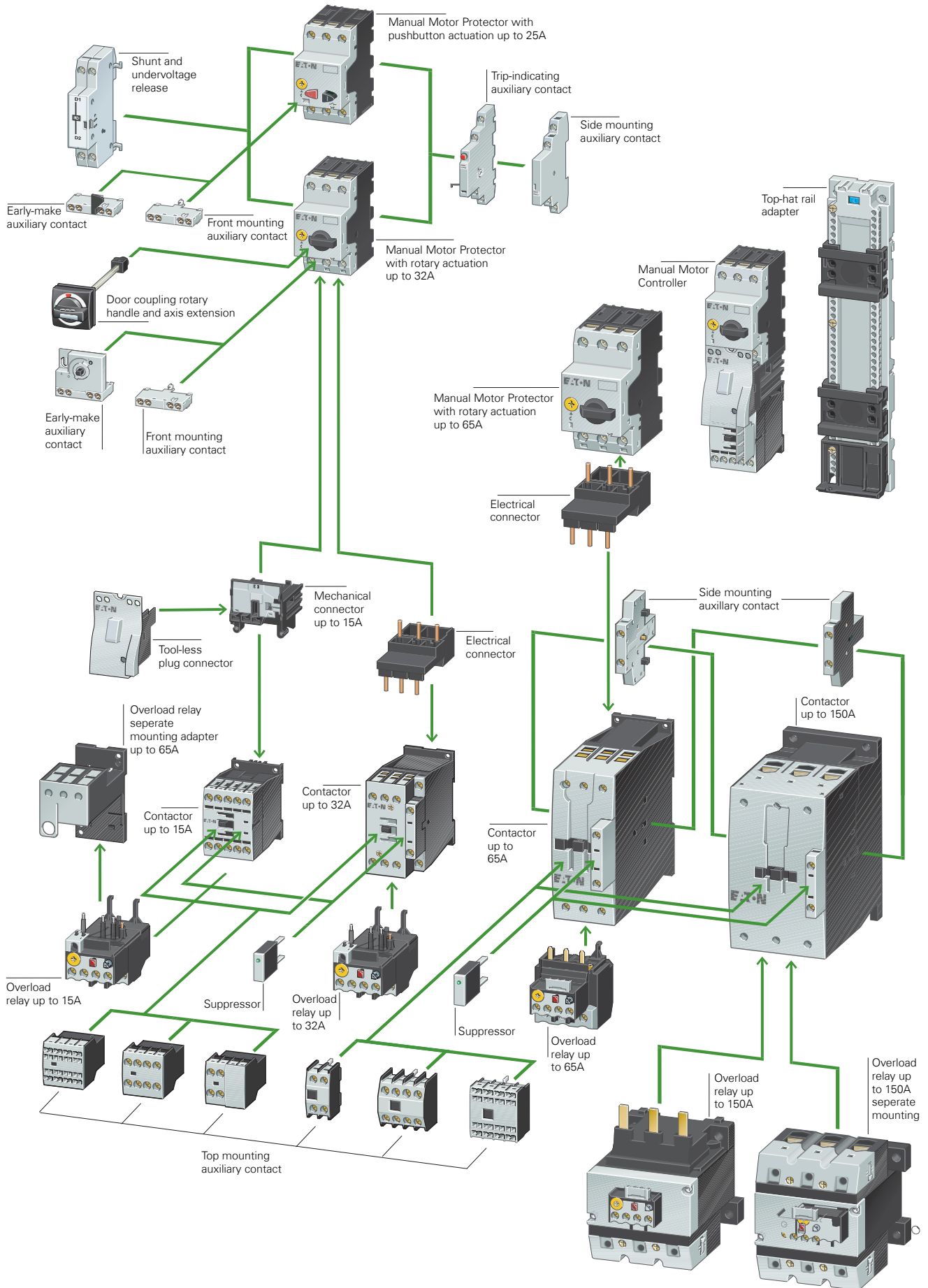


# Motor Control

## Xstart IEC Motor control



## Xstart IEC Motor control

The XStart range of contactors, overloads & manual motor protectors is a complete range of IEC Motor control. XStart is an efficient & effective solution for applications from 7-2600A.

Feature	Benefit
AC & DC devices with the same dimensions achieved with an electronically controlled coil system.	Space savings, reduced engineering design time.
Twin terminals with separate sockets in contactors up to 400A.	Offers installation & application flexibility when using different size wires. The improved integrity of the connections reduces cabling faults.
Reduced sealing power consumption for DC contactors due to an electronic coil controller that uses less power.	With sealing wattage as low as 0.5W, XStart contactors reduce power consumption & generate less heat. This results in lower cooling requirements, & the ability to mount more contactors per cabinet.
Integrated suppressors in DC controlled contactors from 7-1000A. Integrated surge suppressors in all contactors from 115A & above.	Offers reductions in total logistics & inventory costs by limiting the number of products ordered & stocked. Increased installation & maintenance efficiency, as wiring is not required.



### Xstart IEC Mini contactors

Due to its compact size, this line of mini controls is best suited to be applied in light duty loads such as hoisting, packaging, material handling, heating, lighting & automation systems. These mini contactors are a particularly compact, economic & environmentally friendly solution wherever control of small motors or loads is required.

#### Mini contactor relays

Rated operational current AC-15		Conventional free air thermal current	Aux. contact	Item no.
220 V, 230 V, 240 V	380 V, 400 V, 415 V			
$I_e$ A	$I_e$ A	$I_{th}$ A		
6	3	10	4 N/O -	<b>DILER-40(...)</b>
			3 N/O 1 NC	<b>DILER-31(...)</b>
			2 N/O 2 NC	<b>DILER-22(...)</b>



DILER-40

#### IEC Miniature controls

Operational current AC-3 Amp rating	Thermal current AC-1	Maximum kW ratings AC-3, 3-Phase Motors, 50 – 60 Hz		No. of power poles	Aux. contacts	Item no.
		240V	415V			
6.6	20	1.5	3	3	1NO	<b>DILEEM-10(...)</b>
6.6	20	1.5	3	3	1NC	<b>DILEEM-01(...)</b>
9	20	2.2	4	3	1NO	<b>DILEM-10(...)</b>
9	20	2.2	4	3	1NC	<b>DILEM-01(...)</b>
12	20	3.5	5.5	3	1NO	<b>DILEM12-10(...)</b>
12	20	3.5	5.5	3	1NC	<b>DILEM12-01(...)</b>
9	20	2.2	4	4	-	<b>DILEM4(...)</b>



DILEEM-10

#### IEC Miniature overload relays

- Trip Class 10A
- Ambient temperature compensated -5° to 50°C
- Selectable manual / automatic reset
- 1NO-1NC auxiliary contact as standard
- Direct mount with DILEM contactors

Motor full load current (FLC)	Trip class	Contact configuration	Item no.
0.1 – 0.16A	10A	1NO-1NC	<b>ZE-0,16</b>
0.16 – 0.24A			<b>ZE-0,24</b>
0.24 – 0.4A			<b>ZE-0,4</b>
0.4 – 0.6A			<b>ZE-0,6</b>
0.6 – 1A	10A	1NO-1NC	<b>ZE-1,0</b>
1 – 1.6A			<b>ZE-1,6</b>
1.6 – 2.4A			<b>ZE-2,4</b>
2.4 – 4A	10A	1NO-1NC	<b>ZE-4</b>
4 – 6A			<b>ZE-6</b>
6 – 9A			<b>ZE-9</b>
9 – 12A			<b>ZE-12</b>



ZE-0,16

## Xstart IEC Mini contactors

### IEC Miniature controls accessories (auxiliary contacts for mini contactors, front (top) mounted)



11DILE

Contact configuration	Poles	Item no.
1NO/1NC	2	<b>11DILE</b>
2NO	2	<b>20DILE</b>
2NC	2	<b>02DILE</b>
2NO2NC	4	<b>22DILE</b>
1NO/3NC	4	<b>13DILE</b>
3NO1NC	4	<b>31DILE</b>
4NO	4	<b>40DILE</b>
4NC	4	<b>04DILE</b>
1ECNO/1LONC	2	<b>11DDILE</b>
2ECNO/2LONC	2	<b>22DDILE</b>

Note: Auxiliary contacts are rated for 10A AC-1.



RCDILE250

#### Coil selection chart

Coil Voltage (50Hz)	Suffix code
415 AC	(415V50HZ, 480V60HZ)
230-240 AC	(240V50HZ)
110 AC	(110V50HZ/120V60HZ)
24 AC	(24V50HZ)
24 DC	(415V50HZ, 480V60HZ)

Note: Mini Contactor Coils are not interchangeable.  
For additional coil voltages contact Eaton.

#### RC-suppressor

Description	Item no.
Mini contactor relay. 110-250 AC. For use with DILE...	<b>RCDILE250</b>

Note: For AC operated contactors 50-60 Hz.  
DC operated contactor relays have an integrated suppressor.



#### Mechanical interlock

Description	Item no.
Mechanical Interlock	<b>MVDILE</b>

Note: For two contactors with AC or DC operated coils that are horizontally or vertically mounted, the distance between contactors is 0 mm



#### Reversing link kit

Description	Item no.
Main current wiring for reversing contactors & starters.	<b>MVS-WB-EM</b>

Note: Reversing Link Kit does not include mechanical interlock. Order part No. MVDILE for Mechanical Interlock.



#### Star-delta link kit

Description	Item no.
Main current wiring for star-delta combinations. Includes the Star-Delta Bridge.	<b>MVS-SB-EM</b>



#### Other accessories

Description	Item no.
Connector for mechanically arranging contactors in combinations.	<b>VODILE</b>
Shroud IP40 Sealable Shroud, snap fit	<b>HDILE</b>

Note: 0 mm distance between contactors with connector.

## Xstart IEC control relays

### Basic devices with positively driven contacts



Rated operational current AC-15		Conventional free air thermal current	Aux. contact	Item no.
240 V	415 V			
$I_e$	$I_e$	$I_{th}$		
A	A	A		
4	4	16	4 N/O -	<b>DILA-40(...)</b>
			3 N/O 1 NC	<b>DILA-31(...)</b>
			2 N/O 2 NC	<b>DILA-22(...)</b>

## Xstart IEC Contactors

### IEC Contactors

- AC-3 contactor ratings to 1600A & AC-1 contactor ratings to 2600A
- Panel or DIN-Rail mounting to 72A
- IP20 finger & back-of-hand proof
- Built-in NO or NC auxiliary contacts to 38A
- Built-in surge suppression on DC coils Frame B-G & AC or DC coils on Frame L-R
- Can be used with ZB or ZEB overload relays
- Can be used with PKZM or PKE for manual Motor controllers



### Full voltage non-reversing 3-pole contactors

#### IEC ratings

AC-3 Ie (A)	AC-1 (60°C) Ie = Ith (A)	Maximum kW ratings AC-3 3-Phase Motors 50 – 60 Hz			Aux. contacts	Item no.
		400V	660/ 690V			
<b>Frame B</b>						
7	20	3	3.5	1NO	<b>DILM7-10(...)</b>	
7	20	3	3.5	1NC	<b>DILM7-01(...)</b>	
9	20	4	4.5	1NO	<b>DILM9-10(...)</b>	
9	20	4	4.5	1NC	<b>DILM9-01(...)</b>	
12	20	5.5	6.5	1NO	<b>DILM12-10(...)</b>	
12	20	5.5	6.5	1NC	<b>DILM12-01(...)</b>	
15.5	20	7.5	7	1NO	<b>DILM15-10(...)</b>	
15.5	20	7.5	7	1NC	<b>DILM15-01(...)</b>	
<b>Frame C</b>						
18	35	7.5	11	1NO	<b>DILM17-10(...)</b>	
18	35	7.5	11	1NC	<b>DILM17-01(...)</b>	
25	40	11	14	1NO	<b>DILM25-10(...)</b>	
25	40	11	14	1NC	<b>DILM25-01(...)</b>	
32	40	15	17	1NO	<b>DILM32-10(...)</b>	
32	40	15	17	1NC	<b>DILM32-01(...)</b>	
38	40	18.5	21	1NO	<b>DILM38-10(...)</b>	
38	40	18.5	21	1NC	<b>DILM38-01(...)</b>	
<b>Frame D</b>						
40	50	18.5	23	—	<b>DILM40(...)</b>	
50	65	22	30	—	<b>DILM50(...)</b>	
65	80	30	35	—	<b>DILM65(...)</b>	
72	80	37	35	—	<b>DILM72(...)</b>	
<b>Frame F</b>						
80	90	37	63	—	<b>DILM80(...)</b>	
95	110	45	75	—	<b>DILM95(...)</b>	
<b>Frame G</b>						
115	130	55	90	—	<b>DILM115(...)</b>	
150	160	75	96	—	<b>DILM150(...)</b>	
170	185	90	96	—	<b>DILM170(...)</b>	

Note: The 7 – 38A contactors have positively driven contacts between the integrated auxiliary contact & the auxiliary contact module as well as within the auxiliary contact modules.  
The 40 – 72A contactors have positively driven contacts within the auxiliary contact module. 6 auxiliary contacts are possible with a combination of side mounted & front mount auxiliary contacts.  
DC operated contactors (Frames B – G, 7 – 170A) have a built-in suppressor circuit. Frame B – C contactors with 1NC built-in auxiliary are mirror contacts.



Frame B



Frame C



Frame D



Frame F & G

#### IEC ratings

AC-3 Ie (A)	AC-1 (60°C) Ie = Ith (A)	Maximum kW ratings AC-3 3-Phase Motors 50 – 60 Hz			Aux. contacts	Item no.
		400V	660/ 690V	1000V		
<b>Frame L – Electronic Coil</b>						
185	275	90	140	108	2NO-2NC	<b>DILM185A/22(...)</b>
225	315	110	150	108	2NO-2NC	<b>DILM225A/22(...)</b>
250	330	132	195	108	2NO-2NC	<b>DILM250/22(...)</b>
<b>Frame M – Electronic Coil</b>						
300	350	160	195	132	2NO-2NC	<b>DILM300A/22(...)</b>
400	500	200	344	132	2NO-2NC	<b>DILM400/22(...)</b>
500	700	250	344	132	2NO-2NC	<b>DILM500/22(...)</b>

Contactors Frame L - R; Electronic Coil: Wide range of control voltages. Can be controlled by a PLC output, Can be controlled by a low power command device, like a limit switch or sensor.



Frame L

## Xstart IEC Contactors

### IEC Contactors

#### Full voltage non-reversing 3-pole contactors



Frame M



Frame N



Frame R

#### IEC ratings

AC-3 Ie (A)	AC-1 (60°C) Ie = Ith (A)	Maximum kW ratings AC-3 3-Phase Motors 50 – 60 Hz			Aux. contacts	Item no.
		400V	660/ 690V	1000V		
<b>Frame M – Standard coil (110/120V, 230/240V AC coil only)</b>						
300	430	160	195	-	2NO-2NC	<b>DILM300A-S/22(...)</b>
400	612	200	344	-	2NO-2NC	<b>DILM400-S/22(...)</b>
500	857	250	344	-	2NO-2NC	<b>DILM500-S/22(...)</b>
<b>Frame N – Electronic coil</b>						
580	800	315	560	600	2NO-2NC	<b>DILM580/22(...)</b>
650	850	355	630	600	2NO-2NC	<b>DILM650/22(...)</b>
750	900	400	720	800	2NO-2NC	<b>DILM750/22(...)</b>
820	1000	450	750	800	2NO-2NC	<b>DILM820/22(...)</b>
1000	1000	560	1000	1100	2NO-2NC	<b>DILM1000/22(...)</b>
<b>Frame R – Electronic coil</b>						
1600	1800	900	1600	1770	2NO-2NC	<b>DILM1600/22(...)</b>
-	1400	-	-	-	-	<b>DILH1400/22(...)</b>
-	2000	-	-	-	-	<b>DILH2000/22(...)</b>
-	2200	-	-	-	-	<b>DILH2200/22(...)</b>
-	2600	-	-	-	-	<b>DILH2600/22(...)</b>

Note: AC & DC operated contactors have a built-in suppressor circuit. (Frames L – R, 185 – 2600A).

### DIL DC contactor

Thanks to the use of proven hybrid technology, the contacts in Eaton DC contactors have a long lifespan and low contact wear. Hybrid contactors feature two mechanical contacts – a extinguishing contact and a break contact – that are connected in series.

#### Efficient and compact

- With up to 150,000 operations, these DIL DC contactors have a lifespan that is six times longer than that of comparable devices
- Lower switching contact wear as a result of extremely short arcing times
- Convenient to switch on and off: either conventionally or directly with a programmable logic controller (PLC)

#### Reliable and flexible

- Wide control voltage range of 110 V – 250 V AC, 110 V – 350 V DC
- Bi-directional operation (polarity insensitivity) ensures ease of use
- Wide temperature range of -40 °C to +70 °C

#### Ideal for a large variety of applications

- Solar power
- Rail traffic
- Marine & Offshore
- Energy storage
- Automotive charging infrastructure
- DC grids



Description	Item no.
DC-1 contactor 300A/1000V	DILDC300/22(RDS250)
DC-1 contactor 600A/1000V	DILDC600/22(RDS250)

## Xstart IEC Contactors

### Coil suffix tables

Coil voltage (suffix)	DILM7-15	DILM17-65, DILM80-95	DILM72	DILM115-225A
24V AC	24V50HZ	24V50HZ	24V50/60HZ	RAC24
110V AC	110V50HZ,120V60HZ	110V50HZ,120V60HZ	110V50HZ,120V60HZ	RAC120
240V AC	240V50HZ	240V50HZ	240V50HZ	RAC240
415VAC	415V50HZ,480V60HZ	415V50HZ,480V60HZ	400V50HZ,440V60HZ	RAC440
24V DC	24VDC	RDC24	RDC24	RDC24
48V DC	48VDC	RDC60	-	RDC60
110V DC	110VDC	RDC130	-	RDC130
230V DC	220VDC	RDC240	RDC240	RDC240
Coil voltage (suffix)	DILM250-500	DILM580-820	DILM1000	DILM1600
24V AC	-	-	-	-
110V AC	RA110	RA110	-	-
240V AC	RA250	RA250	RA250	RAW250
415VAC	RAC500	RAC500	-	-
24V DC	RDC48	-	-	-
48V DC	RDC48	-	-	-
110V DC	RA110	RA110	-	-
230V DC	RA250	RA250	RA250	RAW250

### IEC 4-Pole Contactors, frame B – frame G

le (A) AC-3	le = Ith (A) (40°C) AC-1	Maximum kW ratings AC-3 3 Ph Motors 50 – 60 Hz 400V, kW	Item no.
<b>Frame B</b>			
12	20	5.5	DILMP20(...)
<b>Frame C</b>			
18	32	7.5	DILMP32-10(...)
25	45	11	DILMP45-10(...)
<b>Frame D</b>			
40	63	18.5	DILMP63(...)
50	80	22	DILMP80(...)
<b>Frame G</b>			
80	125	37	DILMP125(...)
95	160	45	DILMP160(...)
115	200	55	DILMP200(...)

### IEC Capacitor contactors, frame C – Frame D

Switching duty in kvar - Group compensation, w/o reactor				Item no.
230V	400V	525V	690V	
<b>Frame C</b>				
7.5	12.5	16.7	20	DILK12-11(...)
11	20	25	33.3	DILK20-11(...)
15	25	33.3	40	DILK25-11(...)
<b>Frame D</b>				
20	33.3	40	55	DILK33-10(...)
25	50	65	85	DILK50-10(...)

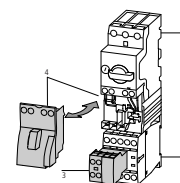
Note: Weld resistant contactors for capacitors, with inrush current peaks up to 180 I<sub>n</sub>

### Accessories - Auxiliary contacts

Conventional thermal current, Open at 60°C Ith = le, AC-1 in Amps	Poles	Contact configuration	Item no.
<b>Frame B – C – Front (Top) Mount</b>			
16	2	2NO	DILA-XHI20
16	2	2NC	DILA-XHI02
16	2	1NO-1NC	DILA-XHI11
16	2	1ECNO-1LONC	DILA-XHIV11
16	2	2NO	DILA-XHIT20 <sup>Ⓞ</sup>
16	2	1NO-1NC	DILA-XHIT11 <sup>Ⓞ</sup>
16	2	2NC	DILA-XHIT02 <sup>Ⓞ</sup>
16	4	2NO-2NC	DILA-XHIT22 <sup>Ⓞ</sup>
16	4	4NO	DILA-XHI40
16	4	4NC	DILA-XHI04
16	4	2NO-2NC	DILA-XHI22
16	4	3NO-1NO	DILA-XHI31
16	4	1NO-3NC	DILA-XHI13
16	4	1NO-1NC, 1ECNO-1LONC	DILA-XHIV22



Frame B-C



Frame B - side mount: can be mounted to the left side of contactor only. Cannot be used in combination with front (top) mount auxiliary contacts or mechanical interlocks.

Note: Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO (early make) & NC (late break) contacts) & for the built-in auxiliary contacts of the DILM7 - DILM38... Auxiliary break contact can be used as mirror contact to IEC/EN 60947-4-1 Annex F (not NC (late break) contact). No auxiliary contacts can be fitted between two contactors.

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

## Xstart IEC Contactors

### Accessories

#### Accessories - Auxiliary contacts



Frame B



Frame C



Frame D-G



DILM1000-XHI11-SI



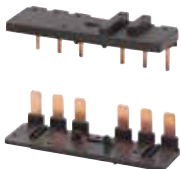
DILM12-XMV



DILM32-XMV



DILM500-XMV



DILM32-XRL

Conventional thermal current, Open at 60°C I <sub>th</sub> = I <sub>e</sub> , AC-1 in Amps	Poles	Contact configuration	Item no.
<b>Frame B – Side mount</b>			
16	1	1NO	<b>DILA-XHI10-S</b>
16	1	1NC	<b>DILA-XHI01-S</b>
<b>Frame C – Side mount</b>			
10	2	1NO-1NC	<b>DILM32-XHI11-S</b>
<b>Frame D – G Front (top) mount</b>			
16	2	2NO	<b>DILM150-XHI20</b>
16	2	2NC	<b>DILM150-XHI02</b>
16	2	1NO-1NC	<b>DILM150-XHI11</b>
16	4	4NO	<b>DILM150-XHI40</b>
16	4	4 NC	<b>DILM150-XHI04</b>
16	4	2NO-2NC	<b>DILM150-XHI22</b>
16	4	3NO-1NC	<b>DILM150-XHI31</b>
16	4	1NO-3NC	<b>DILM150-XHI13</b>
16	4	1NO-1NC, 1ECNO-ILONC	<b>DILM150-XHIV22</b>

#### Side mount auxiliary contacts for frame D – R, 40 – 2600A

Conventional free air thermal current, I <sub>th</sub> = I <sub>e</sub> , AC-1 in Amps	Poles	Contact configuration	Item no.
<b>Frame D – L (40 - 225A)</b>			
10	2	1NO-1NC	<b>DILM1000-XHI11-SI</b>
10	2	IECNO-ILONC	<b>DILM1000-XHIV11-SI</b>
<b>Frame L – R (250 - 2600A)</b>			
10	2	1NO-1NC	<b>DILM820-XHI11-SI</b>
10	2	IECNO-ILONC	<b>DILM820-XHI11V-SI</b>

Note: For Frames B – C, cannot use both a side & a top mount auxiliary contact at the same time. For Frame D, 6 auxiliary contacts maximum (can be a combination of side & top mount units). For Frames F – R, 8 auxiliary contacts maximum (can be a combination of side & top mount units).

#### Mechanical interlock<sup>Ⓞ</sup>

For use with...	Pkg. qty.	Item no.
DILM7 - 15 DILMP20 DILA	5	<b>DILM12-XMV</b>
DILM17 - 38	1	<b>DILM32-XMV</b>
DILM40 - 72	1	<b>DILM65-XMV</b>
DILM80 - 170	1	<b>DILM150-XMV<sup>Ⓞ</sup></b>
DILM185A - 500	1	<b>DILM500-XMV</b>
DILM580 - 1000	1	<b>DILM820-XMV<sup>Ⓞ</sup></b>

#### Reversing link kits

For use with...	Pkg. qty.	Item no.
DILM7 - 12	1	<b>DILM12-XRL<sup>Ⓞ</sup></b>
DILM17 - 32	1	<b>DILM32-XRL</b>
DILM40 - 65	1	<b>DILM65-XRL</b>
DILM80 - 150	1	<b>DILM150-XRL</b>

Ⓞ For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For B – G frames, mechanical lifespan is 2.5 x 10<sup>6</sup> operations & the distance between contactors is 0 mm. For L – N frames, mechanical lifespan is 5 x 10<sup>6</sup> operations & no auxiliary contact can be mounted between the mechanical interlock & the contactor — the distance between contactors is 15 mm.

Ⓞ DILM150-XMV and DILM820-XMV consist of an interlock element & mounting plate.

Ⓞ Also includes Interlocking Bridge (DILM12-XEV).

## Xstart IEC Contactors

### Accessories

#### Suppressor circuit

Voltage U <sub>s</sub> V	For use with	Item no.
<b>RC suppressors</b>		
24 - 48 AC	DILM7 - DILM15	<b>DILM12-XSPR48</b>
110 - 240 AC	DILMP20	<b>DILM12-XSPR240</b>
240 - 500 AC	DILA	<b>DILM12-XSPR500</b>
24 - 48 AC	DILM17 - DILM32	<b>DILM32-XSPR48</b>
110 - 240 AC	DILK12 - DILK25	<b>DILM32-XSPR240</b>
240 - 500 AC	DILMP32 - DILMP45	<b>DILM32-XSPR500</b>
24 - 48 AC	DILM40 - DILM95	<b>DILM95-XSPR48</b>
110 - 240 AC	DILK33 - DILK50	<b>DILM95-XSPR240</b>
240 - 500 AC	DILMP63 - DILMP200	<b>DILM95-XSPR500</b>
<b>Varistor suppressors</b>		
24 - 48 AC		<b>DILM12-XSPV48</b>
48 - 130 AC	DILM7 - DILM15	<b>DILM12-XSPV130</b>
130 - 240 AC	DILMP20	<b>DILM12-XSPV240</b>
240 - 500 AC	DILA	<b>DILM12-XSPV500</b>
24 - 48 AC		<b>DILM32-XSPV48</b>
48 - 130 AC	DILM17 - DILM32	<b>DILM32-XSPV130</b>
130 - 240 AC	DILK12 - DILK25	<b>DILM32-XSPV240</b>
240 - 500 AC	DILL..	<b>DILM32-XSPV500</b>
24 - 48 AC	DILMP32 - DILMP45	<b>DILM32-XSPV500</b>
24 - 48 AC		<b>DILM95-XSPV48</b>
48 - 130 AC	DILM40 - DILM95	<b>DILM95-XSPV130</b>
130 - 240 AC	DILK33 - DILK50	<b>DILM95-XSPV240</b>
240 - 500 AC	DILMP63 - DILMP200	<b>DILM95-XSPV500</b>
<b>Varistor suppressors with integrated LED</b>		
24 - 48 AC	DILM7 - DILM15	<b>DILM12-XSPVL48</b>
130 - 240 AC	DILMP20	<b>DILM12-XSPVL240</b>
24 - 48 AC	DILA	<b>DILM12-XSPVL240</b>
24 - 48 AC		<b>DILM32-XSPVL48</b>
130 - 240 AC	DILM17 - DILM32	<b>DILM32-XSPVL240</b>
24 - 48 AC	DILK12 - DILK25	<b>DILM32-XSPVL240</b>
130 - 240 AC	DILL..	<b>DILM32-XSPVL240</b>
24 - 48 AC	DILMP32 - DILMP45	<b>DILM32-XSPVL240</b>
24 - 48 AC		<b>DILM95-XSPVL48</b>
130 - 240 AC	DILM40 - DILM95	<b>DILM95-XSPVL240</b>
130 - 240 AC	DILK33 - DILK50	<b>DILM95-XSPVL240</b>
130 - 240 AC	DILMP63 - DILMP200	<b>DILM95-XSPVL240</b>
<b>Diode suppressor</b>		
12 - 250 DC	DILM7 - DILM15	<b>DILM12-XSPD</b>
	DILMP20	
	DILA	



DILM12-XSPR48



DILM12-XSPV48



DILM12-XSPVL48



DILM12-XSPD



## Xstart IEC Contactors

### Accessories

#### Paralleling links for main contacts\*



DILM12-XP1



DILM32-XP1



DILM150-XP1



DILM12-XS1



DILM400-XS1



DILM12-XSL



DILM32-XSL



DILM32-XIP2X



DILM65-XIP2X

For use with	Item no.
DILM7 - DILM15	<b>DILM12-XP1</b>
DILM17 - DILM32	<b>DILM32-XP1</b>
DILM40 - DILM72	<b>DILM65-XP1</b>
DILM80 - DILM72	<b>DILM150-XP1</b>
DILM185A	<b>DILM185-XP1</b>

\* Consisting of 2 paralleling links

#### Star-point bridges

For use with	Item no.
DILM7 - DILM15	<b>DILM12-XS1</b>
DILM17 - DILM32	<b>DILM32-XS1</b>
DILM40 - DILM72	<b>DILM65-XS1</b>
DILM80 - DILM170	<b>DILM150-XS1</b>
DILM185A - DILM400	<b>DILM400-XS1</b>
DILM500	<b>DILM500-XS1</b>

#### Star-delta wiring kit

For use with	Item no.
DILM7, DILM9, DILM12, DILM15	<b>DILM12-XSL</b>
DILM17, DILM25, DILM32	<b>DILM32-XSL</b>
DILM40, DILM50, DILM65	<b>DILM65-XSL</b>
DILM80, DILM95	<b>DILM95-XSL</b>
DILM115, DILM150	<b>DILM150-XSL</b>

#### IP2X cover set

For use with	Item no.
DILM17, DILM25, DILM32, DILM38, DILMP32, DILMP45	<b>DILM32-XIP2X</b>
DILM40, DILM50, DILM65, DILM72, DILMP63, DILMP80	<b>DILM65-XIP2X</b>
DILM80, DILM95, DILM115, DILM150, DILM170, DILMP125, DILMP160, DILMP200, ZB150	<b>DILM150-XIP2X</b>

## Xstart IEC Contactors

### Accessories

#### Electronic timer modules

Description	For use with	Item no.
<b>On-delayed</b>		
<b>Cannot be combined with top mounting auxiliary contacts. Incl. suppressor circuits</b>		
24V AC/DC	DILM7 - DILM32	<b>DILM32-XTEE11(RA24)</b>
100 ... 130 V AC	DILMP20	<b>DILM32-XTEE11(RA130)</b>
200 ... 240 V AC	DILMP32 - DILMP45 DILA	<b>DILM32-XTEE11(RAC240)</b>
<b>Off-delayed, auxiliary voltage-free</b>		
<b>Cannot be combined with top mounting auxiliary contacts. Incl. suppressor circuits</b>		
24V AC/DC		<b>DILM32-XTED11-1(RA24)</b>
		<b>DILM32-XTED11-10(RA24)</b>
		<b>DILM32-XTED11-100(RA24)</b>
100 ... 130 V AC	DILM7 - DILM32	<b>DILM32-XTED11-1(RAC130)</b>
	DILMP20	<b>DILM32-XTED11-10(RAC130)</b>
	DILMP32 - DILMP45	<b>DILM32-XTED11-100(RAC130)</b>
	DILA	<b>DILM32-XTED11-100(RAC130)</b>
200 ... 240 V AC		<b>DILM32-XTED11-1(RAC240)</b>
		<b>DILM32-XTED11-10(RAC240)</b>
		<b>DILM32-XTED11-100(RAC240)</b>
<b>For star-delta applications</b>		
<b>Cannot be combined with top mounting auxiliary contacts. Incl. suppressor circuits</b>		
24V AC/DC	DILM7 - DILM32	<b>DILM32-XTEY20(RA24)</b>
100 ... 130 V AC	DILMP20	<b>DILM32-XTEY20(RAC130)</b>
200 ... 240 V AC	DILMP32 - DILMP45 DILA	<b>DILM32-XTEY20(RAC240)</b>



DILM32-XTEE11(RA24)



DILM32-XTED11-1(RA24)



DILM32-XTEY20(RA24)

### Accessories

Description	For use with	Item no.
<b>SmartWire-Darwin module for installation on contactors. One module per contactor</b>		
Two digital inputs for potential-free contacts. 1 electrical interlock for the surface mounting of reversing starters. Messages: Contactor switch status, status of the digital inputs 1 and 2.	DILM7... - DILM32 DILM38 DILA	<b>DIL-SWD-32-001</b>
Two digital inputs for potential-free contacts. 1 electrical interlock for the surface mounting of reversing starters. 1-0-A switch for manual or automatic operation. Messages: contactor switching position, status of the digital inputs 1 and 2, 1-0-A switch position.	DILM7... - DILM32 DILM38 DILA	<b>DIL-SWD-32-002</b>
<b>Wiring set for motor feeder plug</b>		
PE module with contact plate	DILM7 DILM9 DILM12 DILM15	<b>DILM12-XMCE</b>
Motor plate with PE module and contact plate	DILM7 DILM9 DILM12 DILM15	<b>DILM12-XMCP/E</b>
	PKZM0/PKE + DILM7 PKZM0/PKE + DILM9 PKZM0/PKE + DILM12 PKZM0/PKE + DILM15	<b>DILM12-XMCP/T</b>



DIL-SWD-32-001



DILM12-XMCP/E

## Xstart IEC Contactors

### Accessories



DILM32-XTEPLH



DILM1000-XSM



DILM225A-XHB



ETS4-VS3



DILM32-XSP(RDC24)



CMD(24VDC)

#### Sealable shrouds - Transparent

For use with	Item no.
DILM32-XTE...	<b>DILM32-XTEPLH</b>

#### Suppressor circuits for vacuum contactors (on load side)

For use with	Item no.
DILM580 DILM650 DILM750 DILM820 DILM1000	<b>DILM1000-XSM</b>
DILH2000 DILH2200 DILH2600	<b>DILH2600-XSM</b>

#### Terminal Cover

For use with	Item no.
DILM185A DILM225A	<b>DILM225A-XHB</b>
DILM250 DILM300A DILM400	<b>DILM400-XHB</b>
DILM500	<b>DILM500-XHB</b>
DILM580 DILM650	<b>DILM650-XHB</b>
DILM750 DILM820 DILM1000	<b>DILM820-XHB</b>

#### Amplifier module for separate mounting

Rated operational current AC-15			Actuating voltage U <sub>s</sub> A DC	For use with	Item no.
AC-15 230V I <sub>e</sub> A	400V I <sub>e</sub> A	DC 220V I <sub>e</sub> A			
2	2	0.03	24	...DILM DILMP... DILL... DILK...	<b>ETS4-VS3</b>

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

#### Replacement coils for DILM contactors

For use with	DC voltage Item no.	AC voltage Item no.
DILM17 DILM25 DILM32 DILM38	<b>DILM32-XSP (RDC24) *</b>	<b>DILM32-XSP (240V50HZ)</b>
DILM40 DILM50 DILM65 DILM72	<b>DILM65-XSP (RDC24) *</b>	<b>DILM65-XSP (240V50HZ)</b>
DILM80 DILM95	<b>DILM95-XSP (RDC24) *</b>	<b>DILM95-XSP (240V50HZ)</b>
DILM115 DILM150 DILM170	<b>DILM150-XSP (RDC24) *</b>	<b>DILM150-XSP (RAC240)</b>
DILM185A DILM225A	<b>DILM225A-XSP (RDC24) *</b>	<b>DILM225A-XSP (RAC240)</b>

\* (Includes electronic module)

For use with	DC voltage Item no.	AC voltage Item no.
DILM250 DILM300A	<b>DILM250-XSP/E (RA250)</b>	<b>DILM250-XSP/E (RA250)</b>
DILM400 DILM500	<b>DILM500-XSP/E (RA250)</b>	<b>DILM500-XSP/E (RA250)</b>
DILM580 DILM650 DILM750 DILM820 DILM1000	<b>DILM1000-XSP/E (RA250)</b>	<b>DILM1000-XSP/E (RA250)</b>
DILH1400	-	<b>DILH1400-XSP/E (RAW250)</b>
DILM250-S DILM300A-S	-	<b>DILM250-S-XSP/E (220-240V50/60HZ)</b>
DILM400-S DILM500-S	-	<b>DILM500-S-XSP/E (220-240V50/60HZ)</b>

### Contactor monitoring device

#### CMD

##### Application

The function of the CMD is to monitor the main contacts of a contactor against welding. For this the control voltage of the contactor is compared with the state of the main contacts which is reliably monitored using a mirror contact (IEC EN60947-4-1 Annex F). If the coil is deenergized and the contactor does not drop out the CMD trips the upstream circuit-breaker/motor protective circuit breaker/switch-disconnector via a shunt release.

##### Safety

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

Description	Item no.
Contactor monitoring device, 24VDC	<b>CMD(24VDC)</b>
Contactor monitoring device, 240VAC	<b>CMD(220-240VAC)</b>

## Overload relays



Description	Thermal overload relays	Electronic overload relays	Advanced motor protection relays
Type	ZB	ZEB	C445
Relay type	Thermal Bi-Metallic	Electronic	Electronic
Direct connect to contactor	Yes, (DILM)	Yes, (DILM)	—
Separate mount	Yes, Adapter	Yes	Yes
FLC Range	0.1 - 630A	0.1 - 1500A	0.3 - 800A (with CTs)
FLC max.:min. ratio	Approx. 1.5:1	5:1	—
Motor overload protection	Yes	Yes	Yes
Underload protection	—	—	Yes
Supply protection	—	—	Yes
Enhanced phase loss protection	—	Yes	Yes
Enhanced phase imbalance protection	—	Yes	Yes
Trip class	10A	Selectable 10 / 20 / 30	5 – 40
Reset type	Selectable manual / automatic	Selectable manual / automatic	Selectable manual / automatic / programmable / remote
Communications with I/O	—	Yes	Yes (Modbus, ETHERNET/IP, PROFIBUS)
Remote display	—	—	Yes
Ground fault	—	Yes	Yes
Alarm no trip	—	—	Yes (voltage & ground faults)
Jam	—	Yes	Yes
Programmable reset timers	—	—	Yes
Programmable reset attempts	—	—	Yes
Current monitoring	—	Yes	Yes
Voltage monitoring	—	—	Yes
Power monitoring	—	—	Yes
Thermal capacity monitoring	—	Yes	Yes
Motor run hours monitoring	—	—	Yes

## Overload relays

### ZB bi-metallic overload relays

- Direct mount to DILM contactors or separate mount
- Class 10A, up to 630A motors
- Ambient - compensated bi-metallic
- Test/off pushbutton
- Reset pushbutton manual/auto
- Tripfree release



ZB12-2,4



ZB32-16



ZB65-57



ZB150-100



ZB150-70/KK

Setting range overload release, I <sub>r</sub>	Aux contact configuration	For use with contactor Ampere range	Item no.
<b>Frame B – Direct mount to contactor (DILM7-15)</b>			
0.1 – 0.16	1NO-1NC	7 – 15A	<b>ZB12-0,16</b>
0.16 – 0.24	1NO-1NC	7 – 15A	<b>ZB12-0,24</b>
0.24 – 0.4	1NO-1NC	7 – 15A	<b>ZB12-0,4</b>
0.4 – 0.6	1NO-1NC	7 – 15A	<b>ZB12-0,6</b>
0.6 – 1	1NO-1NC	7 – 15A	<b>ZB12-1</b>
1 – 1.6	1NO-1NC	7 – 15A	<b>ZB12-1,6</b>
1.6 – 2.4	1NO-1NC	7 – 15A	<b>ZB12-2,4</b>
2.4 – 4	1NO-1NC	7 – 15A	<b>ZB12-4</b>
4 – 6	1NO-1NC	7 – 15A	<b>ZB12-6</b>
6 – 10	1NO-1NC	7 – 15A	<b>ZB12-10</b>
9 – 12	1NO-1NC	9 – 15A	<b>ZB12-12</b>
12 – 16	1NO-1NC	12 – 15A	<b>ZB12-16</b>
<b>Frame C – Direct mount to contactor (DILM17-38)</b>			
0.1 – 0.16	1NO-1NC	17 – 38A	<b>ZB32-0,16</b>
0.16 – 0.24	1NO-1NC	17 – 38A	<b>ZB32-0,24</b>
0.24 – 0.4	1NO-1NC	17 – 38A	<b>ZB32-0,4</b>
0.4 – 0.6	1NO-1NC	17 – 38A	<b>ZB32-0,6</b>
0.6 – 1	1NO-1NC	17 – 38A	<b>ZB32-1</b>
1 – 1.6	1NO-1NC	17 – 38A	<b>ZB32-1,6</b>
1.6 – 2.4	1NO-1NC	17 – 38A	<b>ZB32-2,4</b>
2.4 – 4	1NO-1NC	17 – 38A	<b>ZB32-4</b>
4 – 6	1NO-1NC	17 – 38A	<b>ZB32-6</b>
6 – 10	1NO-1NC	17 – 38A	<b>ZB32-10</b>
10 – 16	1NO-1NC	17 – 38A	<b>ZB32-16</b>
16 – 24	1NO-1NC	17 – 38A	<b>ZB32-24</b>
24 – 32	1NO-1NC	17 – 38A	<b>ZB32-32</b>
32 – 38	1NO-1NC	17 – 38A	<b>ZB32-38</b>
<b>Frame D – Direct mount to contactor (DILM40-72)</b>			
6 – 10	1NO-1NC	40 – 72A	<b>ZB65-10</b>
10 – 16	1NO-1NC	40 – 72A	<b>ZB65-16</b>
16 – 24	1NO-1NC	40 – 72A	<b>ZB65-24</b>
24 – 40	1NO-1NC	40 – 72A	<b>ZB65-40</b>
40 – 57	1NO-1NC	40 – 72 A	<b>ZB65-57</b>
50 – 65	1NO-1NC	40 – 72A	<b>ZB65-65</b>
65 – 75	1NO-1NC	40 – 72 A	<b>ZB65-75</b>
<b>Frame F – G – Direct mount to contactor (DILM80-170)</b>			
35 – 50	1NO-1NC	80 – 170A	<b>ZB150-50</b>
50 – 70	1NO-1NC	80 – 170A	<b>ZB150-70</b>
70 – 100	1NO-1NC	80 – 170A	<b>ZB150-100</b>
95 – 125	1NO-1NC	80 – 170A	<b>ZB150-125</b>
120 – 150	1NO-1NC	80 – 170A	<b>ZB150-150</b>
145 – 175	1NO-1NC	80 – 170A	<b>ZB150-175</b>
<b>Frame F – G – Separate mount to contactor (DILM80-170)</b>			
35 – 50	1NO-1NC	80 – 170A	<b>ZB150-50/KK</b>
50 – 70	1NO-1NC	80 – 170A	<b>ZB150-70/KK</b>
70 – 100	1NO-1NC	80 – 170A	<b>ZB150-100/KK</b>
95 – 125	1NO-1NC	80 – 170A	<b>ZB150-125/KK</b>
120 – 150	1NO-1NC	80 – 170A	<b>ZB150-150/KK</b>
145 – 175	1NO-1NC	80 – 170A	<b>ZB150-175/KK</b>

## Overload relays

### ZB bi-metallic Overload Relays

Setting range Overload release, I <sub>r</sub>	Aux contact configuration	For use with contactor Ampere range	Item no.
<b>Frame L – Direct mount or separate mount (DILM185A-300A)</b>			
50 – 70	1NO-1NC	185 - 225A	<b>Z5-70/FF225A</b>
70 – 100	1NO-1NC	185 - 225A	<b>Z5-100/FF225A</b>
95 – 125	1NO-1NC	185 - 225A	<b>Z5-125/FF225A</b>
120 – 160	1NO-1NC	185 - 225A	<b>Z5-160/FF225A</b>
160 – 220	1NO-1NC	185 - 225A	<b>Z5-220/FF225A</b>
200 – 250	1NO-1NC	185 - 225A	<b>Z5-250/FF225A</b>
50 – 70	1NO-1NC	250A	<b>Z5-70/FF250</b>
70 – 100	1NO-1NC	250A	<b>Z5-100/FF250</b>
95 – 125	1NO-1NC	250A	<b>Z5-125/FF250</b>
120 – 160	1NO-1NC	250A	<b>Z5-160/FF250</b>
160 – 220	1NO-1NC	250A	<b>Z5-220/FF250</b>
200 – 250	1NO-1NC	250A	<b>Z5-250/FF250</b>
250 - 300	1NO-1NC	300A	<b>Z5-300/FF250</b>

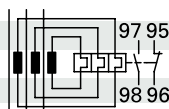


Z5-160/FF225A

Note: Short circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting.  
Trip Class: 10A. Suitable for protection of EEx e-motors.

### Current transformer operated overload relay

Setting range Overload release, I <sub>r</sub>	Contact Sequence	Aux contact configuration	For use with contactor Ampere range	Item no.
<b>Frame L – N – Separate Mount</b>				
42 - 63		1NO-1NC	185 - 650A	<b>ZW7-63</b>
60 - 90		1NO-1NC	185 - 650A	<b>ZW7-90</b>
85 - 125		1NO-1NC	185 - 650A	<b>ZW7-125</b>
110 - 160		1NO-1NC	185 - 650A	<b>ZW7-160</b>
160 - 240		1NO-1NC	185 - 650A	<b>ZW7-240</b>
190 - 290		1NO-1NC	185 - 650A	<b>ZW7-290</b>
270 - 400		1NO-1NC	185 - 650A	<b>ZW7-400</b>
360 - 540		1NO-1NC	185 - 650A	<b>ZW7-540</b>
420 - 630		1NO-1NC	185 - 650A	<b>ZW7-630</b>



ZB32-XEZ

### DIN-Rail or panel-mount adapter, frame C – D

#### Accessories

For use with...	Item no.
ZB32	<b>ZB32-XEZ</b>
ZB65	<b>ZB65-XEZ</b>

Can be snap fitted on a top hat rail (DIN-Rail) or can be screw fitted.

#### External reset button, IP65

For use with...	Item no.
ZW7...	
ZE, Z5	<b>M22-DZ-B-GB14</b>
ZB12, ZB32	
ZB65, ZB150	



M22-DZ-B-GB14

### ZEB12 electronic overload relay

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

#### ZEB12 direct mounting

Ground fault detection	Setting range of overload releases I <sub>r</sub> , A	Auxiliary contact	For use with...	Item no.
Without	0.33 - 1.65	1NO - 1NC		<b>ZEB12-1,65</b>
Without	1 - 5	1NO - 1NC	DILM7	<b>ZEB12-5</b>
Without	4 - 20	1NO - 1NC	DILM9	<b>ZEB12-20</b>
With	0.33 - 1.65	1NO - 1NC	DILM12	<b>ZEB12-1,65-GF</b>
With	1 - 5	1NO - 1NC	DILM15	<b>ZEB12-5-GF</b>
With	4 - 20	1NO - 1NC		<b>ZEB12-20-GF</b>



ZEB12-1,65

**Overload relays**

**ZEB32 electronic overload relay**



ZEB32-1,65

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

**ZEB32 direct mounting**

Ground fault detection	Setting range of overload releases $I_r$ , A	Auxiliary contact	For use with...	Item no.
Without	0.33 - 1.65	1NO - 1NC		<b>ZEB32-1,65</b>
Without	1 - 5	1NO - 1NC		<b>ZEB32-5</b>
Without	4 - 20	1NO - 1NC		<b>ZEB32-20</b>
Without	9 - 45	1NO - 1NC	DILM17 DILM25	<b>ZEB32-45</b>
With	0.33 - 1.65	1NO - 1NC	DILM32 DILM38	<b>ZEB32-1,65-GF</b>
With	1 - 5	1NO - 1NC		<b>ZEB32-5-GF</b>
With	4 - 20	1NO - 1NC		<b>ZEB32-20-GF</b>
With	9 - 45	1NO - 1NC		<b>ZEB32-45-GF</b>

**ZEB32 separate mounting**

Ground fault detection	Setting range of overload releases $I_r$ , A	Auxiliary contact	For use with...	Item no.
Without	0.33 - 1.65	1NO - 1NC		<b>ZEB32-1,65/KK</b>
Without	1 - 5	1NO - 1NC		<b>ZEB32-5/KK</b>
Without	4 - 20	1NO - 1NC		<b>ZEB32-20/KK</b>
Without	9 - 45	1NO - 1NC	DILM17 DILM25	<b>ZEB32-45/KK</b>
With	0.33 - 1.65	1NO - 1NC	DILM32 DILM38	<b>ZEB32-1,65-GF/KK</b>
With	1 - 5	1NO - 1NC		<b>ZEB32-5-GF/KK</b>
With	4 - 20	1NO - 1NC		<b>ZEB32-20-GF/KK</b>
With	9 - 45	1NO - 1NC		<b>ZEB32-45-GF/KK</b>

**ZEB65 & ZEB150 electronic overload relay**



ZEB65-45

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

**ZEB65 direct mounting**

Ground fault detection	Setting range of overload releases $I_r$ , A	Auxiliary contact	For use with...	Item no.
Without	9 - 45	1NO - 1NC		<b>ZEB65-45</b>
With	9 - 45	1NO - 1NC	DILM40 DILM50	<b>ZEB65-45-GF</b>
Without	20 - 100	1NO - 1NC		<b>ZEB65-100</b>
With	20 - 100	1NO - 1NC	DILM65 DILM72	<b>ZEB65-100-GF</b>

**ZEB150 direct mounting**

Ground fault detection	Setting range of overload releases $I_r$ , A	Auxiliary contact	For use with...	Item no.
Without	20 - 100	1NO - 1NC	DILM80 DILM95	<b>ZEB150-100</b>
With	20 - 100	1NO - 1NC	DILM115 DILM150	<b>ZEB150-100-GF</b>

**ZEB150 separate mounting**

Ground fault detection	Setting range of overload releases $I_r$ , A	Auxiliary contact	For use with...	Item no.
Without	20 - 100	1NO - 1NC	DILM80 DILM95	<b>ZEB150-100/KK</b>
With	20 - 100	1NO - 1NC	DILM115 DILM150	<b>ZEB150-100-GF/KK</b>

## Overload relays

### ZEB accessories

#### Current sensors

Setting range of overload releases I, A	For use with...	Item no.
60 - 300		<b>ZEB-XCT300</b>
120 - 600	ZEB32-5-GF/KK	<b>ZEB-XCT600</b>
200 - 1000	ZEB32-5/KK	<b>ZEB-XCT1000</b>
300 - 1500		<b>ZEB-XCT1500</b>

#### Remote reset

Description	Item no.
Remote reset module 24Vdc*	<b>C440-XCOM</b>
Remote reset module 120Vac*	<b>ZEB-XRR-120</b>
Remote reset module 24Vac*	<b>ZEB-XRR-24</b>

\* Customer can wire remote mounted button to reset module (that is, 22mm pushbutton (M22-D-B-GB14-K10))

#### Thermistor overload relays for machine protection

- 3 A rated operational current for AC-15, 240 V

Description	Rated control voltage Us, V	Item no.
Without automatic reset Mains & fault LED display	24 – 240 V 50/60 Hz, 24 – 240 V DC	<b>EMT6</b> ①
Without automatic reset Mains & fault LED display With 2 sensor circuits		<b>EMT62</b>
Without automatic reset Mains & fault LED display Trip with short-circuit in the sensor cable	24 – 240 V 50/60 Hz, 24 – 240 V DC	<b>EMT6-K</b>
Without automatic reset Mains & fault LED display	230 V 50/60 Hz	<b>EMT6(230V)</b> ①
Selector switch with/without automatic reset For manual or remote resetting Test button Mains & fault LED display	24 – 240 V 50/60 Hz, 24 – 240 V DC	<b>EMT6-DB</b> ①
Selector switch with/without automatic reset For manual or remote resetting Test button Mains & fault LED display With 2 sensor circuits		<b>EMT62-DB</b>
Selector switch with/without automatic reset For manual or remote resetting Test button Mains & fault LED display Trip with short-circuit in the sensor cable	24 – 240 V 50/60 Hz, 24 – 240 V DC	<b>EMT6-KDB</b>
Selector switch with/without automatic reset For manual or remote resetting Test button Mains & fault LED display	230 V 50/60 Hz	<b>EMT6-DB(230V)</b> ①
Multifunction device Selector switch with/without automatic reset Trip with short-circuit in the sensor cable Zero-voltage safe For manual or remote resetting Test button Short-circuit detection and retention can be deactivated Mains & fault LED display	24 – 240 V 50/60 Hz, 24 – 240 V DC	<b>EMT6-DBK</b>
<b>Accessories - screw adapter</b>		
For screw fixing	–	<b>CS-TE</b>

① Provide additional short-circuit protection in the sensor circuit with a current monitoring relay.



EMT6



EMT6-DB



EMT6-DBK



CS-TE



## Overload relays

### C445 Global motor management relay

The Power Xpert® C445 motor management relay is Eaton's newest addition to the C400 series of advanced motor protection. With industry-leading diagnostic capabilities, energy usage analytics, and an unrivaled compact footprint, the C445 can be seamlessly integrated into a variety of systems and applications. Power options - 120/240 Vac or 24 Vdc

C445 motor management relay has a fully programmable trip and alarm thresholds with time delays. The Modular pass-through design with scalable options for current, voltage, power, energy protections and monitoring. With the voltage loss restart functionality, the C445 allows for automatic recovery in the event of undervoltage conditions without the need for user intervention, and the advanced diagnostics allows for quick and accurate identification of the root cause of a fault in line, load and motor conditions. The pre-programmed operation mode allows fast, easy, error-free installation for the majority of applications.



#### Product range

- 0.3–800 A
- 415V/690 Vac, 3.3k Vac with voltage transformers
- 20–80 Hz operation
- Selectable trip class (5–40)

#### On-board I/O

- 4 digital inputs
- 120 Vac or 24 Vdc
- 3 relay outputs
- 2N/O, 1C/O

#### On-board communication options

- EtherNet/IP
- Modbus TCP, Modbus RTU
- PROFIBUS DP
- USB

### Control user interface - C445UM

Easy and safe monitoring, control and parameter setting

Door-mounted display enables safe and complete device diagnostics and parameter setting without opening the MCC door. Contextual LCD buttons provide intuitive navigation through monitoring menus. Optionally use control buttons for compact local control without the need for hardwiring.



- RUNNING LED**
- ON: Running
  - Flashing: Starting



- STOPPED LED**
- ON: Stopped
  - Flashing: Inhibited



- AUTO LED**
- ON: Controlled by remote source

### Measurement module



The pass-through design measurement module samples the current, voltage, power and energy data consumed by the electric motor and continuously passes it electronically to the base control module via a cable connection. For applications with limited mounting space, users can mount the base control module directly onto the 45 mm measurement module, achieving a best-in-class compact footprint.

- 45, 55 and 90 mm frames provide direct pass-through capability from 0.3 to 136 A
- External current transformer (CT) kits available for applications up to 800 A
- Standard current-based monitoring and protection with options for voltage and PTC inputs

Frame size	Current range (A)	Current (I) sensing	Voltage (V) sensing	PTC sensing	Item no.	
45 mm	0.3-2.4	Yes	.	.	<b>C445MA-2P4I</b>	
		Yes	.	Yes	<b>C445MA-2P4P</b>	
		Yes	Yes	.	<b>C445MA-2P4V</b>	
		Yes	Yes	Yes	<b>C445MA-2P4A</b>	
	1-5	Yes	.	.	<b>C445MA-005I</b>	
		Yes	.	Yes	<b>C445MA-005P</b>	
		Yes	Yes	.	<b>C445MA-005V</b>	
		Yes	Yes	Yes	<b>C445MA-005A</b>	
4-32	Yes	.	.	<b>C445MA-032I</b>		
	Yes	.	Yes	<b>C445MA-032P</b>		
	Yes	Yes	.	<b>C445MA-032V</b>		
	Yes	Yes	Yes	<b>C445MA-032A</b>		
	6-45	Yes	.	.	<b>C445MA-045I</b>	
		Yes	.	Yes	<b>C445MA-045P</b>	
		Yes	Yes	.	<b>C445MA-045V</b>	
		Yes	Yes	Yes	<b>C445MA-045A</b>	
55 mm	9-72	Yes	.	.	<b>C445MB-072I</b>	
		Yes	.	Yes	<b>C445MB-072P</b>	
		Yes	Yes	.	<b>C445MB-072V</b>	
	90 mm	11-90	Yes	Yes	Yes	<b>C445MB-072A</b>
			Yes	.	.	<b>C445MC-090I</b>
			Yes	.	Yes	<b>C445MC-090P</b>
90 mm	11-90	Yes	Yes	.	<b>C445MC-090V</b>	
		Yes	Yes	Yes	<b>C445MC-090A</b>	
		Yes	.	.	<b>C445MC-136I</b>	
	17-136	Yes	.	Yes	<b>C445MC-136P</b>	
		Yes	Yes	.	<b>C445MC-136V</b>	
		Yes	Yes	Yes	<b>C445MC-136A</b>	

## Overload relays

### C445 Global motor management relay

#### Base control module

The core of the C445 system, the base control module contains all of the protection, monitoring and control algorithms in addition to native I/O points. An interchangeable communication card slot allows for various communications with a single base unit.

- 120/240 Vac or 24 Vdc power source options
- Four 120 Vac or 24 Vdc inputs, 2N/O and 1C/O relay outputs
- Optional communications
- USB, Modbus RTU, Modbus TCP, EtherNet/IP, PROFIBUS DP
- Multiple pre-configured operation modes



Power source	Voltage range	Digital inputs	Relay outputs	On-board communications	Item no.
120/240 Vac	0–690 Vac	(4) 120 Vac	(2) Form A, (1) Form C (non-latching)	—	<b>C445BA-SANN</b>
				Modbus Serial	<b>C445BA-SANM</b>
			(2) Form A, (1) Form C (latching)	—	<b>C445BA-SALN</b>
		(4) 24 Vdc	(2) Form A, (1) Form C (non-latching)	Modbus Serial	<b>C445BA-SALM</b>
				—	<b>C445BA-SDNN</b>
			(2) Form A, (1) Form C (latching)	Modbus Serial	<b>C445BA-SDNM</b>
24 Vdc	0–690 Vac	(4) 120 Vac	(2) Form A, (1) Form C (non-latching)	—	<b>C445BD-SANN</b>
				Modbus Serial	<b>C445BD-SANM</b>
			(2) Form A, (1) Form C (latching)	—	<b>C445BD-SALN</b>
		(4) 24 Vdc	(2) Form A, (1) Form C (non-latching)	Modbus Serial	<b>C445BD-SALM</b>
				—	<b>C445BD-SDNN</b>
			(2) Form A, (1) Form C (latching)	Modbus Serial	<b>C445BD-SDNM</b>
			(2) Form A, (1) Form C (latching)	—	<b>C445BD-SDLN</b>
				Modbus Serial	<b>C445BD-SDLM</b>

#### External Current Transformers

Use CTs and 1–5 A C445MA-005\_ measurement module. CT kit does not include measurement module (order separately)

CT Range (A)	Description	Terminal Size	Item no.
17–300	300:5 single-phase CT, 1.25 inch dia hole, UL and CSA ANSI/ IEEE C57.13, 50–400 Hz, 600 Vac, 10 kV, relay class C50, accuracy 0.3% B0.1	(2) 8–32 brass terminals, comes with mounting bracket kit	<b>XCT300-5</b>
75–600	600:5 single-phase CT, 2.00 inch dia hole, UL and CSA ANSI/ IEEE C57.13, 50–400 Hz, 600 Vac, 10 kV, relay class C50, accuracy 0.3% B0.1	(2) 8–32 brass terminals, comes with mounting bracket kit	<b>XCT600-5</b>
100–800	800:5 single-phase CT, 2.50 inch dia hole, UL and CSA ANSI/ IEEE C57.13, 50–400 Hz, 600 Vac, 10 kV, relay class C50, accuracy 0.3% B0.1	(2) 8–32 brass terminals, comes with mounting bracket kit	<b>XCT800-5</b>

#### Connection Cables and Accessories

D77E connection cables are required to connect the base control module to the measurement module and to the user interface. Order the appropriate lengths for each connection. User interface wiring harnesses are required to utilize the digital inputs on the user interface. Order one wiring harness per user interface to connect to these inputs. C445XS-USBMICRO and C445XS-USBLEADS are used to connect the Power Xpert inControl tool (see next page for details). C445XS-USBRJ12 is used for firmware upgrades.

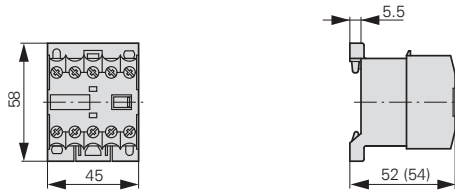
Description	Item no.
Connection cable (base control module to measurement module or user interface), 13 cm length, 600 V rating	<b>D77E-QPIP13</b>
Connection cable (base control module to measurement module or user interface), 13 cm length, 1000 V rating	<b>D77E-QPIP13-HV</b>
Connection cable (base control module to measurement module or user interface), 25 cm length, 600 V rating	<b>D77E-QPIP25</b>
Connection cable (base control module to measurement module or user interface), 25 cm length, 1000 V rating	<b>D77E-QPIP25-HV</b>
Connection cable (base control module to measurement module or user interface), 100 cm length, 600 V rating	<b>D77E-QPIP100</b>
Connection cable (base control module to measurement module or user interface), 100 cm length, 1000 V rating	<b>D77E-QPIP100-HV</b>
Connection cable (base control module to measurement module or user interface), 200 cm length, 600 V rating	<b>D77E-QPIP200</b>
Connection cable (base control module to measurement module or user interface), 300 cm length, 600 V rating	<b>D77E-QPIP300</b>
Connection cable (base control module to measurement module or user interface), 300 cm length, 1000 V rating	<b>D77E-QPIP300-HV</b>
User interface digital inputs wiring harness, 50 cm, 16 AWG wires	<b>C445XU-050</b>
User interface digital inputs wiring harness, 100 cm, 16 AWG wires	<b>C445XU-100</b>
User interface digital inputs wiring harness, 200 cm, 16 AWG wires	<b>C445XU-200</b>
User interface digital inputs wiring harness, 300 cm, 16 AWG wires	<b>C445XU-300</b>
Spare parts kit—terminal connectors, mounting feet	<b>C445XS-TERM</b>
Standard USB A male to micro USB male cable	<b>C445XS-USBMICRO</b>
Standard USB A male to loose leads cable (for use with Modbus Serial terminals)	<b>C445XS-USBLEADS</b>
Standard USB A male to RJ-12 cable (for firmware upgrades)	<b>C445XS-USBRJ12</b>

# Motor Control

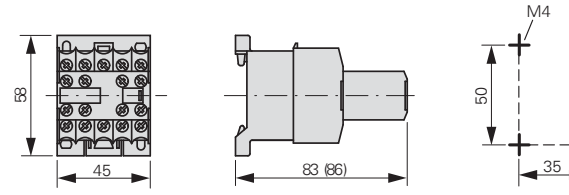
## Dimensions

### Mini contactor relays

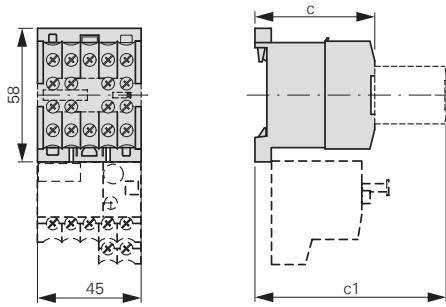
DILER-...(-C)  
DILER-...-G(-C)



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



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



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

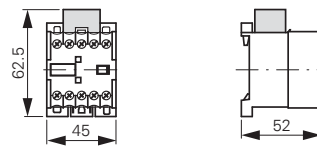
Dimensions: 50 mm height, 35 mm width, M4 screw hole.

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

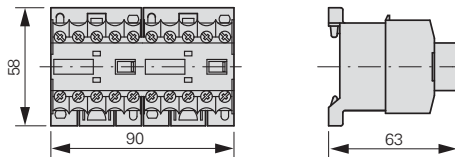


### Suppressor circuit

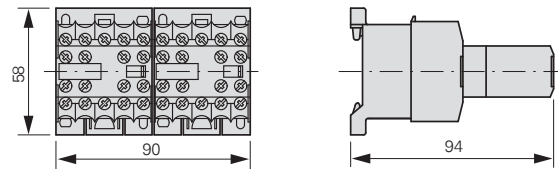
RCDILE...  
VGDILE



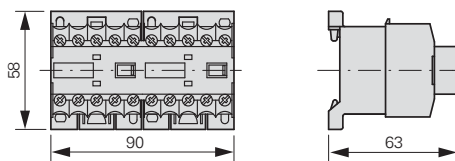
2DILE-... + MVDILE  
2DILE-...-G + MVDILE



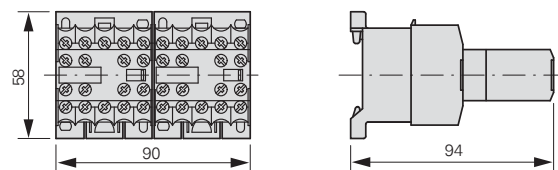
2DILE-... + MVDILE + ...DILE  
2DILE-...-G + MVDILE + ...DILE



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

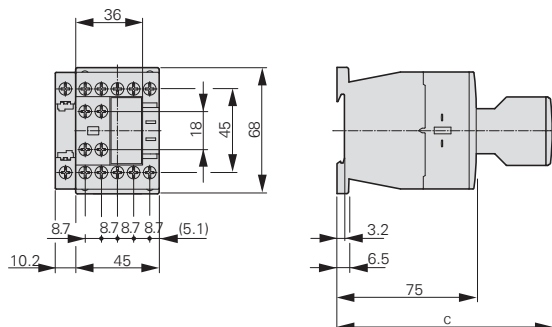


2DILE-... + MVDILE + ...DILE  
2DILE-...-G + MVDILE + ...DILE



### Contactors with auxiliary contact module

DILM7...DILM15  
DILA...

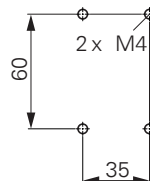
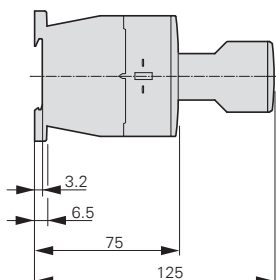
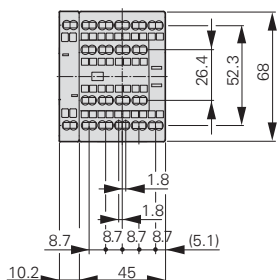


Part no.	c
DILM32-XHI	117
DILA-XHI	117
DILA-XHI...T	125

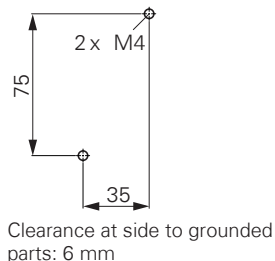
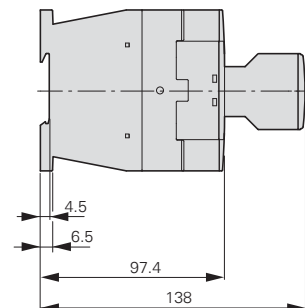
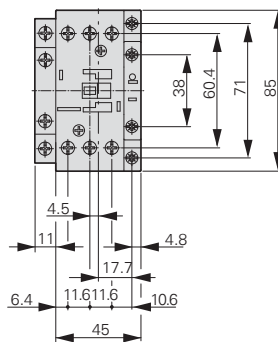
## Dimensions

### Contactors

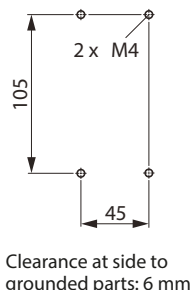
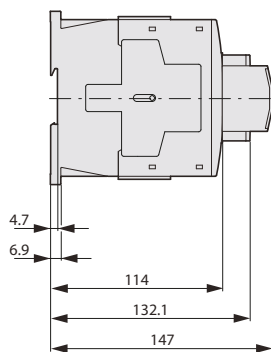
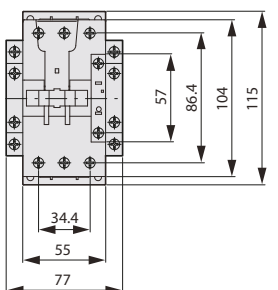
DILMC7...DILMC15  
DILAC...  
DILA-XHIC...



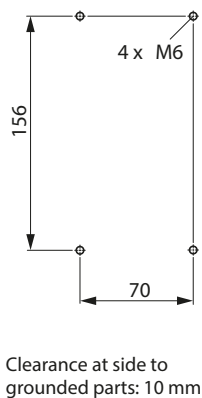
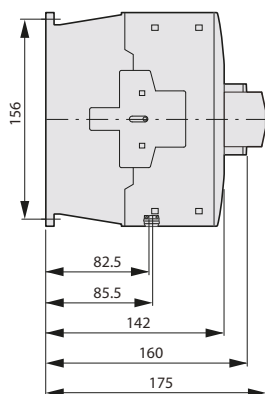
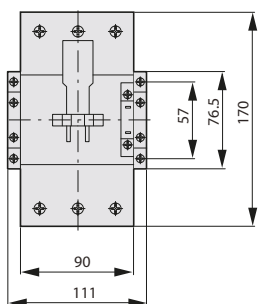
DILM17...DILM38  
DILMC17...DILMC32  
DILMF8...DILMF32



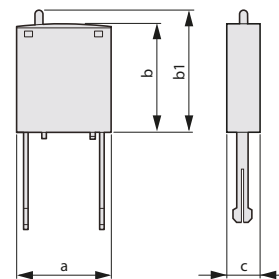
DILM40...DILM72



DILM80...DILM170



### Suppressor circuit



Part no.	a	b
DILM12-XSP...	25	28
DILM32-XSP...	25	28
DILM95-XSP...	25	28

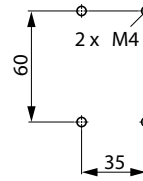
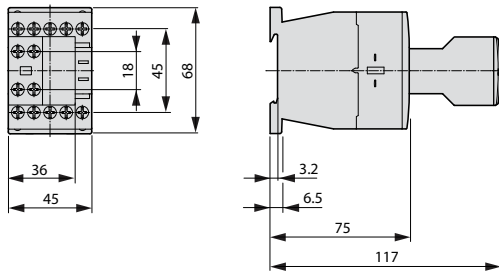
Part no.	b1	c
DILM12-XSP...	≈32	9
DILM32-XSP...	≈32	9
DILM95-XSP...	≈32	9

# Motor Control

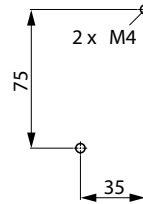
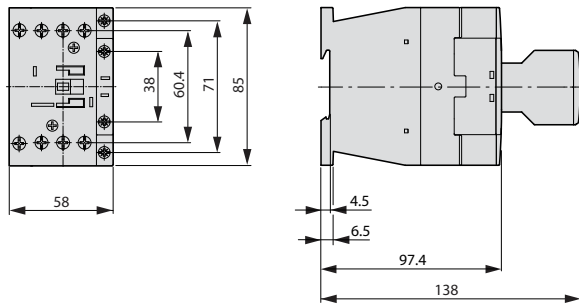
## Dimensions

### Contactor with auxiliary contact module

DILMP20



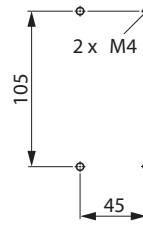
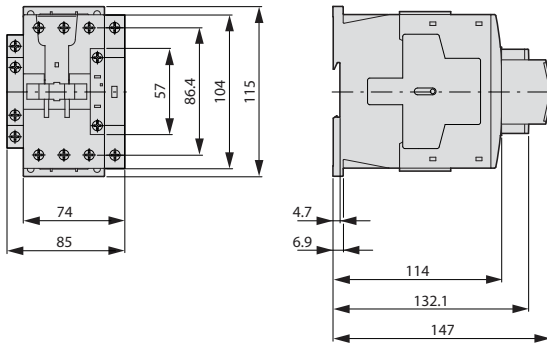
DILMP32 DILMP45



Distance at side to grounded parts: 6 mm

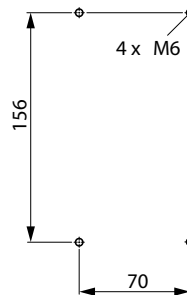
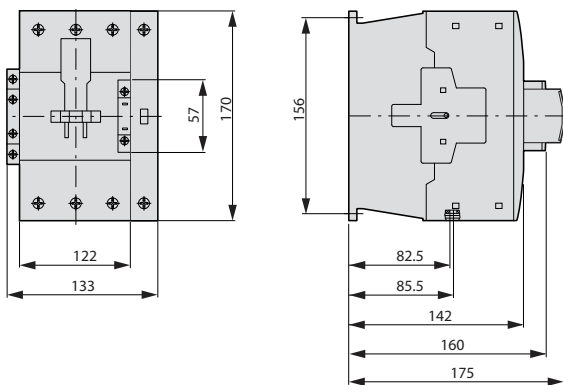
### Contactors

DILMP63 DILMP80



Distance at side to grounded parts: 6 mm

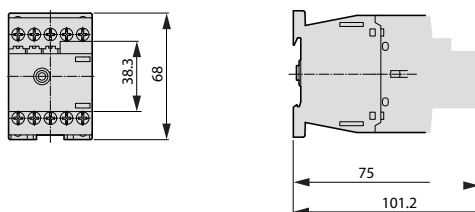
DILMP125 DILMP160 DILMP200



Clearance at side to earthed parts: 10 mm

### Motor suppressor module

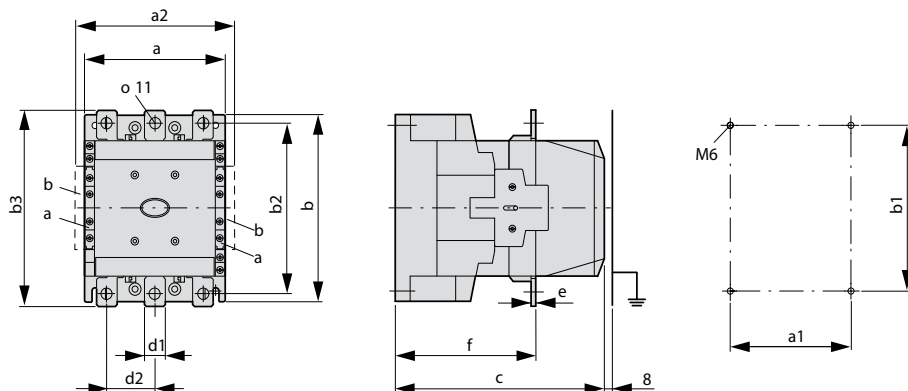
DILM12-XMSM



## Dimensions

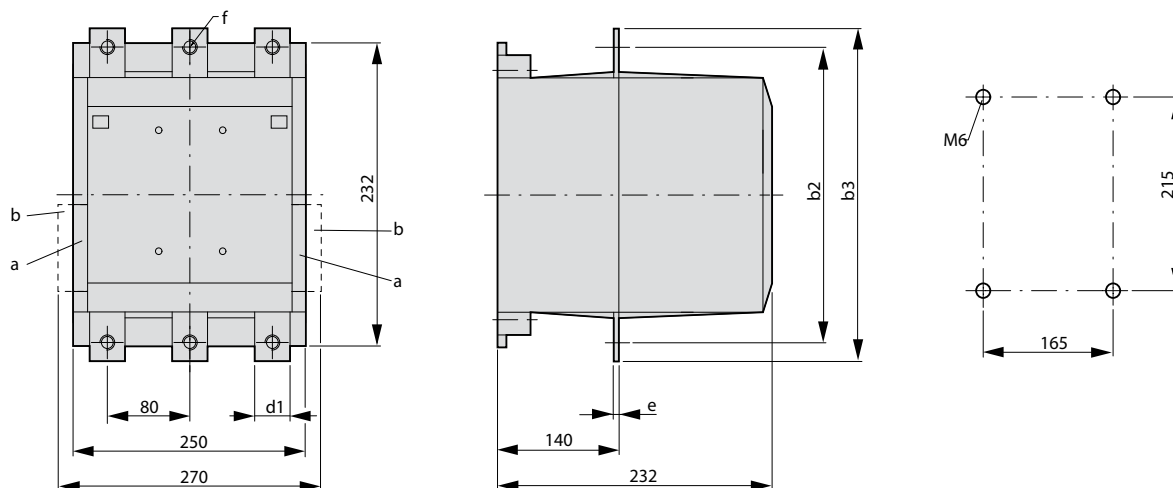
### Complete units

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



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

DILM580...DILM1000



a DILM820-XHI...-SI  
b DILM820-XHI11-SA

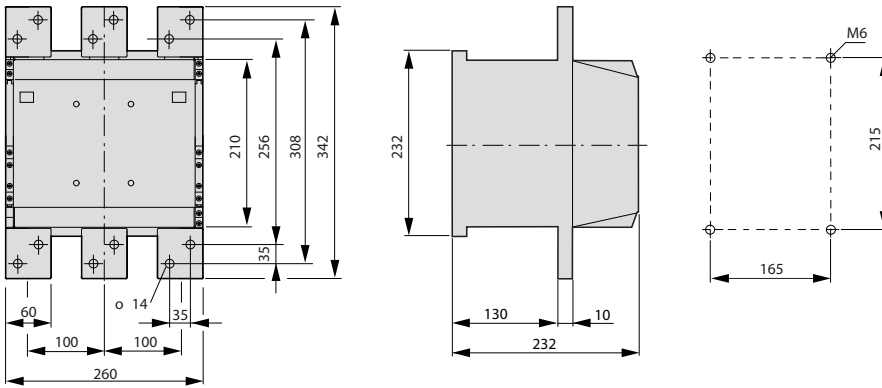
Part no.	b2	b3	d1	e	f
DILM580	256	296	45	6	13.5
DILM650	256	296	45	6	13.5
DILM750	256	296	45	6	13.5
DILM820	256	296	45	6	13.5
DILM1000	256	296	45	10	13.5

# Motor Control

## Dimensions

### AC-1 contactors greater than 1000A

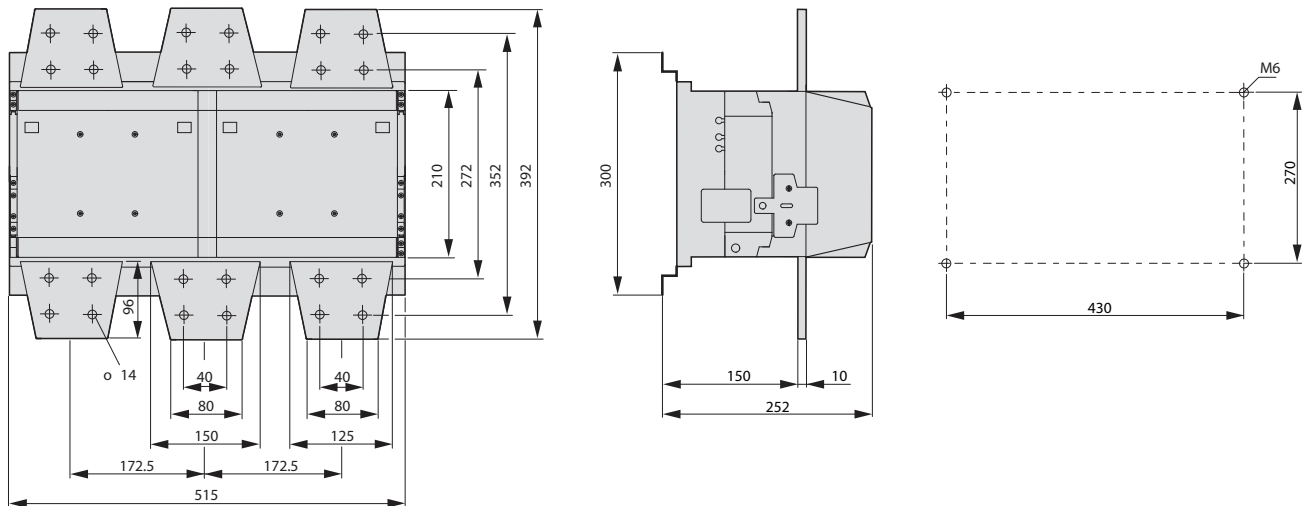
DILH1400



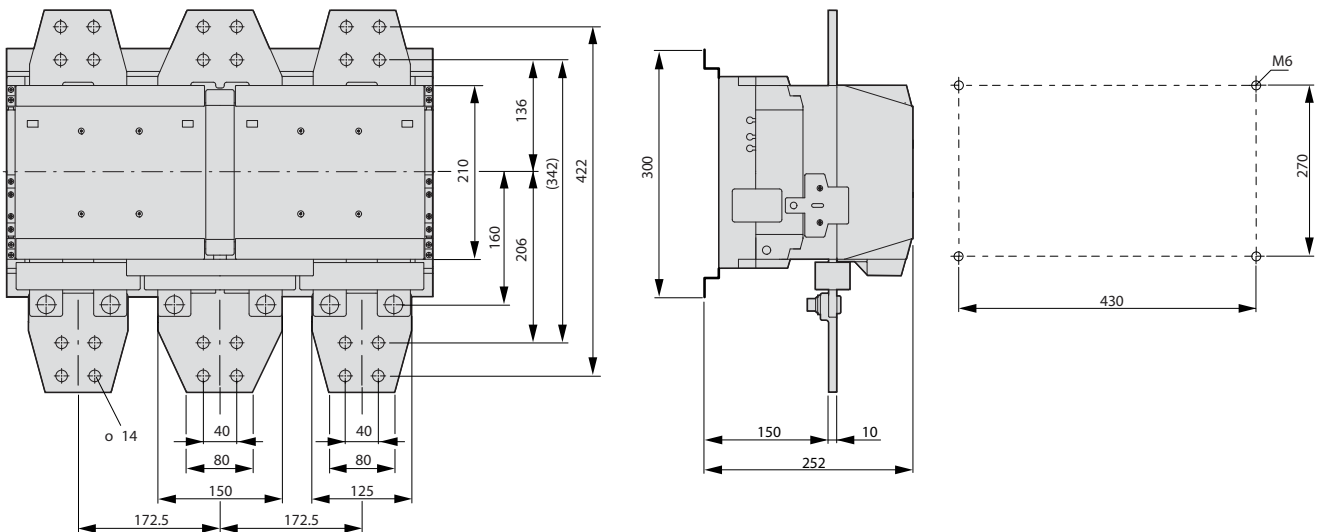
DILM1600

DILH2000

DILH2200



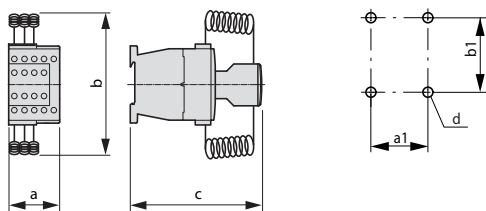
DILH2600



## Dimensions

### Contactor for capacitors

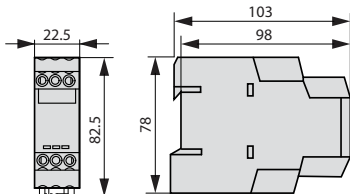
DILK...



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

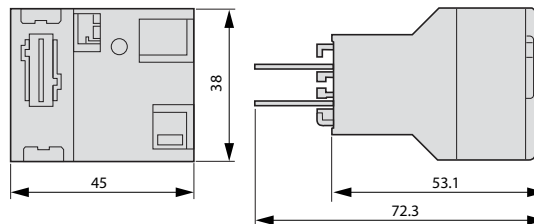
### Contactor monitoring devices

CMD(...)



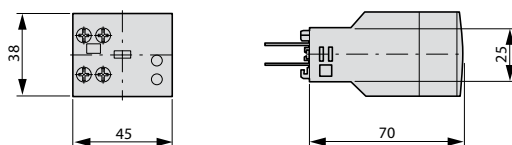
### SWD contactor modules

DIL-SWD-32...



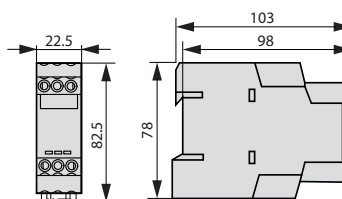
### Electronic timer modules

DILM...XTE



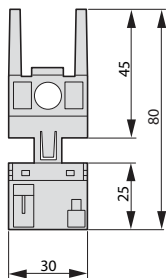
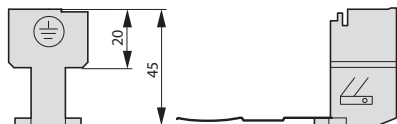
### Amplifier module

ETS4-VS3

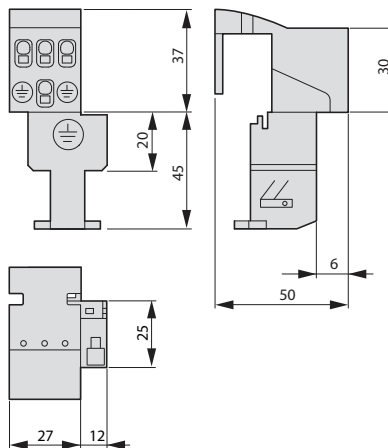


### Wiring set for motor feeder plug

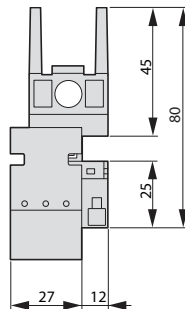
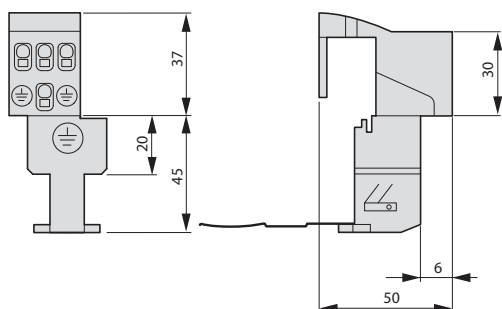
DILM12-XMCE



DILM12-XMCP/T



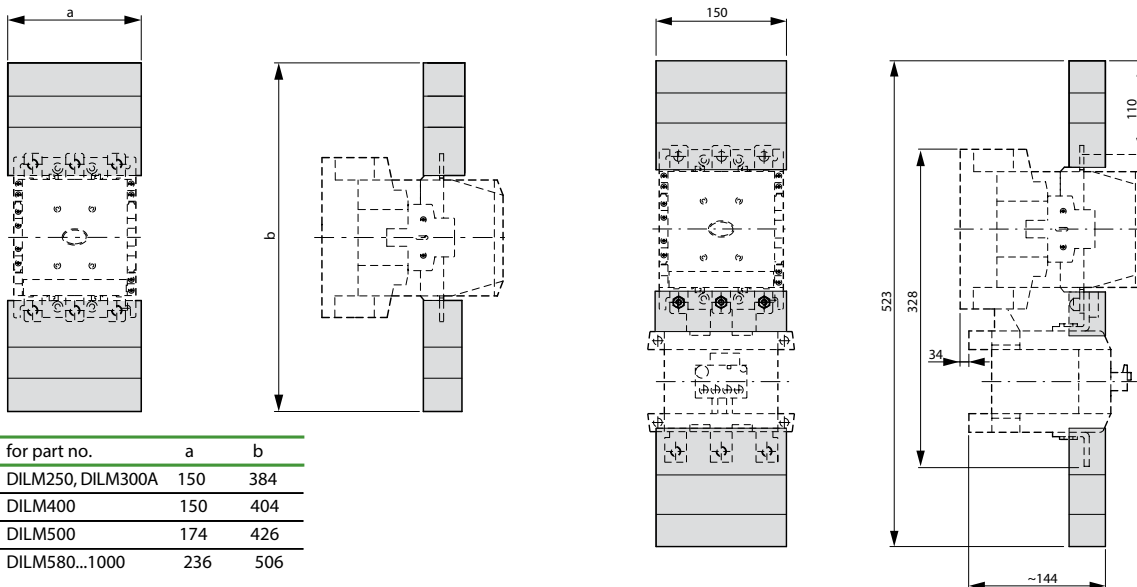
DILM12-XMCP/E



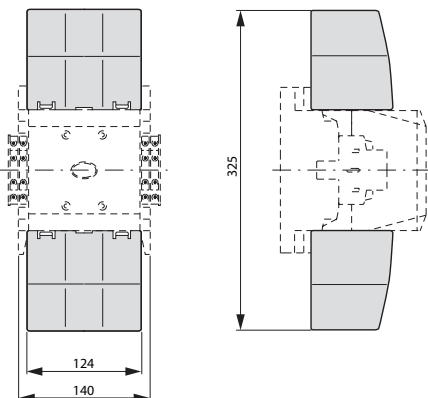


## Dimensions

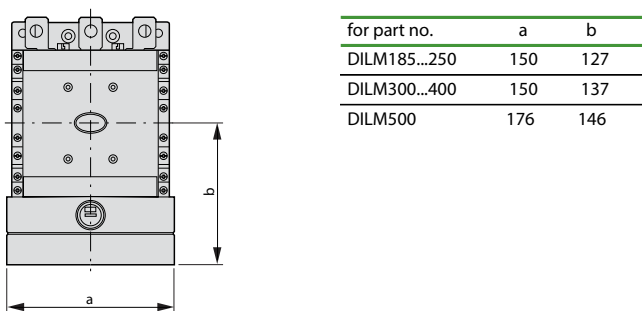
### Contactors with terminal shrouds



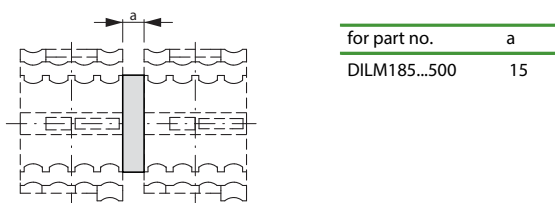
### DILM185A...DILM225A + DILM225A-XHB



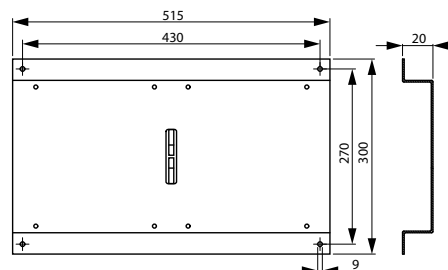
### Contactors with star-point bridge and terminal shrouds



### Mechanical interlock DILM500-XMV



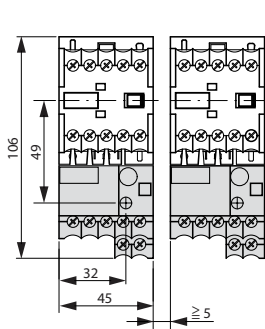
### DILM820-XMV



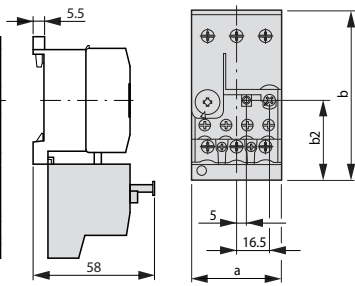
Dimensions

Overload relays

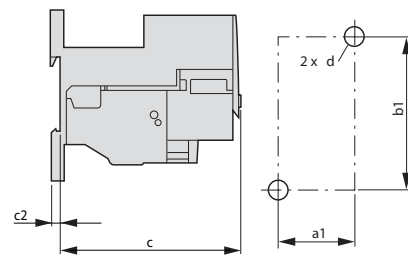
ZE-...



ZB32-XEZ

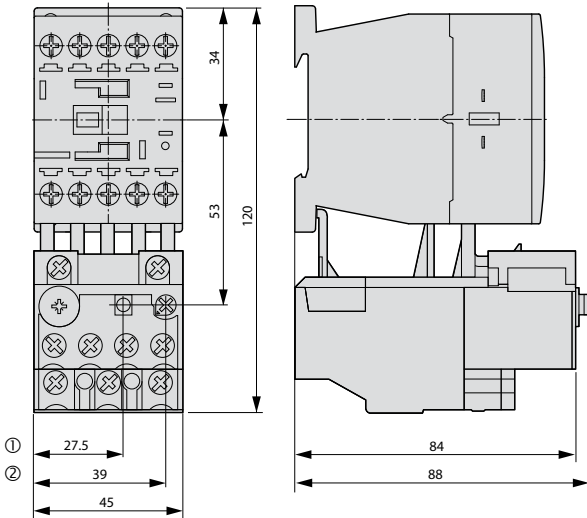


ZB65-XEZ



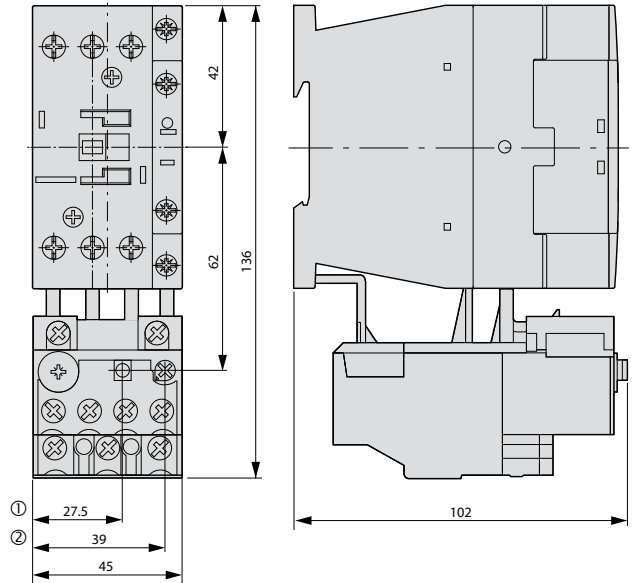
	ZB32	ZB65
a	45	60
b	85	86
c	90.5	112
c2	3.8	4.7
a1	35	50
b1	75	75
b2	40.5	47
d	M4	M5

ZB12

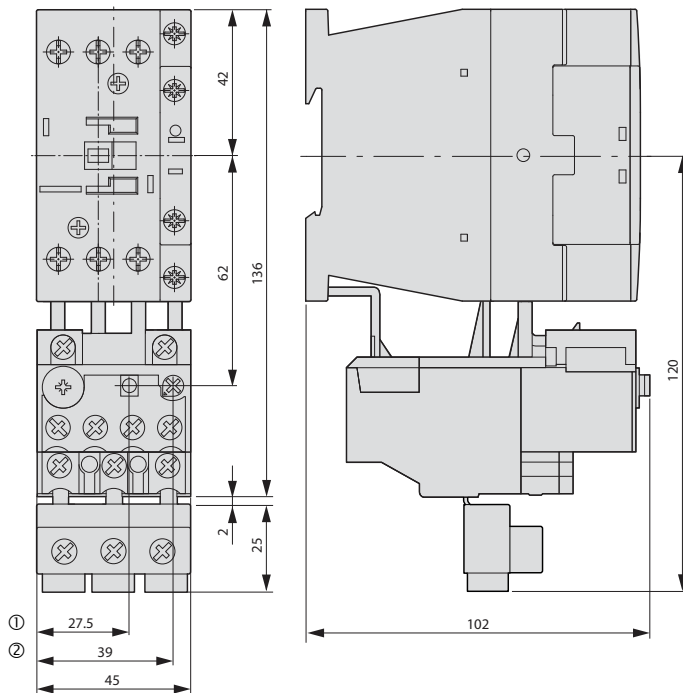


- ① OFF
- ② Reset/ON

ZB32



ZB32-38



Automatic fault notification

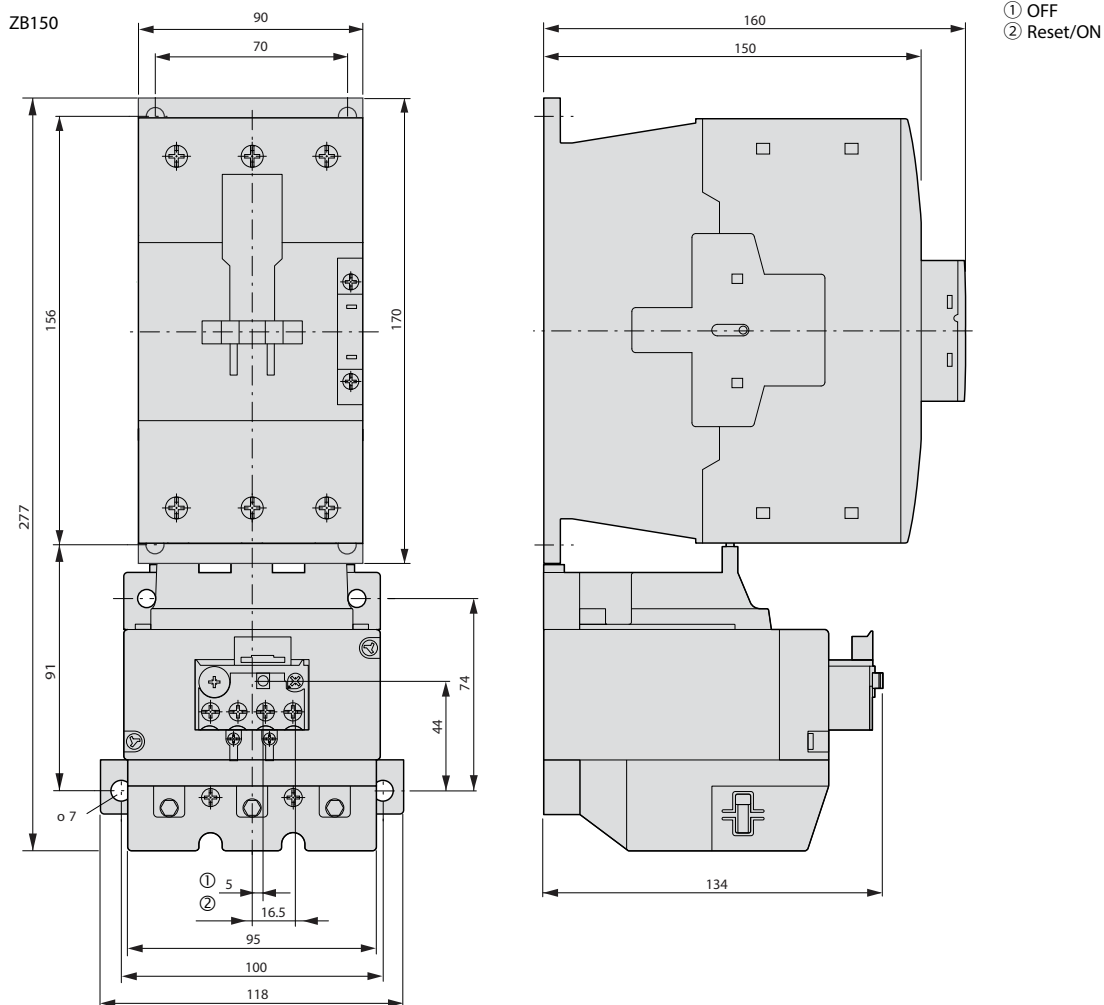
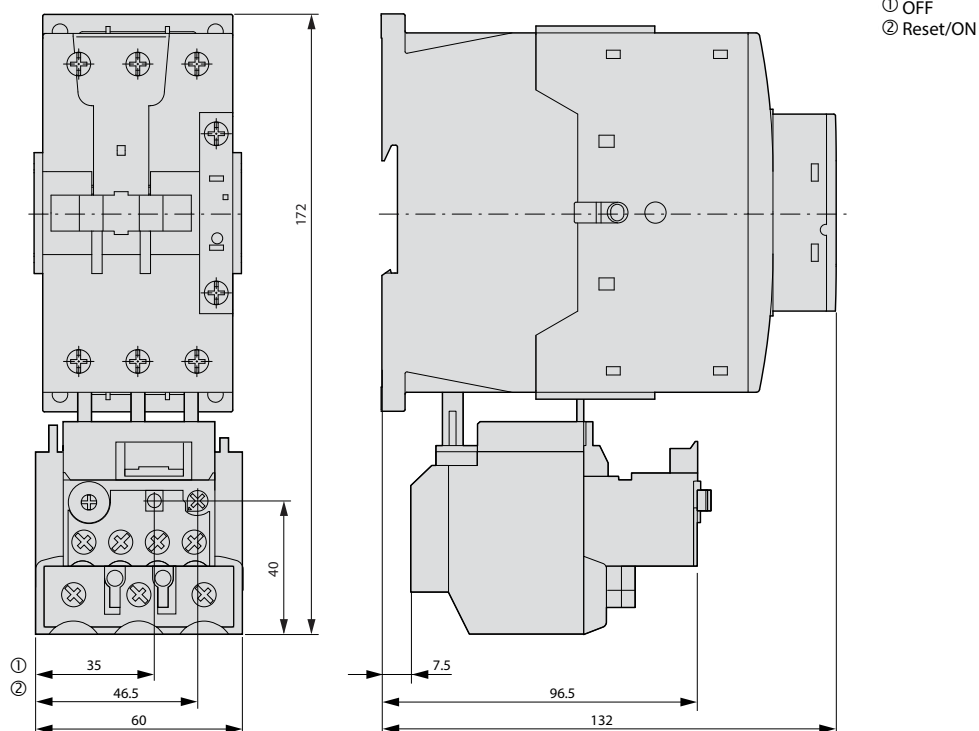
- View 10 fault que
- View trip snapshot

# Motor Control

## Dimensions

### Overload relays

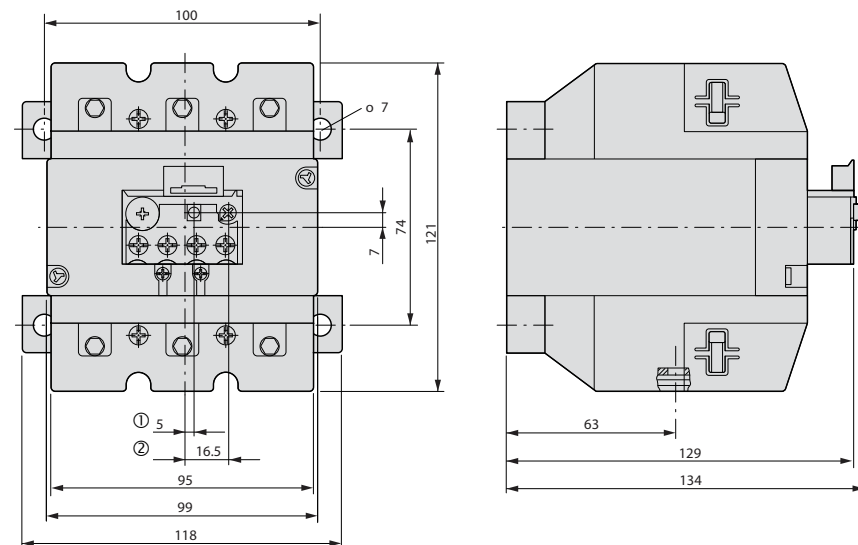
ZB65



## Dimensions

### Overload relays

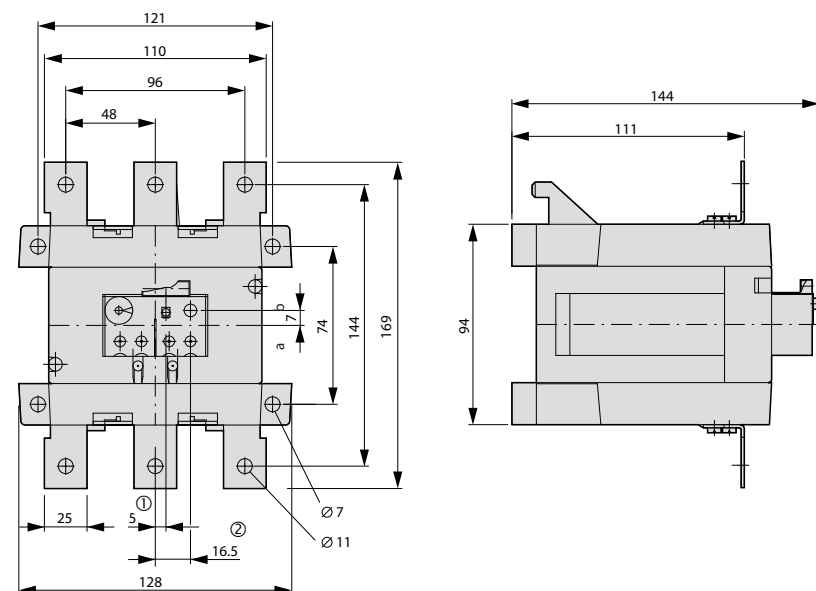
ZB150-50/KK



① OFF  
② Reset/ON

### Z5 overload relays greater than 150A

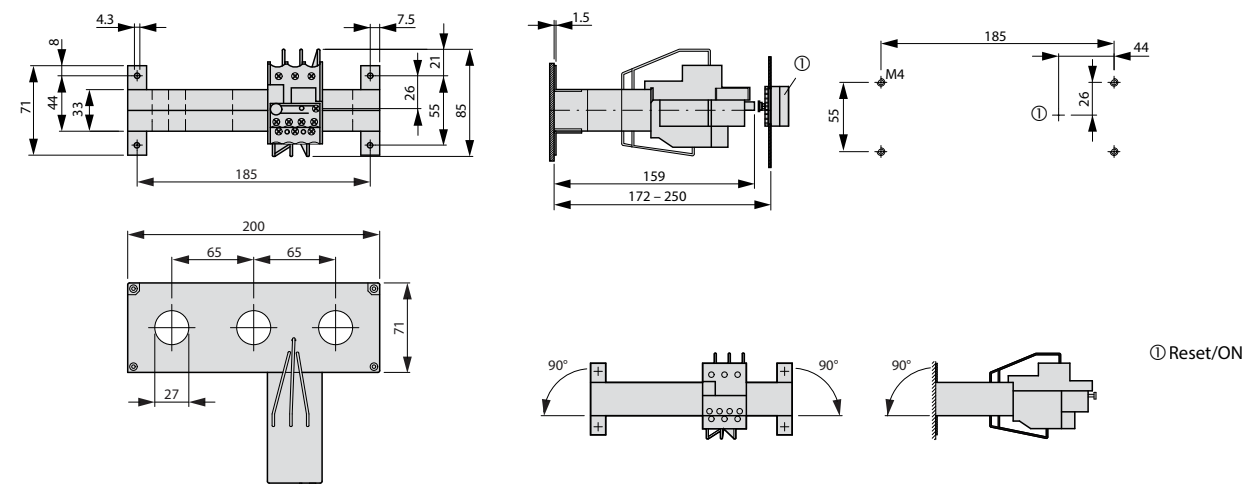
Z5-.../FF250



① OFF  
② Reset/ON

### Current transformer-operated overload relays

ZW7-...



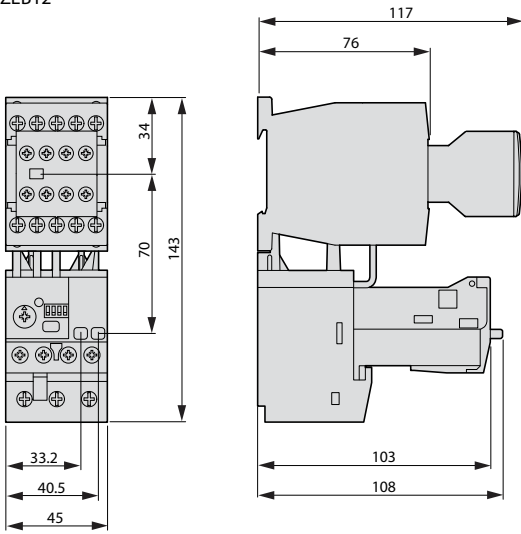
① Reset/ON

# Motor Control

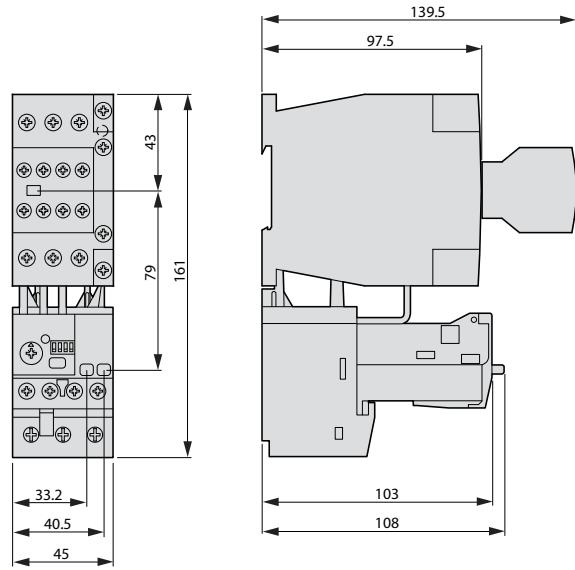
## Dimensions

### Electronic overload relays

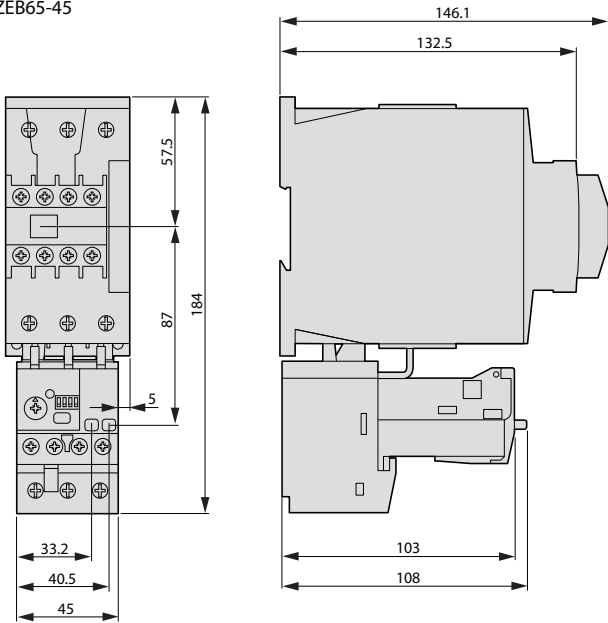
ZEB12



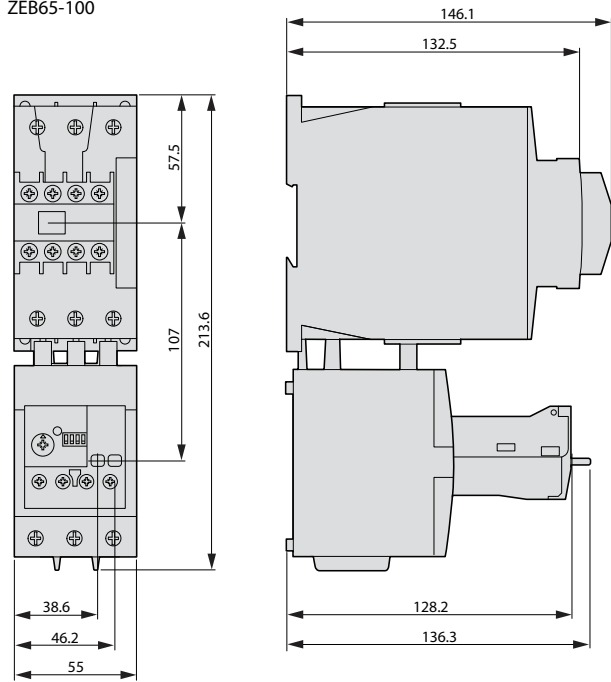
ZEB32



ZEB65-45



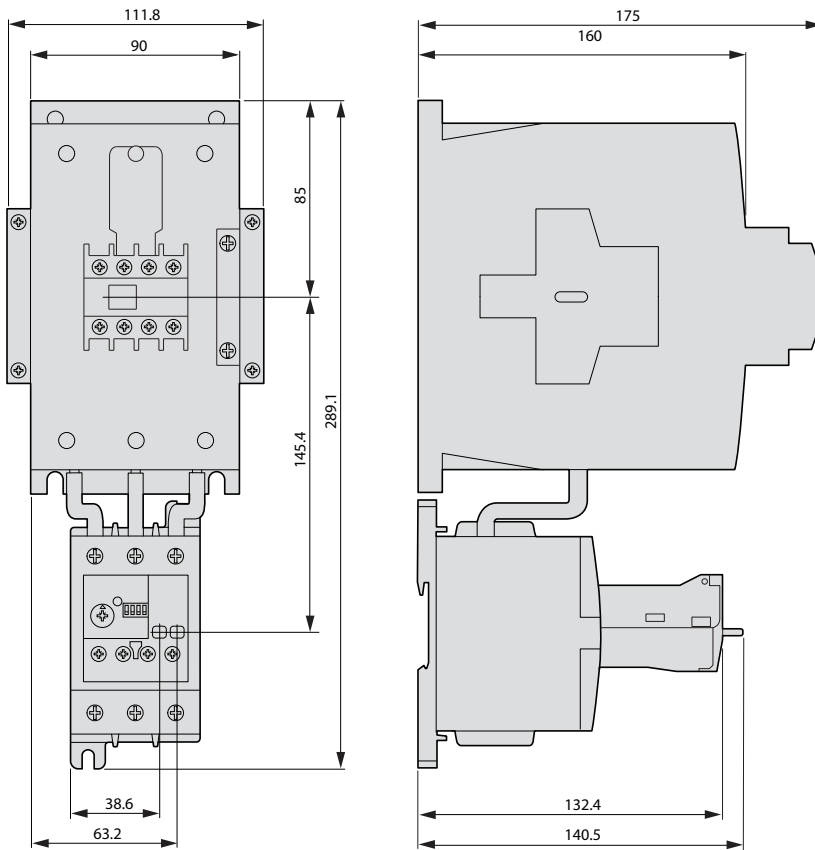
ZEB65-100



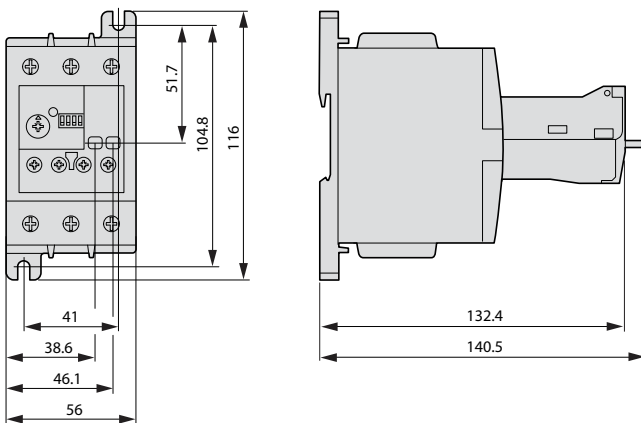
## Dimensions

### Electronic overload relays

ZEB150-100



ZEB150-100/KK

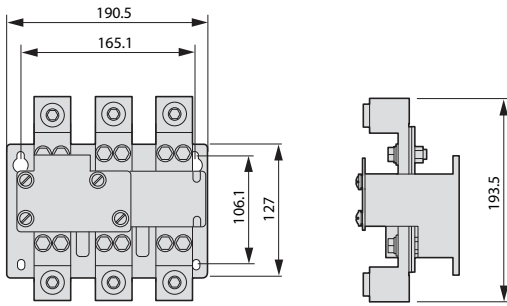


# Motor Control

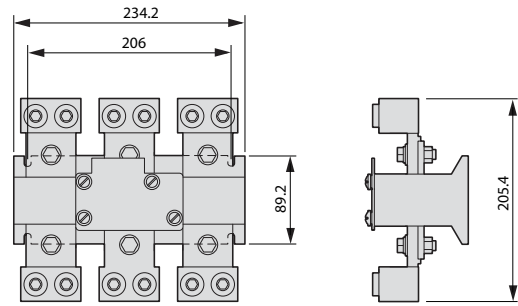
## Dimensions

### Current sensors

ZEB-XCT300

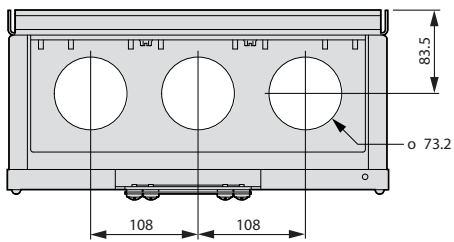
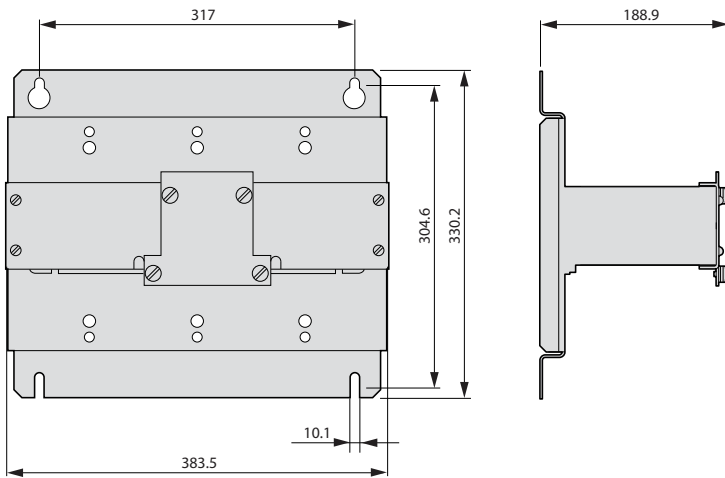


ZEB-XCT600



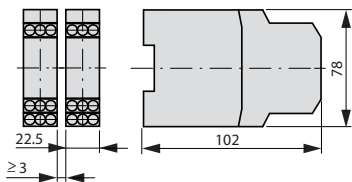
ZEB-XCT1000

ZEB-XCT1500



### EMT6 thermistor overload relays for machine protection

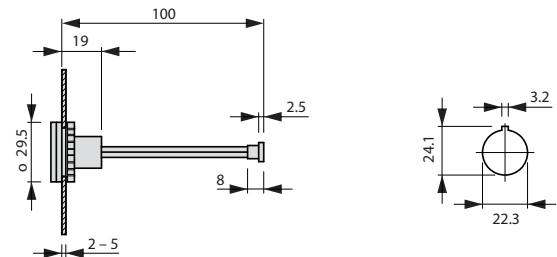
EMT6...



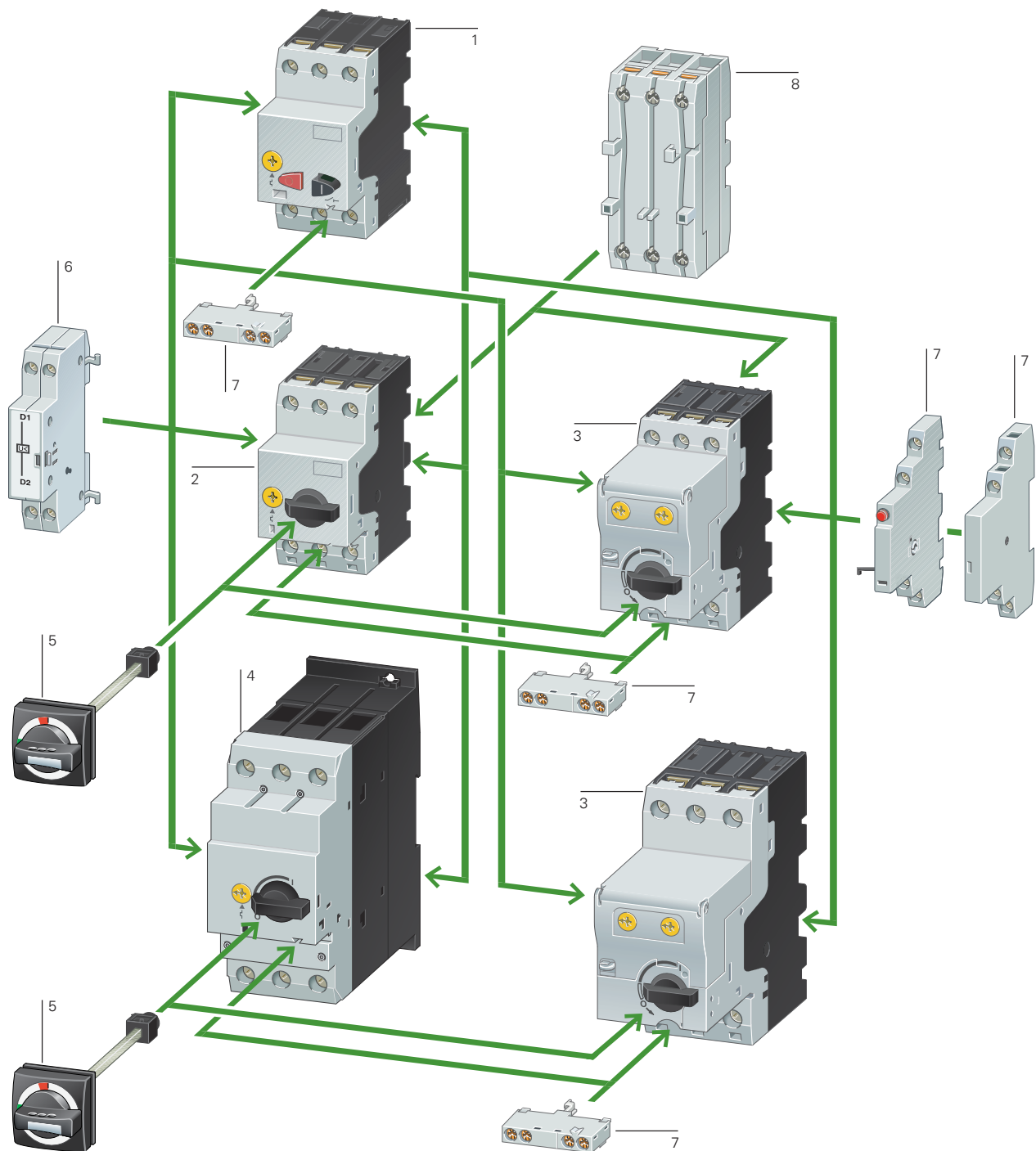
### External reset button

M22-DZ-B

M22-DZ-X



IEC Manual motor protectors



- |   |   |
|---|---|
| 1. Motor-protective circuit-breaker PKZM01                                  | 4. Motor-protective circuit-breaker PKZM4 |
| 2. Motor-protective circuit-breaker PKZM0                                   | 5. Door coupling handles IP65             |
| 3. Motor-protective circuit-breaker with wide-range overload protection PKE | 6. Shunt release                          |
|   | 7. Standard auxiliary contacts            |
|   | 8. Current limiters                       |



## Motor Protectors

### IEC Manual motor protectors

- Class 10 overload protection
- Motor applications from 0.1A to 63A
- Built-in heater & magnetic trip elements to protect the motor
- Adjustment dial for setting motor FLC



### Pushbutton manual motor protectors

Rated Uninterrupted Current – I <sub>u</sub> = I <sub>e</sub> (Amps)	FLC adjustment range/overload release – I <sub>r</sub> (Amps)	Short circuit release – I <sub>rm</sub> (Amps)	Maximum Motor Ratings ①			Item no.
			Maximum kW Rating AC-3 – P (kW) 3-Phase			
			220 - 240V	380 - 415V	440V	
Frame B (Type 1 & Type 2 Coordination)						
0.16	0.1 – 0.16	2.2	—	—	—	<b>PKZM01-0,16</b>
0.25	0.16 – 0.25	3.5	—	0.06	0.06	<b>PKZM01-0,25</b>
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	<b>PKZM01-0,4</b>
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	<b>PKZM01-0,63</b>
1	0.63 – 1	14	0.12	0.25	0.25	<b>PKZM01-1</b>
1.6	1 – 1.6	22	0.25	0.55	0.55	<b>PKZM01-1,6</b>
2.5	1.6 – 2.5	35	0.37	0.75	1.1	<b>PKZM01-2,5</b>
4	2.5 – 4	56	0.75	1.5	1.5	<b>PKZM01-4</b>
6.3	4 – 6.3	88	1.1	2.2	3	<b>PKZM01-6,3</b>
10	6.3 – 10	140	2.2	4	4	<b>PKZM01-10</b>
12	8 – 12	168	3	5.5	5.5	<b>PKZM01-12</b>
16	10 – 16	224	4	7.5	9	<b>PKZM01-16</b>
20	16 – 20	280	5.5	9	11	<b>PKZM01-20</b>
25	20 – 25	350	5.5	12.5	12.5	<b>PKZM01-25</b>



PKZM01-1

### Rotary manual motor protectors

Rated Uninterrupted Current – I <sub>u</sub> = I <sub>e</sub> (Amps)	FLC adjustment range/overload release – I <sub>r</sub> (Amps)	Short Circuit Release – I <sub>rm</sub> (Amps)	Maximum Motor Ratings ①					Item no. ②
			Maximum kW Rating AC-3 – P (kW) 3-Phase					
			220 - 240V	380 - 415V	440V	500V	660 - 690V	
B (Type 1 & Type 2 Coordination)								
0.16	0.1 – 0.16	2.2	—	—	—	—	0.06	<b>PKZM0-0,16</b>
0.25	0.16 – 0.25	3.5	—	0.06	0.06	0.06	0.12	<b>PKZM0-0,25</b>
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	0.12	0.18	<b>PKZM0-0,4</b>
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	0.25	0.25	<b>PKZM0-0,63</b>
1	0.63 – 1	14	0.12	0.25	0.25	0.37	0.55	<b>PKZM0-1</b>
1.6	1 – 1.6	22	0.25	0.55	0.55	0.75	1.1	<b>PKZM0-1,6</b>
2.5	1.6 – 2.5	35	0.37	0.75	1.1	1.1	1.5	<b>PKZM0-2,5</b>
4	2.5 – 4	56	0.75	1.5	1.5	2.2	3	<b>PKZM0-4</b>
6.3	4 – 6.3	88	1.1	2.2	3	3	4	<b>PKZM0-6,3</b>
10	6.3 – 10	140	2.2	4	4	4	7.5	<b>PKZM0-10</b>
12	8 – 12	168	3	5.5	5.5	5.5	11	<b>PKZM0-12</b>
16	10 – 16	224	4	7.5	9	9	12.5	<b>PKZM0-16</b>
20	16 – 20	280	5.5	9	11	12.5	15	<b>PKZM0-20</b>
25	20 – 25	350	5.5	12.5	12.5	15	22	<b>PKZM0-25</b>
32	25 – 32	448	7.5	15	15	22	30	<b>PKZM0-32</b>
Frame D (Type 1 & Type 2 Coordination)								
16	10 – 16	224	4	7.5	9	9	12.5	<b>PKZM4-16</b>
25	16 – 25	350	5.5	12.5	12.5	15	22	<b>PKZM4-25</b>
32	25 – 32	448	7.5	15	17.5	22	22	<b>PKZM4-32</b>
40	32 – 40	560	11	20	22	24	30	<b>PKZM4-40</b>
50	40 – 50	700	14	25	30	30	45	<b>PKZM4-50</b>
58	50 – 58	812	17	30	37	37	55	<b>PKZM4-58</b>
65	55 – 65	882	18.5	34	37	45	55	<b>PKZM4-63</b>



PKZM0-1



PKZM4-16

① Select manual motor protectors by full load amperes. Maximum motor ratings (kW) are for reference only.

Note: Service Factor (SF) — Setting I<sub>r</sub> of current scale in dependence of load factor:  
 SF = 1.15 -> I<sub>r</sub> = 1 x I<sub>n</sub> mot  
 SF = 1 -> I<sub>r</sub> = 0.9 x I<sub>n</sub> mot

② Eaton PKZM0 & PKZM4 handles are not padlockable. Order part no. AK-PKZ0 handle if a lockable handle is required.

### Lockable rotary handle for MMPs

For use with	Item no.
PKZM0 & PKZM4	<b>AK-PKZ0</b>



AK-PKZ0

## Motor Protectors

### Electronic Motor-protective circuit-breaker PKE

Switch & protect motors up to 65 A with electronic wide-range overload protection. Modular design. Highest level of flexibility. Highest level of performance.

The selection of a suitable motor-protective circuit-breaker is decisive for the functional safety & service life of a motor. Motor-protective circuit-breakers PKE with electronic overload protection offer an interesting alternative to the bimetal solution here & complement the intelligent PKZ series from Eaton. The motor-protective circuit-breaker PKE provides the highest level of flexibility featuring a compact & modular design with plug-in control unit for motor currents up to 65 A.

The large current setting ranges decisively reduce the number of variants & minimise the engineering work & costs accordingly.

#### PKE features & benefits:

- Autonomous supply via current transformer
- Large electronically controlled setting range
- Exchangeable control units
- Tripping classes greater than CLASS 10
- Precise & extremely long-time stable tripping characteristic curves
- Minimum heat losses
- Protection suited to individual starting conditions
- Motor starter design with standard components
- Common range of accessories from system PKZ0
- Parameter data read out options
- Very service friendly
- Reduction of engineering time & costs
- Advanced control unit includes a COM interface for SmartWire

Motor rating kW	Rated motor current AC-3			Overload release setting range	Base unit	Control unit Standard	Control unit Advanced (with COM interface)
	240V A	415V A	660 V 690 V A				
0.06	0.37	-	-	0.3 ... 1.2 A	PKE12	PKE-XTU-1,2	PKE-XTUA-1,2
0.09	0.54	0.31	-				
0.12	0.72	0.41	-				
0.18	1.04	0.6	0.35				
0.25	-	0.8	0.5				
0.37	-	1.1	0.7				
0.55	-	-	0.9				
0.75	-	-	1.1	1 ... 4 A	PKE12	PKE-XTU-4	PKE-XTUA-4
0.18	1.04	-	-				
0.25	1.4	-	-				
0.37	2	1.1	-				
0.55	2.7	1.5	-				
0.75	3.2	1.9	1.1				
1.1	-	2.6	1.5				
1.5	-	3.6	2.1				
2.2	-	-	2.9				
3	-	-	3.8				
0.75	3.2	-	-	3 ... 12 A	PKE12 PKE32	PKE-XTU-12	PKE-XTUA-12
1.1	4.6	-	-				
1.5	6.3	3.6	-				
2.2	8.7	5	-				
3	11.5	6.6	3.8				
4	-	8.5	4.9				
5.5	-	11.3	6.5				
7.5	-	-	8.8	8 ... 32 A	PKE32	PKE-XTU-32	PKE-XTUA-32
2.2	8.7	-	-				
3	11.5	-	-				
4	14.8	8.5	-				
5.5	19.6	11.3	-				
7.5	26.4	15.2	8.8				
11	-	21.7	12.6				
15	-	29.3	17				
18.5	-	-	20.9				

PKE 12, 12A (45 mm)



0.3A → 12A  
0.09 - 5.5 kW (400 V)

PKE 32, 32A (45 mm)



3A → 32A  
1.5 - 15 kW (400 V)

PKE 65, 65A (55 mm)



8A → 65A  
4 - 34 kW (400 V)

5 plug-in control units up to 65 A in 2 versions.



Standard



Extended



## Motor Protectors

### Electronic motor-protective circuit-breaker PKE



PKE-XTUA-32



PKE-XTUWA-32



PKE-SWD-SP



NHI21-PKZ0



VHI20-PKZ0

Motor rating kW	Rated motor current AC-3			Overload release setting range	Base unit	Control unit Standard	Control unit Advanced (with COM interface)
	240V A	415V A	660 V 690 V A				
22	-	-	23.8	8 ... 32 A	PKE32	PKE-XTU-32	PKE-XTUA-32
30	-	-	32				
5.5	19.6	-	-	16...65 A	PKE65	PKE-XTU-65	PKE-XTUA-65
7.5	26.4	-	-				
11	38	21.7	-				
15	51	29.3	17				
18.5	63	36	20.9				
22	-	41	23.8				
30	-	55	32				
37	-	-	39	8...32 A	PKE65	PKE-XTUW-32	PKE-XTUWA-32
45	-	-	47				
55	-	-	58				
2.2	8.7	-	-				
3	11.5	-	-				
4	14.8	8.5	-				
5.5	19.6	11.3	-				
7.5	26.4	15.2	8.8				
11	-	21.7	12.6				
15	-	29.3	17				
18.5	-	-	20.9				
22	-	-	23.8				
30	-	-	58				

#### Smartwire-DT module for connecting PKE-XTUA trip block to Smartwire-DT

Description	Item no.
Messages	
Contact state PKS	
Motor current and thermal motor image in %	
Trip indicators	PKE-SWD-SP
Set value overload releases	
Remote disconnection of motor-protective circuit breakers	

#### IEC manual motor protectors accessories

##### Auxiliary contacts

Contact configuration	Item no.
Side-Mount	
1NO-1NC	NHI11-PKZ0
2NO-1NC	NHI21-PKZ0
1NO-2NC	NHI12-PKZ0
Front-Mount	
1NO-1NC	NHI-E-11-PKZ0
1NO	NHI-E-10-PKZ0
Trip indicating aux. contact	AGM2-10-PKZ0 AGM2-01-PKZ0

##### Early-make auxiliary contacts

Contact configuration	For use with..	Item no.
2N/O	PKZM0 PKZM0-T PKM0 PKZM4	VHI20-PKZ0
2N/O	PKZM01	VHI20-PKZ01

## Motor Protectors

### Electronic motor-protective circuit-breaker PKE

#### IP65 rotary handle mechanism - PKZM0 ①②③

Description	Item no.
Complete Kits — Includes Handle, Shaft & Required Hardware	
Rotary Handle Mechanism IP65 Black — For use on main switches to IEC / EN 60204.	<b>PKZ0-XH</b>
Rotary Handle Mechanism IP65 Red / Yellow — For use on main switch with Emergency-Stop function to IEC / EN 60204.	<b>PKZ0-XRH</b>
Rotary Handle Mechanism IP65 Black — For use on main switches to IEC / EN 60204 where PKZ0 is mounted 90° from vertical.	<b>PKZ0-XH-MCC</b>
Rotary Handle Mechanism IP65 Red / Yellow — For use on main switch with Emergency-Stop function to IEC / EN 60204 where PKZ0 is mounted 90° from vertical.	<b>PKZ0-XRH-MCC</b>
Rotary Handle Mechanism IP65 Black — For use on main switches to IEC / EN 60204 where PKZ0 is mounted 90° from vertical. FOR USE WITH xEnergy	<b>PKZ0-XHT-MCC</b>

① With ON/OFF switch position & "+" (tripped), lockable with 3 padlocks, 4 – 8 mm hasp. Can be locked in the OFF position, if required.

② Rotary handle mechanisms ship with door interlock disabled. See instruction publication with product for how to enable door interlock.

③ Not for use with VHI20-PKZ0 early-make front-mount auxiliary contact.



PKZ0-XH



PKZ0-XRH-MCC



A-PKZ0(110V50HZ)



U-PKZ0(24VDC)



PL-PKZ0



CL-PKZ0

#### IP65 rotary handle mechanism - PKE

Description	Item no.
For use as main switch to IEC/EN 60204 black	<b>PKE-XH</b>
For use as main switch with Emergency-Stop function to IEC/EN 60204 red-yellow	<b>PKE-XRH</b>
For use as a main switch to EN 60204 in MCC power distribution systems and with PKE installed when rotated by 90° black	<b>PKE-XH-MCC</b>
For use as a main switch to EN 60204 in MCC power distribution systems and with PKE installed when rotated by 90° red-yellow	<b>PKE-XRH-MCC</b>
For use as a main switch to EN 60204 in MCC power distribution systems and with PKE installed when rotated by 90° black FOR USE WITH xEnergy	<b>PKE-XHT-MCC</b>

#### Shunt release

Voltage	Item no.
24 vac	<b>A-PKZ0(24V50HZ)</b>
110 vac	<b>A-PKZ0(110V50HZ)</b>
240 vac	<b>A-PKZ0(240V50HZ)</b>
415 vac	<b>A-PKZ0(415V50HZ)</b>
24 vdc	<b>A-PKZ0(24VDC)</b>

#### Undervoltage release

Voltage	Item no.
24 vac	<b>U-PKZ0(24V50HZ)</b>
110 vac	<b>U-PKZ0(110V50HZ)</b>
240 vac	<b>U-PKZ0(240V50HZ)</b>
415 vac	<b>U-PKZ0(415V50HZ)</b>
24 vdc	<b>U-PKZ0(24VDC)</b>

#### Sealing facility

Description	Item no.
To prevent tampering with the overload release & the test function (For use with PKZM0 & PKZM4)	<b>PL-PKZ0</b>

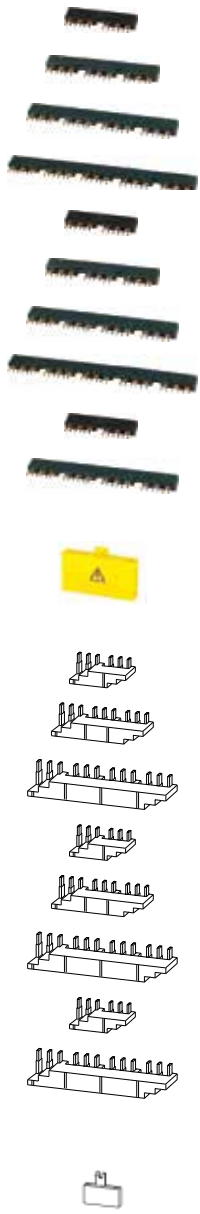
#### Current limiters

Description	Item no.
For increasing switching capacity of motor-protective circuit-breakers without auto-protection	<b>CL-PKZ0</b>

## Motor Protectors

### IEC Manual motor protectors accessories

#### Three-phase commoning links ①



For Use with...	Qty. MMP	Length of link (mm)	Unit width (mm)	Item no.
<b>Frame B</b>				
MMP With No Side-Mounted Auxiliaries or Voltage Releases	2	90	45	<b>B3.0/2-PKZ0</b>
	3	135	45	<b>B3.0/3-PKZ0</b>
	4	180	45	<b>B3.0/4-PKZ0</b>
	5	225	45	<b>B3.0/5-PKZ0</b>
	2	99	45 + 9	<b>B3.1/2-PKZ0</b>
For motor-protective circuit-breaker each with an auxiliary contact or trip-indicating auxiliary contact fitted on the right	3	153	45 + 9	<b>B3.1/3-PKZ0</b>
	4	207	45 + 9	<b>B3.1/4-PKZ0</b>
	5	261	45 + 9	<b>B3.1/5-PKZ0</b>
For PKZM0... with one auxiliary contact each & a trip-indicating auxiliary contact fitted on right or a voltage release fitted on left	2	108	45 + 18	<b>B3.2/2-PKZ0</b>
	4	234	45 + 18	<b>B3.2/4-PKZ0</b>
Shroud for unused terminals. Protection against direct contact. For closing off non-used connections on the three phase commoning link. B3...-PKZ0	-	-	-	<b>H-B3-PKZ0</b>
<b>Frame D</b>				
MMP With No Side-Mounted Auxiliaries or Voltage Releases	2	110	55	<b>B3.0/2-PKZ4</b>
	3	165	55	<b>B3.0/3-PKZ4</b>
	4	220	55	<b>B3.0/4-PKZ4</b>
For motor-protective circuit-breakers/starters each with an auxiliary contact or trip-indicating auxiliary contact fitted on the right & with a DIL1(A)M contactor	2	-	-	<b>B3.1/2-PKZ4</b>
	3	-	-	<b>B3.1/3-PKZ4</b>
	4	-	-	<b>B3.1/4-PKZ4</b>
For PKZM4 with one auxiliary contact each or trip-indicating auxiliary contact fitted on right or a voltage release fitted on left	2	-	-	<b>B3.2/2-PKZ4</b>
	4	-	-	<b>B3.2/4-PKZ4</b>
Shroud for unused terminals. Protection against direct contact. To cover unused terminals on three-phase commoning link	-	-	-	<b>H-B3-PKZ4</b>

① Protected against accidental contact. B-Frame short circuit proof  $U_e = 690V$ ,  $I_u = 63A$ ; D-Frame short circuit proof  $U_e = 690V$ ,  $I_u = 128A$ . Frame B links can be combined by rotating mounting. Frame D links cannot be combined. + MMP w/1 aux. (2, 3, 4, 5 module) + trip indicating etc. for frames B & D.

#### Incoming terminal for three-phase commoning link ②



For use with...	Item no.
B-Frame PKZM0/PKE	<b>BK25/3-PKZ0</b>
PKZM4	<b>BK50/3-PKZ4-E</b>

② For three-phase commoning link, protected against accidental contact,  $U_e = 690V$ ,  $I_u = 63A$ ; for conductor cross-sections: 2.5 – 25 mm<sup>2</sup> stranded; 2.5 – 16 mm<sup>2</sup> flexible with ferrules, AWG 14-6.

## Motor Protectors

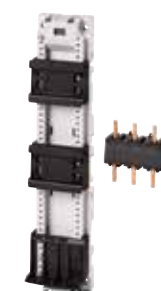
### IEC Manual motor protectors accessories

#### Combination connection kits for connection of rotary MMP with IEC contactor

For use with...	Description	Item no.
<b>Non-Reversing Starters</b>		
PKE/PKZMO + DILM7-15 DS7 (4-12A)	Comprised of: Mechanical connection element for PKZM0 & contactor Main current wiring between PKZM0 & contactor in tool-less plug connection Cable guidance Use contactor auxiliary switch DILA-XHIT... Control cable guidance: max. 6 cables up to 2.5 mm <sup>2</sup> external diameter or 4 cables up to 3.5 mm <sup>2</sup> external diameter.	<b>PKZM0-XDM12</b>
PKZMO + DILM17-32	Comprised of: DIN-Rail adapter plate	<b>PKZM0-XDM32</b>
PKZM4 + DILM40-65	Main current wiring between PKZM0 & contactor	<b>PKZM4-XDM65</b>
<b>Reversing starters</b>		
PKZM0, PKE + DILM7-01 DILM9-01 DILM12-01	Consists of: Mechanical connection element for PKZM0 and contactor Reversing starters main supply wiring with tool-less plug connection	<b>PKZM0-XRM12</b>
PKZM0, PKE + DILM17 DILM25 DILM32	Consists of: Top-hat rail adapter plates Reversing starters supply wiring	<b>PKZM0-XRM32</b>
<b>Wiring kit</b>		
PKZM0, PKE + DILM17 DILM25 DILM32 DS7-34...SX016... DS7-34...SX024... SX032...	Main supply wiring between PKZM0 and contactor Use only in combination with busbar adapter or mounting rail adapter plate	<b>PKZM0-XM32DE</b>
PKZM4 + DILM40 DILM50 DILM65	Main current supply between PKZM4 and contactor	<b>PKZM4-XM65DE</b>



PKZM0-XDM12



PKZM4-XDM65



PKZM0-XM32DE

#### Insulated enclosures for surface mounting

Degree of protection	For use with...	Description	Item no.
<b>PKZM01 Pushbutton Manual Motor Protectors</b>			
IP65	PKZM01	With operating membrane	<b>CI-PKZ01-G</b>
IP65		With Emergency-Stop (E-Stop) pushbutton actuator, Red-Yellow	<b>CI-PKZ01-PVT</b>
<b>D-Frame (10 – 65A) PKZM0/PKZM4 Rotary Manual Motor Protectors Ⓞ</b>			
IP65	PKZM4	With black/grey rotary handle	<b>CI-K4-PKZ4-G</b>
		With black/grey rotary handle	<b>CI-K2-PKZ0-G</b>
IP65	PKZM0	With red/yellow rotary handle for use as Emergency-Stop switches to IEC/ EN 60204	<b>CI-K2-PKZ0-GR</b>
IP65		PKZM4	With red/yellow rotary handle for use as Emergency-Stop switches to IEC / EN 60204

Ⓞ Integrated terminal for PE(N) connection.

Ⓞ % Metric knockouts: Top ÷ bottom: M25/M32. In backplate: M25/M32. Control cable entry: M20.



CI-PKZ01-PVT



CI-K2-PKZ0-G

#### MMP enclosure accessories (padlock attachment)

For use with...	Description	Item no.
CI-K2-PKZ0-GR & CI-K2-PKZ0-G	Padlocking feature. Up to 3 padlocks with 3 – 6 mm hasp thickness. For use as main switch to IEC/EN 60204.	<b>SVB-PKZ0-CI</b> Ⓞ
CI-K4-PKZ4-GR & CI-K4-PKZ4-G		<b>SVB-PKZ4-CI</b> Ⓞ

More enclosures are available. Contact your local sales office for more information.

Ⓞ Lockable in the 0-position of the XTPR manual motor protector.



SVB-PKZ0-CI

## Motor Protectors

### IEC Motor control busbar adapters

#### Busbar adapter, 3 pole

Rated operational voltage  $U_e = 690$  V. For mounting on CU flat busbars with 60 mm interval between busbar centres, suitable for 5 mm & 10 mm busbar thickness.



BBA0-25



BBA4L-63



BBA0R-32



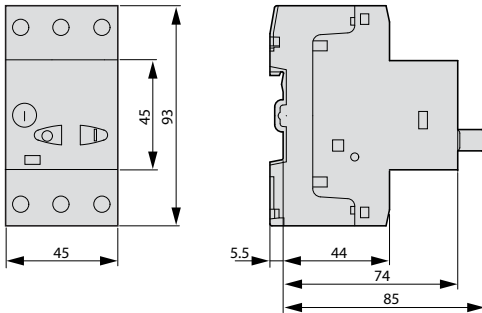
BBA-XSM

Rated operational current, $I_e$ , A	Width (mm)	Length (mm)	For use with...	Item no.
For direct-on-line starters				
25	45	200	PKE/ PKZM0 + DILM7 PKE/ PKZM0 + DILM9 PKE/ PKZM0 + DILM12 PKE/ PKZM0 + DILM15	<b>BBA0-25</b>
32	45	200	PKE/ PKZM0 + DILM17 PKE/ PKZM0 + DILM25 PKE/ PKZM0 + DILM32	<b>BBA0-32</b>
63	55	260	PKZM4 + DILM17 PKZM4 + DILM25 PKZM4 + DILM32 PKZM4 + DILM40 PKZM4 + DILM50 PKZM4 + DILM65	<b>BBA4L-63</b>
For reversing starters				
25	90	200	PKE/ PKZM0 + 2 x DILM7-01 PKE/ PKZM0 + 2 x DILM9-01 PKE/ PKZM0 + 2 x DILM12-01	<b>BBA0R-25</b>
32	90	200	PKE/ PKZM0 + 2 x DILM17-01 PKE/ PKZM0 + 2 x DILM25-01 PKE/ PKZM0 + 2 x DILM32-01	<b>BBA0R-32</b>
Empty module, without electrical contacts				
–	45	200	–	<b>BBA0/2TS-L</b>
–	54	200	–	<b>BBA4/2TS-L</b>
Side mounted module, can be plugged into both sides				
–	9	200	–	<b>BBA-XSM</b>

## Dimensions

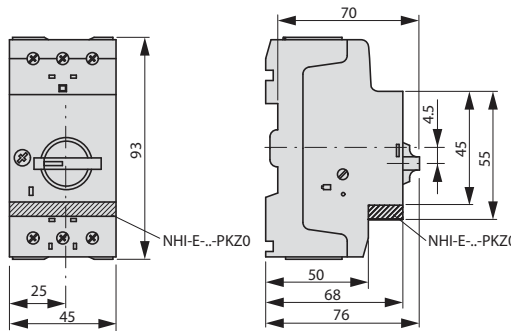
### Motor Protectors

#### Motor-protective circuit breaker PKZM01...



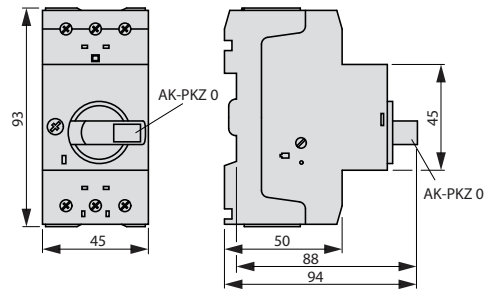
#### Motor-protective circuit breaker Transformer-protective circuit breakers Motor-protective circuit breaker with auxiliary contacts

PKZM0-...(+NHI-E-...-PKZ0)  
PKZM0-...-T(+NHI-E-...-PKZ0)  
PKM0-...(+NHI-E-...-PKZ0)



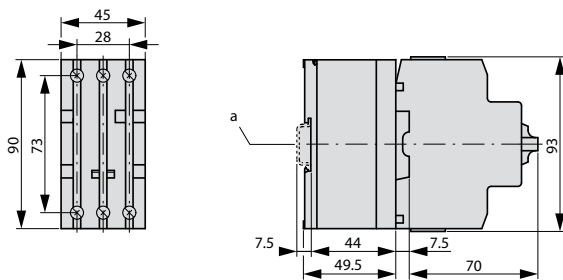
#### Motor-protective circuit breaker with lockable rotary handles

PKZM0-...+AK-PKZ0



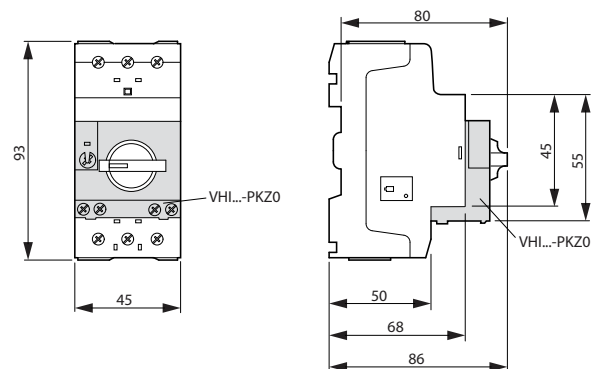
#### Current limiters

CL-PKZ...



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

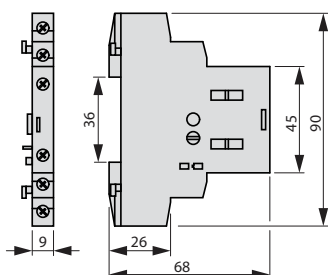
PKZM0-...+VHI-...-PKZ0



① Top-hat rail IEC/EN 60715

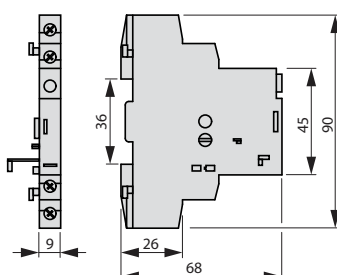
#### Standard auxiliary contacts

NHI...-PKZ0



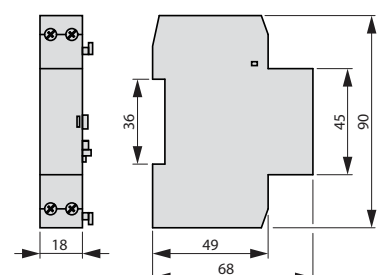
#### Trip indicators

AGM2...-PKZ0



#### Shunt release - undervoltage release

A-PKZ0...  
U-PKZ0...





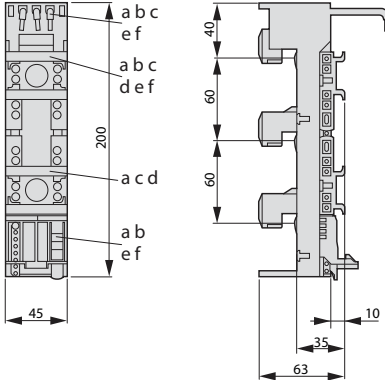
## Dimensions

### Motor Protectors

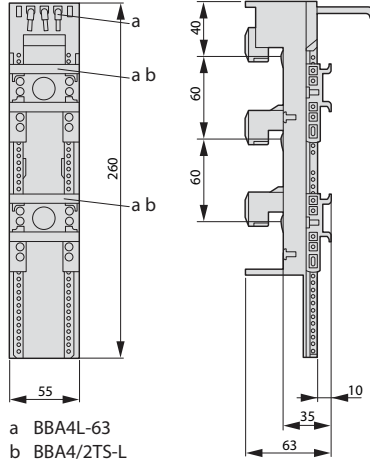
#### Busbar adaptors

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

BBA4/2TS-L  
 BBA4L-63



a BBA0-32/2TS-C d BBA0/2TS-L  
 b BBA0-25/2TS e BBA0-25  
 c BBA0C-16 f BBA0-32



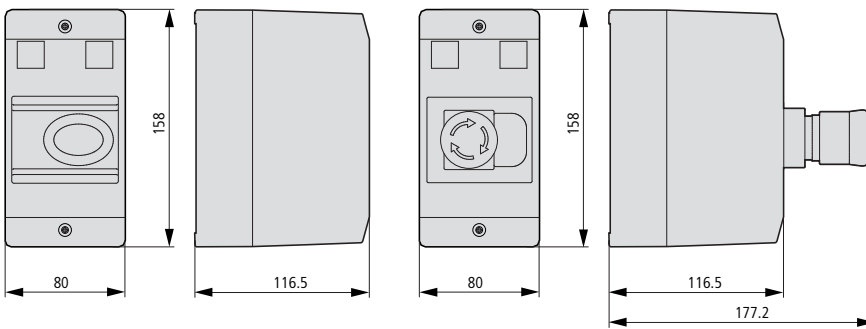
a BBA4L-63  
 b BBA4/2TS-L

#### Insulated enclosures for surface mounting

CI-PKZ01  
 CI-PKZ01-G

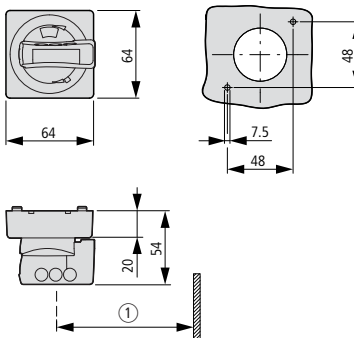
CI-PKZ01-PVT  
 CI-PKZ01-PVS

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



#### Door coupling handles

PKZ0-X(R)H...



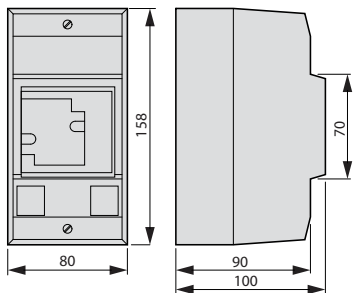
Mounting depth: 100 to 240 mm  
 from the top edge of the top-hat rail  
 to the front edge of the cabinet  
 door/cover  
 Distance between switch axis and  
 cover hinge: at least 100 mm

① At least 100 mm from cover hinge

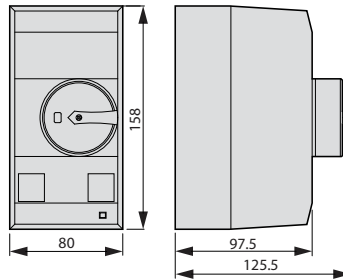
## Dimensions

### Motor Protectors

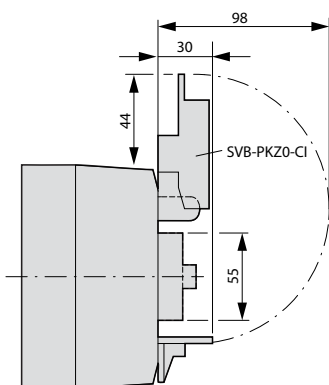
#### Insulated enclosures for surface mounting CI-PKZ0-M



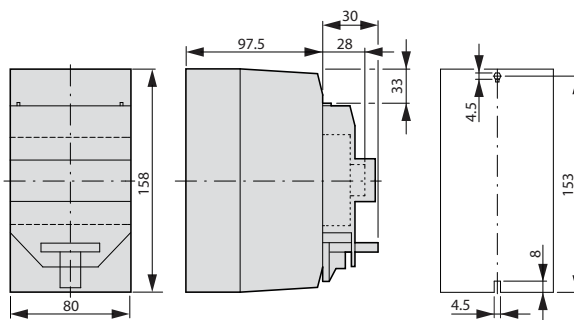
#### CI-PKZ10G...M



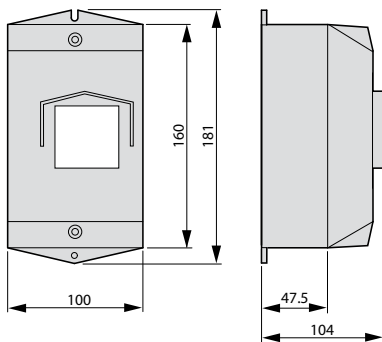
#### CI-PKZ0...M + SVB-PKZ0-CI



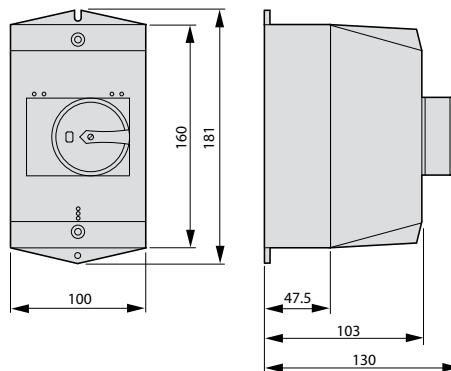
#### Drilling dimensions CI-PKZ0...M



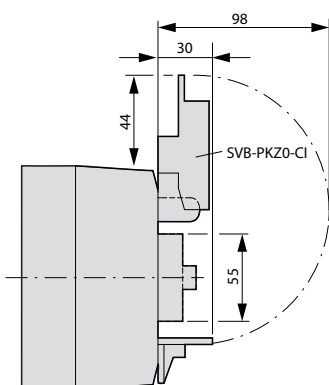
#### CI-K2-PKZ0



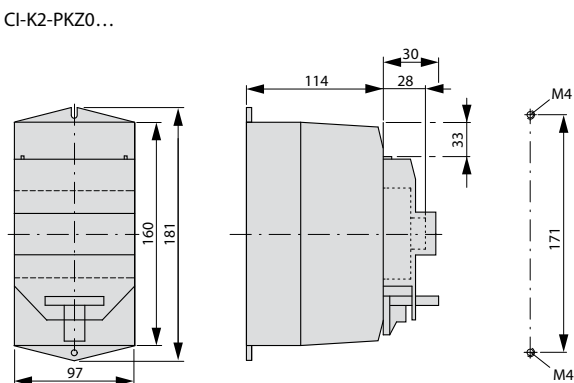
#### CI-K2-PKZ0G(R)(V)



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



#### Drilling dimensions CI-K2-PKZ0...



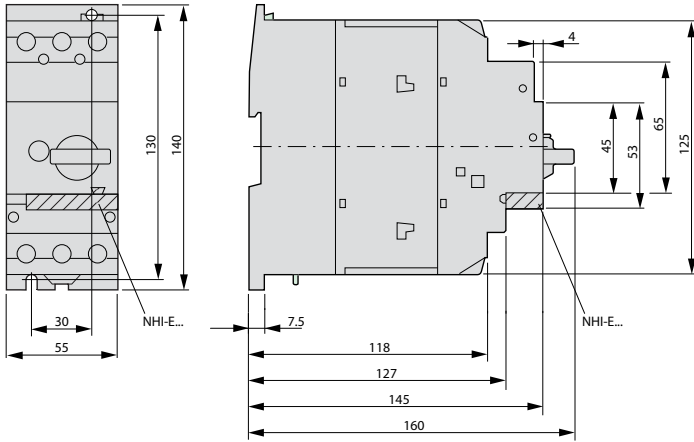
# Motor Control

## Dimensions

### Motor Protectors

#### Motor-protective circuit breakers

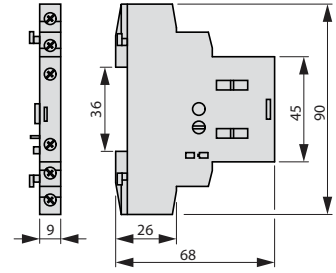
PKZM4-...



#### Standard auxiliary contacts

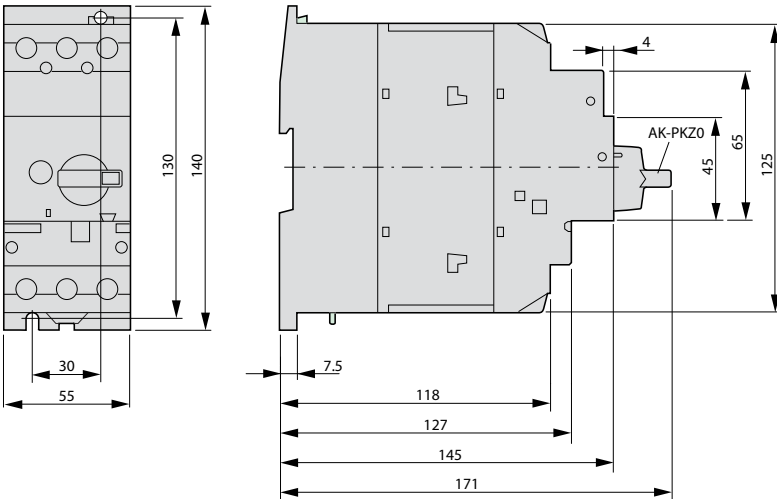
NHI...-PKZ...

NHI...-PKZ0



#### Motor-protective circuit breakers with lockable cover

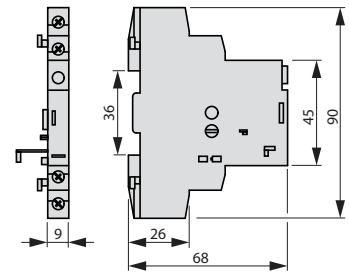
PKZM4-... +AK-PKZ0



#### TriTrup indicators

AGM2...-PKZ...

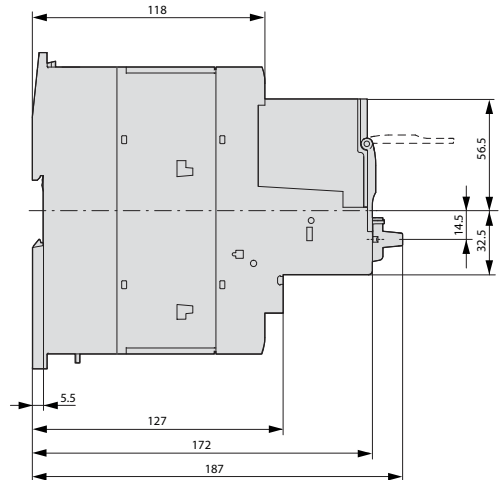
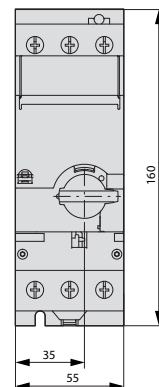
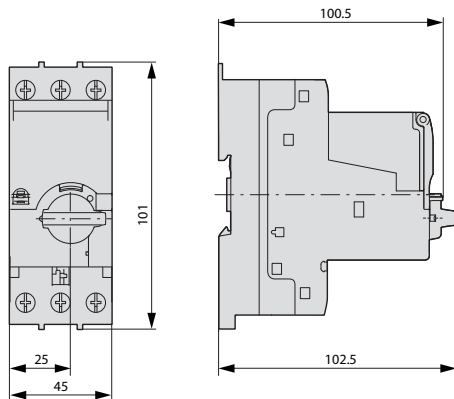
AGM2...-PKZ0



#### PKE Motor-protective circuit breakers

PKE12, PKE32

PKE65

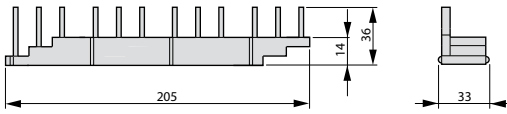


## Dimensions

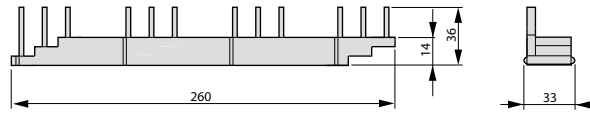
### Motor Protectors

#### Three-phase commoning links

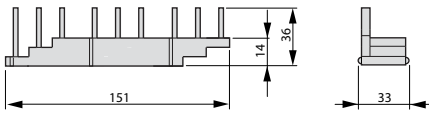
B3.0/4-PKZ4



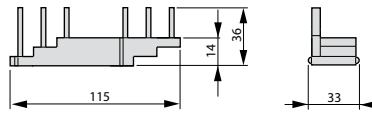
B3.2/4-PKZ4



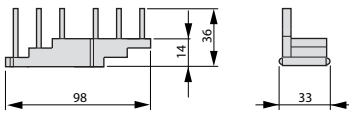
B3.0/3-PKZ4



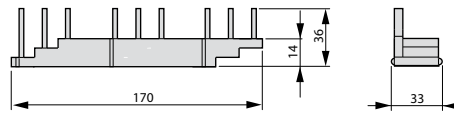
B3.2/2-PKZ4



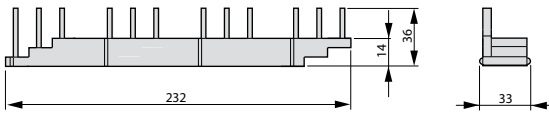
B3.0/2-PKZ4



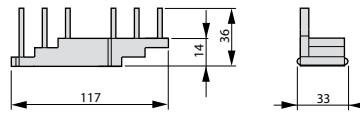
B3.1/3-PKZ4



B3.1/4-PKZ4

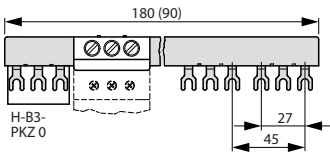


B3.1/2-PKZ4



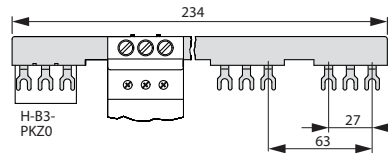
B3.0/4-PKZ0

B3.0/2-PKZ0



B3.2/4-PKZ0

B3.2/2-PKZ0

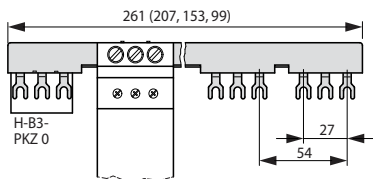


B3.1/5-PKZ0

B3.1/3-PKZ0

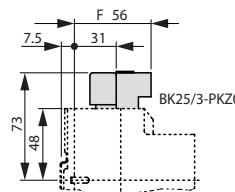
B3.1/4-PKZ0

B3.1/2-PKZ0

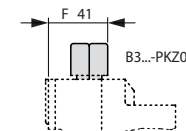


#### Incoming terminals

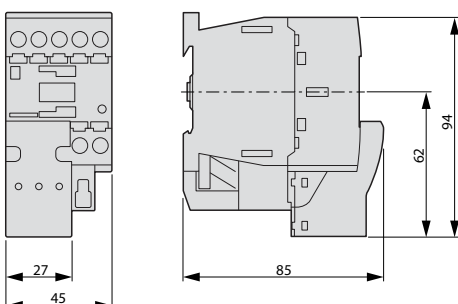
BK25/3-PKZ0



Overlapping mounting to extend the three-phase commoning link



#### Motor plug DILM12-XMCP/T



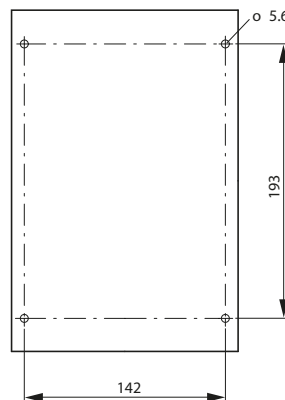
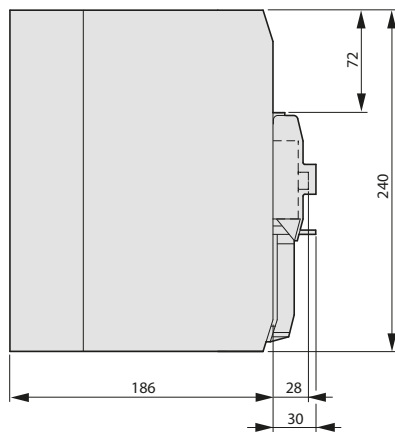
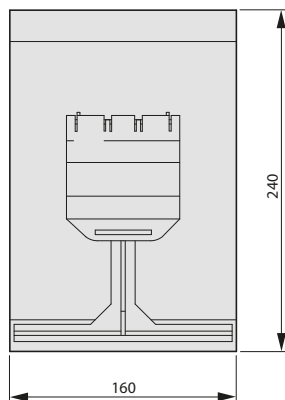
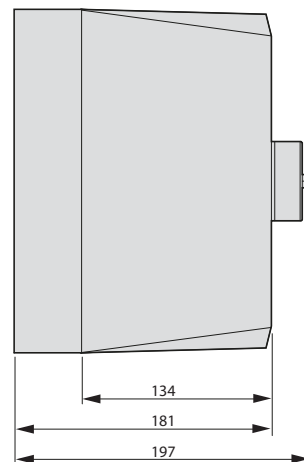
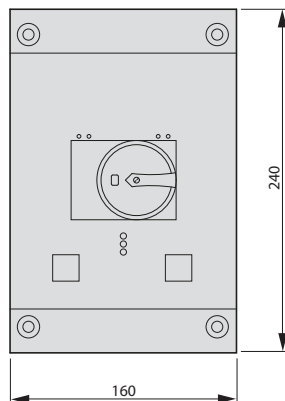
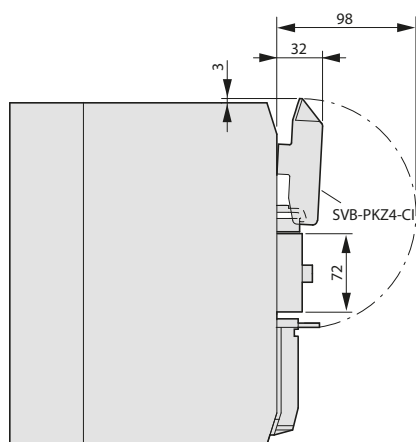
## Dimensions

### Motor Protectors

#### Insulated enclosures for surface mounting

CI-K4-PKZ4-G(R)  
+SVB-PKZ4-CI

CI-K4-PKZ4-G



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



# Display, Switch, Control and Set – Simply easy



The control relay easy500/700/800 offer all the technical opportunities to implement solutions in industry and building automation, machine engineering and in apparatus construction as well as trade applications. A host of different device versions with various functions, voltage types, expansion and networking options are available for implementing the right solution. With their different performance classes easy500, easy700 and easy800, the easyRelays provide the optimum solution for small, medium and large control tasks.

The combination of a control relay easy800 with direct connection to the communication system for SmartWire-DT switchgear provides an innovative solution in control panel design and construction. The renowned simple handling of easyRelay and the efficient SmartWire-DT connection technology provide considerable savings in terms of time and costs during planning, commissioning and maintenance.

**EATON**  
Powering Business Worldwide

## Starters

### DOL starters

IP65 Surface mounting starter, fitted with start & stop/reset pushbuttons.



EDOL40NO240

kW(400 - 415VAC)	AC-3 Amps	Coil voltage	Aux. contacts	Dimensions (W x H x D) mm	Item no.
4	11	240	1NO	90 x 184 x 113	<b>EDOL40NO240</b>
5.5	12	240	1NO	90 x 184 x 113	<b>EDOL55NO240</b>
7.5	16	240	1NO	90 x 184 x 113	<b>EDOL75NO240</b>
11	22	240	1NO	100 x 194 x 123	<b>EDOL11NO240</b>
4	11	415	1NO	90 x 184 x 113	<b>EDOL40NO415</b>
5.5	12	415	1NO	90 x 184 x 113	<b>EDOL55NO415</b>
7.5	16	415	1NO	90 x 184 x 113	<b>EDOL75NO415</b>
11	22	415	1NO	100 x 194 x 123	<b>EDOL11NO415</b>

Order Overloads Separately.

### Overload relays



EDOL25TOL

Full load current (A)	Item no.
0.35 - 0.5	<b>EDOL045TOL</b>
0.45 - 0.63	<b>EDOL063TOL</b>
0.55 - 0.8	<b>EDOL08TOL</b>
0.75 - 1.0	<b>EDOL10TOL</b>
0.9 - 1.3	<b>EDOL1P3TOL</b>
1.1 - 1.6	<b>EDOL1P6TOL</b>
1.4 - 2.0	<b>EDOL02TOL</b>
1.8 - 2.5	<b>EDOL25TOL</b>
2.3 - 3.2	<b>EDOL32TOL</b>
2.9 - 4.0	<b>EDOL04TOL</b>
3.5 - 4.8	<b>EDOL48TOL</b>
4.5 - 6.3	<b>EDOL63TOL</b>
5.5 - 7.5	<b>EDOL75TOL</b>
7.2 - 10	<b>EDOL100TOL</b>
9.0 - 12.5	<b>EDOL125TOL</b>
11.3 - 16	<b>EDOL16TOL</b>
15.0 - 20.0	<b>EDOL20TOL</b>
17.5 - 21.5	<b>EDOL215TOL</b>
21.0 - 25.0	<b>EDOL250TOL</b>
24.5 - 30.0	<b>EDOL30TOL</b>

1NO/1NC Electrically Separated Auxiliary Contacts.

Single - phase sensitivity for phase imbalance & phase loss protection.

Temperature Compensated.

### Spare coils



EDOLCOIL240A

Coil voltage (AC)	Item no.
24V	<b>EDOLCOIL24A</b>
32V	<b>EDOLCOIL32A</b>
110V	<b>EDOLCOIL110A</b>
240V	<b>EDOLCOIL240A</b>
415V	<b>EDOLCOIL415A</b>
480V	<b>EDOLCOIL480A</b>
12V	<b>EDOLCOIL12A</b>

Coils suit all starter sizes.

Starters

DOL starters

Rated operational current AC-3, 415 V Ie, A	Max. rating for three-phase motors, 50 – 60 Hz		Individual components of the combination		DOL starter ① Item no.
	AC-3, 80/ 415 V P, kW	AC-4, 80/ 415 V P, kW	Contactors Q11 Item no.	Contactors Q12 Item no.	
Open units					
9	4	2.5	DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20	DOLRS4/U(...V50HZ) ②⑥
12	5.5	3	DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20	DOLRS5.5/U(...V50HZ) ②⑥
18	7.5	4.5	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	DOLRS7.5/U(...V50HZ) ②⑥
25	11	6	DILM25-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	DOLRS11/U(...V50HZ) ②⑥
32	15	7	DILM32-01 + DILA-XHI20	DILM32-01 + DILA-XHI20	DOLRS15/U(...V50HZ) ②⑥
40	18.5	9	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	DOLRS18.5/U(...V50HZ) ③⑥
50	22	10	-	-	DOLRS22/U(...V50HZ) ③⑥
65	30	12	DILM65 + DILM150-XHI11	DILM65 + DILM150-XHI11	DOLRS30/U(...V50HZ) ③⑥
Enclosed units					
9	4	2.5	DILM9-01 + DILA-XHI20	DILM9-01 + DILA-XHI20	DOLRS4/I(...V50HZ) ④⑥
12	5.5	3	DILM12-01 + DILA-XHI20	DILM12-01 + DILA-XHI20	DOLRS5.5/I(...V50HZ) ④⑥
18	7.5	4.5	DILM17-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	DOLRS7.5/I(...V50HZ) ④⑥
25	11	6	DILM25-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	DOLRS11/I(...V50HZ) ④⑥
32	15	7	DILM32-01 + DILA-XHI20	DILM32-01 + DILA-XHI20	DOLRS15/I(...V50HZ) ④⑥
40	18.5	9	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI11	DOLRS18.5/I(...V50HZ) ⑤⑥
50	22	10	-	-	DOLRS22/I(...V50HZ) ⑤⑥
65	30	12	DILM65 + DILM150-XHI11	DILM65 + DILM150-XHI11	DOLRS30/I(...V50HZ) ⑤⑥

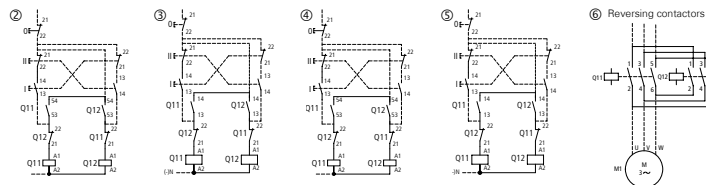


DOLRS4/U(...V50HZ)



DOLRS4/I(...V50HZ)

① Specify voltage & frequency when ordering.  
Standard voltages: V AC: 24 V, 110 V, 240 V, 415 V at 50 Hz.  
Non-standard voltages: V AC: 12 – 600 V at 50 or 60 Hz.  
V DC: 12 – 250 V. For DC voltage add suffix “-G” to Item No.  
N.B. additional charge applies. Please enquire for non-standard configurations.



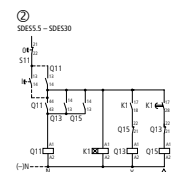
Star-delta starters

Rated operational current AC-3, 380/415 V Ie, A	Max. rating for three-phase motors, 50 – 60 Hz P, kW	Max. change over time S	Individual components of the combination			
			Mains contactor Q11 Item No.	Delta contactor Q15 Item No.	Star contactor Q13 Item No.	Star-delta starter Item No. ①
Star-delta starter combinations						
Open units - Timing relay K1T: ETR4-51, Complete with overload						
12	5.5 ①	20	DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES5.5/U(...) ②④
16	7.5	20	DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES7.5/U(...) ②④
22	11	20	DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES11/U(...) ②④
30	15	20	DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES15/U(...) ②④
45	22	20	DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	SDES22/U(...) ②④
55	30	20	DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	SDES30/U(...) ②④
70	37	20	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI31	DILM40 + DILM150-XHI11	SDES37/U(...) ③④
90	45	20	DILM50 + DILM150-XHI11	DILM50 + DILM150-XHI31	DILM40 + DILM150-XHI11	SDES45/U(...) ③④
115	55	20	DILM65 + DILM150-XHI11	DILM65 + DILM150-XHI31	DILM40 + DILM150-XHI11	SDES55/U(...) ③④
140	75	20	DILM80 + DILM150-XHI11	DILM80 + DILM150-XHI31	DILM50 + DILM150-XHI11	SDES75/U(...) ③④
Enclosed units - Complete with pushbutton & overload, According to IEC 60947						
12	5.5	20	DILM7-10 + DILA-XHI20	DILM7-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES5.5/I(...) ④
16	7.5	20	DILM9-10 + DILA-XHI20	DILM9-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES7.5/I(...) ④
22	11	20	DILM12-10 + DILA-XHI20	DILM12-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES11/I(...) ④
30	15	20	DILM17-10 + DILA-XHI20	DILM17-01 + DILA-XHI20	DILM7-01 + DILA-XHI20	SDES15/I(...) ④
45	22	20	DILM25-10 + DILA-XHI20	DILM25-01 + DILA-XHI20	DILM17-01 + DILA-XHI20	SDES22/I(...) ④
55	30	20	DILM32-10 + DILA-XHI20	DILM32-01 + DILA-XHI20	DILM25-01 + DILA-XHI20	SDES30/I(...) ④
70	37	20	DILM40 + DILM150-XHI11	DILM40 + DILM150-XHI31	DILM40 + DILM150-XHI11	SDES37/I(...) ④
90	45	20	DILM50 + DILM150-XHI11	DILM50 + DILM150-XHI31	DILM40 + DILM150-XHI11	SDES45/I(...) ④
115	55	20	DILM65 + DILM150-XHI11	DILM65 + DILM150-XHI31	DILM40 + DILM150-XHI11	SDES55/I(...) ④
140	75	20	DILM80 + DILM150-XHI11	DILM80 + DILM150-XHI31	DILM50 + DILM150-XHI11	SDES75/I(...) ④



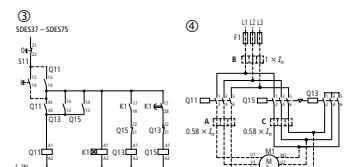
SDES5.5-U

① Specify voltage & frequency when ordering.  
Standard voltages: V AC: 24 V, 110 V, 240 V, 415 V at 50 Hz  
Non-standard voltages: V AC: 12 – 600 V at 50 or 60 Hz, V DC: 12 – 250 V For DC voltage add suffix “-G” to part no.  
N.B. additional charge applies. Please enquire for non-standard configurations.



**Overload relay settings** Starting  
A: I<sub>n</sub> × 0.58 ≤ 15 s Protection of the motor in Y and d configuration  
B: I<sub>n</sub> × 1 15 – 40 s Only partial motor protection in star position  
C: I<sub>n</sub> × 0.58 > 40 s Motor not protected in star position.

Timing relay set to approx. 10 s.  
Main circuit: Depending on the coordination type required (i.e. Type “1” or Type “2”) it must be established whether the fuse protection and the input wiring for the mains contactor and delta contactor are to be common or separate.







## Contactors

### 1000V Mining contactors

#### Eaton V201 vacuum contactor

Eaton's V201 Vacuum Contactors are known for quality & proven performance. They are ideally suited for heavy-duty applications in harsh environments. These contactors are most commonly used for mining applications.

- Rated for up to 1500V
- Small physical size
- Long life
- Reduced maintenance
- No noise, no arc flash
- No atmospheric contamination of the contacts
- Derating is not required at higher voltages
- Mounting in any position



V201KRCJZ1

#### Vacuum contactors

Description	Item no.
160A	<b>V201KRCJZ1</b>
320A	<b>V201KTCJZ1</b>
540A	<b>V201KVCJZ1</b>
610A	<b>V201KZCJZ1</b>

110V AC Coil as standard. Vacuum Contactor Amp Ratings are AC3. Vacuum switch tubes cannot be replaced.



V201KTCJZ1

#### Auxiliary contacts for V201 vacuum contactors & DPCK air break contactors

Description	Item no.
1NO/1NC	<b>J-11</b>
2NO	<b>J-20</b>
2NC	<b>J-02</b>
1NO/1NC delay – 160A only	<b>J-1CV</b>

#### Accessories

Description	Item no.
For mechanically interlocking two 160A Vacuum Contactors	<b>180C113G04</b>
For mechanically interlocking two 320A Vacuum Contactors	<b>180C113G16</b>
For mechanically interlocking two 540A Vacuum Contactors	<b>180C113G17</b>
Interphase barriers for 160A Vacuum contactor. Contains a set of two interphase barriers.	<b>IPB1</b> ①

① A set is suitable for line OR load side of the contactor. For line AND load side interphase barriers, order two sets.



V201KVCJZ1

#### Replacement parts

Description	Suffix	Item no.
Size 4	110/120 Vac, 50/60 Hz	J <b>9085A57G01</b>
	220/240 Vac, 50/60 Hz	K <b>9085A57G02</b>
	380/415 Vac, 50/60 Hz	H <b>ID89221G07</b>
	440/480 Vac, 50/60 Hz	U <b>9085A57G03</b>
Size 5	110/120 Vac, 50/60 Hz	J <b>7874A09G01</b> ③
	220/240 Vac, 50/60 Hz	K <b>7874A09G04</b> ④
	380/415 Vac, 50/60 Hz	H <b>7874A09G10</b>
	440/480 Vac, 50/60 Hz	U <b>7874A09G05</b>
Size 6	110/120 Vac, 50/60 Hz	J <b>7874A24G01</b> ③
	220/240 Vac, 50/60 Hz	K <b>7874A24G02</b> ④
	380/415 Vac, 50/60 Hz	H <b>7874A24G07</b>
	440/480 Vac, 50/60 Hz	U <b>7874A24G03</b>

③ 125 Vdc can be directly applied to the Size 5 and 6 coil rated for 120 Vac/60 Hz (cannot be applied to Size 4).

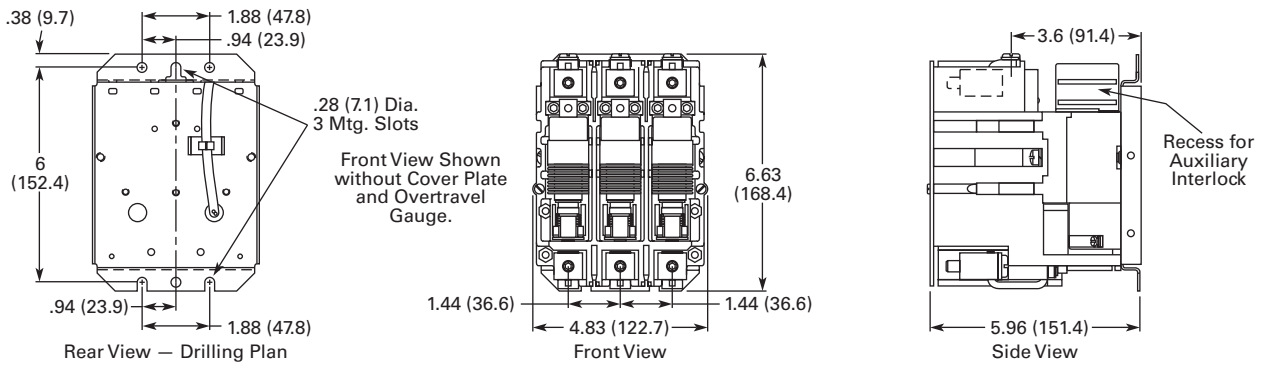
④ 250 Vdc can be directly applied to the Size 5 and 6 coil rated for 240 Vac/60 Hz (cannot be applied to Size 4).

## Dimensions

### 1000V Mining contactors

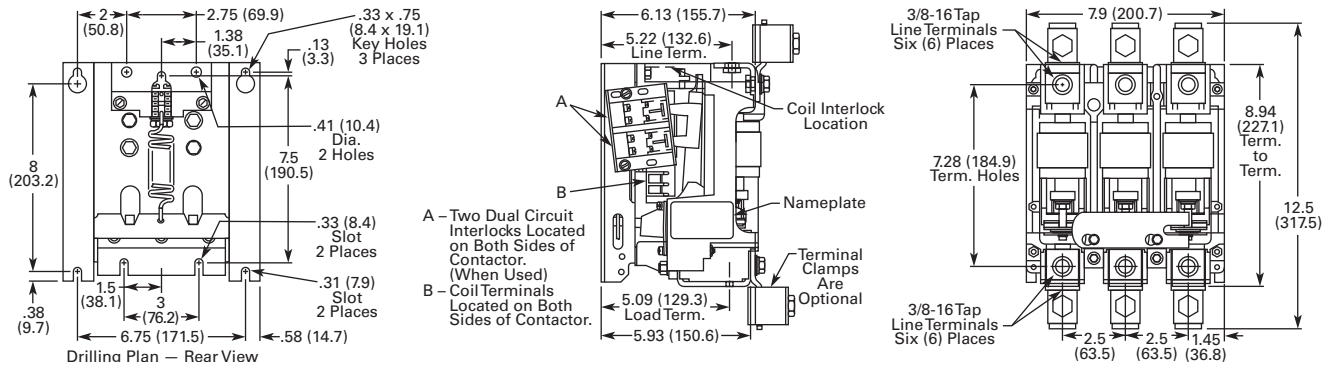
#### Open type contactors and starters - size 4 and 160A

##### Size 4 and 160A non-revising contactor



#### Open type contactors and starters - size 5 and 320A

##### Size 5 and 320A non-revising contactor



#### Open type contactors and starters - size 6, 540A and 610A

##### Size 6, 540 and 610A non-revising contactor

