xStart: Efficient solutions for motor control



xStart

The complete range of contactors, efficient motor-starters and variable speed drives for the motor circuit. New simple to install solutions based on clever communication.

- DIL contactors
- PKZ motor-protective circuit-breakers
- MSC motor-starters
- DS 4 softstarters
- DF & DV Drives
- Rapid Link

Product information

DIL M motor contactors
PKZ motor-protective circuit-breakers
MSC motor-starters

MOELLER

Think future. Switch to green.

xStart is the intelligent solution: easier engineering, faster fitting



1

Both trade and industry expect innovations in electrical engineering to bring them clear advantages by making processes more efficient – all the way from the planning stage through engineering to fitting and installation. The new xStart range from Moeller does just that.

"We need a partner we can rely on. Moeller satisfies all of our needs."



With Moeller you can meet any challenge!

Moeller has proved its competence as a partner with high-quality, efficient motor-related solutions for more than a century. xStart now offers you the complete range of products needed for switching, protecting, starting, running up and controlling motors. You can rely on our competence in each of these areas, and we can meet any challenge from contactors to drive control.

1 The latest innovation is the new MSC motor-starter: a combination of standard components, i.e. the new DIL M motor contactors and the optimised PKZ motor-protective circuit-breakers.

Just four slim starter modules up to 150 A, each with the same dimensions for AC and DC, significantly simplify planning and engineering.



2

2 The newly developed DIL M motor contactors can switch motors up to 150 A. Their significantly improved performance criteria such as pick-up and sealing consumption, space saving foot-prints and ease of installation make these contactors state-of-the-art, top-class product.

Tested quality

Every single one of our products is built and tested to the latest national and international standards. Having attained all the major approvals, they are perfectly suited to the world's market.

PKZ motor-protective circuit-breakers: now better than ever



PKZ motor-protective circuit-breakers from Moeller have long set the benchmark for quality. And now, for inclusion in the xStart concept, these products have been updated once again, and enhanced in terms of their technical specification.

The PKZM 0 now switches motors up to 32 A. At the same time, its short-circuit switching capacity is significantly increased: the short-circuit rating (400 V) is now 150 kA up to 12 A and 50 kA up to 32 A. The PKZM 4 also has a switching capacity of 50 kA. This simplifies the engineering of safety and reliability, with current limiters becoming virtually obsolete. PKZM 01 is a completely new product with push-button operation for switching motors up to 16 A (50 kA/400 V).

"PKZ motor-protective circuit-breakers are, and always will be, the epitome of safety, reliability and quality in motor protection."





Common accessories throughout the system

Whether PKZM 0, PKZM 01 or PKZM 4, the accessories are always the same. Whether On or Off, overload or short circuit, differential indication helps to locate the cause of tripping without delay, every time. The auxiliary contacts can be fitted without tools and are fail-safe in the way they signal every switching state. One particularly convenient component is the NHI-E front auxiliary contact that can be optionally built into already installed and wired circuit-breakers. It goes without saying that all the auxiliary contacts and releases are worldmarket devices, for all the customary mains voltages.

1 Shunt trips and undervoltage trips

2 PKZM 0 motor-protective circuit-breakers from 0 to 32 A

3 PKZM 4 motor-protective circuit-breakers from 10 to 65 A

4 The optionally integrable front auxiliary contact indicates the switching position of 1 NO and NC contact or 1 NO contact

5 Trip-indicating contacts: two contacts provide differential indication of short circuit or overload

6 Standard auxiliary contacts with up to three contacts for the On/Off switching position

The door coupling handle (IP 65) has a tripped position in addition to the On and Off positions.

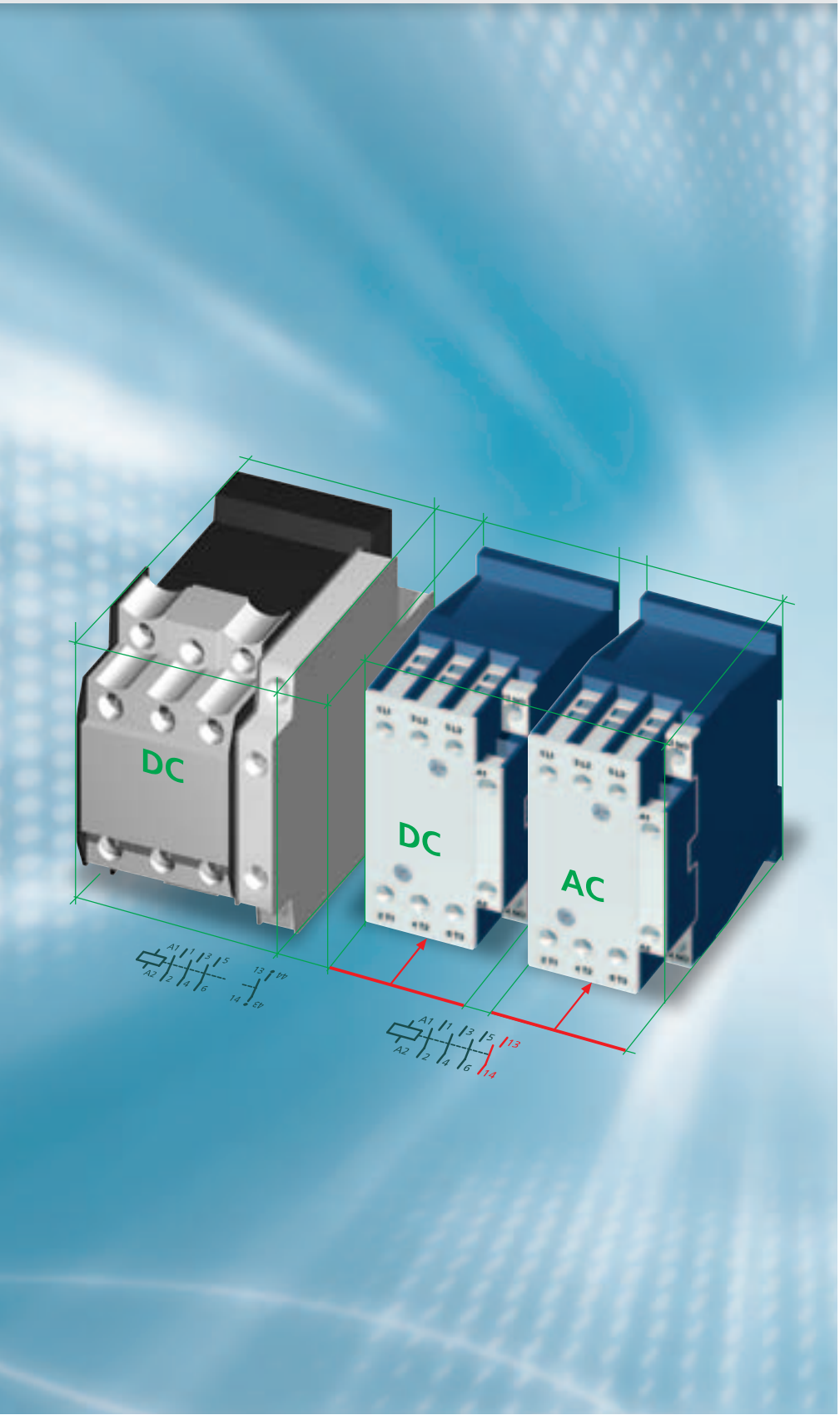
PKZM 01 motor-protective circuit-breakers: easy to operate by pressing or hitting a button

The new PKZM 01 motor-protective circuit-breakers for motors up to 12 A are ideally suited to small machines and applications where operation by pressing or even hitting a button is preferred. In addition to the auxiliary contacts from the PKZM 0 range, special enclosures with ingress protection IP 65 or IP 40 and the appropriate Emergency-Stop buttons are available for these new components. Their short-circuit switching capacity is 50 kA.





AC and DC contactors: both the same frame size – simplifies engineering



Great efficiency in planning and engineering with AC and DC contactors is achieved by them being the same dimensions. With only four component sizes covering the rating range up to 150 A engineering is further simplified.

Definitely useful: up to 32 A, the auxiliary contact is already built in, and the DC contactors include a suppressor circuit up to 150 A. From 12 A, the DC contactors have an electronic drive that removes the need for coupling relays. With all these extras already included in the contactors, your costs are clearly reduced.

DC contactors now are no bigger than AC contactors

The new DIL contactors are significantly more compact than their predecessors, even though, up to 32 A, the auxiliary contact is included. The advantage of this is particularly striking with the DC contactors that now are the same size as their AC counterparts. This makes everything easier, i.e. planning, engineering and fitting, without having to alter the control system, even if the control current has to change for another customer.



"With these new motor contactors, Moeller is definitely on to a winner. They bring real advantages from the planning all the way to the fitting costs."

1 This reduces the cost of your control panel

The space-saving is achieved not just by the reduced component dimensions, but also due to the lower heat dissipation that, particularly with the DC contactors, helps keep the cabinet size down and saves the cost of a fan. The significantly reduced sealing consumption achieved by innovative, electronic drives makes this possible. The Moeller DC contactors from 17 up to 65 A have a sealing consumption of only 0.5 Watt, even those at 150 A only use 1.5 Watt. This also results in lower power consumption for the whole installation.

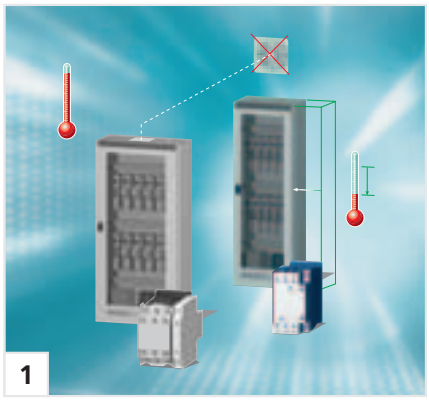
2 No compromise where termination reliability is concerned

DIL contactors up to 150 A have box terminals with two clamping chambers, allowing unequal cable cross-sections to be terminated absolutely securely, even in strongly vibrating machines. This makes wiring easier and cuts down on associated errors.

3 The benefits of the electronically controlled drive

All DC motor contactors from DIL M17 have an electronically controlled drive that offers the following advantages:

- Significantly less heat dissipation due to reduced sealing consumption
- Smaller control transformers because of lower pick-up consumption
- Direct actuation from the PLC without coupling contactors.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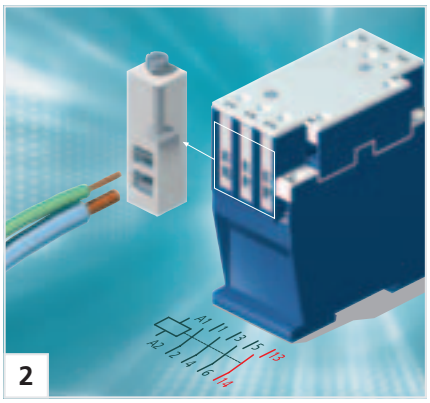
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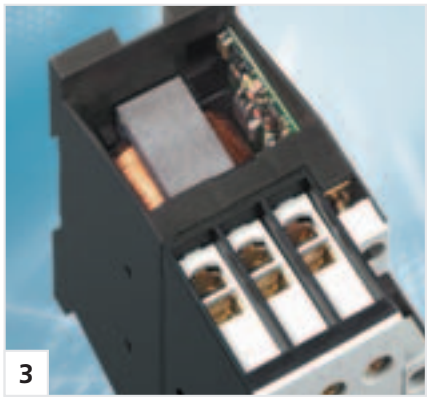
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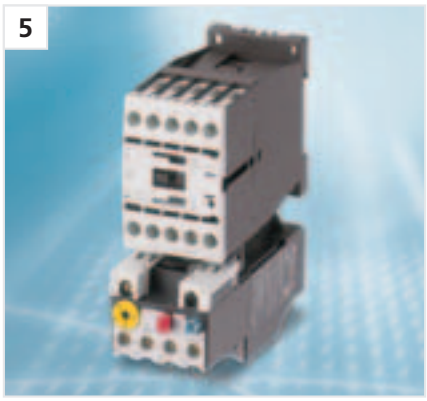
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4 The new DIL A auxiliary contacts perfectly complement the new DIL M motor contactors.

5 Z overloads relays protect the motor against phase failure or overload. Their auxiliary contacts switch the motor contactor off, and signal the fault. These relays are suitable for protecting EEx e-motors according to ATEX 100 a guideline.

The simplicity of it! –
Toolless plug connection!



Using the new xStart motor-starter combinations it is possible to create the best solutions from standard products even more easily and efficiently.

Moeller has optimised the DIL and PKZ standard products in such a way that, by using simple toolless plug connectors, they can be assembled to form reliable motor-starters. Without the need for tools! The MSC motor-starter combinations can also be supplied as complete devices. Costs for fitting and wiring can be considerably reduced in this way. Costs for testing are cut and errors are prevented from the start. Another advantage lies in increased safety during maintenance work where removal of the combination plug connector produces a visible isolating gap. This Moeller technology is available on our direct-online and reversing starters up to 15.5 A.

"The toolless plug connection is very quick to fit – just what I need to reduce costs."



Slim solutions: DOL starters from standard components

The new direct-on-line starters built from standard components are available in four slim frame sizes. The contactor and the protective switch are of the same compact width dimension. Thus you lose not a millimetre of control panel space. The convenient MSC motor-starters using toolless plug connection technology are available up to 15.5 A and require only a top-hat rail for mounting. The mechanical connector ensures a secure hold and the electrical connector provides optimum reliability and safety. Complete mounting connectors are offered for DOL and reversing starters from 17 up to 32 A. This prevents fitting errors and cuts down on wiring time.

Plug and go: reversing starters from standard components

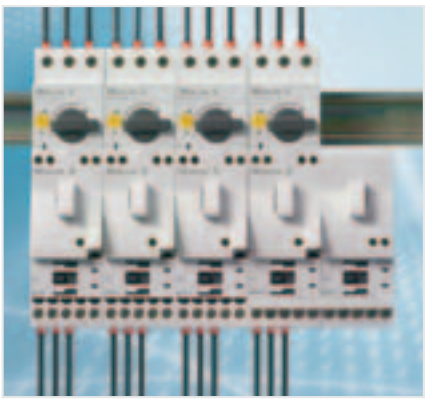
The reversing starters offer distinct advantages to the assembler. Instead of laboriously having to tighten up 23 screws, a small number of components simply plug together. This of course speeds up fitting work, and means fewer errors and a very clearly laid out switching installation.

Speedier wiring using spring-loaded terminations

Moeller provides proven quality with tension clamp terminals. Numerous tests have proved that contactors and motor-protective circuit-breakers are just as securely wired in this way as by screw connection – even in strongly vibrating machines. But wiring work using tension clamp terminals is very much quicker to do. The main current paths on PKZM 0 and motor contactors up to 12 A all use spring-loaded terminals. The sundries for termination are always available for both screw and tension clamp connection.









Reversing starters with mechanical interlock – as compact as it gets!



Reversing starters and star-delta combinations up tp 15.5 A can be combined without tools.

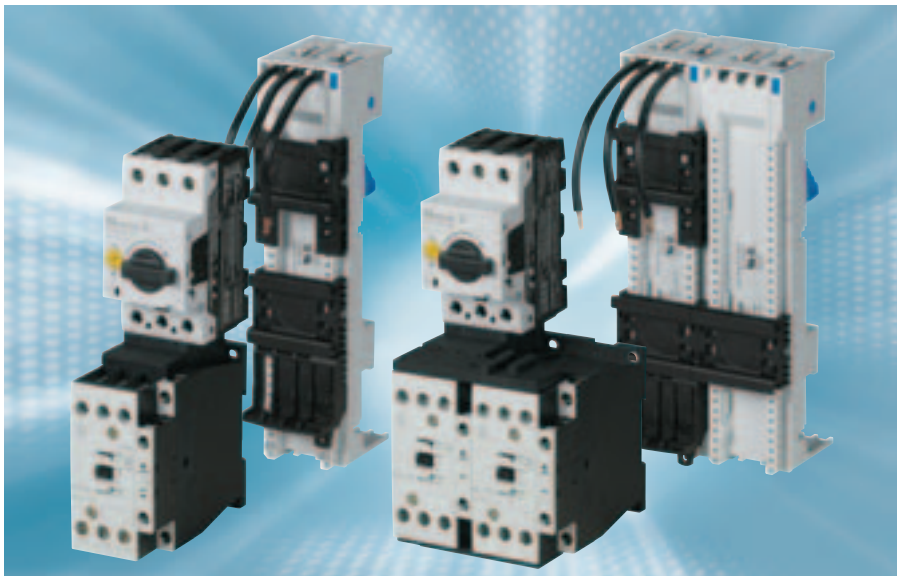
Moeller has significantly reduced the wiring costs with reversing and star-delta combinations using tool-less plug connections. Moeller DIL M contactors up to 15.5 A feature sockets in which the connection elements are simply plugged in as standard and without additional expense. Thus, costs associated with operations such as cutting wires to length, stripping of insulation, work on the wire ends and provision of conductors with markings, as well as application of defined torques when tightening screws, have been totally eliminated. Inspection of 21 electrical connections between the mains and the star and delta contactor are reduced to a simple visual inspection. A measurement with test device probes can be undertaken without having to remove the connection elements.





Precious space is provided in the control panel by the narrow widths of just 55 mm on contactors up to 65 A. The mechanical interlocks which are usually found on reversing contactor combinations do not require any additional space from Moeller. The smart, patented solution is a plastic sphere. It is simply inserted into the side cavities provided on both contactors and reliably prevents simultaneous switch on. Furthermore, a lateral clearance between the contactors is not required – the contactors can be mounted and wired side-by-side.
Generally, DC contactors in the range up to 65 A have a longer depth than AC contactors. However, with xStart – thanks to electronically supported magnet systems – all dimensions of the DC variants are identical to those of the AC variants. If the manufacturer of mass produced machines uses differing control voltages, the testing of the control panel layout is now eliminated, the DC contactors are simply positioned on the top-hat rail or mounting plate in the same manner as the AC variants.
The heat dissipation limits the packing density in control panels. Solutions which are possible from a purely mechanical viewpoint cannot be implemented due to heat dissipation considerations. The extremely low holding power of just 0.5 W with Moeller DC contactors now enables solutions which were previously impossible.





Mounting rail adapter with new flexibility

The switchgear interconnected with the three phase commoning links is generally snapped onto a mounting rail. The result is an additional benefit where components can be easily removed from an interconnected group by offsetting the adapter mounting rail without having to disassemble the entire three phase commoning link.

Optimum compatibility: Starters and busbar adapters

The xStart system has been extended by the new busbar adapter, which is compatible with the busbar system and the system accessories from Wöhner, the market leader in this field. Conformity to the standard ensures that busbar adapters for 60 mm busbar clearances fit all similar manufacturers systems. An additional benefit is that the busbar adapter material used worldwide is a standard copper profile. Prefabricated connectors or the new tool-less plug connections are available for establishing connections between circuit-breakers and contactors. With large and uniform requirements, Moeller supplies the adapter fitted complete with switchgear for DOL and reversing starters.

Simply select tested motor starters to approval types I and II

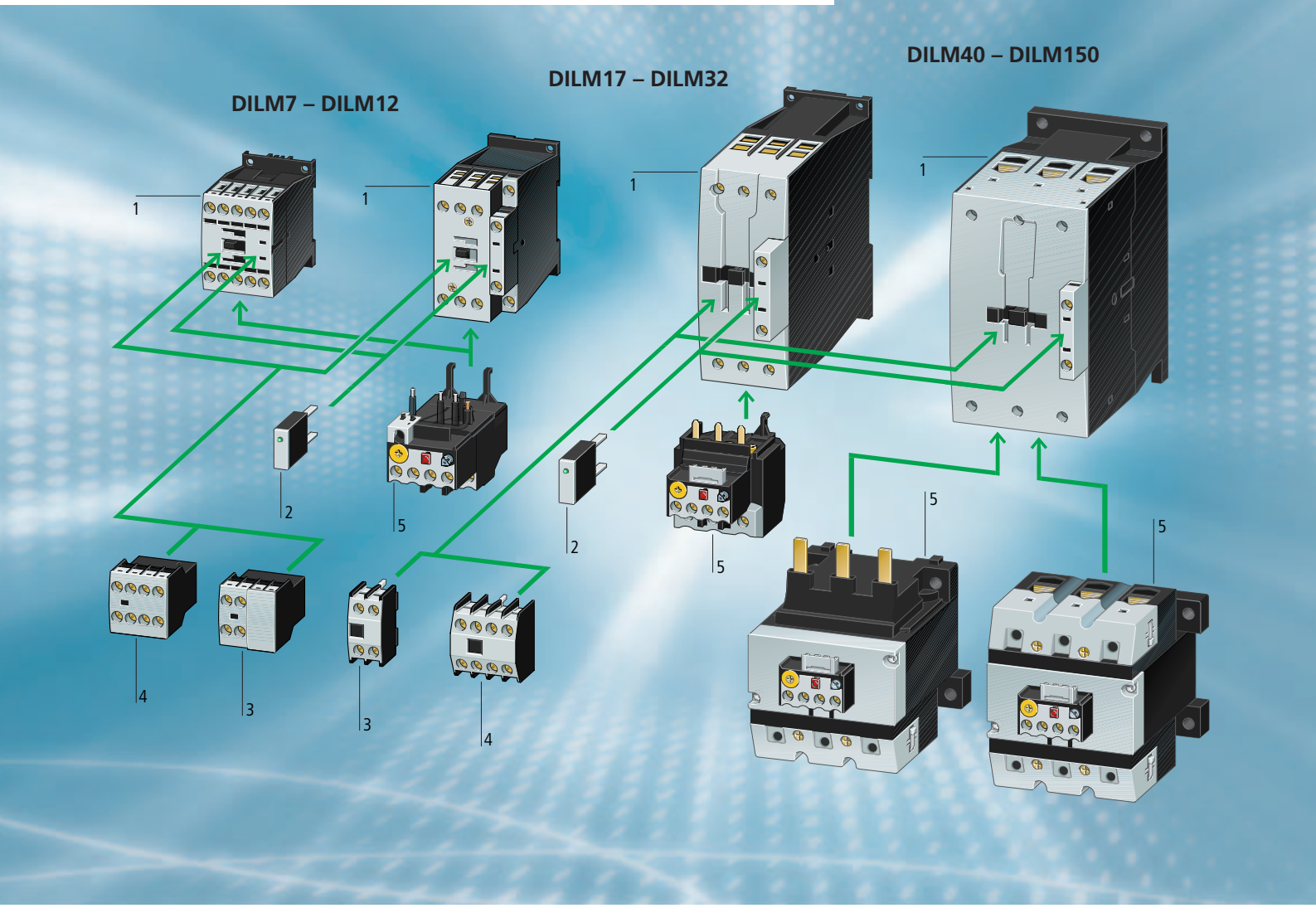
The DOL starter (complete unit) consists of a PKZM0 motor-protective circuit-breaker and a DILM contactor.

Moeller provides a PC-based electronic selection program for motor starters in addition to the comprehensive selection page in the Moeller main catalogue. This program considers various operating voltages, short-circuit ratings and coordination types, as well as fuseless and fused combinations. This small program is available from Moeller free of charge on the Internet. Moeller has provided the practically-minded with a carton selection slider for a number of years.



www.moeller.net/select

Contactors DIL M7 – 150
DILA contactor relays



1. Basic units

2. Suppressor [1)]

3. Auxiliary contact modules, 2-pole

4. Auxiliary contact modules, 4-pole

5. Overload relays

[1)] For AC operated contactors 50-60 Hz;
in DC operated contactors, the suppressor circuit is incorporated.
Note drop-out delay

DILM basic units

	AC-3 380 V 400 V I_e A	AC-3 380 V 400 V P kW	Open $I_{th} = I_e$ A	Contacts B = Break M = Make	Can be combined with auxiliary contact	**AC operation** Auxiliary contact **Type** Article no. 230 V 50 Hz 240 V 60 Hz	**Type** Article no. 24 V 50/60 Hz	**Type** Article no. 110 V 50 Hz, 120 V 60 Hz	**DC actuation** **Type** Article no.
3-pole 	7	3	20	1 M	DILM32-XHI.. DILA-XHI(V)..	**DILM7-10(...)** 276550	**DILM7-10(...)** 276554	**DILM7-10(...)** 276547	**DILM7-10(24VDC)** 276565
	7	3		1 B	DILA-XHI(V)..	**DILM7-01(...)** 276585	**DILM7-01(...)** 276589	**DILM7-01(...)** 276582	**DILM7-01(24VDC)** 276600
	9	4		1 M	DILM32-XHI.. DILA-XHI(V)..	**DILM9-10(...)** 276690	**DILM9-10(...)** 276694	**DILM9-10(...)** 276687	**DILM9-10(24VDC)** 276705
	9	4		1 B	DILA-XHI(V)..	**DILM9-01(...)** 276725	**DILM9-01(...)** 276729	**DILM9-01(...)** 276722	**DILM9-01(24VDC)** 276740
	12	5.5		1 M	DILM32-XHI.. DILA-XHI(V)..	**DILM12-10(...)** 276830	**DILM12-10(...)** 276834	**DILM12-10(...)** 276827	**DILM12-10(24VDC)** 276845
	12	5.5		1 B	DILA-XHI(V)..	**DILM12-01(...)** 276865	**DILM12-01(...)** 276869	**DILM12-01(...)** 276862	**DILM12-01(24VDC)** 276880
	15.5	7.5		1 M	DILM32-XHI.. DILA-XHI(V)..	**DILM15-10(...)** 290057	**DILM15-10(...)** 290062	**DILM15-10(...)** 290055	**DILM15-10(24VDC)** 290073
	15.5	7.5		1 B	DILA-XHI(V)..	**DILM15-01(...)** 290093	**DILM15-01(...)** 290097	**DILM15-01(...)** 290090	**DILM15-01(24VDC)** 290108
4-pole	–	–		–	DILM32-XHI.. DILA-XHI(V)..	**DILMP20(...)** 276970	**DILMP20(...)** 276974	**DILMP20(...)** 276967	**DILMP20(24VDC)** 276985
3-pole 	18	7.5	35	1 M	DILM32-XHI.. DILA-XHI(V)..	**DILM17-10(...)** 277004	**DILM17-10(...)** 277008	**DILM17-10(...)** 277001	**DILM17-10(RDC24)** 277018
	18	7.5	35	1 B	DILA-XHI(V)..	**DILM17-01(...)** 277036	**DILM17-01(...)** 277040	**DILM17-01(...)** 277033	**DILM17-01(RDC24)** 277050
	25	11	40	1 M	DILM32-XHI.. DILA-XHI(V)..	**DILM25-10(...)** 277132	**DILM25-10(...)** 277136	**DILM25-10(...)** 277129	**DILM25-10(RDC24)** 277146
	25	11	40	1 B	DILA-XHI(V)..	**DILM25-01(...)** 277164	**DILM25-01(...)** 277168	**DILM25-01(...)** 277161	**DILM25-01(RDC24)** 277178
	32	15	40	1 M	DILM32-XHI.. DILA-XHI(V)..	**DILM32-10(...)** 277260	**DILM32-10(...)** 277264	**DILM32-10(...)** 277257	**DILM32-10(RDC24)** 277274
	32	15	40	1 B	DILA-XHI(V)..	**DILM32-01(...)** 277292	**DILM32-01(...)** 277296	**DILM32-01(...)** 277289	**DILM32-01(RDC24)** 277306
	40	18.5	50	–	DILM150-XHI(V).. DILM1000-XHI(V)..	**DILM40(...)** 277766	**DILM40(...)** 277770	**DILM40(...)** 277763	**DILM40(RDC24)** 277780
	50	22	60	–		**DILM50(...)** 277830	**DILM50(...)** 277834	**DILM50(...)** 277827	**DILM50(RDC24)** 277844
	65	30	72	–		**DILM65(...)** 277894	**DILM65(...)** 277898	**DILM65(...)** 277891	**DILM65(RDC24)** 277908
	80	37	110	–		**DILM80(...)** 239402	**DILM80(...)** 239406	**DILM80(...)** 239399	**DILM80(RDC24)** 239416
	95	45		–		**DILM95(...)** 239480	**DILM95(...)** 239484	**DILM95(...)** 239477	**DILM95(RDC24)** 239510
	115	55	160	–		**DILM115(RAC240)** 239548	**DILM115(RAC24)** 239545	**DILM115(RAC120)** 239547	**DILM115(RDC24)** 239555
	150	75		–		**DILM150(RAC240)** 239588	**DILM150(RAC24)** 239585	**DILM150(RAC120)** 239587	**DILM150(RDC24)** 239591

The listed auxiliary and main contacts up to 12 A are available with springloaded terminals.
The auxiliary contact modules listed for the DILA contactor relay can also be used for the DILM contactors up to 32 A.
Auxiliary contact members: DILA-XHI to EN 50005, DILM32-XHI to DIN 50012
The 2- and 4-pole DILM32-XHI... auxiliary contact modules can not be combined with DILM...-01 contactors.

Auxiliary contact modules[2)]

		$I_{th} = I_e$ open A	Contacts M = Make B = Break M_E = Early-make contacts B_L = Late-break contacts		Can be combined with basic units	Type	Article no.
	2-pole	10	1 M	1 B	DILM7-10... DILM9-10... DILM12-10... DILM15-10... DILM17-10... DILM25-10... DILM32-10...	**DILM32-XHI11**	**277376**
			–	2 B		**DILM32-XHI02**	**277375**
	4-pole		2 M	2 B		**DILM32-XHI22**	**277377**
	2-pole		2 M	–	DILM7... DILM9... DILM12... DILM15... DILM17... DILM25... DILM32...	**DILA-XHI20**	**276422**
			1 M	1 B		**DILA-XHI11**	**276421**
			–	2 B		**DILA-XHI02**	**276420**
			1 M_E	1 B_L		**DILA-XHIV11**	**276423**
	4-pole		4 M	–		**DILA-XHI40**	**276428**
			3 M	1 B		**DILA-XHI31**	**276427**
			2 M	2 B		**DILA-XHI22**	**276426**
			1 M	3 B		**DILA-XHI13**	**276425**
			–	4 B		**DILA-XHI04**	**276424**
			1 M, 1 M_E	1 B, 1 B_L		**DILA-XHIV22**	**276429**
	2-pole	10	2 M	–	DILM40... DILM50... DILM65... DILM80... DILM95... DILM115... DILM150...	**DILM150-XHI20**	**277945**
			1 M	1 B		**DILM150-XHI11**	**277946**
			–	2 B		**DILM150-XHI02**	**277947**
	4-pole		4 M	–		**DILM150-XHI40**	**277948**
			3 M	1 B		**DILM150-XHI31**	**277949**
			2 M	2 B		**DILM150-XHI22**	**277950**
			1 M	3 B		**DILM150-XHI13**	**277951**
			–	4 B		**DILM150-XHI04**	**277952**
			1 M, 1 M_E	1 B, 1 B_L		**DILM150-XHIV22**	**277953**
–	2-pole		1 M	1 B		**DILM1000-XHI11-SI**	**278425**
			1 M	1 B		**DILM150-XHIA11[1)]**	**283463**

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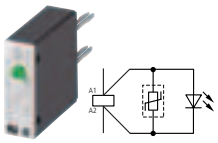
The auxiliary contact modules listed for the DILA contactor relay can also be used for the DILM contactors up to 32 A.
Auxiliary contact members: DILA-XHI to EN 50005, DILM32-XHI to DIN 50012
The 2- and 4-pole DILM32-XHI... auxiliary contact modules can not be combined with DILM...-01 contactors.

[1)] NEW: Also available as 4-pole version DILM150-XHIA22 with terminal markings 53/54, 61/62, 71/72 and 83/84 (Article no. 283464) in order to avoid duplication of terminal markings on combinations with auxiliary contact on the side.

[2)] The following applies for all auxiliary contact modules: I_e=3 A for AC-15 at 380 V, 400 V, 415 V

Accessories

	U_s V AC	For use with	Type	Article no.	Notes
Suppressor Varistor suppressor 	24 – 48	DILM7 – DILM15 DILMP20 DILA	**DILM12-XSPV48**	**281208**	For AC operated contactors, 50-60 Hz, DC operated contactors have an integrated suppressor Note drop-out delay
	48 – 130		**DILM12-XSPV130**	**281209**	
	130 – 240		**DILM12-XSPV240**	**281210**	
	240 – 500		**DILM12-XSPV500**	**281211**	
	24 – 48	DILM17 – DILM32	**DILM32-XSPV48**	**281212**	
	48 – 130		**DILM32-XSPV130**	**281213**	
	130 – 240		**DILM32-XSPV240**	**281214**	
	240 – 500		**DILM32-XSPV500**	**281215**	
	24 – 48	DILM40 – DILM95	**DILM95-XSPV48**	**281216**	
	48 – 130		**DILM95-XSPV130**	**281217**	
	130 – 240		**DILM95-XSPV240**	**281218**	
	240 – 500		**DILM95-XSPV500**	**281219**	
Varistor suppressors with built-in LED 	24 – 48	DILM7 – DILM15 DILMP20 DILA	**DILM12-XSPVL48**	**281220**	For AC operated contactors, 50-60 Hz, DC operated contactors have an integrated suppressor Note drop-out delay
	130 – 240		**DILM12-XSPVL240**	**281221**	
	24 – 48	DILM17 – DILM32	**DILM32-XSPVL48**	**281222**	
	130 – 240		**DILM32-XSPVL240**	**281223**	
	24 – 48	DILM40 – DILM95	**DILM95-XSPVL48**	**281224**	
	130 – 240		**DILM95-XSPVL240**	**281225**	
RC suppressor 	24 – 48	DILM7 – DILM15 DILMP20 DILA	**DILM12-XSPR48**	**281199**	For AC operated contactors, 50-60 Hz, DC operated contactors have an integrated suppressor Note drop-out delay
	130 – 240		**DILM12-XSPR240**	**281200**	
	240 – 500		**DILM12-XSPR500**	**281201**	
	24 – 48	DILM17 – DILM32	**DILM32-XSPR48**	**281202**	
	110 – 240		**DILM32-XSPR240**	**281203**	
	240 – 500		**DILM32-XSPR500**	**281204**	
	24 – 48	DILM40 – DILM95	**DILM95-XSPR48**	**281205**	
	110 – 240		**DILM95-XSPR240**	**281206**	
	240 – 500		**DILM95-XSPR500**	**281207**	
Voltage indicator 	24 – 48	DILM7-DILM15 DILMP20 DILA	**DILM12-XSPI48**	**285251**	
	48 – 130		**DILM12-XSPI130**	**285252**	
	130 – 250		**DILM12-XSPI250**	**285253**	
	24 – 48	DILM17-DILM32	**DILM32-XSPI48**	**285254**	
	48 – 130		**DILM32-XSPI130**	**285255**	
	130 – 250		**DILM32-XSPI250**	**285256**	
	24 – 48	DILM40-DILM150	**DILM150-XSPI48**	**285257**	
	48 – 130		**DILM150-XSPI130**	**285258**	
	130 – 250		**DILM150-XSPI250**	**285259**	
Connector For the mechanical connection of contactors to groups of components 		DILM7 – DILM65 DILA	**DILM32-XVB**	**281227**	0 mm distance between contactors
		DILM80 – DILM150	**DILM150-XVB**	**281226**	
Mechanical interlock  		DILM7 – DILM15 DILMP20 DILA	**DILM12-XMV**	**281196**	For two contactors with AC or DC operation, distance between contactors 0 mm, mechanical lifespan 2.5 X 10^6 switching operations, additional auxiliary contact modules can be fitted
		DILM17 – DILM32	**DILM32-XMV**	**281197**	
		DILM40 – DILM65	**DILM65-XMV**	**281198**	
		DILM80 – DILM150	**DILM150-XMV**	**240081**	

Technical data

					DILM7	DILM9	DILM12	DILM15
General								
Lifespan, mechanical								
AC operated			Operations	× 10^6	10	10	10	10
DC operated			Operations	× 10^6	10	10	10	10
Ambient temperature		open		°C	–25/60	–25/60	–25/60	–25/60
Mechanical shock resistance (IEC/EN 60068-2-27)								
Half-sinusoidal shock	Main contacts	Make contact		g	10	10	10	10
	Auxiliary contacts	Make contact		g	7	7	7	7
		Break contact		g	5	5	5	5
Weight	AC operated			kg	0.23	0.23	0.23	0.23
	DC operated			kg	0.28	0.28	0.28	0.28
Terminal capacity, main contacts								
Solid				mm^2	1 × (0.75 – 4) 2 × (0.75 – 2.5)			
Flexible with ferrule				mm^2	1 × (0.75 – 4) 2 × (0.75 – 2.5)			
Stranded				mm^2	–	–	–	–
Solid or stranded				AWG	18 – 14	18 – 14	18 – 14	18 – 14
Flat conductor			Number of layers × width × thickness	mm	–	–	–	–
Terminal capacity, auxiliary contacts								
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)			
Solid or stranded				AWG	18 – 14	18 – 14	18 – 14	18 – 14
Main contacts								
Rated insulation voltage			U_i	V AC	690	690	690	690
Rated operational voltage			U_e	V AC	690	690	690	690
Making capacity (cos φ to IEC/EN 60947) to 690 V				A	108	108	144	155
Breaking capacity		220/230 V		A	70	90	120	124
		380/400 V		A	70	90	120	124
		500 V		A	50	70	100	100
		660/690 V		A	40	50	70	70
		1000 V		A	–	–	–	–
Component lifespan		AC-3	Operations	× 10^6	1.3	1.3	1.3	0.75
		AC-4	Operations	× 10^6	0.2	0.2	0.2	0.2

Technical data

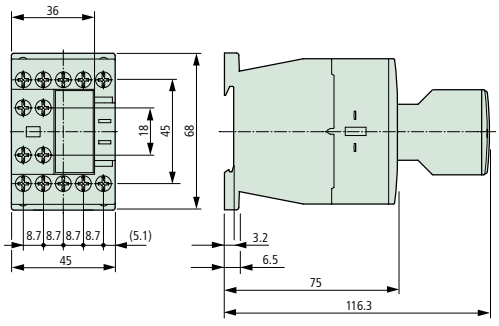
DILM17	DILM25	DILM32	DILM40	DILM50	DILM65	DILM80	DILM95	DILM115	DILM150
10	10	10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10	10	10
–25/60	–25/60	–25/60	–25/60	–25/60	–25/60	–25/60	–25/60	–25/60	–25/60
10	10	10	10	10	10	10	10	10	10
7	7	7	7	7	7	7	7	7	7
5	5	5	5	5	5	5	5	5	5
0.4	0.4	0.4	0.9	0.9	0.9	2	2	2	2
0.4	0.4	0.4	0.9	0.9	0.9	2.1	2.1	2.1	2.1
	1 × (0.75 – 16) 2 × (0.75 – 10)			1 × (2.5 – 16) 2 × (2.5 – 16)		–			
	1 × (0.75 – 16) 2 × (0.75 – 10)			1 × (2.5 – 35) 2 × (2.5 – 25)		1 × (4 – 70) 2 × (4 – 50)		1 × (10 – 95) 2 × (10 – 70)	
	1 × 16			1 × (16 – 50) 2 × (16 – 35)		1 × (16 – 95) 2 × (16 – 70)		1 × (16 – 120) 2 × (16 – 95)	
14 – 6	14 – 6	14 – 6	12 – 2	12 – 2	12 – 2	10 – 4/0	10 – 4/0	8 – 250 MCM	8 – 250 MCM
–	–	–		2 × (6 × 9 × 0.8)			2 × (6 × 16 × 0.8)		
			1 × (0.75 – 4) 2 × (0.75 – 2.5)				1 × (0.75 – 4) 2 × (0.75 – 4)		
			1 × (0.75 – 2.5) 2 × (0.75 – 2.5)				1 × (0.75 – 2.5) 2 × (0.75 – 2.5)		
18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14
690	690	690	690	690	690	1000	1000	1000	1000
690	690	690	690	690	690	1000	1000	1000	1000
238	350	448	560	700	910	1120	1330	1610	2100
170	250	320	400	500	650	800	950	1150	1500
170	250	320	400	500	650	800	950	1150	1500
170	250	320	400	500	650	800	950	1150	1500
120	150	180	250	320	370	650	800	1100	1320
–	–	–	–	–	–	320	370	450	550
1.3	1.3	1.3	1.3	1.3	1.3	0.4	0.4	0.4	0.4
0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1

Technical data

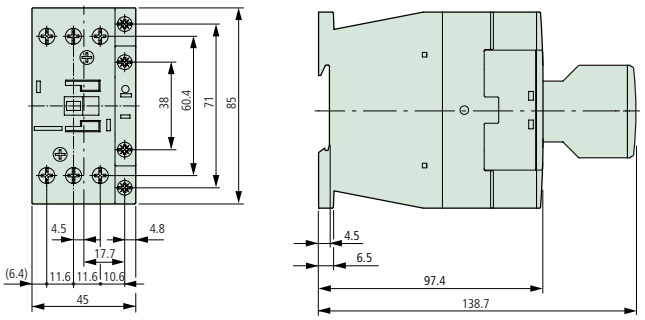
					DILM7	DILM9	DILM12	DILM15
AC								
AC-1 actuation								
Conventional free air thermal Current 3-pole 50 – 60 Hz	Open	at 40 °C		A	22	22	22	22
		at 60 °C		A	20	20	20	20
AC actuation								
Rated operational current, AC-3 open, 50 – 60 Hz, 3-pole		220/230 V	I_e	A	7	9	12	15.5
		380/400 V	I_e	A	7	9	12	15.5
		500 V	I_e	A	5	7	10	12.5
		660/690 V	I_e	A	4	5	7	8.5
Motor rating		220/230 V	P	kW	2.2	2.5	3.5	4
		380/400 V	P	kW	3	4	5.5	7.5
		500 V	P	kW	3.5	4.5	7	7.5
		660/690 V	P	kW	3.5	4.5	6.5	7
Magnet systems								
Pick-up and drop-out values								
AC operated			Pick-up	× U_c	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
DC operated			Pick-up	× U_c	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
Coil consumption from cold and 1.0 × U_c								
AC operated	50 Hz coil 60 Hz coil		Pick-up	VA	24 29	24 29	24 29	24 29
				W	19 23	19 23	19 23	19 23
			Sealing	VA	4.0 4.4	4.0 4.4	4.0 4.4	4.0 4.4
				W	1.2 1.3	1.2 1.3	1.2 1.3	1.2 1.3
DC operated			Pick-up	W	3	3	4.5	4.5
			Sealing	W	3	3	4.5	4.5

Dimensions

DILM7 – DILM15, DILA with auxiliary contact module



DILM17 – DILM32 basic unit with auxiliary contact module

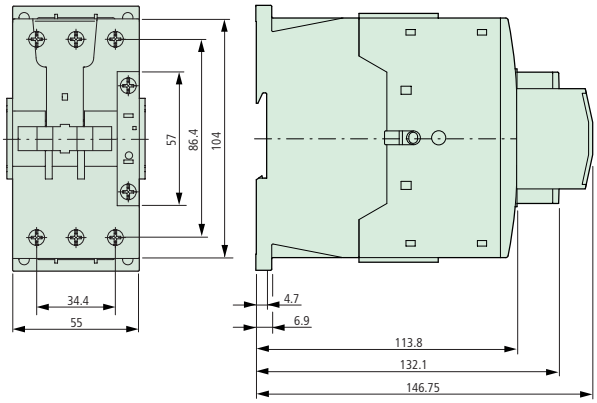


Technical data

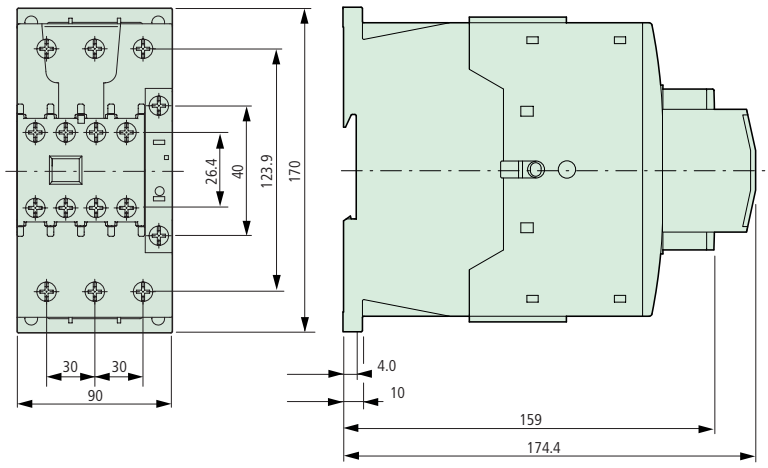
DILM17	DILM25	DILM32	DILM40	DILM50	DILM65	DILM80	DILM95	DILM115	DILM150
40	45	45	60	70	85	130	130	190	190
35	36	36	50	60	72	110	110	160	160
18	25	32	40	50	65	80	95	115	150
18	25	32	40	50	65	80	95	115	150
18	25	32	40	50	65	80	95	115	150
12	15	18	25	32	37	65	80	110	132
5	7.5	10	12.5	15.5	20	25	30	37	48
7.5	11	15	18.5	22	30	37	45	55	75
12	17.5	23	28	36	47	58	70	85	110
11	14	17	23	30	35	63	75	105	125
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 – 1.1	0.8 – 1.1
0.7 – 1.2	0.7 – 1.2	0.7 – 1.2	0.7 – 1.2	0.7 – 1.2	0.7 – 1.2	0.7 – 1.2	0.7 – 1.2	0.7 – 1.2	0.7 – 1.2
50 62	50 62	50 62	150 185	150 185	150 185	310 375	310 375	130 130	130 130
40 50	40 50	40 50	95 120	95 120	95 120	165 190	165 190	130 130	130 130
8.0 9.1	8.0 9.1	8.0 9.1	16.0 19.0	16.0 19.0	16.0 19.0	26.0 31.0	26.0 31.0	3.5 3.5	3.5 3.5
2.4 2.7	2.4 2.7	2.4 2.7	4.0 4.6	4.0 4.6	4.0 4.6	5.5 6.8	5.5 6.8	2.0 2.0	2.0 2.0
12 at 24 V	12 at 24 V	12 at 24 V	24 at 24 V	24 at 24 V	24 at 24 V	90 at 24 V	90 at 24 V	130 at 24 V	130 at 24 V
0.5 at 24 V	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V	0.5 at 24 V	2 at 24 V	2 at 24 V	2 at 24 V	2 at 24 V

Dimensions

DILM40 – DILM65 basic unit with auxiliary contact module



DILM80 – DILM150 basic unit with auxiliary contact module



DILA contactor relays

	Contacts		AC-15 380 V 400 V 415 V		Can be combined with auxiliary contact	**AC operation**			**DC operation**
						Type Article no.	**Type** Article no.	**Type** Article no.	
	M = Make B = Break		I_e A	I_{th} A		230 V 50 Hz 240 V 60 Hz	24 V 50/60 Hz	110 V 50 Hz 120 V 60 Hz	24 V DC
Basic units with interlocked opposing contacts	4 M	–	4	10	DILA-XHI(V)...	**DILA-40(...)** 276329	**DILA-40(...)** 276333	**DILA-40(...)** 276326	**DILA-40(...)** 276344
	3 M	1 B	4	10	DILA-XHI(V)...	**DILA-31(...)** 276364	**DILA-31(...)** 276368	**DILA-31(...)** 276361	**DILA-31(...)** 276379
	2 M	2 B	4	10	DILA-XHI(V)...	**DILA-22(...)** 276399	**DILA-22(...)** 276403	**DILA-22(...)** 276396	**DILA-22(...)** 276414

The listed auxiliary and main contacts up to 12 A are available with springloaded terminals.
The auxiliary contact modules listed for the DILA contactor relay can also be used for the DILM contactors up to 32 A.
Auxiliary contact members: DILA-XHI to EN 50005, DILM32-XHI to DIN 50012
The DILA-22 contactor relay can not be combined with the 4-pole auxiliary contact module.

DILA auxiliary contact modules

	Contacts		Rated operating current AC-15 380 V 400 V 415 V	Conventional current, open at 60 °C	Can be combined with basic unit	**Type** Article no.
	M = Make contact, B = Break contact M_E = Early-make contacts B_L = Late-break contacts		I_e A	I_{th} A		
2-pole	–	2 B	3	10	DILA... DILM7... DILM9... DILM12... DILM15... DILM17... DILM25... DILM32...	**DILA-XHI02** 276420
	1 M	1 B				**DILA-XHI11** 276421
	2 M	–				**DILA-XHI20** 276422
	1 M_E	1 B_L				**DILA-XHIV11** 276423
4-pole	–	4 B			DILA-40... DILA-31... DILM7... DILM9... DILM12... DILM15... DILM17... DILM25... DILM32...	**DILA-XHI04** 276424
	1 M	3 B				**DILA-XHI13** 276425
	2 M	2 B				**DILA-XHI22** 276426
	3 M	1 B				**DILA-XHI31** 276427
	4 M	–				**DILA-XHI40** 276428
	1 M, 1 M_E	1 B, 1 B_L				**DILA-XHIV22** 276429

→ Dimensions Page 18

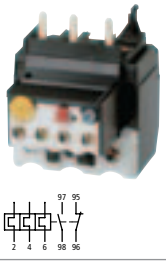
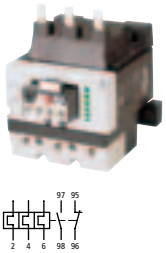
Technical data

				DILA	DILA-XHI...
General					
Lifespan, mechanical					
AC operated		Operations	× 10^6	20	20
DC operated		Operations	× 10^6	20	20
Ambient temperature					
open			°C	–25/60	–25/60
Weight					
AC operated			kg	0.19	
DC operated			kg	0.19	
Terminal capacity					
Screw terminals					
	Solid		mm^2	1 × (0.75 – 4)	
				2 × (0.75 – 2.5)	
	Flexible with ferrule		mm^2	1 × (0.75 – 2.5)	
				2 × (0.75 – 2.5)	
	Solid or stranded		AWG	18 – 14	
Contacts					
Rated insulation voltage		U_i	V AC	690	690
Rated operational voltage		U_e	V AC	690	500
Rated operational current					
AC-15	220/240 V	I_e	A	6	6
	380/415 V	I_e	A	4	3
	500 V	I_e	A	1.5	–
DC-13 [1]	DC-13 L/R ≦ 15 ms				
	Contacts in series:				
	1	24 V	A	–	–
Fault frequency at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA		Fault rate	H_F	< 10^{-8}, < 1 failure to 100 million switching operations	
Magnet systems					
Pick-up and drop-out values					
AC operated					
	50 Hz single-voltage coil and 50/60 Hz dual-voltage coil	Pick-up	× U_s	0.8 – 1.1	–
	Dual-frequency coil 50/60 Hz	Pick-up	× U_s	0.8 – 1.1	–
DC operated [2]					
	Pick-up voltage	Pick-up	× U_s	0.8 – 1.1	–
	Without auxiliary contact module (40 °C)	Pick-up	× U_c	0.7 – 1.3	–
Power consumption					
50 Hz single-voltage coil and 50/60 Hz dual-voltage coil		Pick-up	VA	24	–
		Pick-up	W	19	–
50 Hz single-voltage coil and 50/60 Hz dual-voltage coil		Sealing	VA	4	–
		Sealing	W	1.2	–
DC operated		Pick-up = Sealing	W	3	–

Notes

[1] Making and breaking currents to DC-13 time constant as stated
[2] Smoothed DC or three-phase bridge rectifier

ZB overload relays

	Overload release setting range I_r A	For use with	Short-circuit protection Coordination type gG/gL A "1"	"2"	Type	Article no.	
ZB12 overload relays Single-phasing sensitivity to IEC/EN 60947, VDE 0660 Part 102 Direct fitting 	0.1 – 0.16	DILM7, DILM9, DILM12, DIULM7, DIULM9, DIULM12, SDAINLM12, SDAINLM16, SDAINLM22	25	0.5	**ZB12-0,16**	**278431**	Overload release: tripping class 10 A Short-circuit protection: when fitting directly, note maximum admissible fuse for the contactor. Suitable for the protection of EEx e-motors. EU prototype test certificate available on request.
	0.16 – 0.24			1	**ZB12-0,24**	**278432**	
	0.24 – 0.4			2	**ZB12-0,4**	**278433**	
	0.4 – 0.6			4	**ZB12-0,6**	**278434**	
	0.6 – 1			4	**ZB12-1,0**	**278435**	
	1 – 1.6			6	**ZB12-1,6**	**278436**	
	1.6 – 2.4			10	**ZB12-2,4**	**278437**	
	2.4 – 4			16	**ZB12-4**	**278438**	
	4 – 6			20	**ZB12-6**	**278439**	
	6 – 10		50	25	**ZB12-10**	**278440**	
	9 – 12				**ZB12-12**	**278441**	
	12 – 16				**ZB12-16**	**290168**	
ZB32 overload relays Single-phasing sensitivity to IEC/EN 60947, VDE 0660 Part 102 Direct fitting 	0.1 – 0.16	DILM17, DILM25, DILM32, DIULM17, DIULM25, DIULM32 SDAINLM30, SDAINLM45, SDAINLM55	25	0.5	**ZB32-0,16**	**278442**	Overload release: tripping class 10 A Short-circuit protection: when fitting directly, note maximum admissible fuse for the contactor. Suitable for the protection of EEx e-motors. EU prototype test certificate available on request.
	0.16 – 0.24			1	**ZB32-0,24**	**278443**	
	0.24 – 0.4			2	**ZB32-0,4**	**278444**	
	0.4 – 0.6			4	**ZB32-0,6**	**278445**	
	0.6 – 1			4	**ZB32-1,0**	**278446**	
	1 – 1.6			6	**ZB32-1,6**	**278447**	
	1.6 – 2.4			10	**ZB32-2,4**	**278448**	
	2.4 – 4			16	**ZB32-4**	**278449**	
	4 – 6			20	**ZB32-6**	**278450**	
	6 – 10		50	25	**ZB32-10**	**278451**	
	10 – 16		63	35	**ZB32-16**	**278452**	
	16 – 24		100	35	**ZB32-24**	**278453**	
	24 – 32		125	63	**ZB32-32**	**278454**	
ZB65 overload relays Single-phasing sensitivity to IEC/EN 60947, VDE 0660 Part 102 Direct fitting 	6 – 10	DILM40, DILM50, DILM65, DIULM40, DIULM50, DIULM65 SDAINLM70, SDAINLM90, SDAINLM115	50	25	**ZB65-10**	**278455**	Overload release: tripping class 10 A Short-circuit protection: when fitting directly, note maximum admissible fuse for the contactor. Suitable for the protection of EEx e-motors. EU prototype test certificate available on request.
	10 – 16		63	35	**ZB65-16**	**278456**	
	16 – 24		63	50	**ZB65-24**	**278457**	
	24 – 40		125	63	**ZB65-40**	**278458**	
	40 – 57		160	80	**ZB65-57**	**278459**	
	50 – 65		160	100	**ZB65-65**	**278460**	
ZB150 overload relays Single-phasing sensitivity to IEC/EN 60947, VDE 0660 Part 102 Direct fitting 	25-35	DILM80, DILM95, DILM115, DILM150, DIULM80, DIULM95, DIULM115, DIULM150, SDAINLM140, SDAINLM165, SDAINLM200, SDAINLM260	125	100	**ZB150-35**	**278461**	Overload release: tripping class 10 A Short-circuit protection: when fitting directly, note maximum admissible fuse for the contactor. Suitable for the protection of EEx e-motors. EU prototype test certificate available on request.
	35-50		160	125	**ZB150-50**	**278462**	
	50-70		250	160	**ZB150-70**	**278463**	
	70-100		315	200	**ZB150-100**	**278464**	
	95-125		315	250	**ZB150-125**	**278465**	
	120-142		315	250	**ZB150-150**	**278466**	

Overload relay technical data

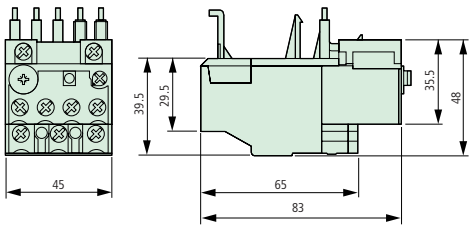
				ZB12, ZB32	ZB65	ZB150
General						
Standards and regulations				IEC/EN 60947, VDE 0660, UL, CSA		
Ambient temperature						
open[1]			°C	–25/50	–25/50	–25/50
enclosed[1]			°C	–25/40	–25/40	–25/40
Main contacts						
Rated operational voltage			U_e	V AC	690 690	1000
Terminal capacity						
Solid			mm²	2 × (1 – 6)	2 × (1 – 16)	16
Flexible without ferrule			mm²	–	–	70
Flexible with ferrule			mm²	2 × (1 – 4)	1 × 25	70
				2 × (1 – 6)[2]	2 × (1 – 10)[3]	
Solid or stranded			AWG	14 – 8	14 – 2	2/0
Auxiliary circuits and control circuits						
Conventional free air thermal current		I_{th}	A	6	6	6
Rated operational current						
AC-15						
	Make contact	240 V	I_e	A	1.5	1.5	1.5
		415 V	I_e	A	0.5	0.5	0.5
		500 V	I_e	A	0.5	0.5	0.5
	Break contact	240 V	I_e	A	1.5	1.5	1.5
		415 V	I_e	A	0.9	0.9	0.9
		500 V	I_e	A	0.8	0.8	0.8
DC-13 L/R ≦ 15 ms[4]						
		24 V	I_e	A	0.9	0.9	0.9
		60 V	I_e	A	0.75	0.75	0.75
		110 V	I_e	A	0.4	0.4	0.4
		220 V	I_e	A	0.2	0.2	0.2

Notes

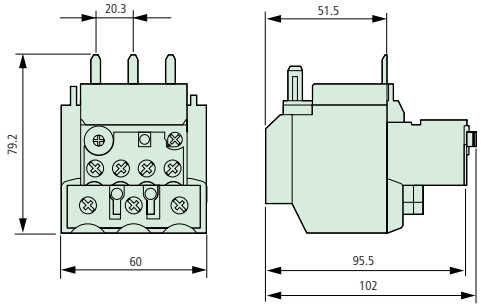
[1] Ambient temperature: operating range to IEC/EN 60947, PTB: –5 °C to +50 °C
[2] 6 mm² flexible with ferrule to DIN 46228
[3] Terminal capacity of main contacts solid and flexible with ferrule: when using 2 conductor of equal cross-section
[4] Rated operational current: making and breaking currents to DC-13, time constant as stated

Dimensions

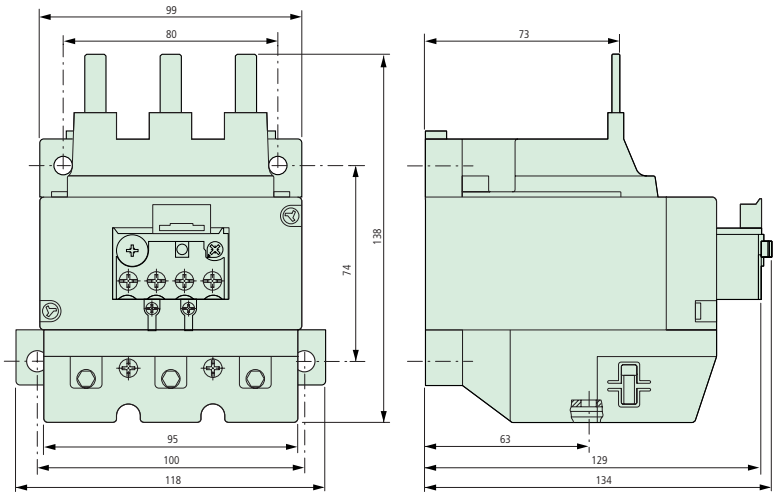
ZB12/ZB32



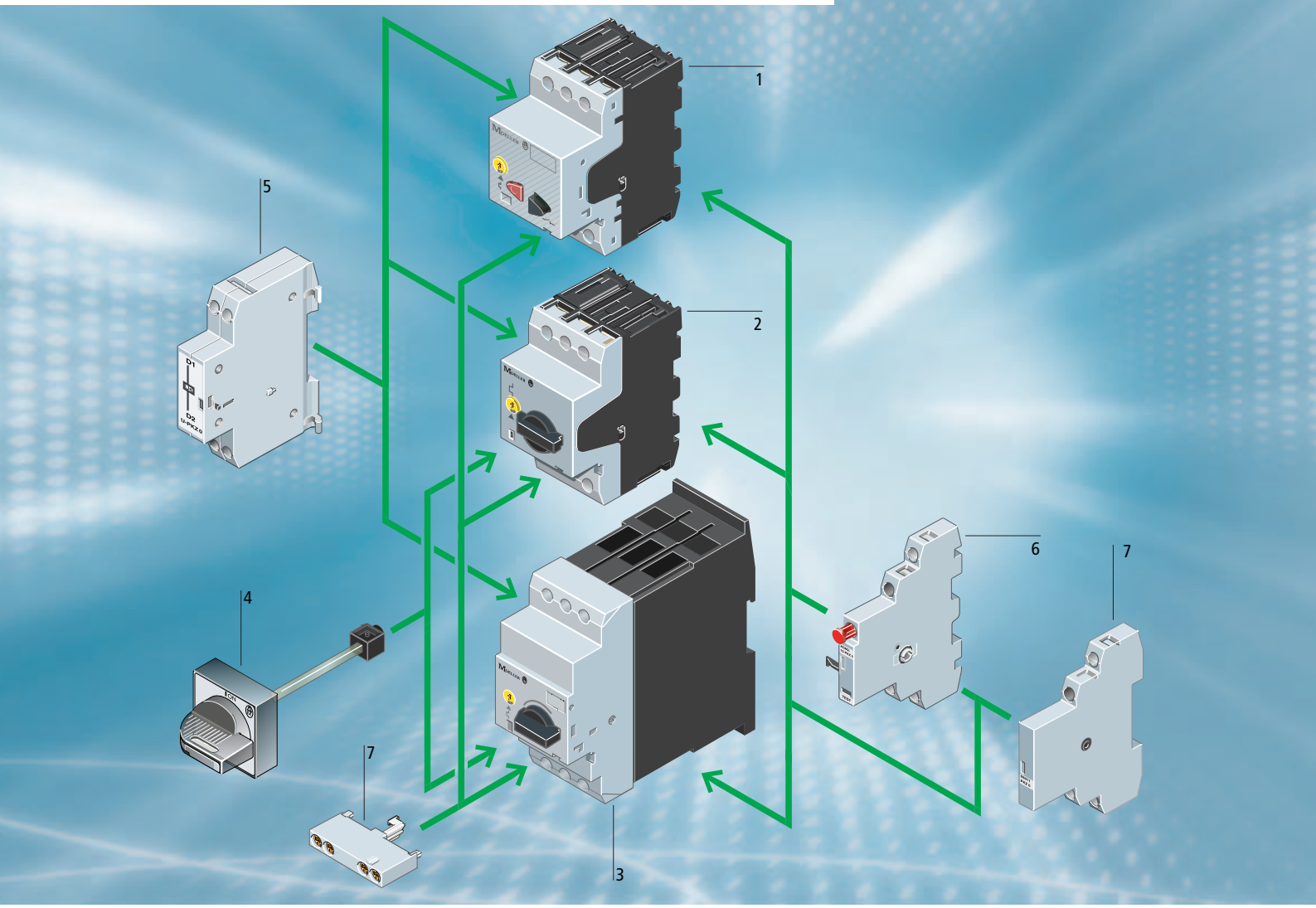
ZB65



ZB150



PKZ
motor-protective circuit-breaker



1. PKZM01 motor-protective circuit-breaker
2. PKZM0 motor-protective circuit-breaker
3. PKZM4 motor-protective circuit-breaker
4. Door coupling rotary handle IP65
5. Voltage release
6. Trip-indicating auxiliary contact
7. Auxiliary contacts

PKZM0, PKZM4 motor-protective circuit-breakers

	Max. motor rating	Rated uninterrupted current	Setting range		Screw terminals
	AC-3		Overload releases	Short-circuit release	**Type**
	380 V 400 V 415 V	I_u	I_r	I_{rm}	Article no.
	P	A	A	A	
	kW				
Motor-protective circuit-breakers, coordination type "1" and "2"	–	0.16	0.1 – 0.16	2.2	**PKZM0-0,16** 072730
	0.06	0.25	0.16 – 0.25	3.5	**PKZM0-0,25** 072731
	0.09	0.4	0.25 – 0.4	5.6	**PKZM0-0,4** 072732
	0.12	0.63	0.4 – 0.63	8.8	**PKZM0-0,63** 072733
	0.25	1	0.63 – 1	14	**PKZM0-1** 072734
	0.55	1.6	1 – 1.6	22	**PKZM0-1,6** 072735
	0.75	2.5	1.6 – 2.5	35	**PKZM0-2,5** 072736
	1.5	4	2.5 – 4	56	**PKZM0-4** 072737
	2.2	6.3	4 – 6.3	88	**PKZM0-6,3** 072738
	4	10	6.3 – 10	140	**PKZM0-10** 072739
	5.5	12	9 – 12	168	**PKZM0-12** 278486
	7.5	16	10 – 16	224	**PKZM0-16** 046938
	9	20	16 – 20	280	**PKZM0-20** 046988
	12.5	25	20 – 25	350	**PKZM0-25** 046989
	15	32	25 – 32	448	**PKZM0-32** 278489
Motor-protective circuit-breaker, coordination type "1" and "2"	7.5	16	10 – 16	224	**PKZM4-16** 222350
	12.5	25	16 – 25	350	**PKZM4-25** 222352
	15	32	25 – 32	448	**PKZM4-32** 222353
	20	40	32 – 40	560	**PKZM4-40** 222354
	25	50	40 – 50	700	**PKZM4-50** 222355
	30	58	50 – 58	812	**PKZM4-58** 222394
	34	65	55 – 65	882	**PKZM4-63** 222413





Note Three-phase motors (approximate values for squirrel-cage rotors)

PKZM01 motor-protective circuit-breaker

	Max. motor rating AC-3 380 V 400 V 415 V *P* kW	Rated uninterrupted current I_u A	Setting range Overload releases I_r A	Short-circuit releases I_{rm} A	Screw terminals **Type** Article no.
Motor-protective circuit-breakers, coordination type "1" and "2"	–	0.16	0.1 – 0.16	2.2	**PKZM01-0,16** 278475
	0.06	0.25	0.16 – 0.25	3.5	**PKZM01-0,25** 278476
	0.09	0.4	0.25 – 0.4	5.6	**PKZM01-0,4** 278477
	0.12	0.63	0.4 – 0.63	8.8	**PKZM01-0,63** 278478
	0.25	1	0.63 – 1	14	**PKZM01-1** 278479
	0.55	1.6	1 – 1.6	22	**PKZM01-1,6** 278480
	0.75	2.5	1.6 – 2.5	35	**PKZM01-2,5** 278481
	1.5	4	2.5 – 4	56	**PKZM01-4** 278482
	2.2	6.3	4 – 6.3	88	**PKZM01-6,3** 278483
	4	10	6.3 – 10	140	**PKZM01-10** 278484
	5.5	12	8 – 12	168	**PKZM01-12** 278485
	7.5	16	10 – 16	224	**PKZM01-16** 283390

Note Three-phase motors (approximate values for squirrel-cage rotors)

Insulated enclosures

		Protection type	For use with	**Type** Article no.
Insulated enclosures for surface mounting	–	IP40 NEMA Type 1	PKZM01+NHI-E or VHI-PKZ01+U or A or NHI+L (2 off)	**CI-PKZ01** 281403
	With actuating diaphragm	IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A or NHI+L (2 off)	**CI-PKZ01-G** 281404
	Lockable in the Off position	IP65 NEMA 4X	PKZM01+NHI-E+U or A (undervoltage or shunt release)+L (2 off)	**CI-PKZ01-SVB** 281405
	Lockable in the Off position, in conjunction with VHI-PKZ01	IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	**CI-PKZ01-SVB-V** 281944
	With stay-put Emergency-Stop mushroom button	IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	**CI-PKZ01-PVT** 281406
	With key-release Emergency-Stop mushroom button	IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	**CI-PKZ01-PVS** 281407
Insulated enclosures for flush mounting	–	Front IP40 NEMA Type 1	PKZM01+NHI-E orVHI-PKZ01+U or A or NHI+L (2 off)	**E-PKZ01** 281633
	With actuating diaphragm	Front IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A or NHI+L (2 off)	**E-PKZ01-G** 281634
	Lockable in the Off position	Front IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	**E-PKZ01-SVB** 281635
	Lockable in the Off position, in conjunction with VHI-PKZ01	Front IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	**E-PKZ01-SVB-V** 281943
	With stay-put Emergency-Stop mushroom button	Front IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	**E-PKZ01-PVT** 281636
	With key-release Emergency-Stop mushroom button	Front IP65 NEMA 4X	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	**E-PKZ01-PVS** 281637

Accessories

	Contacts M = Make	Contacts B = Break	Type of current AC/DC	For use with	**Type** Article no. when ordered separately
Trip-indicating auxiliary contact 	2 × 1 M	–	–	PKZM0 PKZM4 PKZM01	**AGM2-10-PKZ0** 072898
	–	2 × 1 B	–		**AGM2-01-PKZ0** 072899
Early-make auxiliary contacts 	2 M	–	–	PKZM0	**VHI20-PKZ0** 203595
–	2 M	–	–	PKZM01	**VHI20-PKZ01** 278495
Shunt release 	–	–	AC operation	PKZM0 PKZM4 PKZM01	**A-PKZ0(230V50HZ)** 073187
	–	–	DC operation		**A-PKZ0(24VDC)** 073200
Undervoltage release 	–	–	AC operation	PKZM0 PKZM4 PKZM01	**U-PKZ0(230V50HZ)** 4073135
Standard auxiliary contact 	1 M	1 B	–	PKZM0 PKZM4 PKZM01	**NHI11-PKZ0** 072896
	1 M	2 B	–		**NHI12-PKZ0** 072895
	2 M	1 B	–		**NHI21-PKZ0** 072894
Standard auxiliary contact 	1 M	1 B	–		**NHI-E-11-PKZ0** 082882
	1 M	–	–		**NHI-E-10-PKZ0** 082884

Technical data basic units

			PKZM01...	PKZM0-...	PKZM4
General					
Ambient temperature					
open		°C	–25/55	–25/55	–25/55
Terminal capacity					
Solid		mm^2	1 × (1 – 6) 2 × (1 – 6)	1 × (1 – 6) 2 × (1 – 6)	1 × (1 – 50) 2 × (1 – 35)
Flexible with ferrule		mm^2	1 × (1 – 6) 2 × (1 – 6)	1 × (1 – 6) 2 × (1 – 6)	1 × (1 – 35) 2 × (1 – 35)
Solid or stranded		AWG	18 – 10	18 – 10	14 – 2
Tightening torque, terminal screws					
Main contacts		Nm	1.7	1.7	3
Auxiliary contacts		Nm	1	1	1
Main contacts					
Rated operational voltage	U_e	V AC	690	690	690
Rated uninterrupted current = rated operational current	$I_u = I_e$	A	16 or setting current of overcurrent release	32 or setting current of overcurrent release	65 open 63 enclosed or setting current of overcurrent release
Lifespan, mechanical	Operations	× 10^6	0.05	0.1	0.03
Lifespan, electric (AC-3 at 400 V)	Operations	× 10^6	0.05	0.1	0.03
Maximum operating frequency		S/h	40	40	40
Releases					
Temperature compensation					
to IEC/EN 60947, VDE 0660		°C	–5/40	–5/40	–5/40
Operating range		°C	–25/55	–25/55	–25/55
Setting range, overload release		× I_u	0.6 – 1	0.6 – 1	0.6 – 1
Short-circuit release fixed		× I_u	14	14	14
Phase-failure sensitivity			IEC/EN 60947-4-1, VDE 0660 Part 102	IEC/EN 60947-4-1, VDE 0660 Part 102	IEC/EN 60947-4-1, VDE 0660 Part 102

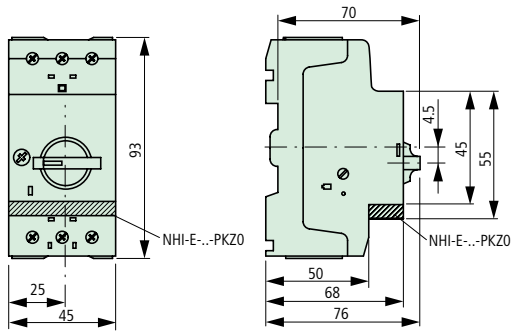
Technical data auxiliary contacts

		NHI...PKZ0	NHI-E-...PKZ0	VHI...PKZ0	AGM
Terminal capacity					
Solid or flexible 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

PKZM, dimensions

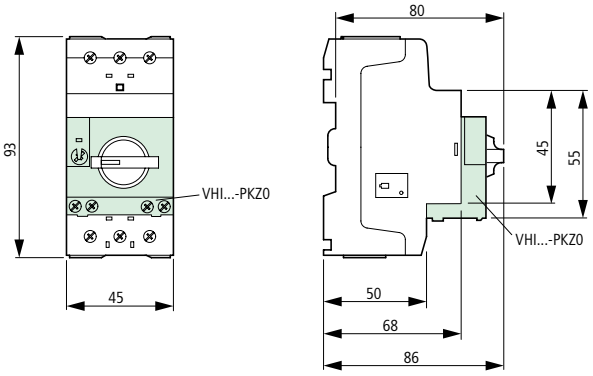
Motor-protective circuit-breakers

PKZM0-…(+NHI-E-..-PKZ0)



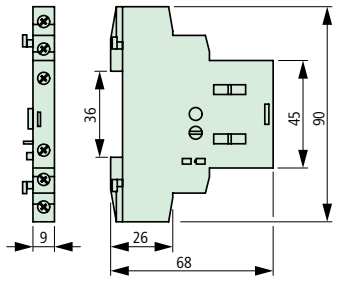
Motor-protective circuit-breaker with early-make auxiliary contact

PKZM0-…+VHI-…-PKZ0



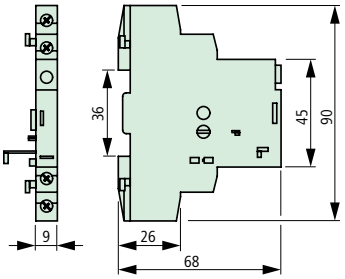
Standard auxiliary contact

NHI…-PKZ0



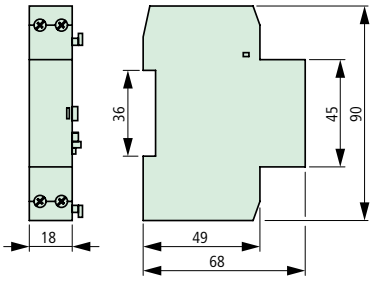
Trip-indicating auxiliary contact

AGM2-…-PKZ0



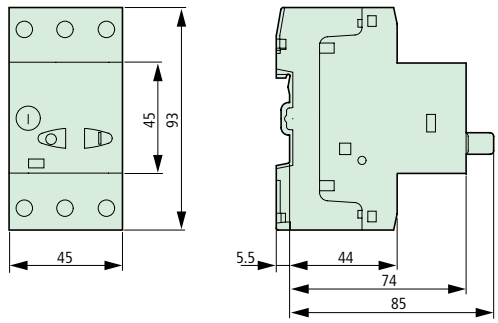
Voltage release

U/A-PKZ0



Motor-protective circuit-breakers

PKZM01



Switching capacity with coordination type "1" and "2"

PKZM0					PKZM01			
	400 V				400 V			
I_u A	I_q kA	I_{cu} kA	I_{cs} kA	A[1]	I_q kA	I_{cu} kA	I_{cs} kA	A[2]
0.16 – 1	150	150	150	N	0	50	50	50
1.6	150	150	150	N	50	50	50	50
2.5	150	150	150	N	50	50	50	50
4	150	150	150	N	50	50	50	50
6.3	150	150	150	N	50	50	50	50
10	150	150	150	N	50	50	50	50
12	50	50	10	50	50	50	10	50
16	50	50	10	50	–	–	–	–
20	50	50	10	50	–	–	–	–
25	50	50	10	50	–	–	–	–
32	50	50	10	50	–	–	–	–

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

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

2) Fuse (A gG/gL) to raise the switching capacity of the motor-protective circuit-breaker to 100 kA

N Not required

No upstream protective device necessary, since inherently protected range ((100/150 kA)

Direct-on-line starter, 400/415 V

	Motor data			Setting range		Motor starter Coordination type "1"	
						Actuating voltage 230 V 50 Hz 240 V 60 Hz	Actuating voltage 24 V DC
	AC-3 380 V 400 V 415 V	Rated operational current 400 V	Rated short-circuit current 380 – 415 V	Overload release	Short-circuit release		
	P kW	I_e A	I_q kA	I_r A	I_{rm} A	**Type** Article no.	**Type** Article no.
Complete units PKZ and DILM	0.06	0.21	150 (50)[1]	0.16 – 0.25	3.5	**MSC-D-0,25-M7 (...)** 281925	**MSC-D-0,25-M7 (...)** 283154
	0.09	0.31	150 (50)[1]	0.25 – 0.4	5.6	**MSC-D-0,4-M7 (...)** 281926	**MSC-D-0,4-M7 (...)** 283155
	0.12	0.41	150 (50)[1]	0.40 – 0.63	8.82	**MSC-D-0,63-M7 (...)** 281927	**MSC-D-0,63-M7 (...)** 283156
	0.18	0.6	150 (50)[1]	0.40 – 0.63	8.82	**MSC-D-0,63-M7 (...)** 281927	**MSC-D-0,63-M7 (...)** 283156
	0.25	0.8	150 (50)[1]	0.63 – 1	14	**MSC-D-1-M7 (...)** 281929	**MSC-D-1-M7 (...)** 283158
	0.37	1.1	150 (50)[1]	1.00 – 1.6	22.4	**MSC-D-1,6-M7 (...)** 283140	**MSC-D-1,6-M7 (...)** 283159
	0.55	1.5	150 (50)[1]	1.00 – 1.6	22.4	**MSC-D-1,6-M7 (...)** 283140	**MSC-D-1,6-M7 (...)** 283159
	0.75	1.9	150 (50)[1]	1.60 – 2.5	35	**MSC-D-2,5-M7 (...)** 283142	**MSC-D-2,5-M7 (...)** 283161
	1.1	2.6	150 (50)[1]	2.50 – 4	56	**MSC-D-4-M7 (...)** 283143	**MSC-D-4-M7 (...)** 283162
	1.5	3.6	150 (50)[1]	2.50 – 4	56	**MSC-D-4-M7 (...)** 283143	**MSC-D-4-M7 (...)** 283162
	2.2	5	150 (50)[1]	4.00 – 6.3	88.2	**MSC-D-6,3-M7 (...)** 283145	**MSC-D-6,3-M7 (...)** 283164
	3	6.6	150 (50)[1]	6.30 – 10	140	**MSC-D-10-M7 (...)** 283146	**MSC-D-10-M7 (...)** 283165
	4	8.5	150 (50)[1]	6.30 – 10	140	**MSC-D-10-M9 (...)** 283147	**MSC-D-10-M9 (...)** 283166
	5.5	11.3	50	8 – 12	168	**MSC-D-12-M12 (...)** 283148	**MSC-D-12-M12 (...)** 283167
	7.5	16 (15.5[2])	50	10 – 16	224	-	-
	7.5	16	50	10 – 16	224	**MSC-D-16-M17 (...)** 283150	**MSC-D-16-M17 (...)** 283168
	11	21.7	50	20 – 25	350	**MSC-D-25-M25 (...)** 283151	**MSC-D-25-M25 (...)** 283169
	15	29.3	50	25 – 32	448	**MSC-D-32-M32 (...)** 283152	**MSC-D-32-M32 (...)** 283170
Components PKZM4 and DILM	5.5	11.3	50	10 - 16	224	-	-
	7.5	16	50	10 - 16	224	-	-
	11	21.7	50	20 - 25	350	-	-
	15	29.3	50	25 - 32	448	-	-
	18.5	36	50	32 - 40	560	-	-
	22	41	50	40 - 50	700	-	-
	30	55	50	50 - 58	812	-	-
	34	63	50	55 - 65	910	-	-









[1] For coordination type "2" [2] IF DILM15-... is used

Direct-on-line starter, 400/415 V

Motor-protective circuit-breake	Contactor	DOL starter set	Contactor	DOL starter set
	Coordination type "1"	Mechanical connection element + Electrical contact element	Coordination type "2"	Mechanical connection element + Electrical contact element
Type Article no.	**Type**[3]	**Type** Article no.	**Type**[3]	**Type** Article no.
PKZM0-0,25 072731	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-0,4 072732	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-0,63 072733	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-0,63 072733	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-1 072734	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-1,6 072735	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-1,6 072735	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-2,5 072736	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-4 072737	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-4 072737	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-6,3 072738	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM7-...**	**PKZM0-XD M12** 283149
PKZM0-10 072739	**DILM7-...**	**PKZM0-XD M12** 283149	**DILM17-...**	**PKZM0-XD M32** 283153
PKZM0-10 072739	**DILM9-...**	**PKZM0-XD M12** 283149	**DILM17-...**	**PKZM0-XD M32** 283153
PKZM0-12 278486	**DILM12-...**	**PKZM0-XD M12** 283149	**DILM17-...**	**PKZM0-XD M32** 283153
PKZM0-16 046938	**DILM15-...**	**PKZM0-XD M12** 283149	**DILM17-...**	**PKZM0-XD M32** 283153
PKZM0-16 046938	**DILM17-...**	**PKZM0-XD M32** 283153	**DILM17-...**	**PKZM0-XD M32** 283153
PKZM0-25 046989	**DILM25-...**	**PKZM0-XD M32** 283153	**DILM25-...**	**PKZM0-XD M32** 283153
PKZM0-32 278489	**DILM32-...**	**PKZM0-XD M32** 283153	**DILM32-...**	**PKZM0-XD M32** 283153
PKZM4-16 222350	**DIL M17-...**	-	**DIL M17-...**	-
PKZM4-16 222350	**DIL M17-...**	-	**DIL M17-...**	-
PKZM4-25 222352	**DIL M25-...**	-	**DIL M25-...**	-
PKZM4-32 222353	**DIL M32-...**	-	**DIL M32-...**	-
PKZM4-40 222354	**DIL M40**	-	**DIL M40**	-
PKZM4-50 222355	**DIL M50**	-	**DIL M50**	-
PKZM4-58 222394	**DIL M65**	-	**DIL M65**	-
PKZM4-63 222413	**DIL M65**	-	**DIL M65**	-

Notes
The direct-on-line starters (complete units) consist of a PKZM0 motor-protective circuit-breaker and a DILM contactor.
Up to 15.5 A, starters are mounted without adapter plates, with only the motor-protective circuit-breaker being secured to the top-hat rail. The contactors receive their mechanical hold via a mechanical connection module.
From 16 A, motor-protective circuit-breakers and contactors are mounted on top-hat-rail adapter plates. The connection of the main contacts between PKZ and contactor is effected via an electrical contact module.

[3] Please find the order number in the Industrial Switchgear main catalogue to suit the actuation voltage

Reversing starter 400/415 V

	Motor data			Setting range		Motor starter Coordination type "1"	
						Actuating voltage 230 V 50 Hz 240 V 60 Hz	Actuating voltage 24 V DC
	AC-3 380 V 400 V 415 V	Rated operational current 400 V	Rated short-circuit current 380 – 415 V	Overload release	Short-circuit releases		
	P kW	I_e A	I_q kA	I_r A	I_{rm} A	**Type** Article no.	**Type** Article no.
Complete units PKZ and DILM	0.06	0.21	150 (50)[1]	0.16 – 0.25	3.5	**MSC-R-0,25-M7 (...)** 283171	**MSC-R-0,25-M7 (...)** 283190
	0.09	0.31	150 (50)[1]	0.25 – 0.4	5.6	**MSC-R-0,4-M7 (...)** 283172	**MSC-R-0,4-M7 (...)** 283191
	0.12	0.41	150 (50)[1]	0.40 – 0.63	8.82	**MSC-R-0,63-M7 (...)** 283173	**MSC-R-0,63-M7 (...)** 283192
	0.18	0.6	150 (50)[1]	0.40 – 0.63	8.82	**MSC-R-0,63-M7 (...)** 283173	**MSC-R-0,63-M7 (...)** 283192
	0.25	0.8	150 (50)[1]	0.63 – 1	14	**MSC-R-1-M7 (...)** 283175	**MSC-R-1-M7 (...)** 283194
	0.37	1.1	150 (50)[1]	1.00 – 1.6	22.4	**MSC-R-1,6-M7 (...)** 283176	**MSC-R-1,6-M7 (...)** 283195
	0.55	1.5	150 (50)[1]	1.00 – 1.6	22.4	**MSC-R-1,6-M7 (...)** 283176	**MSC-R-1,6-M7 (...)** 283195
	0.75	1.9	150 (50)[1]	1.60 – 2.5	35	**MSC-R-2,5-M7 (...)** 283178	**MSC-R-2,5-M7 (...)** 283197
	1.1	2.6	150 (50)[1]	2.50 – 4	56	**MSC-R-4-M7 (...)** 283179	**MSC-R-4-M7 (...)** 283198
	1.5	3.6	150 (50)[1]	2.50 – 4	56	**MSC-R-4-M7 (...)** 283179	**MSC-R-4-M7 (...)** 283198
	2.2	5	150 (50)[1]	4.00 – 6.3	88.2	**MSC-R-6,3-M7 (...)** 283181	**MSC-R-6,3-M7 (...)** 283200
	3	6.6	150 (50)[1]	6.30 – 10	140	**MSC-R-10-M7 (...)** 283182	**MSC-R-10-M7 (...)** 283201
	4	8.5	150 (50)[1]	6.30 – 10	140	**MSC-R-10-M9 (...)** 283183	**MSC-R-10-M9 (...)** 283202
	5.5	11.3	50	8 – 12	168	**MSC-R-12-M12 (...)** 283184	**MSC-R-12-M12 (...)** 283203
	7.5	16 (15.5[2])	50	10 - 16	224	-	-
	7.5	16	50	10 – 16	224	**MSC-R-16-M17 (...)** 283186	**MSC-R-16-M17 (...)** 283204
	11	21.7	50	20 – 25	350	**MSC-R-25-M25 (...)** 283187	**MSC-R-25-M25 (...)** 283205
	15	29.3	50	25 – 32	448	**MSC-R-32-M32 (...)** 283188	**MSC-R-32-M32 (...)** 283206
Components PKZM4 and DILM	5.5	11.3	50	10 - 16	224	-	-
	7.5	16	50	10 - 16	224	-	-
	11	21.7	50	20 - 25	350	-	-
	15	29.3	50	25 - 32	448	-	-
	18.5	36	50	32 - 40	560	-	-
	22	41	50	40 - 50	700	-	-
	30	55	50	50 - 58	812	-	-
	34	63	50	55 - 65	910	-	-









[1] For coordination type "2" [2] IF DILM15-... is used

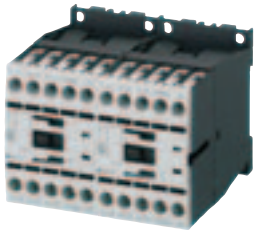
Reversing starter 400/415 V

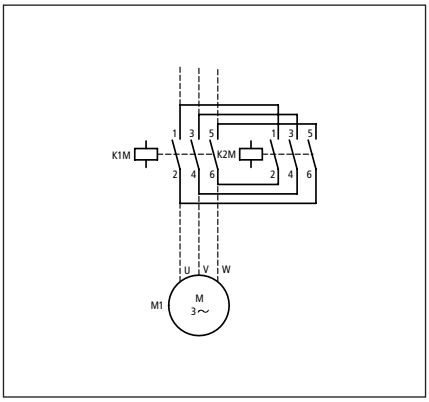
Motor-protective circuit-breakers	Contactor	DOL starter set	Contactor	DOL starter set
	Coordination type "1"	Mechanical connection element + Electrical contact element	Coordination type "2"	Mechanischer connection element + Electrical contact element
Type Article no.	**Type**[3]	**Type** Article no.	**Type**[3]	**Type** Article no.
PKZM0-0,25 072731	**2 X DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-0,4 072732	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-0,63 072733	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-0,63 072733	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-1 072734	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-1,6 072735	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-1,6 072735	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-2,5 072736	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-4 072737	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-4 072737	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-6,3 072738	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM7-01**	**PKZM0-XR M12** 283185
PKZM0-10 072739	**2 x DILM7-01**	**PKZM0-XR M12** 283185	**2 x DILM17-01**	**PKZM0-XR M32** 283189
PKZM0-10 072739	**2 x DILM9-01**	**PKZM0-XR M12** 283185	**2 x DILM17-01**	**PKZM0-XR M32** 283189
PKZM0-12 278486	**2 x DILM12-01**	**PKZM0-XR M12** 283185	**2 x DILM17-01**	**PKZM0-XR M32** 283189
PKZM0-16 046938	**2 x DILM15-01**	**PKZM0-XR M12** 283185	**2 x DILM17-01**	**PKZM0-XR M32** 283189
PKZM0-16 046938	**2 x DILM17-01**	**PKZM0-XR M32** 283189	**2 x DILM17-01**	**PKZM0-XR M32** 283189
PKZM0-25 046989	**2 x DILM25-01**	**PKZM0-XR M32** 283189	**2 x DILM25-01**	**PKZM0-XR M32** 283189
PKZM0-32 278489	**2 x DILM32-01**	**PKZM0-XR M32** 283189	**2 x DILM32-01**	**PKZM0-XR M32** 283189
PKZM4-16 222350	**2 X DIL M17-..**	-	**2 X DIL M17-..**	-
PKZM4-16 222350	**2 X DIL M17-..**	-	**2 X DIL M17-..**	-
PKZM4-25 222352	**2 X DIL M25-..**	-	**2 X DIL M25-..**	-
PKZM4-32 222353	**2 X DIL M32-..**	-	**2 X DIL M32-..**	-
PKZM4-40 222354	**2 X DIL M40**	-	**2 X DIL M40**	-
PKZM4-50 222355	**2 X DIL M50**	-	**2 X DIL M50**	-
PKZM4-58 222394	**2 X DIL M65**	-	**2 X DIL M65**	-
PKZM4-63 222413	**2 X DIL M65**	-	**2 X DIL M65**	-

Notes
The reversing starters (complete units) consist of a PKZM0 motor-protective circuit-breaker and two DILM contactors. Up to 12 A, starters are mounted without adapter plates, with only the motor-protective circuit-breaker being secured to the top-hat rail. The contactors receive their mechanical hold via a mechanical connection module.
From 16 A, motor-protective circuit-breakers and contactors are mounted on top-hat-rail adapter plates. The connection of the main contacts between PKZ and contactor is effected via an electrical contact module.
Complete units with mechanical interlock, starters up to 12 A also with electrical interlock.

[3] Please find the order number in the Industrial Switchgear main catalogue to suit the actuation voltage

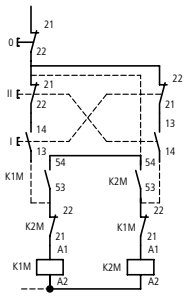
Reversing combinations

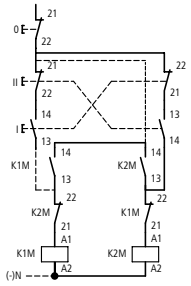
	Rated operational current	Max. three-phase motor rating at 50-60 Hz						
	AC-3 380 V 400 V	AC-3 220 V 230 V	380 V 400 V	660 V 690 V	AC-4 220 V 230 V	380 V 400 V	660 V 690 V	
	I_e	*P*	*P*	*P*	*P*	*P*	*P*	**Type**
	A	kW	kW	kW	kW	kW	kW	Article no.
	7	2.2	3	3.5	1	2.4	2.9	**DIULM7/21**(230V50HZ) 278061
	9	2.5	4	4.5	1.5	2.5	3.6	**DIULM9/21**(230V50HZ) 278086
	12	3.5	5.5	6.5	2	3	4.4	**DIULM12/21**(230V50HZ) 278111
	18	5	7.5	11	2.5	4.5	6.5	**DIULM17/21**(230V50HZ) 278136
	25	7.5	11	14	3.5	6	8.5	**DIULM25/21**(230V50HZ) 278161
	32	10	15	17	4	7	10	**DIULM32/21**(230V50HZ) 278186
	40	12.5	18.5	23	5	9	12	**DIULM40/11**(230V50HZ) 278211
	50	15.5	22	30	6	10	14	**DIULM50/11**(230V50HZ) 278236
	65	20	30	35	7	12	17	**DIULM65/11**(230V50HZ) 278261
	80	25	37	63	12	20	28	**DIUL M80/11** (230V 50Hz) 239799
	95	30	45	75	15	26	36	**DIUL M95/11** (230V 50Hz) 239841
	115	37	55	105	17	30	42	**DIUL M115/11** (RAC240) 239862
	150	48	75	125	20	34	48	**DIUL M150/11** (RAC240) 239880



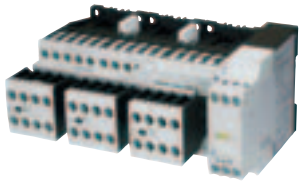
Reversing combinations

Individual combination components		Free auxiliary switch M = Make		Mechanical interlock	
Contactor K1M **Type**	Contactor K2M **Type**	K1M	K2M		
DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	1 M	1 M	+	
DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20	1 M	1 M	+	
DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20	1 M	1 M	+	
DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	1 M	1 M	+	
DILM25-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	1 M	1 M	+	
DILM32-01 + DILA-XHI20	DILM32-01 + DILA-XHI20	1 M	1 M	+	
DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	-	-	+	
DILM50 + DILM150-XHI11	DILM50 + DILM150-XHI11	-	-	+	
DILM65 + DILM150-XHI11	DILM65 + DILM150-XHI11	-	-	+	
DIL M80 + DIL M150-XHI11	DIL M80 + DIL M150-XHI11	-	-	+	
DIL M95 + DIL M150-XHI11	DIL M95 + DIL M150-XHI11	-	-	+	
DIL M115 + DIL M150-XHI11	DIL M115 + DIL M150-XHI11	-	-	+	
DIL M150 + DIL M150-XHI11	DIL M150 + DIL M150-XHI11	-	-	+	



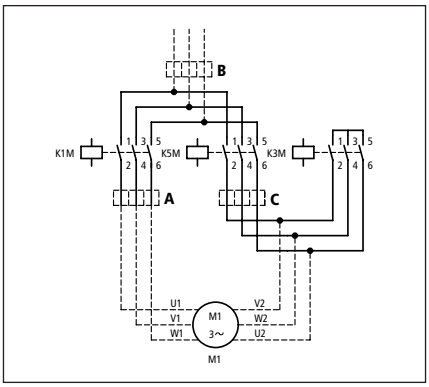


Star-delta combinations

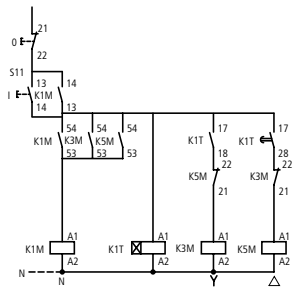




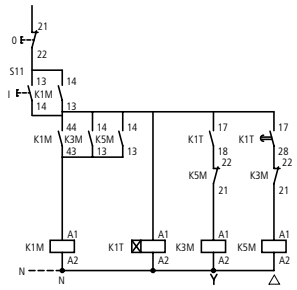
Rated operational current	Max. three-phase motor rating at 50-60 Hz				Switchover time up to	
AC-3 380 V 400 V	AC-3 220 V 230 V	380 V 400 V	500 V	660 V 690 V	s	
I_e	P	P	P	P		**Type**
A	kW	kW	kW	kW	s	Article no.
12	3	5.5	5.5	5.5	20	**SDAINLM12**(230V50HZ) 278286
16	4	7.5	7.5	7.5	20	**SDAINLM16**(230V50HZ) 278311
22	5.5	11	11	11	20	**SDAINLM22**(230V50HZ) 278336
30	7.5	15	18.5	18.5	20	**SDAINLM30**(230V50HZ) 278361
45	11	22	30	22	20	**SDAINLM45**(230V50HZ) 278386
55	15	30	37	30	20	**SDAINLM55**(230V50HZ) 278411
70	18.5	37	45	37	20	**SDAINLM70**(230V50HZ) 239895
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**(RAC240) 240060
260	75	132	160	200	20	**SDAINLM260**(RAC240) 240078



for SDAINL M12-M55



for SDAINL M70-M260



Star-delta combinations

Individual combination components				Free auxiliary switch B = Break M = Make		
Mains contactor K1M **Type**	Delta contactor K5M **Type**	Star contactor K3M **Type**	Timing relay **Type**	K1M	K3M	K5M
DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	ETR4-51	1 M	1 M	1 M
DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20	ETR4-51	1 M	1 M	1 M
DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20	ETR4-51	1 M	1 M	1 M
DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	1 M	1 M	1 M
DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	ETR4-51	1 M	1 M	1 M
DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	ETR4-51	1 M	1 M	1 M
DIL M40 + DIL M150-XHI31	DIL M40 + DIL M150-XHI11	DIL M40 + DIL M150-XHI11	ETR4-51	1 B 1M	-	-
DIL M50 + DIL M150-XHI31	DIL M50 + DIL M150-XHI11	DIL M40 + DIL M150-XHI11	ETR4-51	1 B 1M	-	-
DIL M65 + DIL M150-XHI31	DIL M65 + DIL M150-XHI11	DIL M40 + DIL M150-XHI11	ETR4-51	1 B 1M	-	-
DIL M80 + DIL M150-XHI31	DIL M80 + DIL M150-XHI11	DIL M50 + DIL M150-XHI11	ETR4-51	1 B 1M	-	-
DIL M95 + DIL M150-XHI31	DIL M95 + DIL M150-XHI11	DIL M65 + DIL M150-XHI11	ETR4-51	1 B 1M	-	-
DIL M115 + DIL M150-XHI31	DIL M115 + DIL M150-XHI11	DIL M80 + DIL M150-XHI11	ETR4-51	1 B 1M	-	-
DIL M150 + DIL M150-XHI31	DIL M150 + DIL M150-XHI11	DIL M80 + DIL M150-XHI11	ETR4-51	1 B 1M	-	-

Overload relay settings **Starting**

A: I_N x 0.58 ≤15 s
Protection of the motor in Y and △ configuration

B: I_N x 1 15-40 s
In Y configuration only conditional motor protection

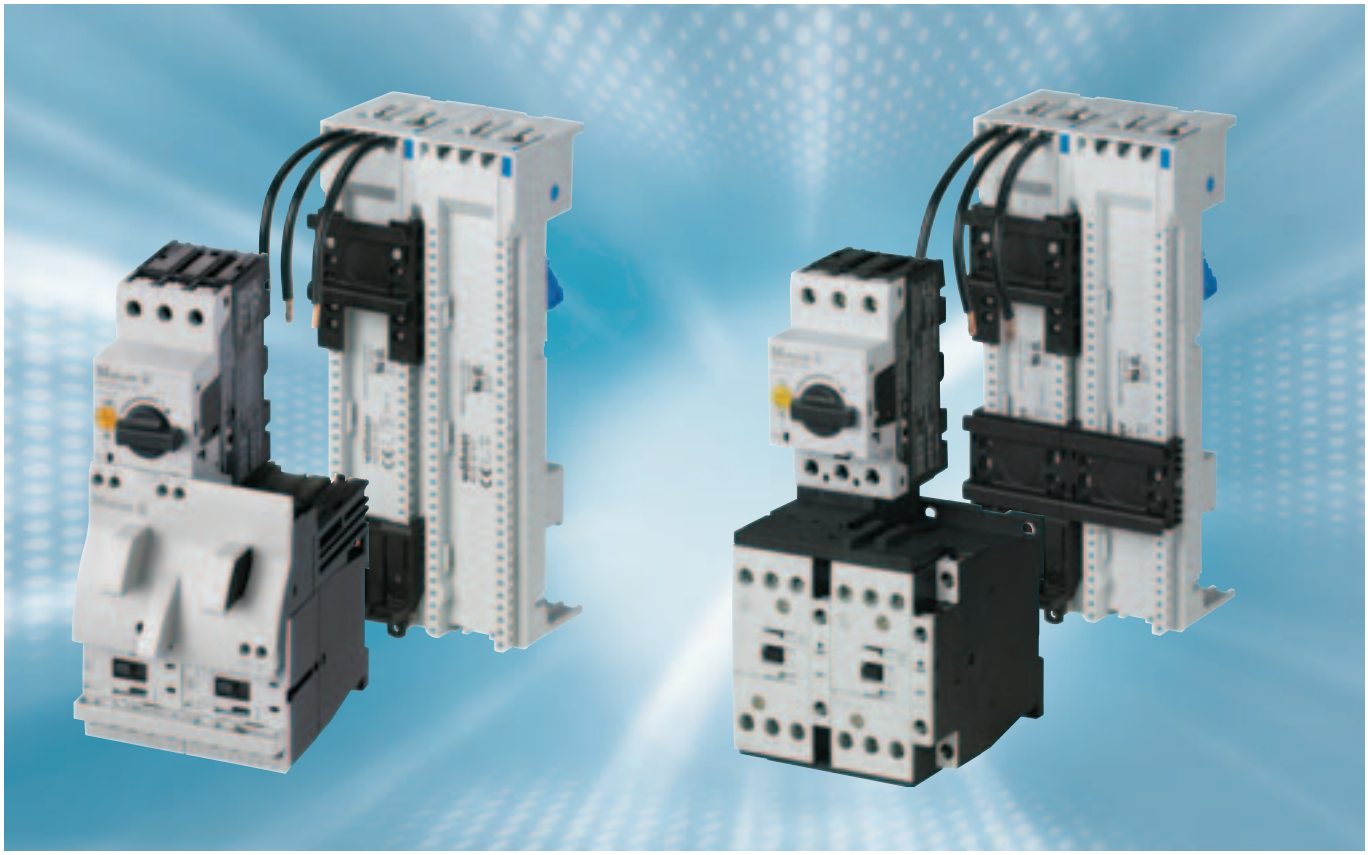
C: I_N x 0.58 > 40 s
No motor protection in Y configuration

Timing relay setting to approx. 10 s

Main circuit:
Depending on the aspired co-ordination type "1" or "2", it is necessary to verify if the fusing and the incomer to the mains and delta contactor can be used together, or if they must be used separately.

Busbar adapter





Busbar adapter, 3-pole[1]

wöhner Version	Rated operational voltage U_e V	Rated operational current I_e A	Conductor cross-section	Adapter width mm	Adapter length mm	Mounting rail	For use with	Wöhner EQUES Easy Connector Order no.	**Notes** Electrical connections
Busbar adapter 25 A	690	25	AWG 12 (4 mm²)	45	200	1	PKZM0 + DIL M 7 contactor DIL M 9 contactor DIL M 12 contactor DIL M 15 contactor	**32450**	PKZM0 and contactor DIL M7..M9..M12..M15 via PKZM0-XDM12
	690	25	AWG 12 (4 mm²)	90	200	1	PKZM0 + 2 x DIL M 7-01 contactor 2 x DIL M 9-01 contactor 2 x DIL M 12-01 contactor	**32452**	PKZM0 and 2 x contactor DIL M 7..M9..M12 via PKZM0-XRM12
Busbar adapter 32 A	690	32	AWG 10 (6 mm²)	45	200	2	PKZM0 + DIL M 17 contactor DIL M 25 contactor DIL M 32 contactor	**32451**	PKZM0 and contactor DIL M17..M25..M32 via PKZM0-XDM32
	690	32	AWG 10 (6 mm²)	90	200	2	PKZM0 + 2 x DIL M 17-01 contactor 2 x DIL M 25-01 contactor 2 x DIL M 32-01 contactor	**32453**	PKZM0 and 2 x contactor DIL M17..M25..M32 via PKZM0-XRM32
Busbar adapter 63 A	690	40	AWG 8 (10 mm²)	72	260	2	PKZ2 + DIL M 7 contactor DIL M 9 contactor DIL M 12 contactor DIL M 17 contactor DIL M 25 contactor DIL M 32 contactor DIL M 40 contactor	**32463**	PKZ2 and contactor DIL M7..M9..M12 via flexible connectors MVS-LB0-00M-G (AWG 12) DIL M17..M25..M32 via flexible connectors MVS-LB0-0M-G (AWG 10)
	690	40	AWG 8 (10 mm²)	72	200	1	PKZ2	**32457**	
	690	63	AWG 8 (10 mm²)	54	260	2	PKZM4 + DIL M 17 contactor DIL M 25 contactor DIL M 32 contactor DIL M 40 contactor DIL M 50 contactor DIL M 65 contactor	**32460**	PKZM4 and contactor DIL M 17..M25..M32 via flexible connectors MVS-LB0-0M-G (AWG 10) DIL M40..M50..M65 via contact module PKZM4-XM65 DE
	690	63	AWG 8 (10 mm²)	54	200	1	PKZM4	**32454**	
Side module plug-in on both sides				9	200	4		**32963**	Can be grouped on AD... for expansion of the mounting width
Connection elements								**32954**	

[1] Can be used in all 60 mm systems. Suitable for 5 and 10 mm rail thickness' via combination foot
[2] Busbar adapter without electrical contacting
[3] Mounting by snap fitting onto the voltage-free busbar

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