

Reliably Switching Highest Currents up to 2000 A



xStart

The complete range for the motor circuit. From contactors to efficient motor-starters to controlled drives. New solutions that rely on communication.

DIL contactors

PKZ motor-protective circuit-breakers

Z, ZB motor-protective relays

MSC motor-starters

DS4 softstarters

Drives

Product Information

DIL M contactors

DIL H contactors

MOELLER



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High Rated Contactors DIL: Switching High Currents Reliably

xStart



Contactors DIL M from 580 A and contactors DIL H from 1400 A are vacuum contactors with significant advantages over air-break contactors:

- The electrical lifespan is considerably higher than air-break contactors.
- A higher packing density and cleaner distribution compartment are possible since there are no open arcs and therefore no escaping gases.

Highly efficient switching

The benefits of vacuum technology arise from the closed system of vacuum switching tubes that excludes any external influences on the switching operations inside the tubes and at the same time prevents switch gases from entering the environment. The most important feature of the vacuum tubes is the long lifespan when switching high currents.

This is due to the reduction of contact erosion since no switching arcs can be produced in a vacuum. The vacuum technology means the small device dimensions are possible compared to conventional contactors which switch in air. Even higher currents can be switched with switching tubes connected in parallel for switching resistive loads (AC-1).



**Use with large motors –
utilisation category AC-3/AC-4**

Whether for bow thrusters in ships, crusher for material recycling and hardboard production, mining machines, water treatment equipment or cement production, contactors DIL M can switch motors up to 1000 A reliably and safely. Circuit-breakers NZM and the overload relays Z ensure reliable motor protection. The extensive product range of circuit-breakers and accessories enable them to be adapted for a wide range of protection tasks with selectable tripping characteristics.



Use with utilisation category AC-1

Contactors DIL M and DIL H are used in several applications for isolating circuits when contactors are used for utilisation category AC-1 applications. For example, as mains connection devices for wind generators, for large heating outputs in plastics processing, induction welding in the steel and aluminium industry or for isolating in conjunction with power electronics.



All contactors DIL M and DIL H from 185 A to 2000 A are available with electronically-controlled drives. This provides outstanding benefits for your application:

- Flexible actuation
- Considerably lower switch cabinet temperatures due to sealing power reduced to 4 %
- Design of smaller control transformers due to pick-up power reduced by up to 79 %
- Considerably greater control voltage tolerance than required by the standard, ensuring greater reliability with voltage deviations
- Long lifespan of switching contacts, due to optimised contact forces
- Integrated suppressor
- Auxiliary contact equipped with 2 make contacts, 2 break contacts

Motor protective relay ZEV

The innovative motor protective relay ZEV is designed to protect motors up to 820 A against phase failure, overload and current imbalance. An earth fault is detected quickly by the external core-balance transformers. The integrated thermistor connection enables the relay to be upgraded to provide a full motor protective system. With eight preselectable tripping classes you can even control the most difficult starting conditions for motors with long starting times.

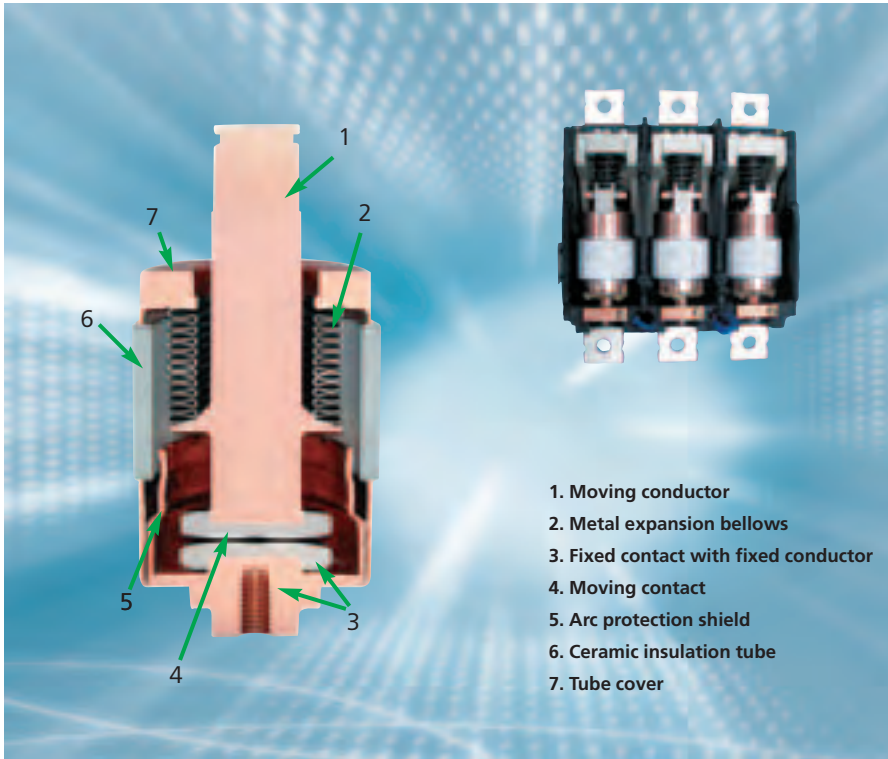
High Rated Contactors – Compact and Powerful

Compact dimensions

The vacuum switching tubes with the electromechanical drive system have a very compact design. Vacuum contactors therefore also offer outstandingly small dimensions.

A look inside the vacuum


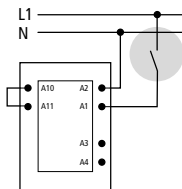

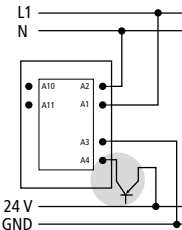

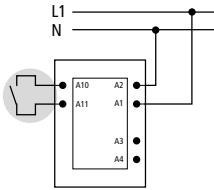
The section drawing of the vacuum tubes shows the fixed and moving contact. The thin metal bellows expand and contract with the moving contact and ensure that the system is sealed during the frequent movements of the contact. All copper coloured parts in the drawing are energized. The ceramic insulation tube isolates the incoming and outgoing sides of the switching tube. The vacuum switching tube technology used has been tried and tested since the 1980s.

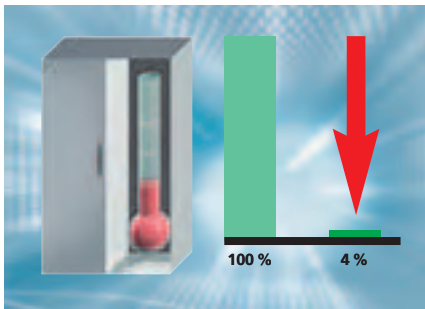


1. Moving conductor
2. Metal expansion bellows
3. Fixed contact with fixed conductor
4. Moving contact
5. Arc protection shield
6. Ceramic insulation tube
7. Tube cover

It's your choice: standard or premium version

All contactors from 185 to 500 A are available as standard or premium versions. All contactors over 500 A are premium version devices in all cases.

Contactor actuation			Standard	Premium
	Conventional: A1/A2 are energized in the usual manner.		+	+
	Directly from the PLC: A 24 V PLC output can be connected at terminals A3/A4 without the need of a coupling relay.		-	+
	From low power command devices: Low-power command devices such as board relays, control circuit devices or position switches can be connected directly to A10/A11.		-	+



Cool contactors reduce the costs for the switching cabinet

The contactors DIL M and DIL H reduce the sealing power required by up to 96 %, which in turn considerably reduces the temperature inside the switch cabinet. The costs for the switch cabinet and operating costs are also reduced. A smaller switch cabinet can be used than normally required, and expensive fans are often unnecessary.

Example: DIL M185 (RA250)

DC operated

Power consumption 3.3 Watt



Only four coils for every application

The premium version of the contactors DIL M enables you to cover all application ranges and voltages used worldwide with only four coils. This makes for simple engineering and mostly only requires one contactor in stock. The other voltage ranges of the coils ensure safe operation even with unreliable network conditions. Single voltage coils for the most typical voltages used worldwide are available for the standard contactors.

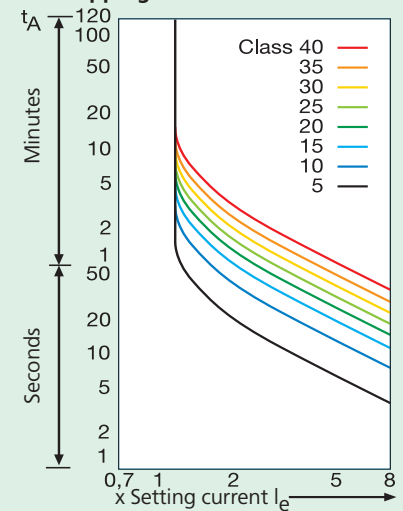


User benefits of the innovative motor protective relay ZEV

User-friendliness has top priority with the motor protective relay ZEV.

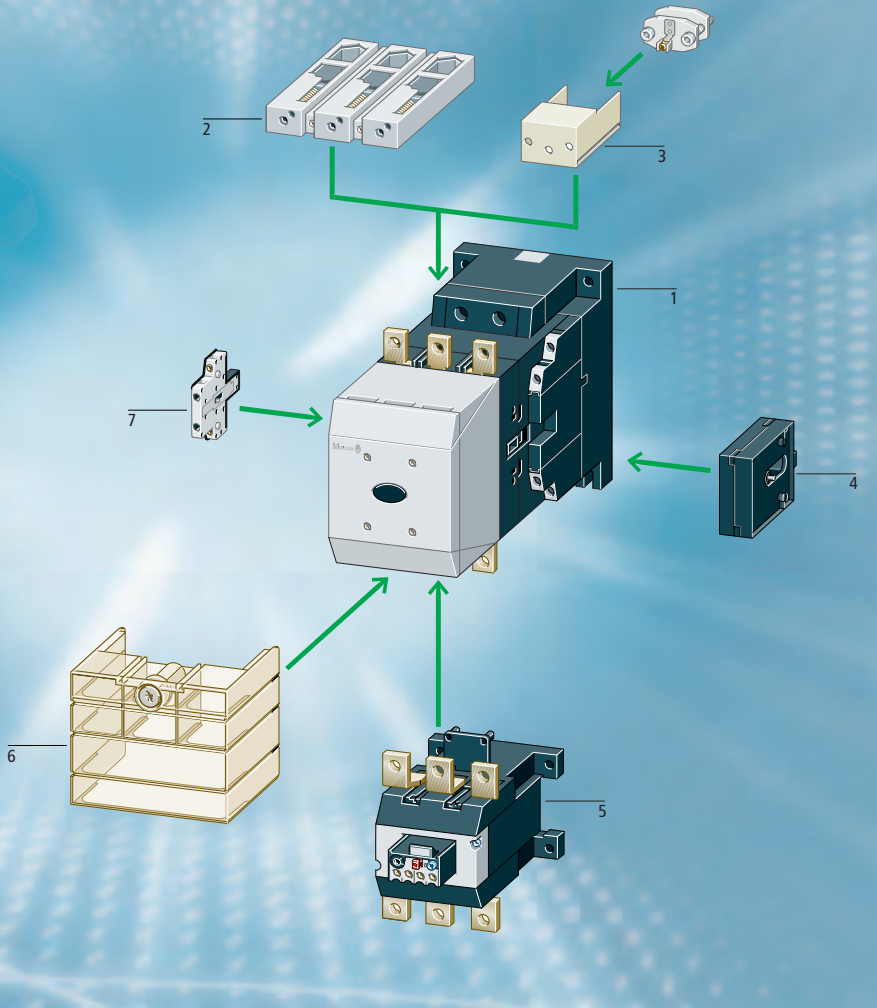
- Simple engineering with multi-voltage coils (24-240 V, 50/60 Hz or DC)
- All settings are menu guided, enabling currents, tripping classes and other functions to be set easily.
- Small and light current sensors with exceptionally broad current ranges simplify selection. The cables are simply passed through the sensors.
- With large currents, the sensor belts are wrapped round the cable and secured with a Velcro fastener (see picture).
- All three phase symbols – L1, L2, L3 – are displayed, so that a faulty phase can be indicated quickly: The symbol for the faulty phase flashes distinctively.
- Differentiated signalling: A trip caused by the thermistor or in the event of an overload can be indicated separately.
- Prewarning on overload: A prewarning is visually indicated or output via a contact before the device trips.

ZEV tripping characteristics



The motor protective relay ZEV can control even the most difficult startup conditions. The extended tripping classes up to Class 40 ensure the reliable protection of motors with long starting times. Optimum protection for any motor startup condition can be provided by selecting one of the eight tripping classes between 5 and 40.

Simply Select: Contactors DIL M and DIL H up to 2000 A



1. Contactors 90 - 560 kW
2. Cable terminal block
3. Flat strip conductor terminals
4. Mechanical interlock
5. Overload relay
6. Terminal cover, finger-proof
7. Auxiliary contact modules, 2-pole, side mounted

Contactor, 3-pole			
AC-1	AC-3	Standard electronics AC: 110 - 120 V 50/60 Hz 220 - 240 V 50/60 Hz	
$I_e=I_{th}$ at 60° C	I_e A (400 V)	P kW (400 V)	Part no. Add voltages from above
275	185	90	DILM185-S/22(...)
315	225	110	DILM225-S/22(...)
350	250	132	DILM250-S/22(...)
400	300	160	DILM300-S/22(...)
500	400	200	DILM400-S/22(...)
700	500	250	DILM500-S/22(...)
800	580	315	—
850	650	355	—
900	750	400	—
1000	820	450	—
1000	1000	560	—
1400	—	—	—
2000	—	—	—

Contactor, 4-pole			
AC-1	AC-1	AC-1	Standard electronics AC: 110 - 120 V 50/60 Hz 220 - 240V 50/60 Hz
$I_e=I_{th}$ at 40° C	at 55° C	at 70° C	Part no. Add voltages from above
160	160	155	DILP160/22(...)
250	230	200	DILP250/22(...)
315	270	215	DILP315/22(...)
500	470	400	DILP500/22(...)
630	470	400	DILP630/22(...)
800	650	575	DILP800/22(...)

*
 RDC48 = 24-48 V DC
 RA110 = 48-110 V, 40-60Hz/DC
 RA250 = 110-250 V, 40-60Hz/DC
 RAC500 = 250-500 V, 40-60Hz
 RAW250 = 230-250 V, 40-60Hz/DC

¹ Devices for world markets IEC Δ UL/CSA
² on request, the ZEV can be fitted



		Auxiliary contacts		Overload/motor protection				
Standard electronics Control circuit terminal with spring-loaded terminals AC: 110 - 120 V 50/60 Hz 220 - 240 V 50/60 Hz		Premium electronics AC/DC: RDC 48*, RDC 110*, RA 250*, RAC 500*		2 DILM1000- XHI11SI integrated	Optional Max. total number of auxiliary contacts: 8	Relays		Circuit-breakers
Part no.	Part no.	Contacts	Part no. SI at side internally SA at side externally	Part no.	Part no.	Part no.	Part no.	
Add voltages from above	Add voltages from above							
DILMC185-S/22(...)	DILM185/22(...)	2N/C 2N/O	DILM1000-XHI11-SI DILM1000-XHI11-SA DILM1000-XHI11V-SI DILM1000-XHIC11-SI DILM1000-XHIC11-SA	Z5	ZW7	ZEV	NZM...	
DILMC225-S/22(...)	DILM225/22(...)	2N/C 2N/O						
DILMC250-S/22(...)	DILM250/22(...)	2N/C 2N/O						
DILMC300-S/22(...)	DILM300/22(...)	2N/C 2N/O						
DILMC400-S/22(...)	DILM400/22(...)	2N/C 2N/O						
DILMC500-S/22(...)	DILM500/22(...)	2N/C 2N/O						
-	DILM580/22(...)	2N/C 2N/O						
-	DILM650/22(...)	2N/C 2N/O						
-	DILM750/22(...)	2N/C 2N/O						
-	DILM820/22(...)	2N/C 2N/O						
-	DILM1000/22(...)	2N/C 2N/O						
-	DILH1400/22(RAW250)*	2N/C 2N/O						
-	DILH2000/22(RAW250)*	2N/C 2N/O					IZM...	

		Auxiliary contact		Short-circuit protection	
		2 DILP800- XHI-SI integrated	Optional Max. total number of auxiliary contacts: 8	Fuse	
		Contacts	Part no. SI at side internally SA at side externally	Part no. Type "1" coordination gG/gL A	Part no. Type "2" coordination gG/gL A
		2N/C 2N/O	DILP800-XHI-SI DILP800-XHI-SA	250	200
		2N/C 2N/O		250	200
		2N/C 2N/O		355	315
		2N/C 2N/O		630	630
		2N/C 2N/O		630	630
		2N/C 2N/O		800	630

Non-Combination Motor-Starters Rating data for approved types ¹				Contactor	Overload relays	Maximum short circuit protection for North America		
Maximum three-phase current motor rating			Maximum motor current			Fuses acc. CEC/NEC	Circuit Breaker Continuous current	
230 V hp	460 V hp	575 V hp	FLC A	Part no.	Part no. ²	A	A	A
60	125	150	156	DILM185	Z5-160	700 CLASS L	600	7200
75	150	200	192	DILM225	Z5-220	700 CLASS L	600	7200
100	200	250	248	DILM250	Z5-250	700 CLASS L	600	7200
125	250	300	312	DILM300	ZW7-400	800 CLASS L	600	7200
150	300	400	382	DILM400	ZW7-400	800 CLASS L	600	7200
200	400	500	480	DILM500	ZW7-540	800 CLASS L	600	7200
200	400	600	480	DILM580	ZEV-XSW820	2000	-	-
250	500	600	600	DILM650	ZEV-XSW820	2000	-	-
300	600	700	700	DILM750	ZEV-XSW820	2000	-	-
350	700	860	860	DILM820	ZEV-XSW820	2000	-	-

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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!

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