

# 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**



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 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 products.



**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 markets.



## 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.

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

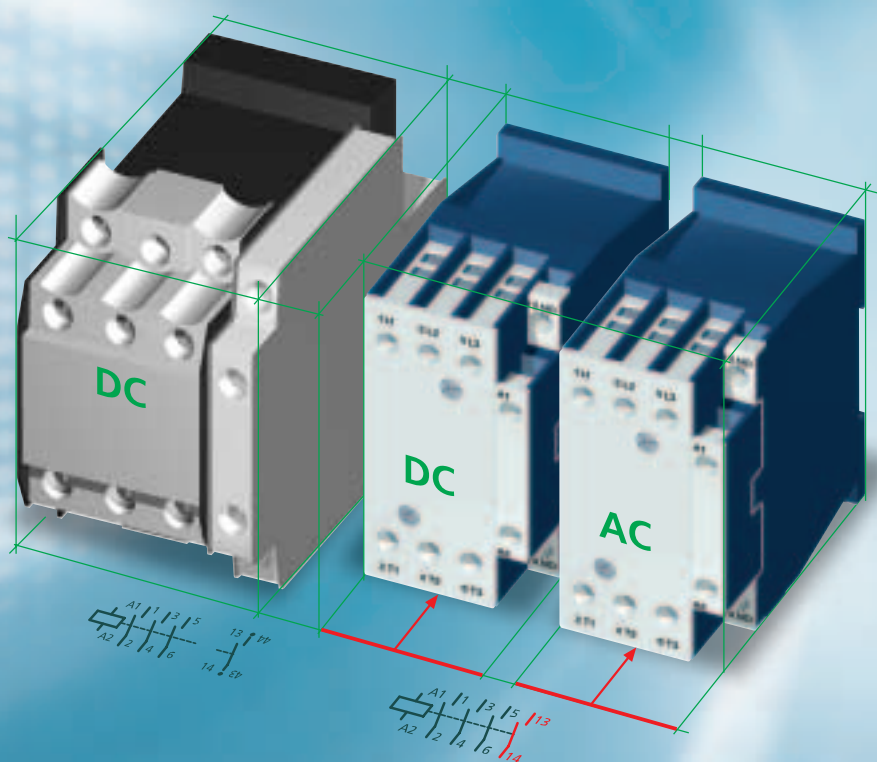
### PKZM 01 motor-protective circuit-breakers: easy to operate by pressing or hitting a button

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.

- 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



## 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.

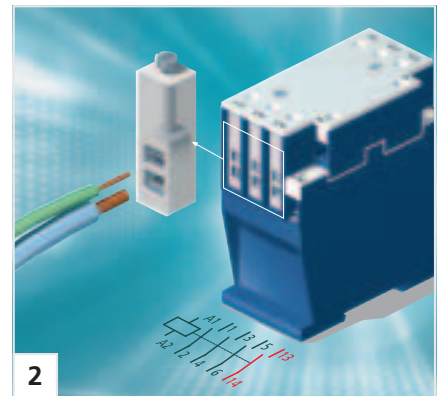
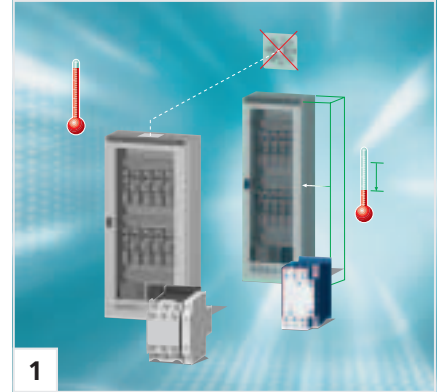
**2 No compromise where termination reliability is concerned**

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 DIL M motor contactors from 12 A have an electronically controlled drive that offers the following advantages:

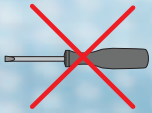
- Significantly less heat dissipation due to reduced sealing consumption
- Smaller control transformers because of lower pick-up consumption
- Direct actuation from the PLC without coupling contactors.



**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-on-line and reversing starters up to 12 A.

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



### **Slim solutions: DOL starters from standard components**

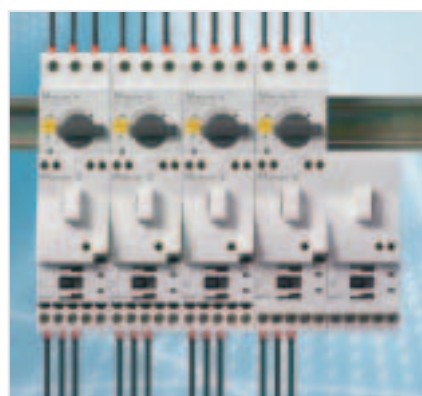
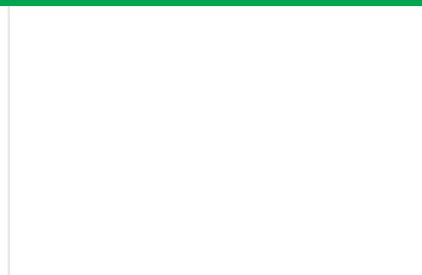
The new direct-on-line starters built from standard components are available in four slim frame sizes. The contactor and the protective switch are of the same compact width dimension. Thus you lose not a millimetre of control panel space. The convenient MSC motor-starters using toolless plug connection technology are available up to 12 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.



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### ***Xtra Combinations***

Xtra Combinations from Moeller offers a range of products and services, enabling the best possible combination options for switching, protection and control in power distribution and automation.

Using Xtra Combinations enables you to find more efficient solutions for your tasks while optimising the economic viability of your machines and systems.

It provides:

- flexibility and simplicity
- great system availability
- the highest level of safety

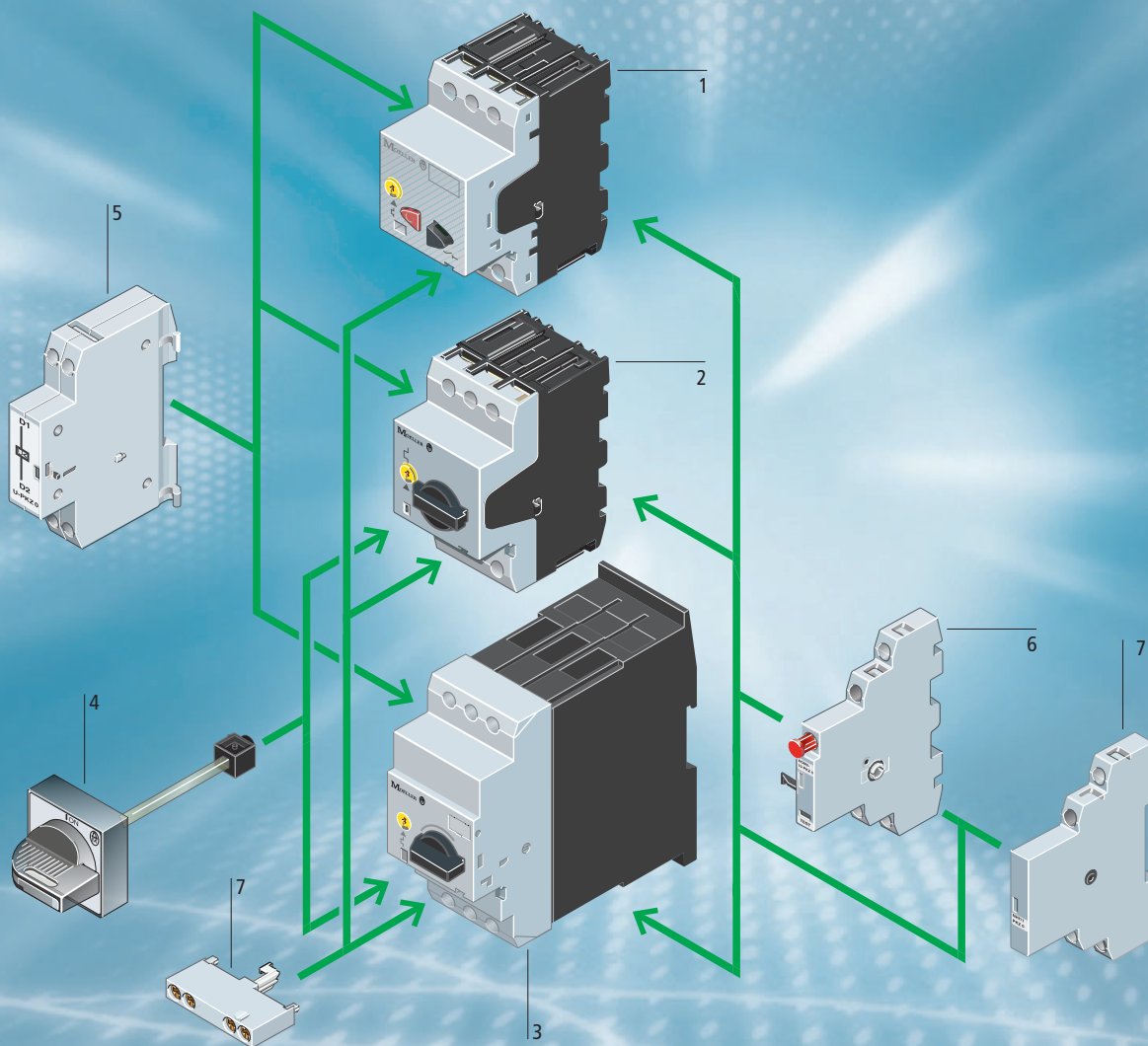
All the products can be easily combined with one another mechanically, electrically and digitally, enabling you to arrive at flexible and stylish solutions tailored to your application – quickly, efficiently and cost-effectively. The products are proven and of such excellent quality that they ensure a high level of operational continuity, allowing you to achieve optimum safety for your personnel, machinery, installations and buildings.

Thanks to our state-of-the-art logistics operation, our comprehensive dealer network and our highly motivated service personnel in 80 countries around the world, you can count on Moeller and our products every time. Challenge us! We are looking forward to it!

**MOELLER** 





Think future. Switch to green.

# 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 AC-3 380 V 400 V 415 V <i>P</i> kW	Rated uninterrupted current $I_u$ A	Setting range		Screw terminals  Type Article no.
			Overload releases $I_r$ A 	Short-circuit release $I_{rm}$ A 	
<b>Motor-protective circuit-breakers, classification type "1" and "2"</b>  	–	0.16	0.1 – 0.16	2.2	<b>PKZM0-0,16</b> 072730
	0.06	0.25	0.16 – 0.25	3.5	<b>PKZM0-0,25</b> 072731
	0.09	0.4	0.25 – 0.4	5.6	<b>PKZM0-0,4</b> 072732
	0.12	0.63	0.4 – 0.63	8.8	<b>PKZM0-0,63</b> 072733
	0.25	1	0.63 – 1	14	<b>PKZM0-1</b> 072734
	0.55	1.6	1 – 1.6	22	<b>PKZM0-1,6</b> 072735
	0.75	2.5	1.6 – 2.5	35	<b>PKZM0-2,5</b> 072736
	1.5	4	2.5 – 4	56	<b>PKZM0-4</b> 072737
	2.2	6.3	4 – 6.3	88	<b>PKZM0-6,3</b> 072738
	4	10	6.3 – 10	140	<b>PKZM0-10</b> 072739
	5.5	12	9 – 12	168	<b>PKZM0-12</b> 278486
	7.5	16	10 – 16	224	<b>PKZM0-16</b> 046938
	9	20	16 – 20	280	<b>PKZM0-20</b> 046988
	12.5	25	20 – 25	350	<b>PKZM0-25</b> 046989
	15	32	25 – 32	448	<b>PKZM0-32</b> 278489
<b>Motor-protective circuit-breaker, classification type "1" and "2"</b>  	7.5	16	10 – 16	224	<b>PKZM4-16</b> 222350
	12.5	25	16 – 25	350	<b>PKZM4-25</b> 222352
	15	32	25 – 32	448	<b>PKZM4-32</b> 222353
	20	40	32 – 40	560	<b>PKZM4-40</b> 222354
	25	50	40 – 50	700	<b>PKZM4-50</b> 222355
	30	58	50 – 58	812	<b>PKZM4-58</b> 222394
	34	65	55 – 63	882	<b>PKZM4-63</b> 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		Screw terminals  Type Article no.
			Overload releases $I_r$ A	Short-circuit releases $I_{rm}$ A	
<b>Motor-protective circuit-breakers, classification type "1" and "2"</b>  	–	0.16	0.1 – 0.16	2.2	<b>PKZM01-0,16</b> 278475
	0.06	0.25	0.16 – 0.25	3.5	<b>PKZM01-0,25</b> 278476
	0.09	0.4	0.25 – 0.4	5.6	<b>PKZM01-0,4</b> 278477
	0.12	0.63	0.4 – 0.63	8.8	<b>PKZM01-0,63</b> 278478
	0.25	1	0.63 – 1	14	<b>PKZM01-1</b> 278479
	0.55	1.6	1 – 1.6	22	<b>PKZM01-1,6</b> 278480
	0.75	2.5	1.6 – 2.5	35	<b>PKZM01-2,5</b> 278481
	1.5	4	2.5 – 4	56	<b>PKZM01-4</b> 278482
	2.2	6.3	4 – 6.3	88	<b>PKZM01-6,3</b> 278483
	4	10	6.3 – 10	140	<b>PKZM01-10</b> 278484
	5.5	12	8 – 12	168	<b>PKZM01-12</b> 278485
	7.5	16	10 – 16	224	<b>PKZM01-16</b> 283390

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

## Insulated enclosures

		Protection type	For use with	Type Article no.
<b>Insulated enclosures for surface mounting</b>  	–	IP40	PKZM01+NHI-E or VHI-PKZ01+U or A or NHI+L (2 off)	<b>CI-PKZ01</b> 281403
	With actuating diaphragm	IP65	PKZM01+NHI-E or VHI-PKZ01+U or A or NHI+L (2 off)	<b>CI-PKZ01-G</b> 281404
	Lockable in the Off position	IP65	PKZM01+NHI-E+U or A (undervoltage or shunt release)+L (2 off)	<b>CI-PKZ01-SVB</b> 281405
	Lockable in the Off position, in conjunction with VHI-PKZ01	IP65	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	<b>CI-PKZ01-SVB-V</b> 281944
	With stay-put Emergency-Stop mushroom button	IP65	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	<b>CI-PKZ01-PVT</b> 281406
	With key-release Emergency-Stop mushroom button	IP65	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	<b>CI-PKZ01-PVS</b> 281407
<b>Insulated enclosures for flush mounting</b>  	–	Front IP40	PKZM01+NHI-E or VHI-PKZ01+U or A or NHI+L (2 off)	<b>E-PKZ01</b> 281633
	With actuating diaphragm	Front IP55	PKZM01+NHI-E or VHI-PKZ01+U or A or NHI+L (2 off)	<b>E-PKZ01-G</b> 281634
	Lockable in the Off position	Front IP55	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	<b>E-PKZ01-SVB</b> 281635
	Lockable in the Off position, in conjunction with VHI-PKZ01	Front IP55	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	<b>E-PKZ01-SVB-V</b> 281943
	With stay-put Emergency-Stop mushroom button	Front IP55	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	<b>E-PKZ01-PVT</b> 281636
	With key-release Emergency-Stop mushroom button	Front IP55	PKZM01+NHI-E or VHI-PKZ01+U or A (undervoltage or shunt release)+L (2 off)	<b>E-PKZ01-PVS</b> 281637

## Accessories

	Contacts		Type of current AC/DC	For use with	Type Article no. when ordered separately
	M = Make	B = Break			
<b>Trip-indicating auxiliary contact</b> 	2 × 1 M	–	–	PKZM0 PKZM4 PKZM01	<b>AGM2-10-PKZ0</b> 072898
	–	2 × 1 B	–		<b>AGM2-01-PKZ0</b> 072899
<b>Early-make auxiliary contacts</b> 	2 M	–	–	PKZM0 PKZM01	<b>VHI20-PKZ0</b> 203595
	–	2 M	–		PKZM01
<b>Shunt release</b> 	–	–	AC operation	PKZM0 PKZM4 PKZM01	<b>A-PKZ0(230V50HZ)</b> 073187
	–	–	DC operation		<b>A-PKZ0(24VDC)</b> 073200
<b>Undervoltage release</b> 	–	–	AC operation	PKZM0 PKZM4 PKZM01	<b>U-PKZ0(230V50HZ)</b> 073135
<b>Standard auxiliary contact</b> 	1 M	1 B	–	PKZM0 PKZM4 PKZM01	<b>NHI11-PKZ0</b> 072896
	1 M	2 B	–		<b>NHI12-PKZ0</b> 072895
	2 M	1 B	–		<b>NHI21-PKZ0</b> 072894
<b>Standard auxiliary contact</b> 	1 M	1 B	–		<b>NHI-E-11-PKZ0</b> 082882
	1 M	–	–		<b>NHI-E-10-PKZ0</b> 082884

## Technical data basic units

			PKZM01...	PKZM0-...	PKZM4
<b>General</b>					
Ambient temperature					
open	°C		-25/55	-25/55	-25/55
Terminal capacity					
Solid	mm <sup>2</sup>		1 × (1 – 6) 2 × (1 – 6)	1 × (1 – 6) 2 × (1 – 6)	1 × (1 – 50) 2 × (1 – 35)
Flexible with ferrule	mm <sup>2</sup>		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
<b>Main contacts</b>					
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	63 or setting current of overcurrent release
Lifespan, mechanical	Operations	× 10 <sup>6</sup>	0.05	0.05	0.03
Lifespan, electric (AC-3 at 400 V)	Operations	× 10 <sup>6</sup>	0.05	0.05	0.03
Maximum operating frequency		Ops/h	25	40	40
<b>Releases</b>					
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

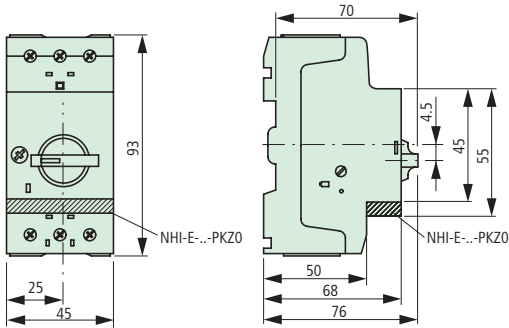
## Technical data auxiliary contacts

			NHI...PKZ0	NHI-E-...PKZ0	VHI...PKZ0	AGM
<b>Terminal capacity</b>						
Solid or flexible with ferrule	mm <sup>2</sup>		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

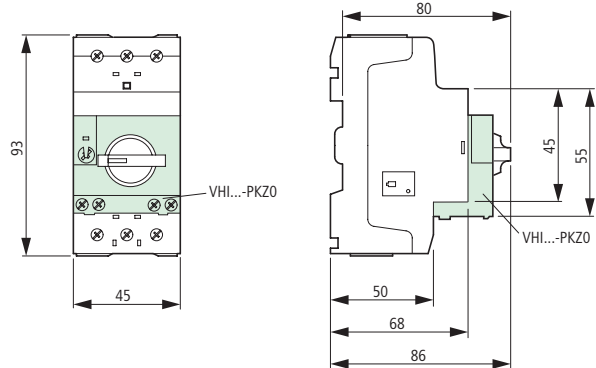
### Motor-protective circuit-breakers

PKZM0-...(+NHI-E-...PKZ0)



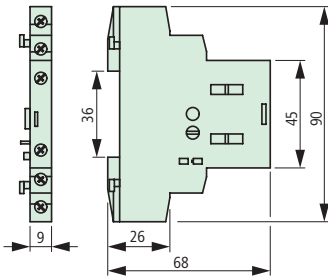
### Motor-protective circuit-breaker with early-make auxiliary contact

PKZM0-...+VHI-...-PKZ0



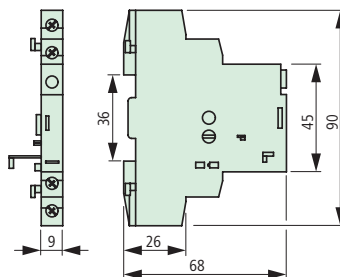
### Standard auxiliary contact

NHI...-PKZ0



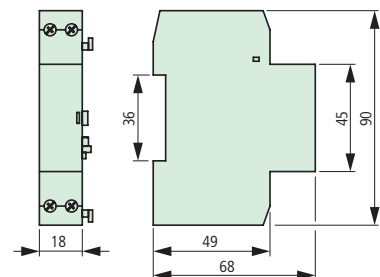
### Trip-indicating auxiliary contact

AGM2-...-PKZ0



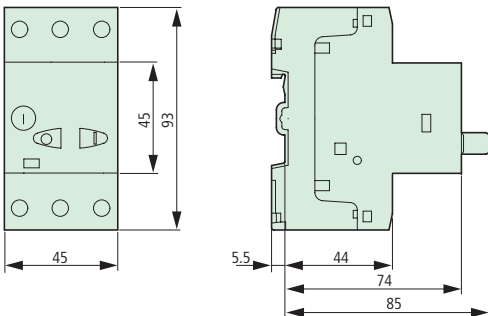
### Voltage release

U/A-PKZ0



### Motor-protective circuit-breakers

PKZM01



### Switching capacity with classification type "1" and "2"

	PKZM0				PKZM01			
	400 V				400 V			
$I_u$	$I_q$	$I_{cu}$	$I_{cs}$		$I_q$	$I_{cu}$	$I_{cs}$	
A	kA	kA	kA	A <sup>1)</sup>	kA	kA	kA	A <sup>2)</sup>
0.16 – 1	150	150	150	N	50	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 60439-2

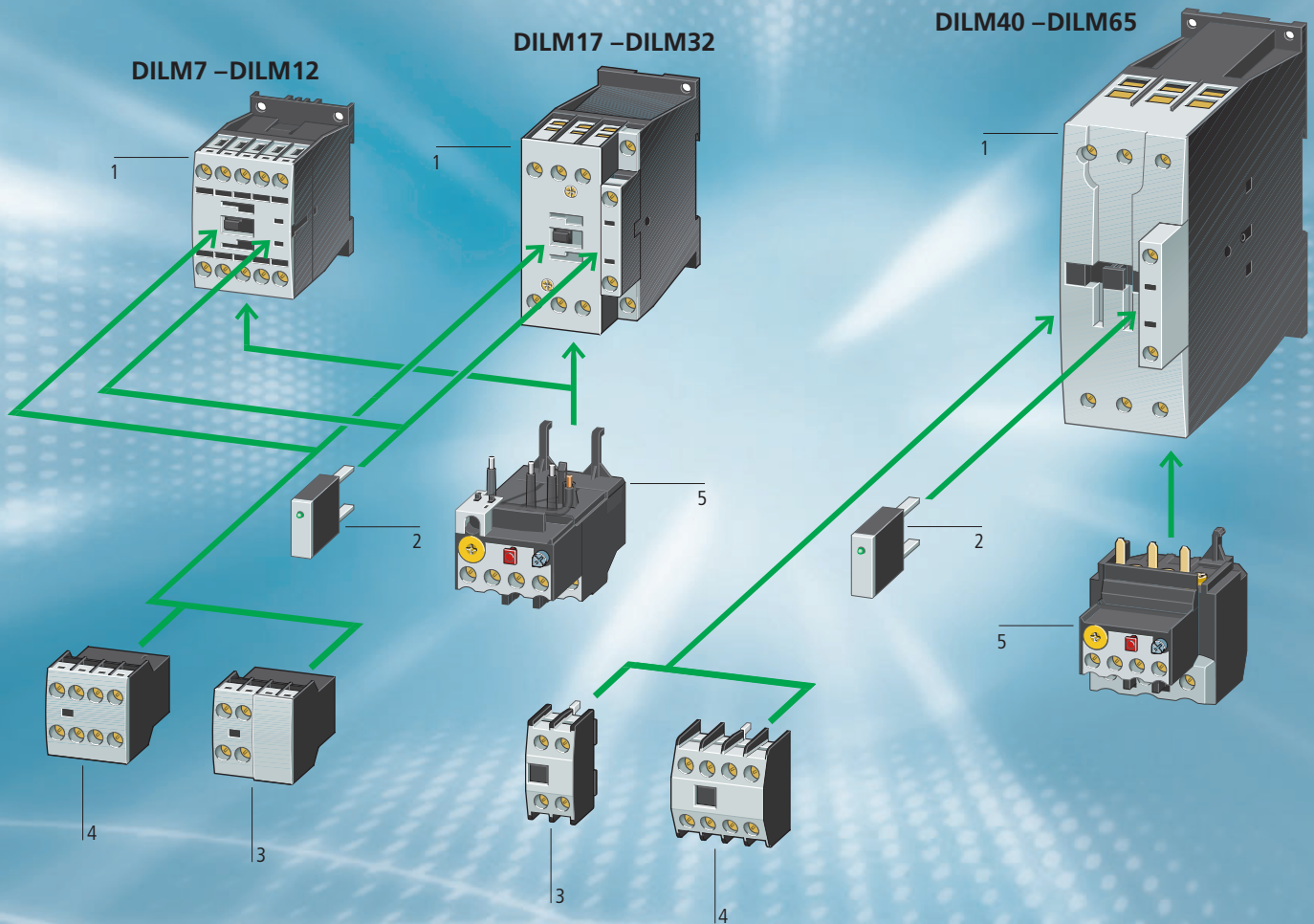
1) Required back-up fuse, if the short-circuit current exceeds the rated conditional short-circuit current of the devices ( $I_{cc} > I_q$ ).

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)




# Contactors DILM7 –65 DILA contactor relays



1. Basic units
2. Suppressor <sup>1)</sup>
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 380V 400 V	AC-3 380V 400 V	open $I_{th} = I_e$	Contacts  B = Break M = Make	Can be combined with auxiliary contact	AC operation			DC actuation	
						Type Article no. 230 V 50Hz	Type Article no. 24 V 50/60 Hz	Type Article no. 110 V 50 Hz, 120 V 60 Hz	Type Article no.	
<b>3-pole</b> 	7	3	20	1 M	–	DILM32-XHI.. DILA-XHI(V)..	<b>DILM7-10(...)</b> 276550	<b>DILM7-10(...)</b> 276554	<b>DILM7-10(...)</b> 276547	<b>DILM7-10(24VDC)</b> 276565
	7	3		–	1 B	DILA-XHI(V)..	<b>DILM7-01(...)</b> 276585	<b>DILM7-01(...)</b> 276589	<b>DILM7-01(...)</b> 276582	<b>DILM7-01(24VDC)</b> 276600
	9	4		1 M	–	DILM32-XHI.. DILA-XHI(V)..	<b>DILM9-10(...)</b> 276690	<b>DILM9-10(...)</b> 276694	<b>DILM9-10(...)</b> 276687	<b>DILM9-10(24VDC)</b> 276705
	9	4		–	1 B	DILA-XHI(V)..	<b>DILM9-01(...)</b> 276725	<b>DILM9-01(...)</b> 276729	<b>DILM9-01(...)</b> 276722	<b>DILM9-01(24VDC)</b> 276740
	12	5.5		1 M	–	DILM32-XHI.. DILA-XHI(V)..	<b>DILM12-10(...)</b> 276830	<b>DILM12-10(...)</b> 276834	<b>DILM12-10(...)</b> 276827	<b>DILM12-10(24VDC)</b> 276845
	12	5.5		–	1 B	DILA-XHI(V)..	<b>DILM12-01(...)</b> 276865	<b>DILM12-01(...)</b> 276869	<b>DILM12-01(...)</b> 276862	<b>DILM12-01(24VDC)</b> 276880
4-pole	–	–		–	–	DILM32-XHI.. DILA-XHI(V)..	<b>DILMP20(...)</b> 276970	<b>DILMP20(...)</b> 276974	<b>DILMP20(...)</b> 276967	<b>DILMP20(24VDC)</b> 276985
<b>3-pole</b> 	18	7.5	35	1 M	–	DILM32-XHI.. DILA-XHI(V)..	<b>DILM17-10(...)</b> 277004	<b>DILM17-10(...)</b> 277008	<b>DILM17-10(...)</b> 277001	<b>DILM17-10(RDC24)</b> 277018
	18	7.5	35	–	1 B	DILA-XHI(V)..	<b>DILM17-01(...)</b> 277036	<b>DILM17-01(...)</b> 277040	<b>DILM17-01(...)</b> 277033	<b>DILM17-01(RDC24)</b> 277050
	25	11	40	1 M	–	DILM32-XHI.. DILA-XHI(V)..	<b>DILM25-10(...)</b> 277132	<b>DILM25-10(...)</b> 277136	<b>DILM25-10(...)</b> 277129	<b>DILM25-10(RDC24)</b> 277146
	25	11	40	–	1 B	DILA-XHI(V)..	<b>DILM25-01(...)</b> 277164	<b>DILM25-01(...)</b> 277168	<b>DILM25-01(...)</b> 277161	<b>DILM25-01(RDC24)</b> 277178
	32	15	40	1 M	–	DILM32-XHI.. DILA-XHI(V)..	<b>DILM32-10(...)</b> 277260	<b>DILM32-10(...)</b> 277264	<b>DILM32-10(...)</b> 277257	<b>DILM32-10(RDC24)</b> 277274
	32	15	40	–	1 B	DILA-XHI(V)..	<b>DILM32-01(...)</b> 277292	<b>DILM32-01(...)</b> 277296	<b>DILM32-01(...)</b> 277289	<b>DILM32-01(RDC24)</b> 277306
<sup>1)</sup> 	40	18.5	50	–	–	DILM150-XHI(V).. DILM1000-XHI(V)..	<b>DILM40(...)</b> 277766	<b>DILM40(...)</b> 277770	<b>DILM40(...)</b> 277763	<b>DILM40(RDC24)</b> 277780
	50	22	60	–	–	DILM150-XHI(V).. DILM1000-XHI(V)..	<b>DILM50(...)</b> 277830	<b>DILM50(...)</b> 277834	<b>DILM50(...)</b> 277827	<b>DILM50(RDC24)</b> 277844
	65	30	72	–	–	DILM150-XHI(V).. DILM1000-XHI(V)..	<b>DILM65(...)</b> 277894	<b>DILM65(...)</b> 277898	<b>DILM65(...)</b> 277891	<b>DILM65(RDC24)</b> 277908

The listed auxiliary and main contacts up to 12 A are available with tension clamp terminations.  
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.

<sup>1)</sup> Availability for supply for DILM40 to DILM65 from December 2004.




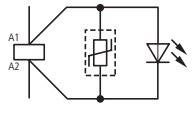



## Auxiliary contact modules

		$I_{th} = I_e$ open A	Contacts M = Make B = Break M <sub>F</sub> = Early-make contacts B <sub>S</sub> = Late-break contacts		$I_e$ AC-15 380 V 400 V 415 V A	Can be combined with basic unit	Type Article no.
	2-pole	10	1 M	1 B	3	DILM7-10... DILM9-10... DILM12-10... DILM17-10... DILM25-10... DILM32-10...	<b>DILM32-XHI11</b> 277376
			–	2 B			<b>DILM32-XHI02</b> 277375
	4-pole		2 M	2 B			<b>DILM32-XHI22</b> 277377
			2-pole	2 M		–	DILM7... DILM9... DILM12... DILM17... DILM25... DILM32...
			1 M	1 B		<b>DILA-XHI11</b> 276421	
			–	2 B		<b>DILA-XHI02</b> 276420	
			1 M <sub>F</sub>	1 B <sub>S</sub>		<b>DILA-XHIV11</b> 276423	
	4-pole		4 M	–		<b>DILA-XHI40</b> 276428	
			3 M	1 B		<b>DILA-XHI31</b> 276427	
			2 M	2 B		<b>DILA-XHI22</b> 276426	
		1 M	3 B	<b>DILA-XHI13</b> 276425			
		–	4 B	<b>DILA-XHI04</b> 276424			
		1 M <sub>F</sub>	1 B <sub>S</sub>	<b>DILA-XHIV22</b> 276429			
	2-pole	10	2	–	3	DILM40... DILM50... DILM65...	<b>DILM150-XHI20</b> 277945
			1	1			<b>DILM150-XHI11</b> 277946
	–		2	<b>DILM150-XHI02</b> 277947			
	4-pole		4	–		<b>DILM150-XHI40</b> 277948	
			3	1		<b>DILM150-XHI31</b> 277949	
			2	2		<b>DILM150-XHI22</b> 277950	
			1	3		<b>DILM150-XHI13</b> 277951	
			–	4		<b>DILM150-XHI04</b> 277952	
			1 M, 1 M <sub>F</sub>	1 B, 1 B <sub>S</sub>		<b>DILM150-XHIV22</b> 277953	
–	2-pole		10	1		1	3

The listed auxiliary and main contacts up to 12 A are available with tension clamp terminations.  
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.

<sup>1)</sup> 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.

## Accessories

	$U_s$ V AC	For use with	Contact sequence	Type Article no.	Notes	
<b>Suppressor</b> Varistor suppressor 	24 – 48	DILM7 – DILM12 DILMP20 DILA		<b>DILM12-XSPV48</b> 281208	For AC operated contactors, 50-60 Hz DC operated contactors have an integrated suppressor Note drop-out delay	
	48 – 130			<b>DILM12-XSPV130</b> 281209		
	130 – 240			<b>DILM12-XSPV240</b> 281210		
	240 – 500			<b>DILM12-XSPV500</b> 281211		
	24 – 48	DILM17 – DILM32		<b>DILM32-XSPV48</b> 281212		
	48 – 130			<b>DILM32-XSPV130</b> 281213		
	130 – 240			<b>DILM32-XSPV240</b> 281214		
	240 – 500			<b>DILM32-XSPV500</b> 281215		
	24 – 48	DILM40 – DILM65		<b>DILM95-XSPV48</b> 281216		Availability for supply for DILM95-XSPV48/130/240/500 from December 2004
	48 – 130			<b>DILM95-XSPV130</b> 281217		
	130 – 240			<b>DILM95-XSPV240</b> 281218		
	240 – 500			<b>DILM95-XSPV500</b> 281219		
Varistor suppressors with built-in LED 	24 – 48	DILM7 – DILM12 DILMP20 DILA		<b>DILM12-XSPVL48</b> 281220	For AC operated contactors, 50-60 Hz DC operated contactors have an integrated suppressor Note drop-out delay	
	127 – 240			<b>DILM12-XSPVL240</b> 281221		
	24 – 48	DILM17 – DILM32		<b>DILM32-XSPVL48</b> 281222		
	130 – 240			<b>DILM32-XSPVL240</b> 281223		
	24 – 48	DILM40 – DILM65		<b>DILM95-XSPVL48</b> 281224		Availability for supply for DILM95-XSPVL48/240 from December 2004
	130 – 240			<b>DILM95-XSPVL240</b> 281225		
RC suppressor 	24 – 48	DILM7 – DILM12 DILMP20 DILA		<b>DILM12-XSPR48</b> 281199	For AC operated contactors, 50-60 Hz DC operated contactors have an integrated suppressor Note drop-out delay	
	130 – 240			<b>DILM12-XSPR240</b> 281200		
	240 – 500			<b>DILM12-XSPR500</b> 281201		
	24 – 48	DILM17 – DILM32		<b>DILM32-XSPR48</b> 281202		
	110 – 240			<b>DILM32-XSPR240</b> 281203		
	240 – 500			<b>DILM32-XSPR500</b> 281204		
	24 – 48	DILM40 – DILM65		<b>DILM95-XSPR48</b> 281205		Availability for supply for DILM95-XSPR48/240/500 from December 2004
	110 – 240			<b>DILM95-XSPR240</b> 281206		
	240 – 500			<b>DILM95-XSPR500</b> 281207		
<b>Connector</b> For the mechanical connection of contactors to groups of components	–	DILM7 – DILM32 DILA	–	<b>DILM32-XVB</b> 281227	0 mm distance between contactors	
	–	DILM40 – DILM65	–	<b>DILM150-XVB</b> 281226	Availability for supply for DILM150-XVB from December 2004	
<b>Mechanical interlock</b> 	–	DILM7 – DILM32 DILMP20 DILA	–	<b>DILM12-XMV</b> 281196	For two contactors with AC or DC operation, distance between contactors 0 mm, mechanical lifespan $2.5 \times 10^6$ switching operations, additional auxiliary contact modules can be fitted	
	–	DILM17 – DILM32	–	<b>DILM32-XMV</b> 281197		
	–	DILM40 – DILM65	–	<b>DILM65-XMV</b> 281198	Availability for supply for DILM65-XMV from December 2004	

## Technical data

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

## Technical data

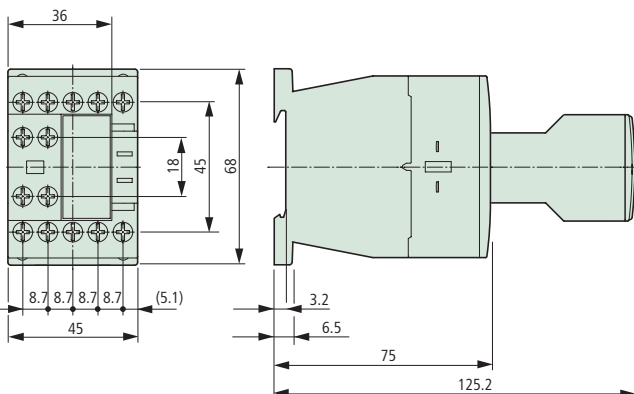
DILM17	DILM25	DILM32	DILM40	DILM50	DILM65
10	10	10	10	10	10
10	10	10	10	10	10
-25/60	-25/60	-25/60	-25/60	-25/60	-25/60
10	10	10	10	10	10
7	7	7	7	7	7
5	5	5	5	5	5
0.4	0.4	0.4	0.9	0.9	0.9
0.4	0.4	0.4	0.9	0.9	0.9
1 × (0.75 – 16)	1 × (0.75 – 16)	1 × (0.75 – 16)	1 × (2.5 – 16)	1 × (2.5 – 16)	1 × (2.5 – 16)
2 × (0.75 – 10)	2 × (0.75 – 10)	2 × (0.75 – 10)	2 × (2.5 – 16)	2 × (2.5 – 16)	2 × (2.5 – 16)
1 × (0.75 – 16)	1 × (0.75 – 16)	1 × (0.75 – 16)	1 × (2.5 – 35)	1 × (2.5 – 35)	1 × (2.5 – 35)
2 × (0.75 – 10)	2 × (0.75 – 10)	2 × (0.75 – 10)	2 × (2.5 – 25)	2 × (2.5 – 25)	2 × (2.5 – 25)
1 × 16	1 × 16	1 × 16	1 × (16 – 50) 2 × (16 – 35)	1 × (16 – 50) 2 × (16 – 35)	1 × (16 – 50) 2 × (16 – 35)
14 – 6	14 – 6	14 – 6	12 – 2	12 – 2	12 – 2
–	–	–	2 × (6 × 9 × 0.8)	2 × (6 × 9 × 0.8)	2 × (6 × 9 × 0.8)
1 × (0.75 – 4)	1 × (0.75 – 4)	1 × (0.75 – 4)	1 × (0.75 – 4)	1 × (0.75 – 4)	1 × (0.75 – 4)
2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)
1 × (0.75 – 2.5)	1 × (0.75 – 2.5)	1 × (0.75 – 2.5)	1 × (0.75 – 2.5)	1 × (0.75 – 2.5)	1 × (0.75 – 2.5)
2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)	2 × (0.75 – 2.5)
18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14
690	690	690	690	690	690
690	690	690	690	690	690
238	350	448	560	700	910
170	250	320	400	500	650
170	250	320	400	500	650
170	250	320	400	500	650
120	150	180	250	320	370
–	–	–	–	–	–
1.3	1.3	1.3	1.3	1.3	1.3
0.2	0.2	0.2	0.2	0.2	0.2

## Technical data

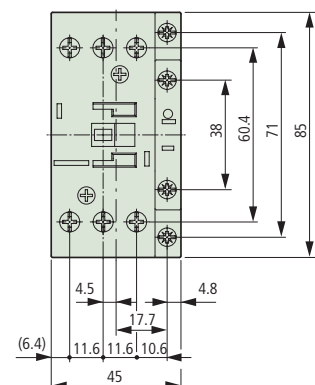
					DILM7	DILM9	DILM12
<b>AC</b>							
<b>AC-1 actuation</b>							
Conventional free air thermal current, 3-pole 50/60 Hz	Open	At 40 °C	A		22	22	22
		At 60 °C	A		20	20	20
<b>AC-3 actuation</b>							
Rated operational current, AC-3 open, 50/60 Hz, 3-pole		220/230 V	$I_e$	A	7	9	12
		380/400 V	$I_e$	A	7	9	12
		500 V	$I_e$	A	5	7	10
		660/690 V	$I_e$	A	4	5	7
Motor rating		220/230 V	$P$	kW	2.2	2.5	3.5
		380/400 V	$P$	kW	3	4	5.5
		500 V	$P$	kW	3.5	4.5	7
		660/690 V	$P$	kW	3.5	4.5	6.5
<b>Magnet systems</b>							
<b>Pick-up and drop-out values</b>							
AC operated		Pick-up	$\times U_c$		0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
DC operated		Pick-up	$\times U_c$		0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
<b>Coil consumption from cold and <math>1.0 \times U_c</math></b>							
AC operated 50/60 Hz	Pick-up	VA			28 26	28 26	28 26
		W			22 21	22 21	22 21
	Sealing	VA			4.6 3.9	4.6 3.9	4.6 3.9
		W			1.4 1.2	1.4 1.2	1.4 1.2
DC operated	Pick-up	W			3	3	4.5
	Sealing	W			3	3	4.5

## Dimensions

DILM7 – DILM12, DILA with auxiliary contact module



DILM17 – DILM32 basic unit

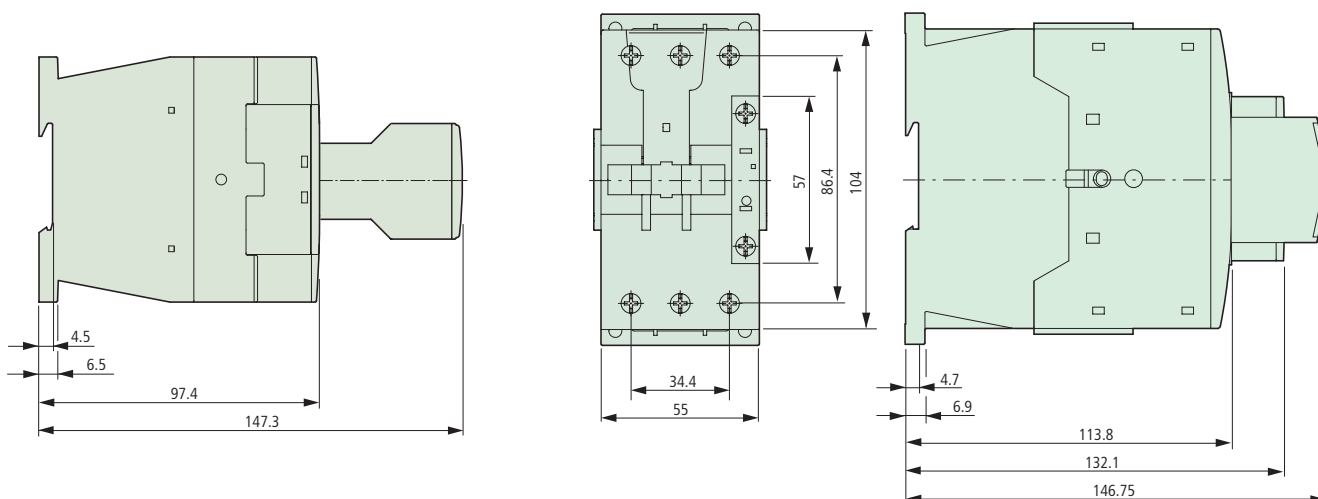


## Technical data


DILM17	DILM25	DILM32	DILM40	DILM50	DILM65
40	45	45	60	70	85
35	36	36	50	60	72
17	25	32	40	50	65
18	32	25	40	50	65
17	25	32	40	50	65
12	15	18	25	32	37
5	10	7.5	12.5	15.5	20
7.5	15	11	18.5	22	30
12	23	17.5	28	36	47
11	17	14	23	30	35
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
60	60	60	–	–	–
54	54	54	–	–	–
48	48	48	–	–	–
43	43	43	–	–	–
9.5	9.5	9.5	–	–	–
7.9	7.9	7.9	–	–	–
2.8	2.8	2.8	–	–	–
2.4	2.4	2.4	–	–	–
12 at 24 V	12 at 24 V	12 at 24 V	24 at 24 V	24 at 24 V	24 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

## Dimensions

DILM40 – DILM65 basic unit



## DILA contactor relays

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



The listed auxiliary and main contacts up to 12 A are available with tension clamp terminations.

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 <sub>F</sub> = Early-make contacts B <sub>S</sub> = Late-break contacts					
<b>2-pole</b>  	–	2 B	3	10	DILA... DILM7... DILM9... DILM12... DILM17... DILM25... DILM32...	<b>DILA-XHI02</b> 276420
	1 M	1 B				<b>DILA-XHI11</b> 276421
	2 M	–				<b>DILA-XHI20</b> 276422
	1 M <sub>F</sub>	1 B <sub>S</sub>				<b>DILA-XHIV11</b> 276423
<b>4-pole</b>  	–	4 B	3	10	DILA... DILM7... DILM9... DILM12... DILM17... DILM25... DILM32...	<b>DILA-XHI04</b> 276424
	1 M	3 B				<b>DILA-XHI13</b> 276425
	2 M	2 B				<b>DILA-XHI22</b> 276426
	3 M	1 B				<b>DILA-XHI31</b> 276427
	4 M	–				<b>DILA-XHI40</b> 276428
	1 M <sub>F</sub>	1 B <sub>S</sub>				<b>DILA-XHIV22</b> 276429

→ Dimensions Page 22

## Technical data


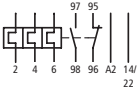

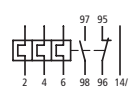

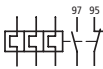
				DILA	DILA-XHI...
<b>General</b>					
Lifespan, mechanical					
AC operated	Operations	$\times 10^6$	20	20	
DC operated	Operations	$\times 10^6$	20	20	
Ambient temperature					
open		°C	-25/60	-25/60	
Weight					
AC operated		kg	0.19		
DC operated		kg	0.19		
Terminal capacity					
Screw terminals					
Solid		mm <sup>2</sup>	1 $\times$ (0.75 – 4) 2 $\times$ (0.75 – 2.5)		
Flexible with ferrule		mm <sup>2</sup>	1 $\times$ (0.75 – 2.5) 2 $\times$ (0.75 – 2.5)		
Solid or stranded		AWG	18 – 14		
<b>Contacts</b>					
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 <sup>1)</sup>	DC-13 L/R $\leq$ 15 ms				
	Contacts in series:				
	1	24 V	A	–	–
Control circuit reliability at $U_e = 24$ V DC, $U_{min} = 17$ V, $I_{min} = 5.4$ mA	Fault probability	$H_F$	$< 10^{-8}$ , $< 1$ failure to 100 mill. switching operations		
<b>Magnet systems</b>					
Pick-up and drop-out values					
AC operated					
50 Hz single-voltage coil and 50/60 Hz dual-voltage coil	Pick-up	$\times U_s$	0.8 – 1.1	–	
Dual-frequency coil 50/60 Hz	Pick-up	$\times U_s$	0.8 – 1.1	–	
DC operated <sup>2)</sup>					
Pick-up voltage	Pick-up	$\times U_s$	0.8 – 1.1	–	
Without auxiliary contact module (40 °C)	Pick-up	$\times U_c$	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 = pick-up	W	3	–	

### Notes

<sup>1)</sup> Making and breaking currents to DC-13 time constant as stated

<sup>2)</sup> Smoothed DC or three-phase bridge rectifier

## ZB overload relays

	Setting range Overload releases	For use with	Short-circuit protection		Type Article no.					
			Classification type "1" gG/gL A	Classification type "2" gG/gL A						
<b>ZB12 overload relays</b> 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	<b>ZB12-0.16</b> 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	<b>ZB12-0.24</b> 278432					
	0.24 – 0.4			2	<b>ZB12-0.4</b> 278433					
	0.4 – 0.6			4	<b>ZB12-0.6</b> 278434					
	0.6 – 1			4	<b>ZB12-1.0</b> 278435					
	1 – 1.6			6	<b>ZB12-1.6</b> 278436					
	1.6 – 2.4			10	<b>ZB12-2.4</b> 278437					
	2.4 – 4			16	<b>ZB12-4</b> 278438					
	4 – 6			20	<b>ZB12-6</b> 278439					
	6 – 10			50	<b>ZB12-10</b> 278440					
	9 – 12			50	<b>ZB12-12</b> 278441					
	<b>ZB32 overload relays</b> 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	<b>ZB32-0.16</b> 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	<b>ZB32-0.24</b> 278443	
0.24 – 0.4		2	<b>ZB32-0.4</b> 278444							
0.4 – 0.6		4	<b>ZB32-0.6</b> 278445							
0.6 – 1		4	<b>ZB32-1.0</b> 278446							
1 – 1.6		6	<b>ZB32-1.6</b> 278447							
1.6 – 2.4		10	<b>ZB32-2.4</b> 278448							
2.4 – 4		16	<b>ZB32-4</b> 278449							
4 – 6		20	<b>ZB32-6</b> 278450							
6 – 10		50	<b>ZB32-10</b> 278451							
10 – 16		63	<b>ZB32-16</b> 278452							
16 – 24		100	<b>ZB32-24</b> 278453							
24 – 32		125	<b>ZB32-32</b> 278454							
<b>ZB65 overload relays</b> Single-phasing sensitivity to IEC/EN 60947, VDE 0660 Part 102 Direct fitting  	6 – 10	DILM40, DILM50, DILM65, DIULM40, DIULM50, DIULM65	50	25	<b>ZB65-10</b> 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	<b>ZB65-16</b> 278456					
	16 – 24			63	<b>ZB65-24</b> 278457					
	24 – 40			125	<b>ZB65-40</b> 278458					
	40 – 57			160	<b>ZB65-57</b> 278459					
	50 – 65			160	<b>ZB65-65</b> 278460					

## Technical data Overload relays

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

### Notes

<sup>1)</sup> Ambient temperature: operating range to IEC/EN 60947, PTB: -5 °C to +50 °C

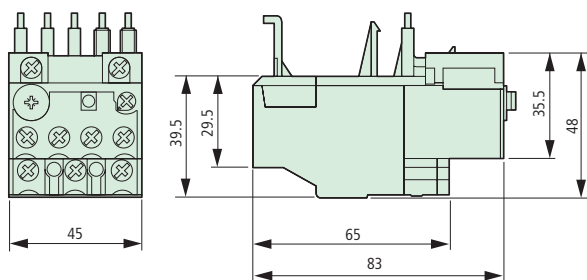
<sup>2)</sup> 6 mm<sup>2</sup> flexible with ferrule to DIN 46228

<sup>3)</sup> Terminal capacity of main contacts solid and flexible with ferrule:  
when using 2 conductor of equal cross-section

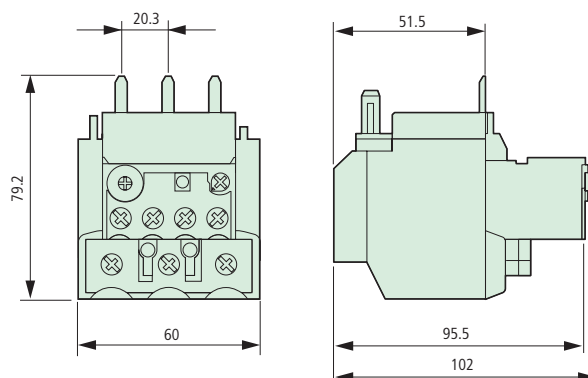
<sup>4)</sup> Rated operational current: making and breaking currents to DC-13, time constant as stated

## Dimensions




ZB12/ZB32



ZB65



## Direct-on-line starter, 400/415 V

	Motor data			Setting range		Motor starter	
	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	Actuating voltage 230 V 50 Hz	Actuating voltage 24 V DC
	$P$ kW	$I_e$ A	$I_q$ kA	$I_r$ A 	$I_m$ A 	Type Article no.	Type Article no.
<b>Complete units PKZ and DILM</b>  Classification type "1" <sup>1)</sup>  	0.06	0.21	100	0.16 – 0.25	3.5	MSC-D-0.25-M7 (...) 281925	MSC-D-0.25-M7 (...) 283154
	0.09	0.31	100	0.25 – 0.4	5.6	MSC-D-0.4-M7 (...) 281926	MSC-D-0.4-M7 (...) 283155
	0.12	0.41	100	0.40 – 0.63	8.82	MSC-D-0.63-M7 (...) 281927	MSC-D-0.63-M7 (...) 283156
	0.18	0.6	100	0.40 – 0.63	8.82	MSC-D-0.63-M7 (...) 281927	MSC-D-0.63-M7 (...) 283156
	0.25	0.8	100	0.63 – 1	14	MSC-D-1-M7 (...) 281929	MSC-D-1-M7 (...) 283158
	0.37	1.1	100	1.00 – 1.6	22.4	MSC-D-1.6-M7 (...) 283140	MSC-D-1.6-M7 (...) 283159
	0.55	1.5	100	1.00 – 1.6	22.4	MSC-D-1.6-M7 (...) 283140	MSC-D-1.6-M7 (...) 283159
	0.75	1.9	100	1.60 – 2.5	35	MSC-D-2.5-M7 (...) 283142	MSC-D-2.5-M7 (...) 283161
	1.1	2.6	100	2.50 – 4	56	MSC-D-4-M7 (...) 283143	MSC-D-4-M7 (...) 283162
	1.5	3.6	100	2.50 – 4	56	MSC-D-4-M7 (...) 283143	MSC-D-4-M7 (...) 283162
	2.2	5	100	4.00 – 6.3	88.2	MSC-D-6.3-M7 (...) 283145	MSC-D-6.3-M7 (...) 283164
	3	6.6	100	6.30 – 10	140	MSC-D-10-M7 (...) 283146	MSC-D-10-M7 (...) 283165
	4	8.5	100	6.30 – 10	140	MSC-D-10-M9 (...) 283147	MSC-D-10-M9 (...) 283166
	5.5	11.3	100	8 – 12	168	MSC-D-12-M12 (...) 283148	MSC-D-12-M12 (...) 283167
	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	

### Notes

<sup>1)</sup> For classification type "2", please inquire.




## Direct-on-line starter, 400/415 V

Motor-protective circuit-breakers	Contactor	Direct-on-line starter set
		Mechanical connection module + electrical contact module

Type	Type	Type
PKZM0-0,25	DILM7-10	PKZM0-XD M12
PKZM0-0,4	DILM7-10	PKZM0-XD M12
PKZM0-0,63	DILM -10	PKZM0-XD M12
PKZM0-0,63	DILM7-10	PKZM0-XD M12
PKZM0-1	DILM7-10	PKZM0-XD M12
PKZM0-1,6	DILM7-10	PKZM0-XD M12
PKZM0-1,6	DILM7-10	PKZM0-XD M12
PKZM0-2,5	DILM7-10	PKZM0-XD M12
PKZM0-4	DILM7-10	PKZM0-XD M12
PKZM0-4	DILM7-10	PKZM0-XD M12
PKZM0-6,3	DILM7-10	PKZM0-XD M12
PKZM0-10	DILM7-10	PKZM0-XD M12
PKZM0-10	DILM9-10	PKZM0-XD M12
PKZM0-12	DILM12-10	PKZM0-XD M12
PKZM0-16	DILM17-10	PKZM0-XD M32
PKZM0-25	DILM25-10	PKZM0-XD M32
PKZM0-32	DILM32-10	PKZM0-XD M32

**Notes**  
 The direct-on-line starters (complete units) consist of a PKZM0 motor-protective circuit-breaker and a DILM contactor. 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.

## Reversing starter 400/415 V

	Motor data			Setting range		Motor starter	
	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	Actuating voltage 230 V 50 Hz	Actuating voltage 24 V DC
	$P$ kW	$e$ A	$I_q$ kA	$I_r$ A 	$I_m$ A 	Type Article no.	Type Article no.
<b>Complete units PKZ and DILM</b>  Classification type "1" <sup>1)</sup> 	0.06	0.21	100	0.16 – 0.25	3.5	MSC-R-0.25-M7 (...) 283171	MSC-R-0.25-M7 (...) 283190
	0.09	0.31	100	0.25 – 0.4	5.6	MSC-R-0.4-M7 (...) 283172	MSC-R-0.4-M7 (...) 283191
	0.12	0.41	100	0.40 – 0.63	8.82	MSC-R-0.63-M7 (...) 283173	MSC-R-0.63-M7 (...) 283192
	0.18	0.6	100	0.40 – 0.63	8.82	MSC-R-0.63-M7 (...) 283173	MSC-R-0.63-M7 (...) 283192
	0.25	0.8	100	0.63 – 1	14	MSC-R-1-M7 (...) 283175	MSC-R-1-M7 (...) 283194
	0.37	1.1	100	1.00 – 1.6	22.4	MSC-R-1.6-M7 (...) 283176	MSC-R-1.6-M7 (...) 283195
	0.55	1.5	100	1.00 – 1.6	22.4	MSC-R-1.6-M7 (...) 283176	MSC-R-1.6-M7 (...) 283195
	0.75	1.9	100	1.60 – 2.5	35	MSC-R-2.5-M7 (...) 283178	MSC-R-2.5-M7 (...) 283197
	1.1	2.6	100	2.50 – 4	56	MSC-R-4-M7 (...) 283179	MSC-R-4-M7 (...) 283198
	1.5	3.6	100	2.50 – 4	56	MSC-R-4-M7 (...) 283179	MSC-R-4-M7 (...) 283198
	2.2	5	100	4.00 – 6.3	88.2	MSC-R-6.3-M7 (...) 283181	MSC-R-6.3-M7 (...) 283200
	3	6.6	100	6.30 – 10	140	MSC-R-10-M7 (...) 283182	MSC-R-10-M7 (...) 283201
	4	8.5	100	6.30 – 10	140	MSC-R-10-M9 (...) 283183	MSC-R-10-M9 (...) 283202
	5.5	11.3	100	8 – 12	168	MSC-R-12-M12 (...) 283184	MSC-R-12-M12 (...) 283203
	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	

### Notes

<sup>1)</sup> For classification type "2", please inquire.

## Reversing starter 400/415 V

Motor-protective  
circuit-breakers

Contactors

Reversing starter set

Mechanical connection module +  
electrical contact module and  
reversing link

Type

Type

Type

PKZM0-0,25

DILM7-01

PKZM0-XR M12

PKZM0-0,4

DILM7-01

PKZM0-XR M12

PKZM0-0,63

DILM-01

PKZM0-XR M12

PKZM0-0,63

DILM7-01

PKZM0-XR M12

PKZM0-1

DILM7-01

PKZM0-XR M12

PKZM0-1,6

DILM7-01

PKZM0-XR M12

PKZM0-1,6

DILM7-01

PKZM0-XR M12

PKZM0-2,5

DILM7-01

PKZM0-XR M12

PKZM0-4

DILM7-01

PKZM0-XR M12

PKZM0-4

DILM7-01

PKZM0-XR M12

PKZM0-6,3

DILM7-01

PKZM0-XR M12

PKZM0-10

DILM7-01

PKZM0-XR M12

PKZM0-10

DILM9-01

PKZM0-XR M12

PKZM0-12

DILM12-01

PKZM0-XR M12

PKZM0-16

DILM17-01

PKZM0-XR M32

PKZM0-25

DILM25-01

PKZM0-XR M32

PKZM0-32

DILM32-01

PKZM0-XR M32

### 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.