.8**	**–**	**DILM7(...)**	**DILM7(...)**	
	0.18	0.6	100	0.6 – 1	8 – 14	**PKZ2/ZM-1**	**–**	**DILM7(...)**	**DILM7(...)**	
	0.25	0.8	100	0.6 – 1	8 – 14	**PKZ2/ZM-1**	**–**	**DILM7(...)**	**DILM7(...)**	
	0.37	1.1	100	1 – 1.6	14 – 22	**PKZ2/ZM-1.6**	**–**	**DILM7(...)**	**DILM7(...)**	
	0.55	1.5	100	1 – 1.6	14 – 22	**PKZ2/ZM-1.6**	**–**	**DILM7(...)**	**DILM7(...)**	
	0.75	1.9	100	1.6 – 2.4	20 – 35	**PKZ2/ZM-2.4**	**–**	**DILM7(...)**	**DILM17(...)**	
	1.1	2.6	100	2.4 – 4	35 – 55	**PKZ2/ZM-4**	**–**	**DILM7(...)**	**DILM17(...)**	
	1.5	3.6	100	2.4 – 4	35 – 55	**PKZ2/ZM-4**	**–**	**DILM7(...)**	**DILM17(...)**	
	2.2	5.0	100	4 – 6	50 – 80	**PKZ2/ZM-6**	**–**	**DILM7(...)**	**DILM17(...)**	
	3	6.6	100	6 – 10	80 – 140	**PKZ2/ZM-10**	**–**	**DILM17(...)**	**DILM17(...)**	
	4	8.5	100	6 – 10	80 – 140	**PKZ2/ZM-10**	**–**	**DILM17(...)**	**DILM17(...)**	
	5.5	11.3	30	10 – 16	130 – 220	**PKZ2/ZM-16**	**–**	**DILM17(...)**	**DILM17(...)**	
	7.5	16	30	10 – 16	130 – 220	**PKZ2/ZM-16**	**–**	**DILM17(...)**	**DILM17(...)**	
	11	21.7	30	16 – 25	200 – 350	**PKZ2/ZM-25**	**–**	**DILM25(...)**	**DILM40(...)**	
	15	29.3	30	25 – 32	275 – 425	**PKZ2/ZM-32**	**–**	**DILM32(...)**	**DILM40(...)**	
	18.5	36	30	32 – 40	350 – 500	**PKZ2/ZM-40**	**–**	**DILM40(...)**	**DILM40(...)**	

	Motor ratings			Setting range	
	Motor rating AC-3 380 V 400 V 415 V	Rated operational current 400 V	Rated short-circuit current 380 – 415 V	Overload releases	Short-circuit releases
	P	I_e	I_q	I_r	I_r
	kW	A	kA	A	A
Modules PKM0, DILM and ZB with/without automatic reset					
	0.06	0.21	100	0.16…0.24	3.5
	0.09	0.31	100	0.24…0.4	5.6
	0.12 0.18	0.41 0.6	100	0.4…0.6	8.82
	0.25	0.8	100	0.6…1	14
	0.37 0.55	1.1 1.5	100	0.1…1.6	22.4
	0.75	1.9	100	1.6…2.4	35
	1.1 1.5	2.6 3.6	100	2.4…4	56
	2.2	5	100	4…6	88.2
	3 4	6.6 8.5	100	6…10	140
	5.5	11.3	50	8…12	168
	7.5	15.2	50	10…16	224
	11	21.7	50	16…24	350
	15	29.3	50	20…32	448

Base unit Part no.	Contactor type "1" coordination Part no.	Overload relay type "1" coordination Part no.	Contactor type "2" coordination Part no.	Overload relay type "2" coordination Part no.	Notes
PKM0-0,25	DILM7-...(...)	ZB12-0,24	DILM7-...(...)	ZB12-0.24	The motor-starter combination consists of the motor-protective circuit-breaker (without overload function), contactor and overload relay modules. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102.
PKM0-0,4	DILM7-...(...)	ZB12-0,4	DILM7-...(...)	ZB12-0.4	
PKM0-0,63	DILM7-...(...) DILM7-...(...)	ZB12-0,6 ZB12-0,6	DILM7-...(...) DILM7-...(...)	ZB12-0.6	
PKM0-1	DILM7-...(...)	ZB12-1	DILM7-...(...)	ZB12-1	
PKM0-1,6	DILM7-...(...) DILM7-...(...)	ZB12-1,6 ZB12-1,6	DILM7-...(...) DILM7-...(...)	ZB12-1.6	
PKM0-2,5	DILM7-...(...)	ZB12-2,4	DILM7-...(...)	ZB12-2.5	
PKM0-4	DILM7-...(...) DILM7-...(...)	ZB12-4 ZB12-4	DILM7-...(...) DILM7-...(...)	ZB12-4	
PKM0-6,3	DILM7-...(...)	ZB12-6	DILM17-...(...)	ZB12-6	
PKM0-10	DILM9-...(...) DILM9-...(...)	ZB12-10 ZB12-10	DILM17-...(...) DILM17-...(...)	ZB12-10	
PKM0-12	DILM12-...(...)	ZB12-12	DILM17-...(...)	ZB12-12	
PKM0-16	DILM17-...(...)	ZB32-16	DILM17-...(...)	ZB12-16	
PKM0-25	DILM25-...(...)	ZB32-24	DILM25-...(...)	ZB12-25	
PKM0-32	DILM32-...(...)	ZB32-32	DILM32-...(...)	ZB12-32	

I_q = Rated conditional short-circuit current.
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 when the bimetallic elements have cooled down.

Further information	Page
Technical data PKZM0	→ Chapter 8
Accessories PKZ	→ 8/8
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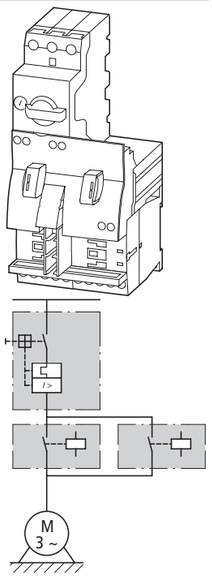
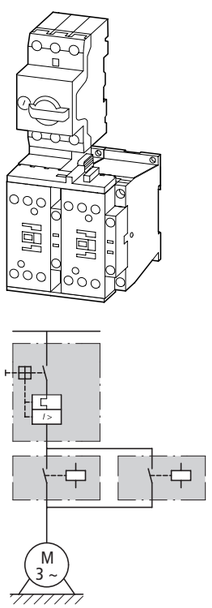
DIL accessories	→ 5/42
Technical data ZB...	→ Chapter 8
Accessories ZB	→ 6/18

Motor ratings			Setting range		Coord.	Motor starter actuating voltage 230 V 50 Hz		Motor starter actuating voltage 24 V DC		Std. pack	Motor-protective circuit-breakers	Contactor	Reversing starter wiring set	Notes
Motor rating	Rated operational current	Rated short-circuit current	Overload releases	Short-circuit releases		Part no. Article no.	Price see price list	Part no. Article no.	Price see price list		Part no.	Part no.	Mechanical connection element and electrical contact module and reversing connector Part no.	
AC-3														
380 V 400 V 415 V	400 V	380 – 415 V												
P	I_e	I_q	I_r	I_{rm}										
kW	A	kA	A	A										
Complete units MSC-R														
0.06	0.21	150	0.16…0.25	3.5	"1","2"	**MSC-R-0,25-M7(230V50HZ)** 283171		**MSC-R-0,25-M7(24VDC)** 283190		1 off	PKZM0-0,25	DILM7-01	PKZM0-XRM12	The reversing starter (complete unit) consists of a PKZM0 motor-protective circuit-breaker and two DILM contactors. With the adapter-less 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 up to 2.5mm external diameter or 4 conductors up to 3.5mm external diameter. From 16 A, the motor-protective circuit-breakers 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 feature electrical interlock. When using the auxiliary contacts DILA-XHIT... (→ 5/29) the plug-in electrical connector can be removed without the removal of the front mounting auxiliary contact.
0.09	0.31	150	0.25…0.4	5.6		**MSC-R-0,4-M7(230V50HZ)** 283172		**MSC-R-0,4-M7(24VDC)** 283191			PKZM0-0,4	DILM7-01	PKZM0-XRM12	
0.12 0.18	0.41 0.6	150	0.4…0.63	8.82		**MSC-R-0,63-M7(230V50HZ)** 283173		**MSC-R-0,63-M7(24VDC)** 283192			PKZM0-0,63	DILM7-01	PKZM0-XRM12	
0.25	0.8	150	0.63…1	14		**MSC-R-1-M7(230V50HZ)** 283175		**MSC-R-1-M7(24VDC)** 283194			PKZM0-1	DILM7-01	PKZM0-XRM12	
0.37 0.55	1.1 1.5	150	1…1.6	22.4		**MSC-R-1,6-M7(230V50HZ)** 283176		**MSC-R-1,6-M7(24VDC)** 283195			PKZM0-1,6	DILM7-01	PKZM0-XRM12	
0.75	1.9	150	1.6…2.5	35		**MSC-R-2,5-M7(230V50HZ)** 283178		**MSC-R-2,5-M7(24VDC)** 283197			PKZM0-2,5	DILM7-01	PKZM0-XRM12	
1.1 1.5	2.6 3.6	150	2.5…4	56		**MSC-R-4-M7(230V50HZ)** 283179		**MSC-R-4-M7(24VDC)** 283198			PKZM0-4	DILM7-01	PKZM0-XRM12	
2.2	5	150	4…6.3	88.2		**MSC-R-6,3-M7(230V50HZ)** 283181		**MSC-R-6,3-M7(24VDC)** 283200			PKZM0-6,3	DILM7-01	PKZM0-XRM12	
3	6.6	150	6.3…10	140	"1"	**MSC-R-10-M7(230V50HZ)** 283182		**MSC-R-10-M7(24VDC)** 283201			PKZM0-10	DILM7-01	PKZM0-XRM12	
4	8.5	150	6.3…10	140		**MSC-R-10-M9(230V50HZ)** 283183		**MSC-R-10-M9(24VDC)** 283202			PKZM0-10	DILM9-01	PKZM0-XRM12	
5.5	11.3	50	8…12	168		**MSC-R-12-M12(230V50HZ)** 283184		**MSC-R-12-M12(24VDC)** 283203			PKZM0-12	DILM12-01	PKZM0-XRM12	
3	6.6	50	6.3…10	140	"1","2"	**MSC-R-10-M17(230V50HZ)** 101049		**MSC-R-10-M17(24VDC)** 101051		1 off	PKZM0-10	DILM17-01	PKZM0-XRM32	
4	11.3	50	8…12	168		**MSC-R-12-M17(230V50HZ)** 101050		**MSC-R-12-M17(24VDC)** 101052			PKZM0-12	DILM17-01	PKZM0-XRM32	
7.5	15.2	50	10…16	224		**MSC-R-16-M17(230V50HZ)** 283186		**MSC-R-16-M17(24VDC)** 283204			PKZM0-16	DILM17-01	PKZM0-XRM32	
11	21.7	50	20…25	350		**MSC-R-25-M25(230V50HZ)** 283187		**MSC-R-25-M25(24VDC)** 283205			PKZM0-25	DILM25-01	PKZM0-XRM32	
15	29.3	50	25…32	448		**MSC-R-32-M32(230V50HZ)** 283188		**MSC-R-32-M32(24VDC)** 283206			PKZM0-32	DILM32-01	PKZM0-XRM32	





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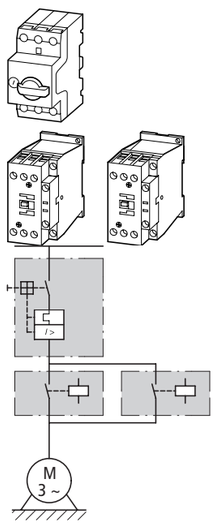
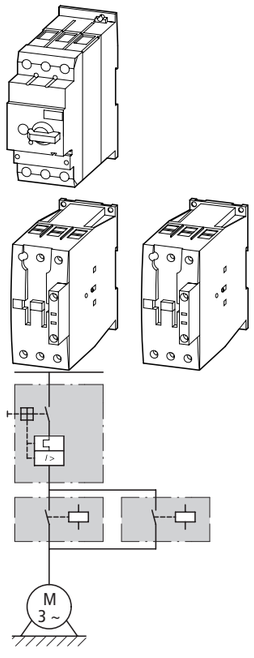
Motor ratings				Setting range		Motor-protective circuit-breakers Part no.		Contactor type "1" coordination Part no.		Contactor type "2" coordination Part no.	Notes
Motor rating AC-3 380 V 400 V 415 V 230 V 240 V	Rated operational current 400 V	Rated short-circuit current 380 – 415 V, Type "1" coordination	Rated short-circuit current 380 – 415 V, Type "2" coordination	Overload releases	Short-circuit releases						
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	**PKZM0-0,25**	2 ×	DILM7-...(...)	2 ×	DILM7-...(...)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
0.09	0.31	150	50	0.25…0.4	5.6	**PKZM0-0,4**	2 ×	DILM7-...(...)	2 ×	DILM7-...(...)	
0.12 0.18	0.41 0.6	150	50	0.4…0.63	8.82	**PKZM0-0,63**	2 ×	DILM7-...(...) DILM7-...(...)	2 ×	DILM7-...(...) DILM7-...(...)	
0.25	0.8	150	50	0.63…1	14	**PKZM0-1**	2 ×	DILM7-...(...)	2 ×	DILM7-...(...)	
0.37 0.55	1.1 1.5	150	50	1…1.6	22.4	**PKZM0-1,6**	2 ×	DILM7-...(...) DILM7-...(...)	2 ×	DILM7-...(...) DILM7-...(...)	
0.75	1.9	150	50	1.6…2.5	35	**PKZM0-2,5**	2 ×	DILM7-...(...)	2 ×	DILM7-...(...)	
1.1 1.5	2.6 3.6	150	50	2.5…4	56	**PKZM0-4**	2 ×	DILM7-...(...) DILM7-...(...)	2 ×	DILM7-...(...) DILM7-...(...)	
2.2	5	150	50	4…6.3	88.2	**PKZM0-6,3**	2 ×	DILM7-...(...)	2 ×	DILM7-...(...)	
3 4	6.6 8.5	150	50	6.3…10	140	**PKZM0-10**	2 ×	DILM9-...(...) DILM9-...(...)	2 ×	DILM17-...(...) DILM17-...(...)	
5.5	11.3	50	50	8…12	168	**PKZM0-12**	2 ×	DILM12-...(...)	2 ×	DILM17-...(...)	
7.5	15.2	50	50	10…16	224	**PKZM0-16**	2 ×	DILM17-...(...)	2 ×	DILM17-...(...)	
11	21.7	50	50	20…25	350	**PKZM0-25**	2 ×	DILM25-...(...)	2 ×	DILM25-...(...)	
15	29.3	50	50	25…32	448	**PKZM0-32**	2 ×	DILM32-...(...)	2 ×	DILM32-...(...)	



Modules PKZM4 and DILM											
5.5 7.5	11.3 15.2	50	50	10…16	224	**PKZM4-16**	2 ×	DILM17-...(...) DILM17-...(...)	2 ×	DILM17-...(...) DILM17-...(...)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform to IEC/EN 60947-4.1 and VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
11	21.7	50	50	20…25	350	**PKZM4-25**	2 ×	DILM25-...(...)	2 ×	DILM25-...(...)	
15	29.3	50	50	25…32	448	**PKZM4-32**	2 ×	DILM32-...(...)	2 ×	DILM32-...(...)	
18.5	36	50	50	32…40	560	**PKZM4-40**	2 ×	DILM40(...)	2 ×	DILM40(...)	
22	41	50	50	40…50	700	**PKZM4-50**	2 ×	DILM50(...)	2 ×	DILM50(...)	
30	55	50	50	50…58	812	**PKZM4-58**	2 ×	DILM65(...)	2 ×	DILM65(...)	
34	63	50	50	55…65	882	**PKZM4-63**	2 ×	DILM65(...)	2 ×	DILM65(...)	



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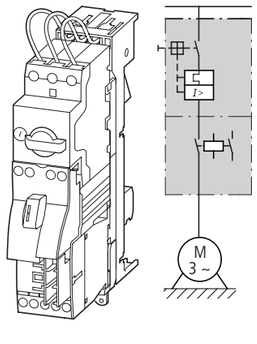
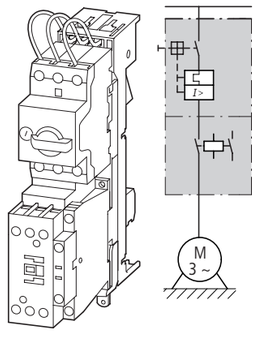
Reversing starters

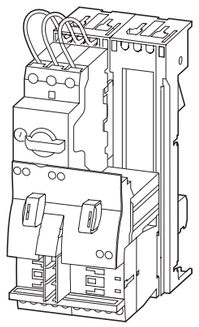
Motor ratings			Setting range		Circuit-breakers Part no.		Contactor type "1" coordination		Contactor type "2" coordination	Notes
Motor rating	Rated operational current 400 V	Rated short-circuit current 400/415 V	Overload releases	Short-circuit releases			Part no.		Part no.	
AC-3 380 V 400 V 415 V										
P	I_e	I_q	I_r	I_{rm}						
kW	A	kA	A	A						
Modules NZM and DILM										
15	29.3	50	25…32	320…448	**NZMN1-M32**	2 ×	DILM40(…)	2 ×	DILM80(…)	The motor-starter combination consists of the motor protective circuit-breaker or circuit-breaker and contactor. They conform with IEC/EN 60947-4-1 or VDE 0660 Part 102. I_q = Rated conditional short-circuit current.
18.5	36		32…40	320…560	**NZMN1-M40**	2 ×	DILM40(…)	2 ×	DILM80(…)	
22	41		40…50	400…700	**NZMN1-M50**	2 ×	DILM50(…)	2 ×	DILM80(…)	
30	55		50…63	504…882	**NZMN1-M63**	2 ×	DILM65(…)	2 ×	DILM80(…)	
37	68		63…80	640…1120	**NZMN1-M80**	2 ×	DILM80(…)	2 ×	DILM80(…)	
45 55	81 99		80…100	800…1250	**NZMN1-M100**	2 ×	DILM95(…) DILM115(…)	2 ×	DILM95(…) DILM115(…)	
75	134		125…160	1280…2240	**NZMN2-M160**	2 ×	DILM150(…)	2 ×	DILM80(…)	
90 110	161 196		160…200	1600…2500	**NZMN2-M200**	2 ×	DILM185/22(…) DILM225/22(…)	2 ×	DILM185/22(…) DILM225/22(…)	
132 160 200	231 279 349		175…350	350…4900	**NZMN3-ME350**	2 ×	DILM250/22(…) DILM300/22(…) DILM400/22(…)	2 ×	DILM250/22(…) DILM300/22(…) DILM400/22(…)	
250	437		225…450	450…6300	**NZMN3-ME450**	2 ×	DILM500/22(…)	2 ×	DILM500/22(…)	
315	544		275…550	550…7700	**NZMN4-ME550**	2 ×	DILM580/22(…)	–		
400 450 500	683 750 820		438…875	875…12250	**NZMN4-ME875**	2 ×	DILM650/22(…) DILM750/22(…) DILM820/22(…)	–		
560	947		700…1400	1400…19600	**NZMN4-ME1400**	2 ×	DILM1000/22(…)	–		

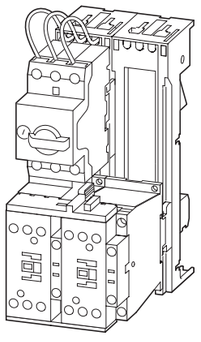
http://catalog.moeller.net Moeller HPL0211-2007/2008 MSC-D.../BBA xStart

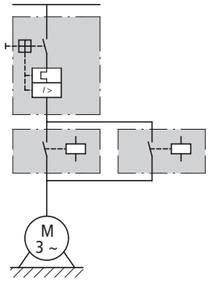
Starter on busbar adapter

	Motor ratings			Setting range			Motor starter actuating voltage 230 V 50 Hz		Motor starter actuating voltage 24 V DC							
Contact sequence	Motor rating	Rated operational current 400 V	Rated short-circuit current 380 – 415 V	Overload releases	Short-circuit releases	Coordination	Part no. Article no.	Price see price list	Part no. Article no.	Price see price list	Std. pack	Motor-protective circuit-breakers Part no.	Contactor Part no.	Wiring set, DOL starter Mechanical connection module and electrical contact module Part no.	Busbar adapter Part no.	Notes
	AC-3	I_e	I_q													
	380 V 400 V 415 V	A	kA													
	P	I_e	I_q	I_r	I_{rm}											
	kW	A	kA	A	A											
Complete devices PKZ and DIL on BBA																
	0.06	0.21	100	0.16…0.25	3.5	"1", "2"	**MSC-D-0,25-M7(230V50HZ)/BBA** 102737		**MSC-D-0,25-M7(24VDC)/BBA** 102964		1 off	PKZM0-0,25	DILM7-10	PKZM0-XDM12	BBA0-25	The DOL starter (complete) consists of a PKZM0 motor-protective circuit-breaker and a DILM contactor. This conbination is mounted on the busbars. The connection of the main circuit between PKZ and contactor is established with electrical contact modules. **Further information** **Page** Technical data PKZM0 → Chapter Accessories PKZ → 8/8 Technical data DILM → Chapter DILM accessories → 5/42
	0.09	0.31	100	0.25…0.4	5.6		**MSC-D-0,4-M7(230V50HZ)/BBA** 102738		**MSC-D-0,4-M7(24VDC)/BBA** 102965			PKZM0-0,4	DILM7-10	PKZM0-XDM12		
	0.12 0.18	0.41 0.6	100	0.4…0.63	8.82		**MSC-D-0,63-M7(230V50HZ)/BBA** 102739		**MSC-D-0,63-M7(24VDC)/BBA** 102966			PKZM0-0,63	DILM7-10	PKZM0-XDM12		
	0.25	0.8	100	0.63…1	14		**MSC-D-1-M7(230V50HZ)/BBA** 102950		**MSC-D-1-M7(24VDC)/BBA** 102967			PKZM0-1	DILM7-10	PKZM0-XDM12		
	0.37 0.55	1.1 1.5	100	1…1.6	22.4		**MSC-D-1,6-M7(230V50HZ)/BBA** 102951		**MSC-D-1,6-M7(24VDC)/BBA** 102968			PKZM0-1,6	DILM7-10	PKZM0-XDM12		
	0.75	1.9	100	1.6…2.5	35		**MSC-D-2,5-M7(230V50HZ)/BBA** 102952		**MSC-D-2,5-M7(24VDC)/BBA** 102969			PKZM0-2,5	DILM7-10	PKZM0-XDM12		
	1.1 1.5	2.6 3.6	100	2.5…4	56		**MSC-D-4-M7(230V50HZ)/BBA** 102953		**MSC-D-4-M7(24VDC)/BBA** 102970			PKZM0-4	DILM7-10	PKZM0-XDM12		
	2.2	5	100	4…6.3	88.2		**MSC-D-6,3-M7(230V50HZ)/BBA** 102954		**MSC-D-6,3-M7(24VDC)/BBA** 102971			PKZM0-6,3	DILM7-10	PKZM0-XDM12		
	3	6.6	100	6.3…10	140	"1"	**MSC-D-10-M7(230V50HZ)/BBA** 102955		**MSC-D-10-M7(24VDC)/BBA** 102972			PKZM0-10	DILM7-10	PKZM0-XDM12		
	4	8.5	100	6.3…10	140		**MSC-D-10-M9(230V50HZ)/BBA** 102956		**MSC-D-10-M9(24VDC)/BBA** 102973			PKZM0-10	DILM9-10	PKZM0-XDM12		
	5.5	11.3	100	8…12	168		**MSC-D-12-M12(230V50HZ)/BBA** 102957		**MSC-D-12-M12(24VDC)/BBA** 102974			PKZM0-12	DILM12-10	PKZM0-XDM12		
	7.5	15.2	50	10…16	224		**MSC-D-16-M15(230V50HZ)/BBA** 102958		**MSC-D-16-M15(24VDC)/BBA** 102975			PKZM0-16	DILM15-10	PKZM0-XDM12		
	3 4	6.6 8.5	100	6.3…10	140	"1", "2"	**MSC-D-10-M17(230V50HZ)/BBA** 102959		**MSC-D-10-M17(24VDC)/BBA** 102976			PKZM0-10	DILM17-10	PKZM0-XM32	BBA0-32	
	5.5	11.3	100	8…12	168		**MSC-D-12-M17(230V50HZ)/BBA** 102960		**MSC-D-12-M17(24VDC)/BBA** 102977			PKZM0-12	DILM17-10	PKZM0-XM32		
	7.5	15.2	50	10…16	224		**MSC-D-16-M17(230V50HZ)/BBA** 102961		**MSC-D-16-M17(24VDC)/BBA** 102978			PKZM0-16	DILM17-10	PKZM0-XM32		
	11	21.7	50	20…25	350		**MSC-D-25-M25(230V50HZ)/BBA** 102962		**MSC-D-25-M25(24VDC)/BBA** 102979			PKZM0-25	DILM25-10	PKZM0-XM32		
	15	29.3	50	25…32	448		**MSC-D-32-M32(230V50HZ)/BBA** 102963		**MSC-D-32-M32(24VDC)/BBA** 102980			PKZM0-32	DILM32-10	PKZM0-XM32		

Motor ratings			Setting range			Motor starter actuating voltage 230 V 50 Hz	
Motor rating	Rated operational current 400 V	Rated short-circuit current 380 – 415 V	Overload releases	Short-circuit releases	Coordination	**Part no.** Article no.	**Price** see price list
AC-3 380 V 400 V 415 V							
P	I_e	I_q	I_r	I_{rm}			
kW	A	kA	A	A			
Complete devices PKZ and DIL on BBA							
0.06	0.21	100	0.16…0.25	3.5	"1", "2"	**MSC-R-0,25-M7(230V50HZ)/BBA** 102981	
0.09	0.31	100	0.25…0.4	5.6		**MSC-R-0,4-M7(230V50HZ)/BBA** 102982	
0.12 0.18	0.41 0.6	100	0.4…0.63	8.82		**MSC-R-0,63-M7(230V50HZ)/BBA** 102983	
0.25	0.8	100	0.63…1	14		**MSC-R-1-M7(230V50HZ)/BBA** 102984	
0.37 0.55	1.1 1.5	100	1…1.6	22.4		**MSC-R-1,6-M7(230V50HZ)/BBA** 102985	
0.75	1.9	100	1.6…2.5	35		**MSC-R-2,5-M7(230V50HZ)/BBA** 102986	
1.1 1.5	2.6 3.6	100	2.5…4	56		**MSC-R-4-M7(230V50HZ)/BBA** 102987	
2.2	5	100	4…6.3	88.2		**MSC-R-6,3-M7(230V50HZ)/BBA** 102988	
3	6.6	100	6.3…10	140	"1"	**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 4	6.6 8.5	100	6.3…10	140	"1", "2"	**MSC-R-10-M17(230V50HZ)/BBA** 102992	
5.5	11.3	100	8…12	168		**MSC-R-12-M17(230V50HZ)/BBA** 102993	
7.5	15.2	50	10…16	224		**MSC-R-16-M17(230V50HZ)/BBA** 102994	
11	21.7	50	20…25	350		**MSC-R-25-M25(230V50HZ)/BBA** 102995	
15	29.3	50	25…32	448		**MSC-R-32-M32(230V50HZ)/BBA** 102996	







Motor starter actuating voltage 24 V DC									
Part no. Article no.	**Price** see price list	Std. pack	**Motor-protective circuit-breakers Part no.**		**Contactor Part no.**	Wiring set, reversing starter Mechanical connection module and electrical contact module and reversing connector **Part no.**	**Busbar adapter Part no.**	**Notes**
MSC-R-0,25-M7(24VDC)/BBA 102997		1 off	PKZM0-0,25	2 ×	DILM7-01	PKZM0-XRM12	BBA0R-25	The reversing starter (complete unit) consists of a PKZM0 motor-protective circuit-breaker and two DILM contactors. These conbinations are mounted on the busbars. The connection of the main circuit between PKZ and contactor is made with electrical contact modules. Complete units with mechanical interlock, starters up to 12 A also feature electrical interlock.
MSC-R-0,4-M7(24VDC)/BBA 102998			PKZM0-0,4	2 ×	DILM7-01			
MSC-R-0,63-M7(24VDC)/BBA 102999			PKZM0-0,63	2 ×	DILM7-01			
MSC-R-1-M7(24VDC)/BBA 103000			PKZM0-1	2 ×	DILM7-01			
MSC-R-1,6-M7(24VDC)/BBA 103001			PKZM0-1,6	2 ×	DILM7-01			
MSC-R-2,5-M7(24VDC)/BBA 103002			PKZM0-2,5	2 ×	DILM7-01			
MSC-R-4-M7(24VDC)/BBA 103003			PKZM0-4	2 ×	DILM7-01			
MSC-R-6,3-M7(24VDC)/BBA 103004			PKZM0-6,3	2 ×	DILM7-01			
MSC-R-10-M7(24VDC)/BBA 103005			PKZM0-10	2 ×	DILM7-01			
MSC-R-10-M9(24VDC)/BBA 103006			PKZM0-10	2 ×	DILM9-01			
MSC-R-12-M12(24VDC)/BBA 103007			PKZM0-12	2 ×	DILM12-01			
MSC-R-10-M17(24VDC)/BBA 103008			PKZM0-10	2 ×	DILM17-01	PKZM0-XM32 + DILM32-XRL	BBA0R-32	
MSC-R-12-M17(24VDC)/BBA 103009			PKZM0-12	2 ×	DILM17-01			
MSC-R-16-M17(24VDC)/BBA 103010			PKZM0-16	2 ×	DILM17-01			
MSC-R-25-M25(24VDC)/BBA 103011			PKZM0-25	2 ×	DILM25-01			
MSC-R-32-M32(24VDC)/BBA 103012			PKZM0-32	2 ×	DILM32-01			

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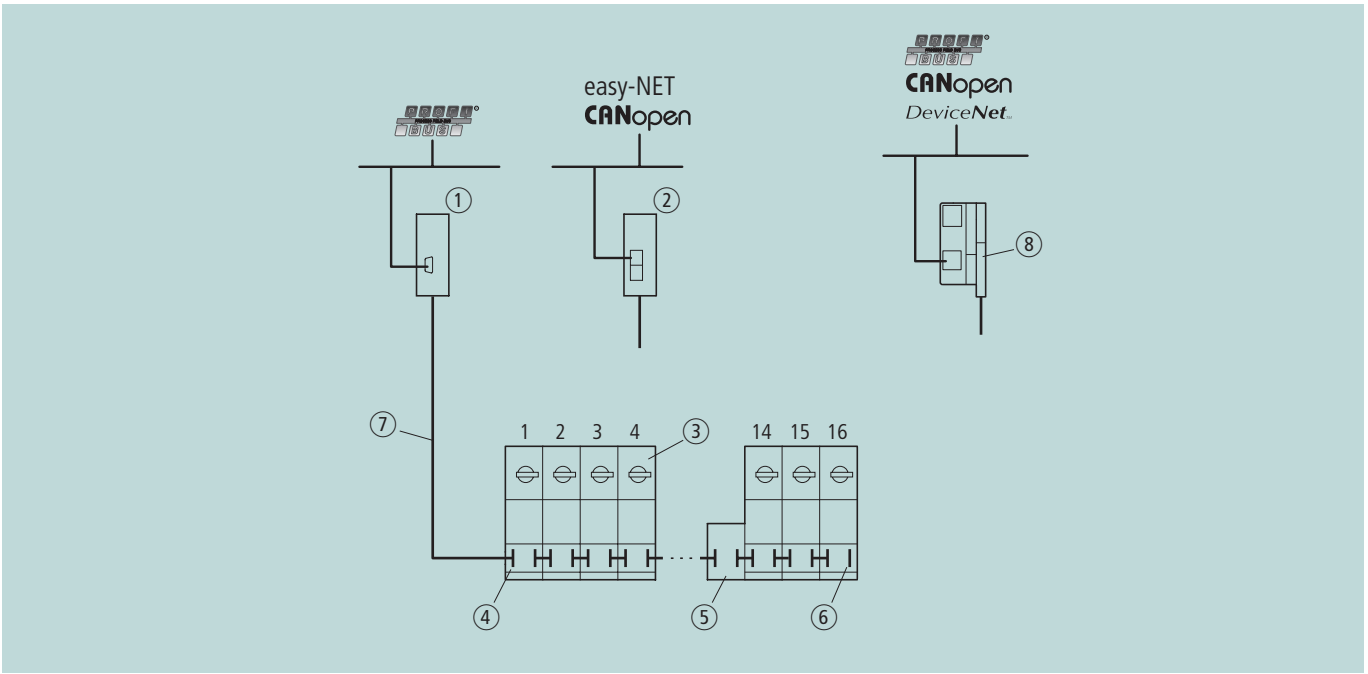


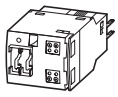
① Gateway PROFIBUS-DP
② Gateway easy-NET/CANopen
③ Contactor DILM or motor starter MSC
④ SmartWire Module for DILM
⑤ SmartWire-Power-Module
⑥ SmartWire terminal plug
⑦ Smart-Wire connection cable
⑧ SmartWire-Interface for e.g. I/O-System XI/ON, Supplier, company MicroInnovation AG, www.microinnovation.com

System description

The SmartWire connection system allows the connection of switchgear to a PLC without complex control wiring. The control wiring between the PLC and the switchgear is replaced by the plug-in SmartWire module for DILM and a pre-manufactured connection cable. The wiring complexity is drastically reduced and wiring errors are impossible. There are further savings also with the assembly, the commissioning and the search for faults on the machine or system.
The inputs and outputs of the PLC are replaced by the SmartWire module for DILM and the control wiring termination points are not necessary. This simplifies the engineering and the documentation of the machine or system.
The SmartWire connection system is an expansion of the well proven Moeller switchgear and is designed to be an accessory for the standard device. The well know system accessories can still be used and the normal flexibility of the switchgear is still available. By using standard devices the necessary stores level is reduced and the worldwide availability of replacement parts is of course guaranteed. The connection to the various field Buses is via Gateways or interface modules available from another manufacturer.

Features

- Gateway
  - Connects the SmartWire modules with the field Bus
  - Supports the field Buses PROFIBUS-DP, 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
  - Supports max. 16 SmartWire modules for DILM
- Interface from third party devices e.g. for the I/O System XI/ON
  - Connection to the field Buses PROFIBUS-DP, CANopen and DeviceNET
- SmartWire-Modue for DILM
  - Pluggable onto contactors of the xStart range
  - 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
  - Use the accessories of the xStart range
  - Suitable for contactor combinations with PKZ or with Z overloads
  - Integrated switch position monitoring of the contactors
  - Integrated mechanical switch position display
  - Actuation of the contactors
  - Interrogation 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-Power-Module
  - Supply of the 24 V-DC control voltage for actuation of DILM contactors
  - Assembly of emergency-stop groups
  - Increase the control voltage power in the SmartWire chain
- Safety engineering
  - Emergency-Stop disconnection as per IEC/EN 954-1, Switching Category 2
  - Central switch off of control voltage at the Gateway or SmartWire Power module
  - Combination with safety conform switchgear possible

	Description	Part no. Article no.	Price see price list	Std. pack	Notes
Gateway					
PROFIBUS-DP					
	Gateway with integrated supply for the SmartWire module and control voltage for the switchgear. Connection to PROFIBUS-DP as slave Transmission rate: 9.6 kBit/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	**Other Gateways** **Page** easy-NET/CANopen → page 4/44
Modules					
SmartWire module for DILM 	SmartWire module to assemble on the contactors DILM7…DILM32. - One module is necessary per contactor. - Connection to SmartWire- Gateway as Slave. - Max. 16 SmartWire modules per chain. - 1 digital input for potential-free contact. - Signalling contactor switch position.	**SWIRE-DIL** 107028		1 off	• Take account of the max. current consumption of the contactor coils per SmartWire chain. • Length of connection cable at the input and the electrical interlock < 2.8 m. • A2 terminal of the contactor must not be bridged. • Electrical interlocking only possible via the terminals on the module for DILM. • Wiring kits DILM 12-XRL and PKZM0-XRM12 cannot be used. • Connection terminals for electrical interlocking are not suitable for safety technology.
SmartWire Power-Module	Power module for suppling the control voltage. - Connection on SmartWire Gateway as interactive station (no address).	**SWIRE-PF** 107029		1 off	Max. 4 power modules per SmartWire chain.
Accessories					
SmartWire connection cable					
	Length: 85 mm	**SWIRE-CAB-008** 107032		25 off	Cable lengths: Engineering → Engineering SmartWire connection system
	Length: 110 mm	**SWIRE-CAB-011** 107033		25 off	
	Length: 150 mm	**SWIRE-CAB-015** 107034		5 off	
	Length: 250 mm	**SWIRE-CAB-025** 107035		5 off	
	Length: 1000 mm	**SWIRE-CAB-100** 107036		1 off	
	Length: 2000 mm	**SWIRE-CAB-200** 107037		1 off	
Termination plug					
	Termination plug for last SmartWire module, 6 pole, no electrical function.	**SWIRE-CAB-000** 107031		25 off	
Data cable					
	6 core, flat-band cable, length: 100 m.	**SWIRE-CAB-100M** 107038		1 off	Pre-manufacture of cable only possible with special tool.
Plug					
	6 plug for flat-band cable.	**SWIRE-CAB-CON** 107039		50 off	
NHI-E with cable					
	NHI-E-10-PKZ0 with connection cable AWG18 blue, for connection to SmartWire module for DILM.	**NHI-E-10L-PKZ0** 107040		5 off	

Cable lengths
For the connection between motor starters and DILM contactors the cable lengths depend upon the combination and the assembly of the devices.

Applications				**Cable length**
DILM/MSC	PKZ accessories	from	to	
DILM contactors	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	110 mm
		DILM17-…32	DILM7-…15	110 mm
Motorstarter 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

For the connection of the SmartWire devices the cable lengths depend upon the 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 SmartWire DIL with mounting beside DILM	150 mm
Connection from Gateway to SWire-DIL with mounting beside PKZ	250 mm
Connection from Gateway to SWire-DIL with mounting beside DILM	250 mm

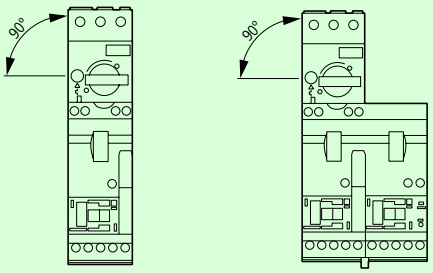
Magnet systems
The number of motor starters or DILM contactors that can be connected is dependant upon the power consumption of the magnet systems per SmartWire chain. To increase the number of SmartWire modules that can be connected Power modules can be used.

24 V DC		DILM7	DILM9	DILM12	DILM15	DILM17	DILM25	DILM32
Pick-up power	W	3	3	4.5	4.5	12 at 24 V	12 at 24 V	12 at 24 V
Sealing power	W	3	3	4.5	4.5	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V

			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			screw fixing with fixing bracket ZB4-101-GF1 (accessory)		on DILM7…DILM32
Dimensions (W × H × D)		mm	35 x 90 x 105	35 x 90 x 74	45 x 44 x 81
Weight		kg	0.15	0.1	0.036
Terminal capacities					
Solid		mm^2	0.34…1.5	0.34…1.5	0.34…1.5
Flexible with ferrule		mm^2	0.34…1.5	0.34…1.5	0.34…1.5
Solid or stranded		AWG	22…16	22…16	22…16
Standard screwdriver		mm	3.5 x 0.8	3.5 x 0.8	3.5 x 0.8
Max. tightening torque		Nm	0.6	0.6	0.5
Climatic environmental conditions					
Ambient temperature					
Operation		°C	–25…+55	–25…+55	–25…+60
Storage		°C	–25…+70	–25…+70	–25…+70
Condensation			Prevent condensation with suitable measures		
Relative humidity, non-condensing (IEC/EN 60068-2-30)		%	5…95	5…95	5…95
Air pressure (operation)		hPa	795…1080	795…1080	795…1080
Ambient conditions, mechanical					
Degree of protection IEC/EN 60529			IP20	IP20	IP20
Pollution degree			2	2	2
Mounting position			Vertical	Vertical	as DILM7…DILM32
Electromagnetic compatibility (EMC)					
Electrostatic discharge (IEC/EN 61000-4-2, Level 3, ESD)					
Air discharge		kV	8	8	8
Contact discharge		kV	4	4	4
Electromagnetic fields (IEC/EN 61000-4-3, RFI)	V/m		10	10	10
Radio interference suppression EN 55011, EN 55022			Class A	Class A	Class A
Burst pulses (IEC/EN 61000-4-4, level 3)					
Supply cables		kV	2	2	2
Signal lines		kV	2	2	2
High-energy pulses (surge) (IEC/EN 61000-4-5, level 2)		kV	0.5 (supply cables, symmetrical)		
Immunity to line-conducted interference to (IEC/EN 61000-4-6)		V	10	10	10
Insulation resistance					
Clearance in air and creepage distances			EN 50178, EN 60947-1, UL 508, CSA C22.2 No 142		
Insulation resistance			EN 50178, EN 60947-1		
Voltage supply, Gateway electronic and SmartWire station electronics $U_{Gateway}$					
Rated operational voltage $U_{Gateway}$		V DC	24, -15 %, +20 %		
Admissible range			20.4…28.8	Supply from gateway	Supply from gateway
Residual ripple		%	≦5		
Maximum current consumption at 24 V DC		mA	500 (typically 100 Gateway + typically 25 per SmartWire module)		
Voltage dips (IEC/EN 61131-2)		ms	10	–	–
Heat dissipation at 24 V DC		W	typically 6	typically 1	typically 0.6
Protection against polarity reversal			Yes	–	–
Short-circuit protection, SmartWire side			Yes		

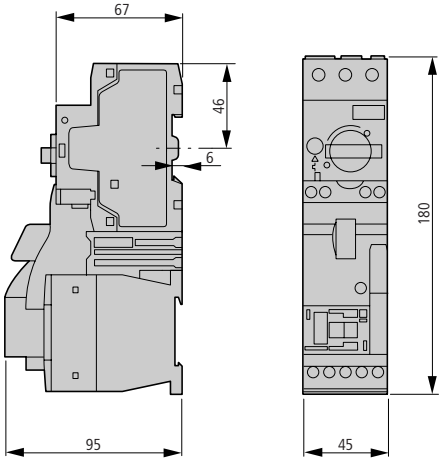
SWIRE-… Moeller HPL0211-2007/2008 http://catalog.moeller.net

			SWIRE-GW-DP	SWIRE-PF	SWIRE-DIL
General					
Power supply U_{AUX} (power supply 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
Admissible 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} bei 24 V DC		A	Normally 3	Normally 3	–
Residual ripple		%	≦ 5	≦ 5	–
Voltage dips (IEC/EN 61131-2)		ms	10	10	–
Protection against polarity reversal			Yes	Yes	
Short-circuit protection, SmartWire side			no, external protection (3 A) necessary, miniature circuit-breaker FAZ		
LEDs					
Ready for operation			Ready: green		Ready: green
Power supply SmartWire contactors			U_{Aux}: green	U_{Aux}: green	
Status PROFIBUS-DP			PROFIBUS DP: green		
Status SmartWire			SmartWire: green		over Ready
Status Outputs					
Connection potential-free contacts					
Number					1
Rated voltage (own supply)	U_e	V DC	–	–	17
Input current at "1" signal, typically		mA	–	–	5
Potential isolation			–		No
max. conductor length		m	–	–	< 2.8
PROFIBUS DP					
Connection technique			SUB-D 9 pole, socket		
Station address			1…126	–	–
Address allocation			DIP switch		
Potential isolation					
for supply voltage U_{AUX}			Yes		No
for supply voltage $U_{Gateway}$			Yes		
To SmartWire			Yes		
Function			PROFIBUS-DP Slave		
Bus protocol			PROFIBUS-DP V1		
Bus terminating resistors			Can be connected via plug		
Data transfer rate			automatically to 12 Mbit/s		
SmartWire module for DILM					
Connection types			Plug, 6-pole	Plug, 6-pole	Plug, 6-pole
Data/power cable			6 core flat-band cable	6 core flat-band cable	6 core flat-band cable
maximum cable length System SmartWire		m	4	4	4
Bus termination			No	Connector plug	Connector plug
Station address			none	none	1…16
Station			max. 126 PROFIBUS stations	Max. 4 power modules per SmartWire chain.	max. 16 per SmartWire chain
Address allocation			none	none	Automatic via SmartWire
Potential isolation					
for supply voltage U_{AUX}			No	No	No
for supply voltage $U_{Gateway}$			No	No	No
Function			SmartWire-Master	none SmartWire module	SmartWire-Slave
Data transfer time System SmartWire					
Write switch					typically 20 ms for all stations
Read status information					typically 10 ms per station

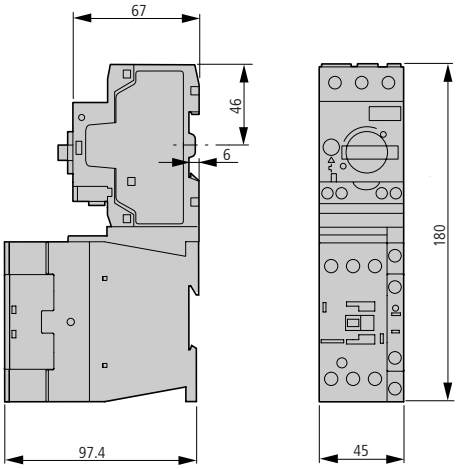
General		
Standards and regulations		IEC/EN 60947-4-1, VDE 0660 UL 508 CSA C 22.2 No. 14 } on request
Mounting position		
Main contacts		
Rated impulse withstand voltage U_{imp}	V	6000
Overvoltage category/degree of pollution		III/3
Rated operational voltage *U*e	V	230 – 415
Further technical data		
PKZM0 motor-protective circuit-breakers		→ Engineering guidelines
DILM contactors		→ Engineering guidelines

DOL starters

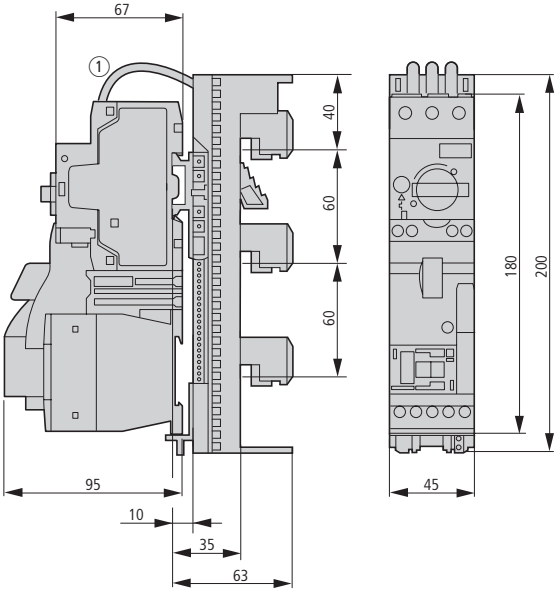
MSC-D-...-M7[...15]...



MSC-D-...-M17[...32]...



MSC-D-...-M7[...15]BBA...



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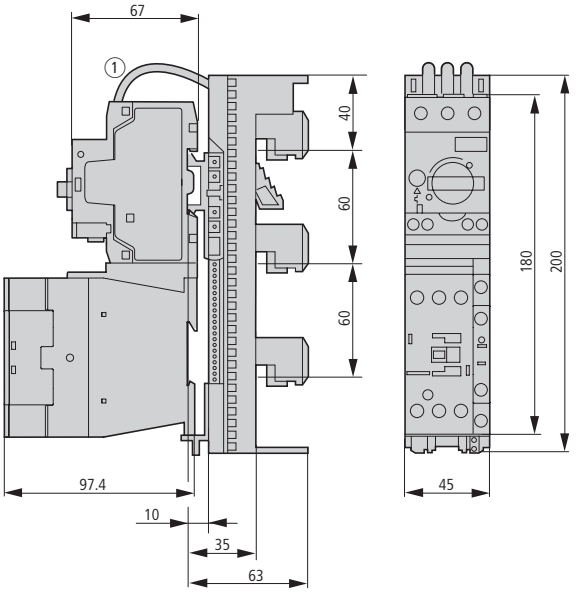
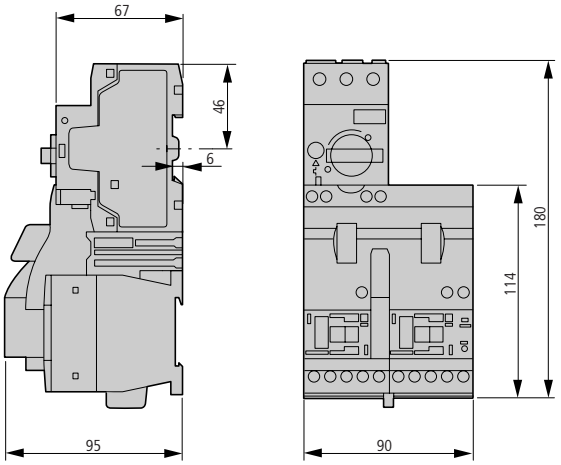


① l = 73 mm

Reversing starters

MSC-R-...-M7[...12]...



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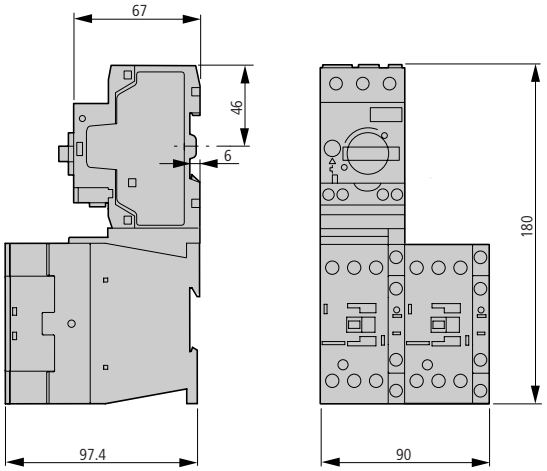
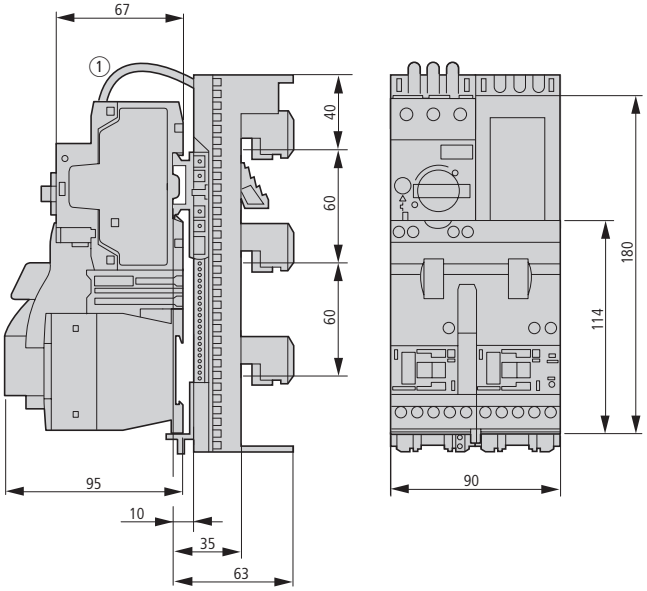
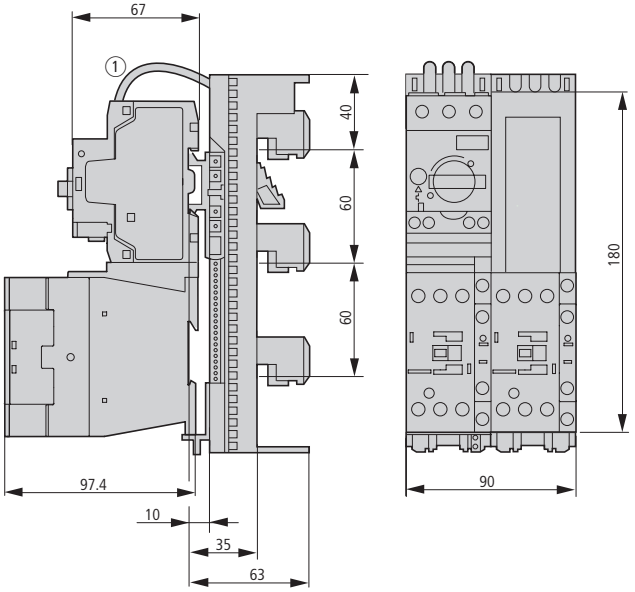


MSC-R-...-M7[...12]BBA...



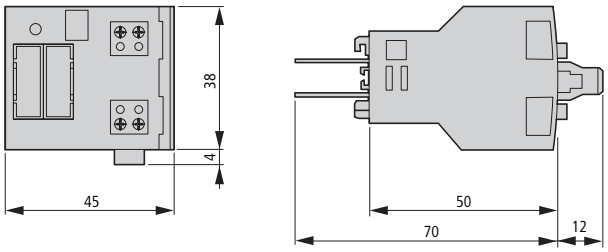
MSC-R-...-M17[...32]BBA...



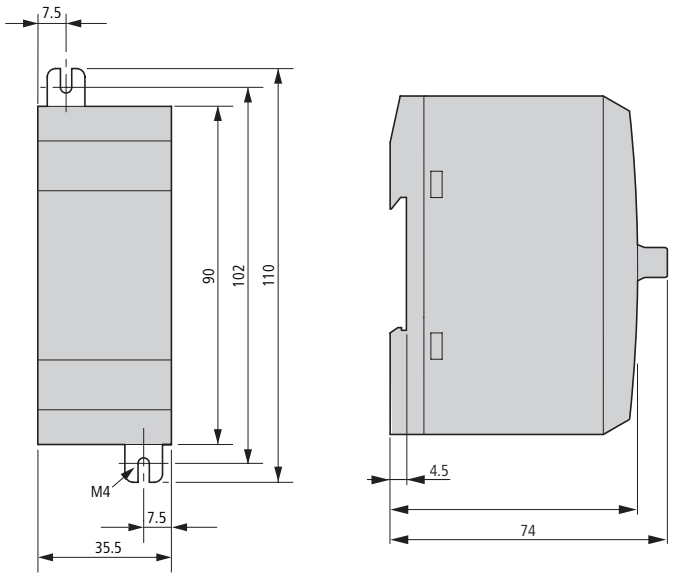
① l = 73 mm

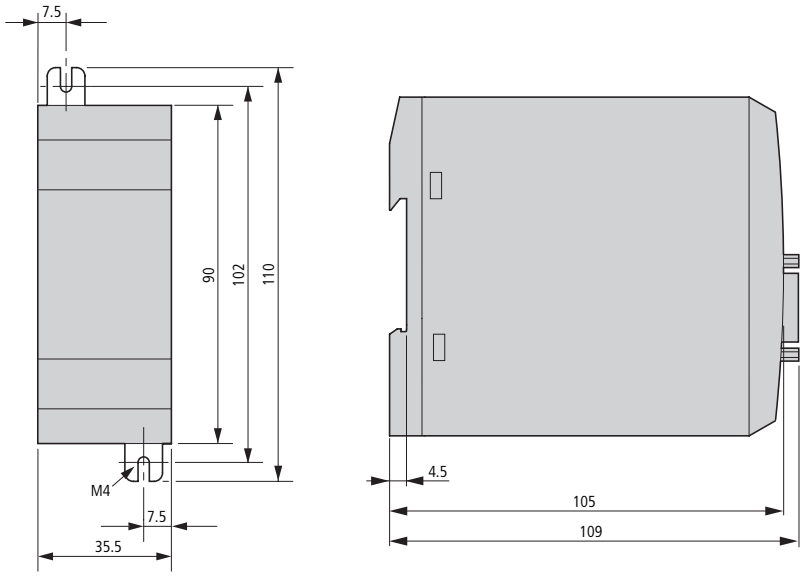
Modules

SWIRE-DIL



SWIRE-PF



Gateway

SWIRE-GW-DP