ETICON

*Capacitor duty contactors are in the CP chapter, see page 378

Contactors

POWER NEEDS CONTROL

Modular contactors for installation into distribution boards

Modular contactor for installation into distribution board

Description
Modular contactors are used for installation in consumer units in dwellings, business premises, hotels, hospitals, shopping centres, sport centers, production halls, warehouses etc.

They are used for remote switching and automatic control of electric devices and equipment, such as:
- lightning
- all types of pumps
- air-conditioning
- electric heating
- single-phase and three-phase motors

They excel in silent operation, long mechanical life time and high quality.

The contactors are designed for mounting on 35 mm mounting rail in accordance with the EN 60715 standard and they can be leaded by means of lead covers. The auxiliary contact block is available for signalization and ventilation module is available for preventing exceeded heating when contactors are used side-by-side.

All contactors have degree of protection IP20.

Besides the basic AC controlled types R20, R25, R40 and R63, types with increased silent operation RD20, RD25, RD40 and RD63 are available. Due to DC magnet and rectifier enable DC and AC voltage control. Surge arrestor is built in for over voltage protection.

Types R20-R, RD20-R, R25-R and RD25-R are upgraded versions of basic types of modular contactors. Besides basic functions they enable manual control with a handle.
Description of the handle positions:
- A: the contactor functions as an installation contactor without manual control
- O: permanently OFF
- I: manual shifting the handle from position A to I causes the contactor to close; when control voltage is applied, the handle is automatically set to position A.

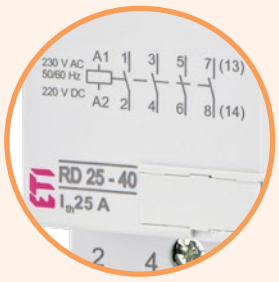
Types RD20-R and RD25-R are provided with a varistor for over voltage protection and a rectifier, which enables control with AC and DC voltage.

Contactors with manual control enable:
- switching depending on tariff (selection of the most convenient tariff)
- switching when control voltage is not applied

Technical specifications according to:
EN60947-4-1; EN60947-5-1; VDE 0660, IEC 947-4-1; IEC 947-5-1

Advantages

→ Contactors RD series are universal power supply AC/DC with built-in varistor surge protection. RD contactors produce less noise (DC coil inside)



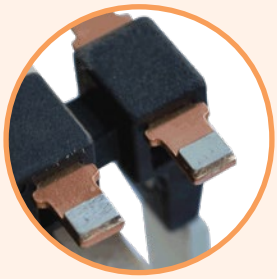
→ Special terminals provide reliable connection with cables.

→ Spring-loaded latch ensures reliable mounting on DIN rail TH 35

→ Contactors series R-R have operating mode switch:
- Automatic mode (normal operation with control circuit-coil)
- Manual mode (0 - permanently open, I - constantly closed).

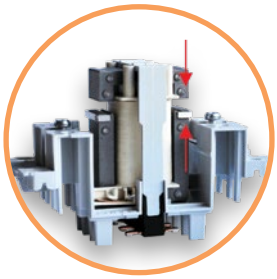
In manual mode constantly close operation I presence of voltage on control circuit-coil returns contactor in automatic mode operation.

→ Contact status can be monitored visually or remote by auxiliary contacts



→ Silver contacts provide the best conductivity and lowest contact resistance

→ Spring loaded contacts to reduce bouncing effect and prolong contact life time

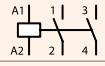
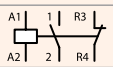
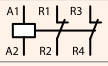


→ Specially designed mechanism consisting of two movable cores significantly reduces the noise level at switching

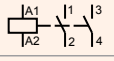
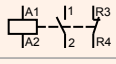
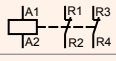
1-pole, 1 module (17,5 mm), 25 A (AC1, 230V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-10-24V	002463507		130	12
R 25-10-230V	002463500		130	12

2-pole, 1 module (17,5 mm), 20 A (AC1, 230V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 20-20 230V	002461210		130	12
R 20-20 24 V	002461211		130	12
R 20-11 230 V	002461220		130	12
R 20-11 24 V	002461221		130	12
R 20-02 230 V	002461230		130	12
R 20-02 24 V	002461231		130	12

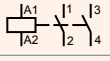
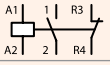
2-pole, 1 module (17,5 mm), 25 A (AC1, 230V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-20-24V	002463501		130	12
R 25-20 230V	002463502		130	12
R 25-11 24V	002463503		130	12
R 25-11 230V	002463504		130	12
R 25-02 24V	002463505		130	12
R 25-02 230V	002463506		130	12

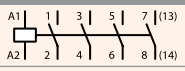
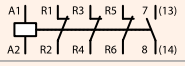
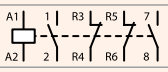
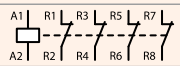
2-pole, 1 module (17,5 mm), 32 A (AC1, 230V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 32-20 230V AC/DC	002464077		130	10/80

2 pole, 2 modules (35 mm), 63 A(AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 63-20 230V	002463482		240	6/60
R 63-20 24V	002463483		240	6/60
R 63-11 230V	002463484		240	6/60
R 63-11 24V	002463485		240	6/60

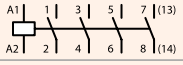
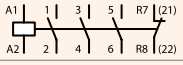
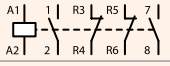
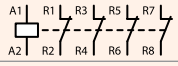
4-pole, 2 modules (35 mm), 25 A (AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-40 230 V	002462310		220	6
R 25-40 24 V	002462311		220	6
R 25-31 230 V	002462320		220	6
R 25-31 24 V	002462321		220	6
R 25-13 230 V	002462330		220	6
R 25-13 24 V	002462331		220	6
R 25-22 230 V	002462340		220	6
R 25-22 24 V	002462341		220	6
R 25-04 230 V	002462350		220	6
R 25-04 24 V	002462351		220	6

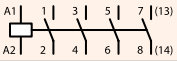
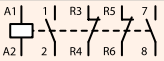
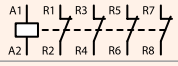
4-pole, 2 modules (35 mm), 32 A (AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 32-40 230V AC/DC	002464078		244	5/40

4-pole, 3 modules (52,5 mm), 40 A (AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 40-40 230 V	002463410		360	4
R 40-40 24 V	002463411		360	4
R 40-31 230 V	002463420		360	4
R 40-31 24 V	002463421		360	4
R 40-22 230 V	002463430		360	4
R 40-22 24 V	002463431		360	4
R 40-04 230 V	002463440		360	4
R 40-04 24 V	002463441		360	4

4 pole, 3 modules (52,5mm), 63 A(AC1, 400 V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 63-40 230 V	002463450		360	4
R 63-40 24 V	002463451		360	4
R 63-31 230 V	002463460		360	4
R 63-31 24 V	002463461		360	4
R 63-22 230 V	002463470		360	4
R 63-22 24 V	002463471		360	4
R 63-04 230 V	002463480		360	4
R 63-04 24 V	002463481		360	4

Auxiliary contactor block for contactors R25, R40, R63 (max. 1 piece)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RH 11	002461101		26	3

*Not available for 1 modules size R contactors, only for 2 and above!

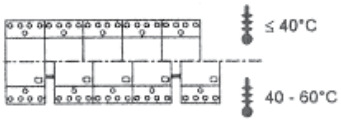
Sealing cover

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
P721	002461110	R 25 (4p)	2	10
P690	002461120	R 40…, R 63…	3	10

Distance piece

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
P730	002461130	R20-R63	12	10

Distance piece



Distance piece is used where ambient temperature is higher than 40°C. Piece width is 1/2 module (8,8 mm)

Max 3 contactors can be side by side - use of distance piece is highly recommended.

1-pole, 1 module (17,5 mm), 20 A (AC1, 230 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 20-10-230V AC/DC	002464000		130	10
RD 20-10-24V AC/DC	002464001			
RD 20-01-230V AC/DC	002464002			
RD 20-01-24V AC/DC	002464003			
2-pole, 1 module (17,5 mm), 20 A (AC1, 230 V)				
RD 20-20-230V AC/DC	002464004		130	10
RD 20-20-24V AC/DC	002464005			
RD 20-11-230V AC/DC	002464006			
RD 20-11-24V AC/DC	002464007			
RD 20-02-230V AC/DC	002464008			
RD 20-02-24V AC/DC	002464009			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

4-pole, 2 modules (35 mm), 25 A (AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 25-40-230V AC/DC	002464010		240	5
RD 25-40-24V AC/DC	002464011			
RD 25-31-230V AC/DC	002464012			
RD 25-31-24V AC/DC	002464013			
RD 25-22-230V AC/DC	002464014			
RD 25-22-24V AC/DC	002464015			
RD 25-04-230V AC/DC	002464016			
RD 25-04-24V AC/DC	002464017			

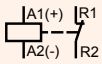
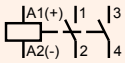
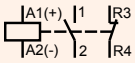
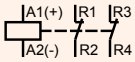
Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

4-pole, 3 modules (52,5 mm), 40 A (AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 40-40-230V AC/DC	002464018		420	5
RD 40-40-24V AC/DC	002464019			
RD 40-31-230V AC/DC	002464020			
RD 40-31-24V AC/DC	002464021			
RD 40-22-230V AC/DC	002464022			
RD 40-22-24V AC/DC	002464023			
RD 40-04-230V AC/DC	002464024			
RD 40-04-24V AC/DC	002464025			

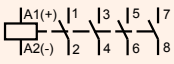
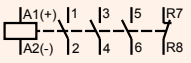
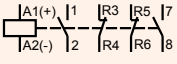
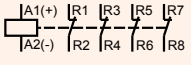
Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

4 pole, 3 modules (52,5mm), 63 A(AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RD 63-40-230V AC/DC	002464026		420	5
RD 63-40-24V AC/DC	002464027			
RD 63-31-230V AC/DC	002464028			
RD 63-31-24V AC/DC	002464029			
RD 63-22-230V AC/DC	002464030			
RD 63-22-24V AC/DC	002464031			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

1-pole, ON - OFF - AUTO, 1 module (17,5 mm), 20 A (AC1, 230V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 20-10-R-230V AC	002464032		130	10
R 20-10-R-24V AC	002464033			
RD 20-10-R-230V AC/DC	002464034			
RD 20-10-R-24V AC/DC	002464035			
R 20-01-R-230V AC	002464036			
R 20-01-R-24V AC	002464037			
RD 20-01-R-230V AC/DC	002464038			
RD 20-01-R-24V AC/DC	002464039			
2-pole, ON - OFF - AUTO, 1 module (17,5 mm), 20 A (AC1, 230V)				
R 20-20-R-230V AC	002464040		130	10
R 20-20-R-24V AC	002464041			
RD 20-20-R-230V AC/DC	002464042			
RD 20-20-R-24V AC/DC	002464043			
R 20-11-R-230V AC	002464044			
R 20-11-R-24V AC	002464045			
RD 20-11-R-230V AC/DC	002464046			
RD 20-11-R-24V AC/DC	002464047			
R 20-02-R-230V AC	002464048			
R 20-02-R-24V AC	002464049			
RD 20-02-R-230V AC/DC	002464050			
RD 20-02-R-24V AC/DC	002464051			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

4-pole, ON - OFF - AUTO, 2 modules (35 mm), 25 A (AC1, 400 V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
R 25-40-R-230V AC	002464052		240	5
R 25-40-R-24V AC	002464053			
RD 25-40-R-230V AC/DC	002464054			
RD 25-40-R-24V AC/DC	002464055			
R 25-31-R-230V AC	002464056			
R 25-31-R-24V AC	002464057			
RD 25-31-R-230V AC/DC	002464058			
RD 25-31-R-24V AC/DC	002464059			
R 25-22-R-230V AC	002464060			
R 25-22-R-24V AC	002464061			
RD 25-22-R-230V AC/DC	002464062			
RD 25-22-R-24V AC/DC	002464063			
R 25-04-R-230V AC	002464064			
R 25-04-R-24V AC	002464065			
RD 25-04-R-230V AC/DC	002464066			
RD 25-04-R-24V AC/DC	002464067			

Take care of dissipated heat by: ≤ 40 °C max. 3 modules side by side
40 - 55 °C max. 2 modules side by side.
For more contactors together, use distance piece IKV

Auxiliary contactor block for contactors RD, R...R, RD...R

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RN-20	002464068		30	1
RN-02	002464069		30	1
RN-11	002464070		30	1

* The auxiliary switch should not be applied in combination with RD20 and RD20-R.

Sealing cover

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
SC20	002464071	RD 20, R20...R	3	2
SC25	002464072	RD 25, R25...R	4	2
SC40/63	002464073	RD 40, RD 60	5	2

Distance piece

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
IKV	002464074	RD, R...R	6	1

Technical data on page 298

Bistable switches RBS

Bistable Switch RBS

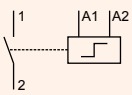
Description

REMOTE SWITCHING
AND AUTOMATIC CONTROL:
- Lightning
- Electric heating
- Electric motors
- Electric equipment

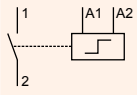
ADVANCED OPERATION:
- Impulse control
- Manual control

OTHER BENEFITS:
- Small switch on coil consumption
- No hold coil consumtion
- Wide application
- Mounting on 35 mm rail
- Sealing terminal covers

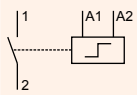
1-pole, 1 module (17,5 mm), 20A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS220-10-230V AC	002464100		130	8
RBS220-10-24V AC	002464112		130	8

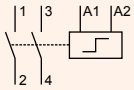
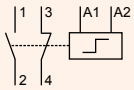
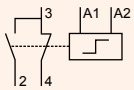
1-pole, 1 module (17,5 mm), 25A (AC1, 440V)

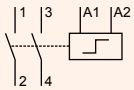
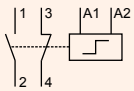
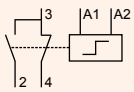
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS225-10-230V AC	002464101		130	8
RBS225-10-24V AC	002464113		130	8

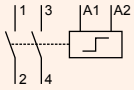
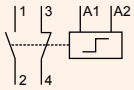
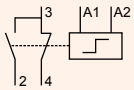
1-pole, 1 module (17,5 mm), 32A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS232-10-230V AC	002464102		130	8
RBS232-10-24V AC	002464114		130	8

Technical data on page 306

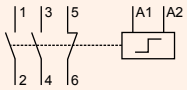
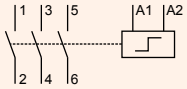
2-pole, 1 module (17,5 mm), 20A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS220-20-230V AC	002464103		130	8
RBS220-20-24V AC	002464115		130	8
RBS220-11-230V AC	002464106		130	8
RBS220-11-24V AC	002464118		130	8
RBS220-1C-230V AC	002464109		130	8
RBS220-1C-24V AC	002464121		130	8

2-pole, 1 module (17,5 mm), 25A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS225-20-230V AC	002464104		130	8
RBS225-20-24V AC	002464116		130	8
RBS225-11-230V AC	002464107		130	8
RBS225-11-24V AC	002464119		130	8
RBS225-1C-230V AC	002464110		130	8
RBS225-1C-24V AC	002464122		130	8

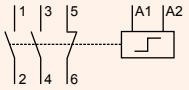
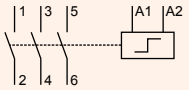
2-pole, 1 module (17,5 mm), 32A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS232-20-230V AC	002464105		130	8
RBS232-20-24V AC	002464117		130	8
RBS232-11-230V AC	002464108		130	8
RBS232-11-24V AC	002464120		130	8
RBS232-1C-230V AC	002464111		130	8
RBS232-1C-24V AC	002464123		130	8

Technical data on page 306

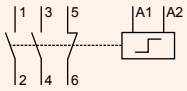
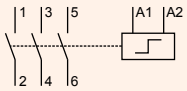
3-pole, 2 modules (35 mm), 20A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS420-21-230V AC	002464127		200	4
RBS420-21-24V AC	002464145		200	4
RBS420-30-230V AC	002464130		200	4
RBS420-30-24V AC	002464148		200	4

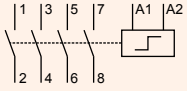
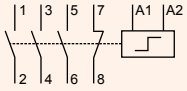
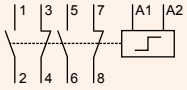
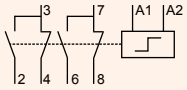
3-pole, 2 modules (35 mm), 25A (AC1, 440V)

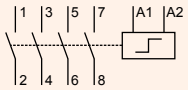
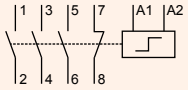
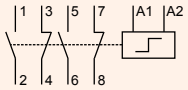
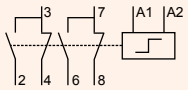
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS425-21-230V AC	002464128		200	4
RBS425-21-24V AC	002464146		200	4
RBS425-30-230V AC	002464131		200	4
RBS425-30-24V AC	002464149		200	4

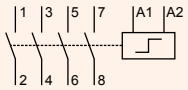
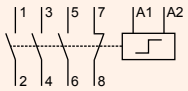
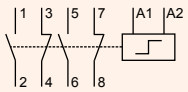
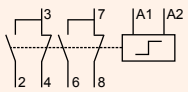
3-pole, 2 modules (35 mm), 32A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS432-21-230V AC	002464129		200	4
RBS432-21-24V AC	002464147		200	4
RBS432-30-230V AC	002464132		200	4
RBS432-30-24V AC	002464150		200	4

4-pole, 2 modules (35 mm), 20A (AC1, 440V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS420-40-230V AC	002464124		200	4
RBS420-40-24V AC	002464142		200	4
RBS420-31-230V AC	002464133		200	4
RBS420-31-24V AC	002464151		200	4
RBS420-22-230V AC	002464136		200	4
RBS420-22-24V AC	002464154		200	4
RBS420-2C-230V AC	002464139		200	4
RBS420-2C-24V AC	002464157		200	4

4-pole, 2 modules (35 mm), 25A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS425-40-230V AC	002464125		200	4
RBS425-40-24V AC	002464143		200	4
RBS425-31-230V AC	002464134		200	4
RBS425-31-24V AC	002464152		200	4
RBS425-22-230V AC	002464137		200	4
RBS425-22-24V AC	002464155		200	4
RBS425-2C-230V AC	002464140		200	4
RBS425-2C-24V AC	002464158		200	4

4-pole, 2 modules (35 mm), 32A (AC1, 440V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
RBS432-40-230V AC	002464126		200	4
RBS432-40-24V AC	002464144		200	4
RBS432-31-230V AC	002464135		200	4
RBS432-31-24V AC	002464153		200	4
RBS432-22-230V AC	002464138		200	4
RBS432-22-24V AC	002464156		200	4
RBS432-2C-230V AC	002464141		200	4
RBS432-2C-24V AC	002464159		200	4

Sealing cover			
Type	Code No.	Weight [g]	Packaging [pcs]
SC	002464160	3	2

*Size of one module - for covering 2-module sized RBS two pcs are needed, one for each side

Miniature and motor contactors, auxiliary contactors and overload relays

Advantages

→ Contactors CEI series (kit) with mechanical interlock - solution for Reversing the motor or implementation of schemes star delta

→ Miniature contactors CEC have possibility to be mounted on printed circuit board with special connection module.

→ Special socket for RC noise filters (surge supressors)

→ Additional time delay relays mounted on side of contactor

→ Mechanical interlock assures also mounting of auxiliary contacts

→ Overload protection relays (bimetal)

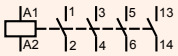
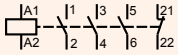
→ Front mounted auxiliary contact block

Miniature and auxiliary contactor CE, CAE, CEI7

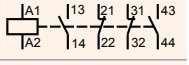
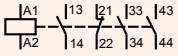
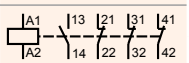
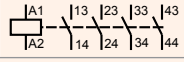
Application:
Miniature contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 7,5kW (at 400V AC3 duty), and auxiliary contactors are used for realizing a wide range of control circuits.
Advantages:

- Mounting on DIN rail and mounting plates
- Small size and high technical performance
- Low power loss (current heat loss)
- Protection against direct contact from front (IEC 536) IP20
- Wide range of accessories
- Surge suppressor (as option)
- Reversing starter with mechanical interlock
- Control voltage 24VAC, 48VAC, 110VAC, 230VAC, 400VAC

Miniature contactor CE07, 16 A (AC1), 7A, 3 kW (AC3)

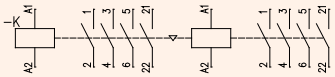
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CE07.10-24V-50/60Hz	004641020		130	1
CE07.10-48V-50/60Hz	004641021			
CE07.10-110V-50/60Hz	004641022			
CE07.10-230V-50/60Hz	004641023			
CE07.10-400V-50/60Hz	004641024			
CE07.01-24V-50/60Hz	004641010		130	1
CE07.01-48V-50/60Hz	004641011			
CE07.01-110V-50/60Hz	004641012			
CE07.01-230V-50/60Hz	004641013			
CE07.01-400V-50/60Hz	004641014			

Miniature contactor relay CAE0; 6A (AC15, 230V)

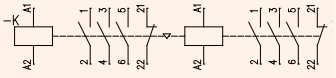
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CAE04.22-230V-50/60Hz	004641343		180	1
CAE04.22-24V-50/60Hz	004641340			
CAE04.31-230V-50/60Hz	004641363			
CAE04.31-24V-50/60Hz	004641360			
CAE04.13-230V-50/60Hz	004641353			
CAE04.13-24V-50/60Hz	004641350			
CAE04.40-230V-50/60Hz	004641383			
CAE04.40-24V-50/60Hz	004641380			

Technical data on page 319

Miniature contactor-reversing starter with mechanical interlock CEI07.10, 16A (AC1), 3,5A, 1,5 kW (AC3)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEI7.10-24V-50/60Hz	004641620		250	1
CEI7.10-48V-50/60Hz	004641621			
CEI7.10-110V-50/60Hz	004641622			
CEI7.10-230V-50/60Hz	004641623			
CEI7.10-400V-50/60Hz	004641624			

Miniature contactor-reversing starter with mechanical interlock CEI07.01, 16A (AC1), 3,5A, 1,5 kW (AC3)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEI7.01-24V-50/60Hz	004641610		250	1
CEI7.01-48V-50/60Hz	004641611			
CEI7.01-110V-50/60Hz	004641612			
CEI7.01-230V-50/60Hz	004641613			
CEI7.01-400V-50/60Hz	004641614			

Surge suppressor

Type	Code No.	Coil voltage	For use with	Weight [g]	Packaging [pcs]
RCE01	004641701	24-48 VAC	CE07, CEI07	14	1
RCE06	004641702	110-220 VAC	CE07, CEI07	14	1
RCE10	004641703	380-400 VAC	CE07, CEI07	14	1

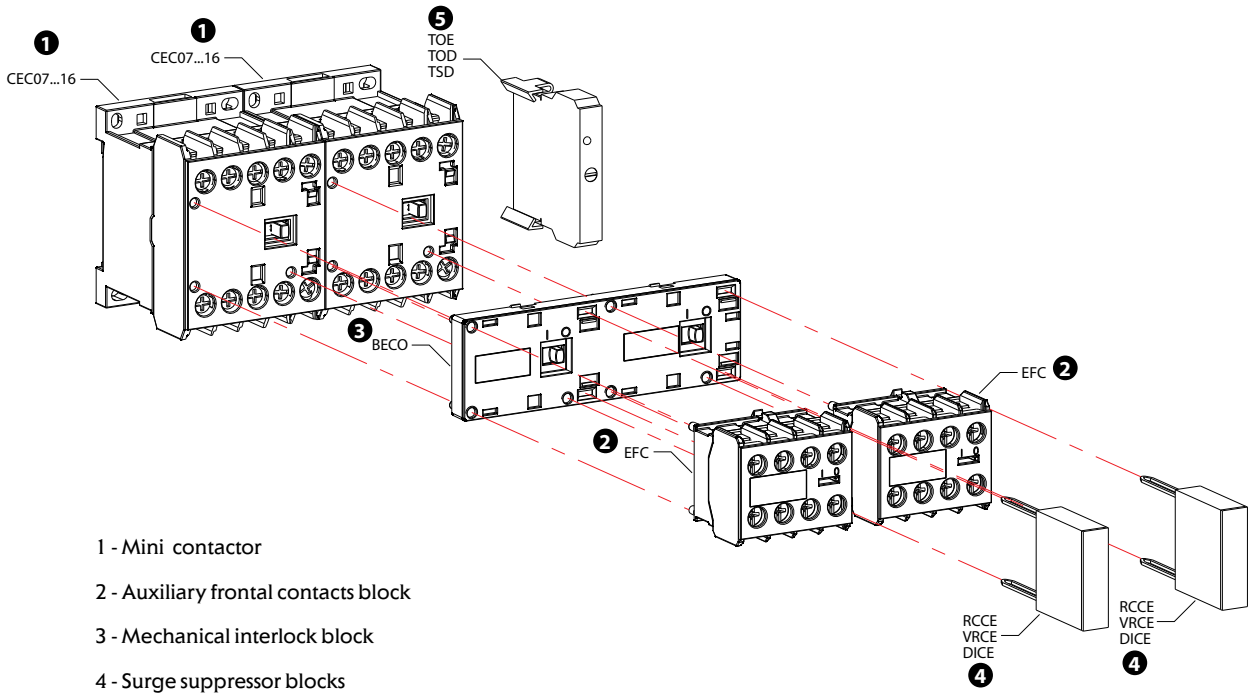
Technical data on page 319

Miniature and auxiliary contactor CEC

Application:
Miniature contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 7,5kW (at 400V AC3 duty), and auxiliary contactors are used for realizing a wide range of control circuits.
Advantages:

- Mounting on DIN rail and mounting plates
- Small size and high technical performance
- Low power loss (current heat loss)
- Protection against direct contact from front (IEC 536) IP20
- Wide range of accessories
- Surge suppressor (as option)
- Reversing starter with mechanical interlock
- Control voltage 24VAC, 48VAC, 110VAC, 230VAC, 400VAC, 24 VDC, 48 VDC, 110 VDC, 220 VDC

Example of CEC configuration:



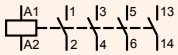
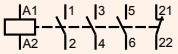
1 - Mini contactor

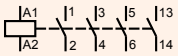
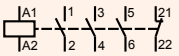
2 - Auxiliary frontal contacts block

3 - Mechanical interlock block

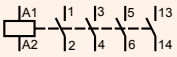
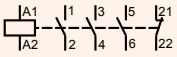
4 - Surge suppressor blocks

5 -Timer

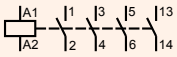
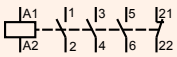
Miniature contactors CEC07; 18A(AC1); 7A,3kW(AC3 400V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC07.10-24V-50/60Hz	004641050		180	1
CEC07.10-42V-50/60Hz	004641051			
CEC07.10-48V-50/60Hz	004641052			
CEC07.10-110V-50/60Hz	004641053			
CEC07.10-230V-50/60Hz	004641054			
CEC07.10-400V-50/60Hz	004641055			
CEC07.10-24VDC	004641100			
CEC07.10-48VDC	004641130			
CEC07.10-110VDC	004641131			
CEC07.10-220VDC	004641132			
CEC07.01-24V-50/60Hz	004641056		180	1
CEC07.01-42V-50/60Hz	004641057			
CEC07.01-48V-50/60Hz	004641058			
CEC07.01-110V-50/60Hz	004641059			
CEC07.01-230V-50/60Hz	004641060			
CEC07.01-400V-50/60Hz	004641061			
CEC07.01-24VDC	004641101			
CEC07.01-48VDC	004641133			
CEC07.01-110VDC	004641134			
CEC07.01-220VDC	004641135			

Miniature contactors CEC09; 20A(AC1); 9A,4kW(AC3, 400V)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC09.10-24V-50/60Hz	004641062		180	1
CEC09.10-42V-50/60Hz	004641063			
CEC09.10-48V-50/60Hz	004641064			
CEC09.10-110V-50/60Hz	004641065			
CEC09.10-230V-50/60Hz	004641066			
CEC09.10-400V-50/60Hz	004641067			
CEC09.10-24VDC	004641102		218	1
CEC09.10-48VDC	004641136			
CEC09.10-110VDC	004641137			
CEC09.10-220VDC	004641138			
CEC09.01-24V-50/60Hz	004641068		180	1
CEC09.01-42V-50/60Hz	004641069			
CEC09.01-48V-50/60Hz	004641070			
CEC09.01-110V-50/60Hz	004641071			
CEC09.01-230V-50/60Hz	004641072			
CEC09.01-400V-50/60Hz	004641073			
CEC09.01-24VDC	004641103		218	1
CEC09.01-48VDC	004641139			
CEC09.01-110VDC	004641140			
CEC09.01-220VDC	004641141			

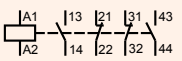
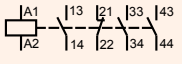
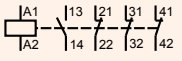
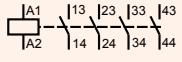
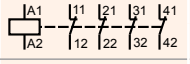
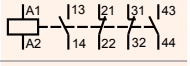
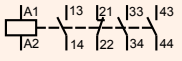
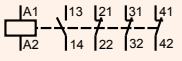
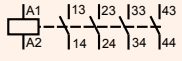
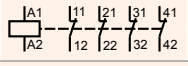
Miniature contactors CEC012; 22A(AC1); 12A,5,5kW(AC3 400V)

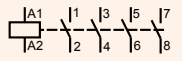
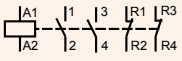
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC012.10-24V-50/60Hz	004641074		180	1
CEC012.10-42V-50/60Hz	004641075			
CEC012.10-48V-50/60Hz	004641076			
CEC012.10-110V-50/60Hz	004641077			
CEC012.10-230V-50/60Hz	004641078			
CEC012.10-400V-50/60Hz	004641079			
CEC012.10-24VDC	004641104		218	1
CEC012.10-48VDC	004641142			
CEC012.10-110VDC	004641143			
CEC012.10-220VDC	004641144			
CEC012.01-24V-50/60Hz	004641080		180	1
CEC012.01-42V-50/60Hz	004641081			
CEC012.01-48V-50/60Hz	004641082			
CEC012.01-110V-50/60Hz	004641083			
CEC012.01-230V-50/60Hz	004641084			
CEC012.01-400V-50/60Hz	004641085			
CEC012.01-24VDC	004641105		218	1
CEC012.01-48VDC	004641145			
CEC012.01-110VDC	004641146			
CEC012.01-220VDC	004641147			

Miniature contactors CEC016; 22A(AC1); 16A,7,5kW(AC3 400V)

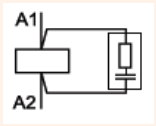
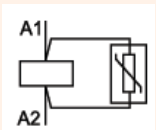
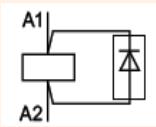
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEC016.10-24V-50/60Hz	004641086		180	1
CEC016.10-42V-50/60Hz	004641087			
CEC016.10-48V-50/60Hz	004641088			
CEC016.10-110V-50/60Hz	004641089			
CEC016.10-230V-50/60Hz	004641090			
CEC016.10-400V-50/60Hz	004641091			
CEC016.10-24VDC	004641106		218	1
CEC016.10-48VDC	004641148			
CEC016.10-110VDC	004641149			
CEC016.10-220VDC	004641150			
CEC016.01-24V-50/60Hz	004641092		180	1
CEC016.01-42V-50/60Hz	004641093			
CEC016.01-48V-50/60Hz	004641094			
CEC016.01-110V-50/60Hz	004641095			
CEC016.01-230V-50/60Hz	004641096			
CEC016.01-400V-50/60Hz	004641097			
CEC016.01-24VDC	004641107		218	1
CEC016.01-48VDC	004641151			
CEC016.01-110VDC	004641152			
CEC016.01-220VDC	004641153			

Technical data on page 319

Miniature contactor relay CECA0; 10A (AC15, 230V)				
Type	**Code No.**	**Wiring diagram**	**Weight [g]**	**Packaging [pcs]**
CECA0.22-24V-50/60Hz	004641160		180	1
CECA0.22-230V-50/60Hz	004642390			
CECA0.31-24V-50/60Hz	004641161			
CECA0.31-230V-50/60Hz	004642391			
CECA0.13-24V-50/60Hz	004641162			
CECA0.13-230V-50/60Hz	004642392			
CECA0.40-24V-50/60Hz	004641163			
CECA0.40-230V-50/60Hz	004642393			
CECA0.04-24V-50/60Hz	004641164			
CECA0.04-230V-50/60Hz	004642394			
CECA0.22-24VDC	004646010		218	1
CECA0.22-220VDC	004641170			
CECA0.31-24VDC	004646011			
CECA0.31-220VDC	004641171			
CECA0.13-24VDC	004646012			
CECA0.13-220VDC	004641172			
CECA0.40-24VDC	004646013			
CECA0.40-220VDC	004641173			
CECA0.04-24VDC	004646014			
CECA0.04-220VDC	004641174			

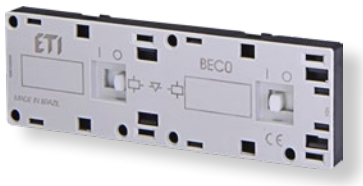
4-pole miniature contactors				
Type	**Code No.**	**Wiring diagram**	**Weight [g]**	**Packaging [pcs]**
CEC07.4P-230V-50/60Hz	004641200		180	1
CEC09.4P-230V-50/60Hz	004641201			
CEC012.4P-230V-50/60Hz	004641202			
CEC016.4P-230V-50/60Hz	004641203			
CEC07.4P-24VDC	004641210			
CEC09.4P-24VDC	004641211			
CEC012.4P-24VDC	004641212			
CEC016.4P-24VDC	004641213			
CEC07.PR-230V-50/60HZ	004641204		180	1
CEC09.PR-230V-50/60HZ	004641205			
CEC012.PR-230V-50/60HZ	004641206			
CEC016.PR-230V-50/60HZ	004641207			
CEC07.PR-24V-DC	004641214			
CEC09.PR-24V-DC	004641215			
CEC012.PR-24V-DC	004641216			
CEC016.PR-24V-DC	004641217			

Technical data on page 319

Surge suppressor					
Type	Code No.	voltage	Wiring diagram	Weight [g]	Packaging [pcs]
RCCE-1	004641720	12-24V 50/60Hz		6	1
RCCE-2	004641721	24-48V 50/60Hz			
RCCE-3	004641722	48-127V 50/60Hz			
RCCE-4	004641723	127-250V 50/60Hz			
RCCE-5	004641724	250-380V 50/60Hz			
RCCE-6	004641725	380-510V 50/60Hz			
VRCE-1	004641726	12-48V AC/12-60V DC		6	1
VRCE-2	004641727	50-127V AC/60-180V DC			
VRCE-3	004641728	130-275V AC/180-300V DC			
VRCE-4	004641729	277-380V AC/300-510V DC			
VRCE-5	004641730	400-510V AC			
DICE-1	004641731	12-600V DC		6	1

Mechanical interlock			
Type	Code No.	Weight [g]	Packaging [pcs]
BEC0	004643603	15	1

For use with CEC



Printed circuit board adapter			
Type	Code No.	Weight [g]	Packaging [pcs]
CEC0	004642720	126	1

For use with CEC

Overload relay RE17D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE17D-0,4	004641400	0,28-0,4	CEC07 – CEC016	150	1
RE17D-0,63	004641401	0,4-0,63			
RE17D-0,8	004641402	0,56-0,8			
RE17D-1,2	004641403	0,8-1,2			
RE17D-1,8	004641404	1,2-1,8			
RE17D-2,8	004641405	1,8-2,8			
RE17D-4,0	004641406	2,8-4,0			
RE17D-6,3	004641407	4-6,3			
RE17D-8,0	004641408	5,6-8			
RE17D-10	004641409	7-10			
RE17D-12,5	004641410	8-12,5			
RE17D-15	004641411	10-15			
RE17D-17	004641412	15-17			

Technical data on page 320, 346

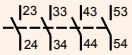
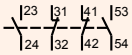
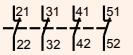
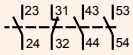
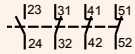
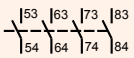
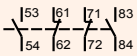
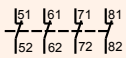
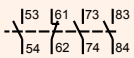
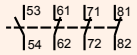
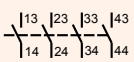
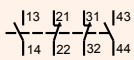
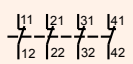
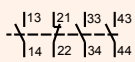
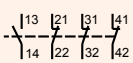
EFC0

EFCA

EFC4

Example of using EFC0 and RCCE

Auxiliary contact blocks

Type	Code No.	Wiring diagram	For use with	Weight [g]	Packaging [pcs]
EFC0-20	004641520		CEC0 3 pole	28	1
EFC0-11	004641521				
EFC0-02	004641522				
EFC0-40	004641523				
EFC0-22	004641524				
EFC0-04	004641525				
EFC0-31	004641526				
EFC0-13	004641527				
EFCA-20	004641530		CECA0	28	1
EFCA-11	004641531				
EFCA-02	004641532				
EFCA-40	004641533				
EFCA-22	004641534				
EFCA-04	004641535				
EFCA-31	004641536				
EFCA-13	004641537				
EFC4-20	004641540		CEC0 4 pole	28	1
EFC4-11	004641541				
EFC4-02	004641542				
EFC4-40	004641543				
EFC4-22	004641544				
EFC4-04	004641545				
EFC4-31	004641546				
EFC4-13	004641547				

Technical data on page 321

Electronic timing relays					
Type	Code No.	Time	Supply Voltage	Weight [g]	Packaging [pcs]
ON delay					
TOE-3-24-240	004642730	0,3-3 sec	24-240V AC/DC	126	1
TOE-10-24-240	004642731	1-10 sec			
TOE-30-24-240	004642732	3-30 sec			
TOE-60-24-240	004642733	6-60 sec			
TOE-100-24-240	004642734	10-100 sec			
TOE-300-24-240	004642735	30-300 sec			
TOE-1800-24-240	004642736	180-1800 sec			
OFF delay					
TOD-3-24-60	004642740	0,3-3 sec	24-60V AC/DC	126	1
TOD-10-24-60	004642741	1-10 sec			
TOD-30-24-60	004642742	3-30 sec			
TOD-60-24-60	004642743	6-60 sec			
TOD-100-24-60	004642744	10-100 sec			
TOD-300-24-60	004642745	30-300 sec			
TOD-1800-24-60	004642746	180-1800 sec			
TOD-3-100-240	004642747	0,3-3 sec	110-240V AC/DC	126	1
TOD-10-100-240	004642748	1-10 sec			
TOD-30-100-240	004642749	3-30 sec			
TOD-60-100-240	004642750	6-60 sec			
TOD-100-100-240	004642751	10-100 sec			
TOD-300-100-240	004642752	30-300 sec			
TOD-1800-100-240	004642753	180-1800 sec			
Star-delta					
TSD-30-24-28	004642760	3-30 sec	24-48V AC	126	1
TSD-30-110-130	004642761		110-130V AC		
TSD-30-220-240	004642762		220 - 240V AC		

Technical data on page 321

Motor contactor CES

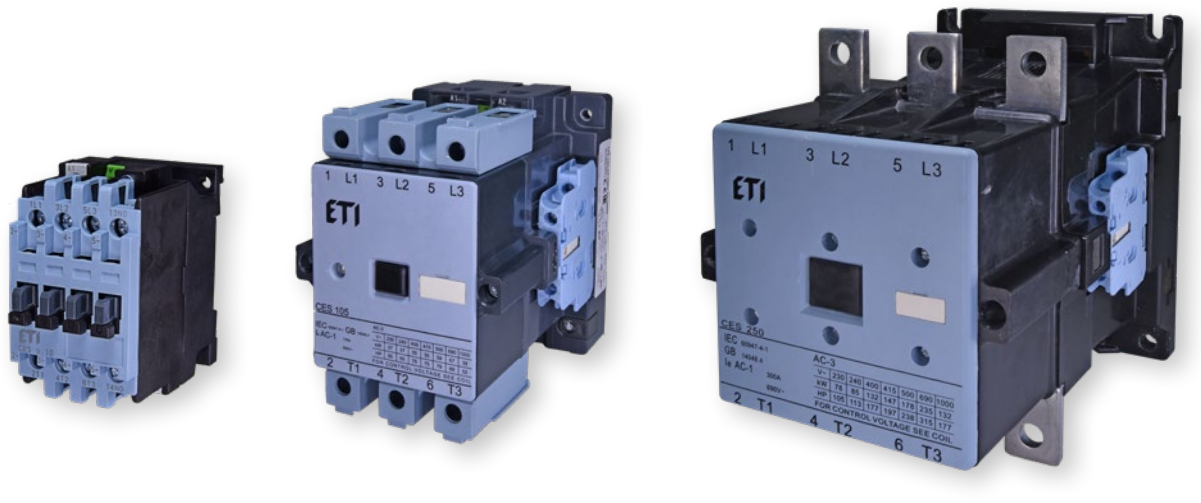
ETICON CES SERIES

IEC 60947-4-1
Contact reliability
Contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 200kW (at 400V AC3 duty)

Auxiliary contacts
CES 6 to CES 45:
Up to 4 auxiliary contact blocks with 1 NO or 1 NC contact can be snapped onto the basic units (front).
CES 65 to CES 105:
Maximum 4 auxiliary contact blocks with 1 NO + 1 NC contacts (lateral) assembled.

When the contactors are energized, the NC contacts open before the NO contacts close.

CES 65..400 NOT POSSIBLE TO MOUNT ON DIN RAIL

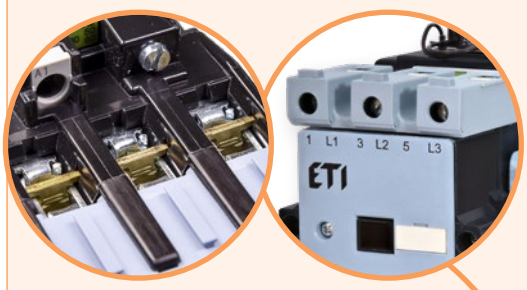


Ordering:

CES	9	.	0	1	-	230V	-	50/60Hz
1	2		3	4		5		6

1 - Contactor type
2 - Rated operational current I_e (AC3)
3 - Number and type NO auxiliary contacts
4 - Number and type NC auxiliary contacts
5 - Coil voltage
6 - Frequency

Advantages

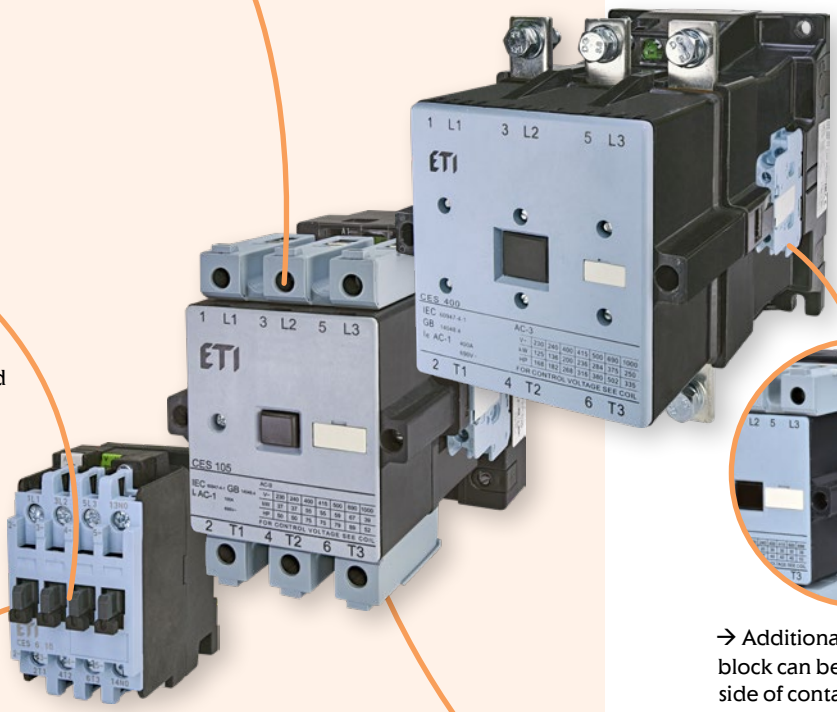


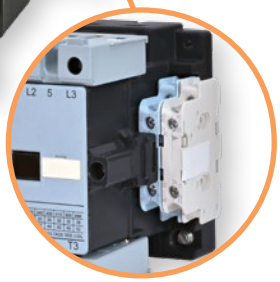
→ CES 40...105 contactor terminals allow simultaneous connection not only single-stranded and stranded conductors, but also conductors of different sections.

→ Additional EMC filters can be installed (CES 140...400 have already integrated).

→ Voltage range control at 230 V AC: from 0.85 up to 1.15 x Us in accordance with IEC 60947.

→ CES 6...45 additional aux. contact blocks can be installed on front of device.





→ Additional 2nd aux. contact block can be installed on each side of contactor CES65...300.

→ Design allows to mount contactor on DIN rail TH 35 or directly on panel

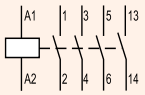
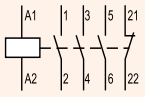
→ Mechanical interlock can be installed between 2 contactors.

→ Possible to mount overload relay directly on contactor or DIN rail TH 35 with mounting adapter CES-AD-RT

→ Overload relays (bimetal) tripping class 10

CES 6

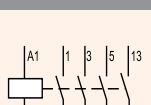
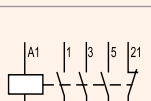
Motor contactor CES 6; 25A(AC1); 6A/2,2kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 6.10-24V-50/60Hz	004646500		370	1
CES 6.10-110V-50/60Hz	004646503		370	1
CES 6.10-230V-50/60Hz	004646501		370	1
CES 6.10-400V-50Hz	004646502		370	1
CES 6.10-24V DC	004646504		0,58	1
CES 6.01-24V-50/60Hz	004646505		370	1
CES 6.01-110V-50/60Hz	004646508		370	1
CES 6.01-230V-50/60Hz	004646506		370	1
CES 6.01-400V-50Hz	004646507		370	1
CES 6.01-24V DC	004646509		580	1

CES 6.10 - Integrated auxiliary contact 1xNO; CES 6.01 - Integrated auxiliary contact 1xNC

CES 9

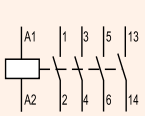
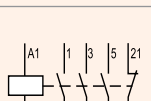
Motor contactor CES 9; 25A(AC1); 9A/4kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 9.10-24V-50/60Hz	004646510		370	1
CES 9.10-110V-50/60Hz	004646511		370	1
CES 9.10-230V-50/60Hz	004646512		370	1
CES 9.10-400V-50Hz	004646513		370	1
CES 9.10-24V DC	004646514		580	1
CES 9.01-24V-50/60Hz	004646515		370	1
CES 9.01-110V-50/60Hz	004646516		370	1
CES 9.01-230V-50/60Hz	004646517		370	1
CES 9.01-400V-50Hz	004646518		370	1
CES 9.01-24V DC	004646519		580	1

CES 9.10 - Integrated auxiliary contact 1xNO; CES 9.01 - Integrated auxiliary contact 1xNC

CES 12

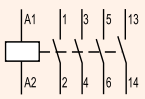
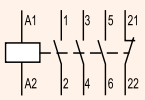
Motor contactor CES 12; 25A(AC1); 12A/5,5kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 12.10-24V-50/60Hz	004646520		370	1
CES 12.10-110V-50/60Hz	004646521		370	1
CES 12.10-230V-50/60Hz	004646522		370	1
CES 12.10-400V-50Hz	004646523		370	1
CES 12.10-24V DC	004646524		580	1
CES 12.10-42V-50/60Hz	004646525		370	1
CES 12.01-24V-50/60Hz	004646526		370	1
CES 12.01-110V-50/60Hz	004646527		370	1
CES 12.01-230V-50/60Hz	004646528		370	1
CES 12.01-400V-50Hz	004646529		370	1
CES 12.01-24V DC	004646530		580	1

CES 12.10 - Integrated auxiliary contact 1xNO; CES 12.01 - Integrated auxiliary contact 1xNC

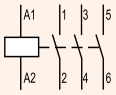
CES 18

Motor contactor CES 18; 25A(AC1); 18A/7,5kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 18.10-24V-50/60Hz	004646531		370	1
CES 18.10-110V-50/60Hz	004646532		370	1
CES 18.10-230V-50/60Hz	004646533		370	1
CES 18.10-400V-50Hz	004646534		370	1
CES 18.10-24V DC	004646535		580	1
CES 18.01-24V-50/60Hz	004646536		370	1
CES 18.01-110V-50/60Hz	004646537		370	1
CES 18.01-230V-50/60Hz	004646538		370	1
CES 18.01-400V-50Hz	004646539		370	1
CES 18.01-24V DC	004646540		580	1

CES 18.10 - Integrated auxiliary contact 1xNO; CES 18.01 - Integrated auxiliary contact 1xNC

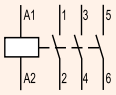
Motor contactor CES 25; 42A(AC1); 25A/11kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 25.00-24V-50/60Hz	004646541		410	1
CES 25.00-110V-50/60Hz	004646542		410	1
CES 25.00-230V-50/60Hz	004646543		410	1
CES 25.00-400V-50Hz	004646544		410	1
CES 25.00-24V DC	004646545		660	1
CES 25.00-42V-50/60Hz	004646546		410	1

Auxiliary contacts top or side mounted must be ordered separately

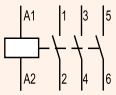
CES 25...32

Motor contactor CES 32; 42A(AC1); 32A/15kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 32.00-24V-50/60Hz	004646547		410	1
CES 32.00-110V-50/60Hz	004646548		410	1
CES 32.00-230V-50/60Hz	004646549		410	1
CES 32.00-400V-50Hz	004646550		410	1
CES 32.00-24V DC	004646551		660	1

Auxiliary contacts top or side mounted must be ordered separately

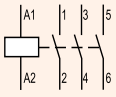
Motor contactor CES 40; 65A(AC1); 40A/18,5kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 40.00-24V-50/60Hz	004646552		670	1
CES 40.00-110V-50/60Hz	004646553		670	1
CES 40.00-230V-50/60Hz	004646554		670	1
CES 40.00-400V-50Hz	004646555		670	1

Auxiliary contacts top or side mounted must be ordered separately

CES 40...45

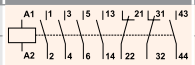
Motor contactor CES 45; 65A(AC1); 45A/22kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 45.00-24V-50/60 Hz	004646556		640	1
CES 45.00-230V-50/60 Hz	004646557		640	1
CES 45.00-400V-50Hz	004646558		640	1
CES 45.00-110V-50/60 Hz	004646559		640	1

Auxiliary contacts top or side mounted must be ordered separately

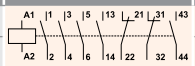
Technical data on page 330

Motor contactor CES 65; 90A(AC1); 65A/30kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 65.22-230V-50/60Hz	004646560		1.625	1
CES 65.22-24V-50/60Hz	004646561		1.625	1

Included side mounted auxiliary contacts 2xNO+2xNC

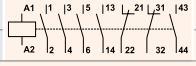
Motor contactor CES 75; 100A(AC1); 75A/37kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 75.22-24V-50/60 Hz	004646562		2.530	1
CES 75.22-230V-50/60 Hz	004646563		2.530	1

Included side mounted auxiliary contacts 2xNO+2xNC

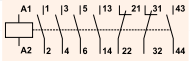
CES 65...105

Motor contactor CES 85; 120A(AC1); 85A/45kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 85.22-24V-50/60 Hz	004646564		2.530	1
CES 85.22-230V-50/60 Hz	004646565		2.530	1

Included side mounted auxiliary contacts 2xNO+2xNC

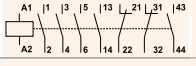
Motor contactor CES 105; 120A(AC1); 105A/55kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 105.22-230V-50/60Hz	004646566		3.758	1
CES 105.22-24V-50/60Hz	004646567		3.758	1

Included side mounted auxiliary contacts 2xNO+2xNC

CES 140

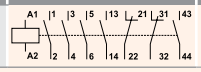
Motor contactor CES 140; 160A(AC1); 140A/75kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 140.22-230V-50/60Hz	004646568		3.300	1

Included side mounted auxiliary contacts 2xNO+2xNC

Technical data on page 330

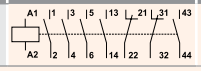
Motor contactor CES 170; 210A(AC1); 170A/90kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 170.22-230V-50/60Hz	004646569		4.800	1

Included side mounted auxiliary contacts 2xNO+2xNC

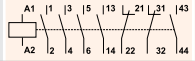
CES 170...205

Motor contactor CES 205; 220A(AC1); 205A/110kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 205.22-230V-50/60Hz	004646570		4.800	1

Included side mounted auxiliary contacts 2xNO+2xNC

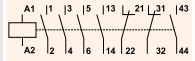
Motor contactor CES 250; 300A(AC1); 250A/132kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 250.22-230V-50/60Hz	004646571		6.200	1

Included side mounted auxiliary contacts 2xNO+2xNC

CES 250...300

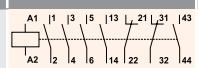
Motor contactor CES 300; 320A(AC1); 300A/160kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 300.22-230V-50/60Hz	004646572		6.200	1

Included side mounted auxiliary contacts 2xNO+2xNC

CES 400

Motor contactor CES 400; 500A(AC1); 400A/200kW(AC3, 400V)

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CES 400.22-230V-50/60Hz	004646573		6.800	1

Included side mounted auxiliary contacts 2xNO+2xNC

Technical data on page 330

Accessories

CES-BCF

Auxiliary contact block - front mounted; 5,6A(230V, AC-15/AC-14), 3,8A(400V, AC-15/AC-14)

Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
CES-BCF 10	004646574	1 NO	CES 6…CES 45		20	10
CES-BCF 01	004646575	1 NC	CES 6…CES 45		20	10

Up to max. 4 contacts

CES-BCSU 11

CES-BCSS 11

Auxiliary contact block - lateral; 5,6A(230V, AC-15/AC-14), 3,8A(400V, AC-15/AC-14)

Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
CES-BCSU 11	004646576	1 NO + 1 NC	CES65…CES 400		52	2
CES-BCSS 11	004646577	1 NO + 1 NC	CES65…CES 400		42	2

Up to max. 4 contacts, 2 per each side
BCSU - upgrade contact with screws
BCSS - spare part only, no mounting screws
Possible to order only multiples of 2pcs (2, 4, 6, 8…) due to the default packaging system

CES-MIL 6-45

CES-MIL 65-300

Mechanical interlock for mechanical locking of contactors

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
CES-MIL 6-45	004646578	CES6…CES45	20	1
CES-MIL 65-300	004646579	CES65…CES300	130	1
CES-MIL 400	004646580	CES400	130	1

CES-DIC3

Surge suppressor

Type	Code No.	Coil voltage	For use with	Weight [g]	Packaging [pcs]
CES-DIC3	004646581	24 - 250 VDC	CES6…CES32	15	1
CES-VR4	004646582	24-48 VAC	CES6…CES45	15	1
CES-VR5	004646583	127-240 VAC	CES6…CES45	15	1
CES-VR6	004646584	240-400 VAC	CES6…CES45	23	1
CES-VR7	004646585	24-48 VAC	CES65…CES400	14	1
CES-VR8	004646586	127-240 VAC	CES65…CES400	15	1

Already integrated in CES140…CES400

Technical data on page 333

Overload relay

Thermal overload relays

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
CES-RT0-0,4	004646587	0,25 - 0,4	CES6…CES18	140	1
CES-RT0-0,63	004646588	0,4 - 0,63	CES6…CES18	140	1
CES-RT0-1	004646589	0,63 - 1	CES6…CES18	140	1
CES-RT0-1,6	004646590	1 - 1,6	CES6…CES18	140	1
CES-RT0-2,5	004646591	1,6 - 2,5	CES6…CES18	140	1
CES-RT0-4.0	004646592	2,5 - 4	CES6…CES18	140	1
CES-RT0-6,3	004646593	4 - 6,3	CES6…CES18	140	1
CES-RT0-10	004646594	6,3 - 10	CES6…CES18	140	1
CES-RT0-12,5	004646595	8 - 12,5	CES6…CES18	140	1
CES-RT0-18	004646596	12,5 - 18	CES6…CES18	140	1
CES-RT1-16	004646597	10 - 16	CES25…CES32	200	1
CES-RT1-25	004646598	16 - 25	CES25…CES32	200	1
CES-RT1-32	004646599	25 - 32	CES25…CES32	200	1
CES-RT2-36	004646600	25 - 36	CES40…CES45	200	1
CES-RT2-45	004646601	36 - 45	CES40…CES45	200	1
CES-RT3-57	004646602	40 - 57	CES65…CES105	400	1
CES-RT3-70	004646603	57 - 70	CES65…CES105	400	1
CES-RT3-88	004646604	70 - 88	CES65…CES105	400	1
CES-RT3-105	004646605	88 - 105	CES65…CES105	400	1
CES-RT4-120	004646606	90 - 120	CES140…CES400	700	1
CES-RT4-135	004646607	110 - 135	CES140…CES400	700	1
CES-RT4-150	004646608	120 - 150	CES140…CES400	700	1
CES-RT4-160	004646609	135 - 160	CES140…CES400	700	1
CES-RT4-180	004646610	150 - 180	CES140…CES400	2.500	1
CES-RT4-250	004646611	160 - 250	CES140…CES400	2.500	1
CES-RT4-400	004646612	250 - 400	CES140…CES400	2.500	1

Overload relay mounting kits for rails TH35

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
CES-AD-RT0	004646613	CES-RT0	50	1
CES-AD-RT1	004646614	CES-RT1	50	1
CES-AD-RT2	004646615	CES-RT2	132	1
CES-AD-RT3	004646616	CES-RT3	164	1

CES-AD-RT

CES-RT0 CES-RT1

CES-RT2

CES-RT3

CES-RT4 120, 135, 150

CES-RT4 160, 180

CES-RT4 250, 400

Technical data on page 335

Motor contactor CEM

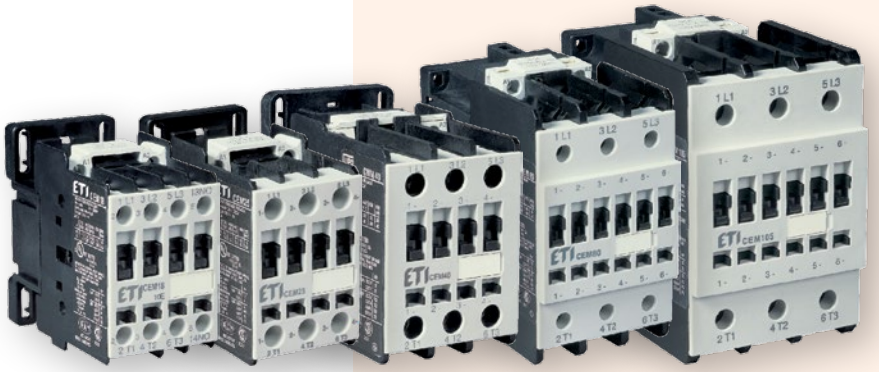
Application

Contactors are used to remotely control and protect (in combination with overload relays) electric motors and other electric loads with nominal power up to 300kW (at 400V AC3 duty).

Advantages

- Mounting on DIN rail and mounting plates
- High technical performance
- Low power loss (current heat loss)
- Protection against direct contact from front (IEC 536) IP20
- Wide range of accessories
- Surge suppressor (as option)
- Control voltage 24VAC, 48VAC, 110VAC, 230VAC, 400VAC

IE3 CONFORM



Ordering:

CEM9.01-230V-50/60Hz

I(AC3)[A] — Coil voltage

Nr. of NO — Nr. of NC - Number and type of auxiliary contacts

Advantages

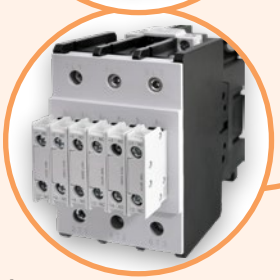
AC

DC

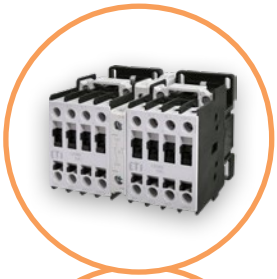
→ Possible to exchange coils with different coil voltages.

→ Additionaly EMC filter can be connected close to coil to supress RF signals and surges.

→ Lateral (side mounting) of auxiliary contacts.

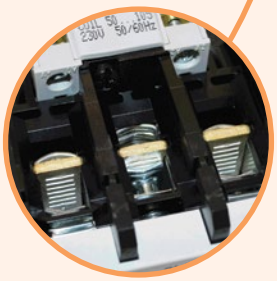


→ Front mounted auxiliary contacts



→ Mechanical interlock can lock two different size contactors
New: mechanical interlock with integrated aux. contacts BLIME 9-105 02.

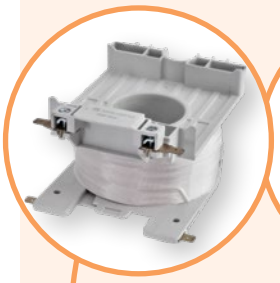
→ Wide range of bimetal relays for overload protection. Possible to install directly on contactor or on DIN rail by using additional adapter BF.



→ CEM 32 ... CEM105 Contactor terminals allow simultaneous connection not only single-stranded and stranded conductors, but also conductors of different sections.

→ Mounting on DIN rail or directly on panel.

→ Built in Varistor (EMC filter).



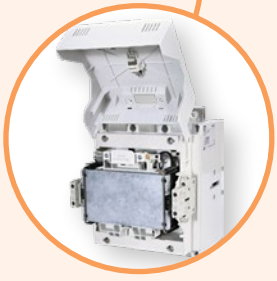
→ Replacement control coils and electronics available.

→ Additional protection covers against touch.

→ Possibility to install additional 2nd aux. contact block on each side of contactor.

→ Additional TBE terminals allow simultaneous connection not only single-stranded and stranded conductors, but also conductors of different sections.

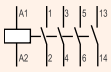
→ Possible to install mechanical interlock between 2 contactors.



→ Easy access for maintenance and visual control of damages.

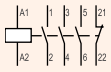
→ Overload bimetal relays for overload protection are available.

Motor contactor CEM9.10; 25A(AC1); 9A; 4kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM9.10-24V-50/60Hz	004642120		295	1
CEM9.10-48V-50/60Hz	004642121		295	1
CEM9.10-110V-50/60Hz	004642122		295	1
CEM9.10-230V-50/60Hz	004642123		295	1
CEM9.10-400V-50/60Hz	004642124		295	1
CEM9.10-24V DC	004642220		510	1
CEM9.10-220V DC	004642221		510	1

* Auxiliary contact 1NO integrated

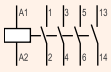
Motor contactor CEM9.01; 25A(AC1); 9A; 4kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM9.01-24V-50/60Hz	004642110		295	1
CEM9.01-48V-50/60Hz	004642111		295	1
CEM9.01-110V-50/60Hz	004642112		295	1
CEM9.01-230V-50/60Hz	004642113		295	1
CEM9.01-400V-50/60Hz	004642114		295	1
CEM9.01-24V DC	004642210		510	1
CEM9.01-220V DC	004642211		510	1

* Auxiliary contact 1NC integrated

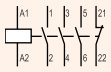
For auxiliary contact blocks, see page 274

Motor contactor CEM12.10; 25A(AC1); 12A; 5.5kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM12.10-24V-50/60Hz	004643120		295	1
CEM12.10-48V-50/60Hz	004643121		295	1
CEM12.10-110V-50/60Hz	004643122		295	1
CEM12.10-230V-50/60Hz	004643123		295	1
CEM12.10-400V-50/60Hz	004643124		295	1
CEM12.10-24V DC	004643220		510	1
CEM12.10-220V DC	004643221		510	1

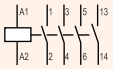
* Auxiliary contact 1NO integrated

Motor contactor CEM12.01; 25A(AC1); 12A; 5.5kW(AC3)*

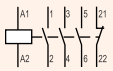
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM12.01-24V-50/60Hz	004643110		295	1
CEM12.01-48V-50/60Hz	004643111		295	1
CEM12.01-110V-50/60Hz	004643112		295	1
CEM12.01-230V-50/60Hz	004643113		295	1
CEM12.01-400V-50/60Hz	004643114		295	1
CEM12.01-24V DC	004643210		510	1
CEM12.01-220V DC	004643211		510	1

* Auxiliary contact 1NC integrated

Technical data on page 340

Motor contactor CEM18.10; 32A(AC1); 18A; 7.5kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM18.10-24V-50/60Hz	004644120		295	1
CEM18.10-48V-50/60Hz	004644121		295	1
CEM18.10-110V-50/60Hz	004644122		295	1
CEM18.10-230V-50/60Hz	004644123		295	1
CEM18.10-400V-50/60Hz	004644124		295	1
CEM18.10-24V DC	004644220		510	1
CEM18.10-220V DC	004644221		510	1

* Auxiliary contact 1NO integrated

Motor contactor CEM18.01; 32A(AC1); 18A; 7.5kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM18.01-24V-50/60Hz	004644110		295	1
CEM18.01-48V-50/60Hz	004644111		295	1
CEM18.01-110V-50/60Hz	004644112		295	1
CEM18.01-230V-50/60Hz	004644113		295	1
CEM18.01-400V-50/60Hz	004644114		295	1
CEM18.01-24V DC	004644210		510	1
CEM18.01-220V DC	004644211		510	1

* Auxiliary contact 1NC integrated

For auxiliary contact blocks, see page 274

Motor contactor CEM25.00; 45A(AC1); 25A; 11kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM25.00-24V-50/60Hz	004645100		295	1
CEM25.00-48V-50/60Hz	004645101		295	1
CEM25.00-110V-50/60Hz	004645102		295	1
CEM25.00-230V-50/60Hz	004645103		295	1
CEM25.00-400V-50/60Hz	004645104		295	1
CEM25.00-24V DC	004645200		510	1
CEM25.00-220V DC	004645201		510	1

For different configurations of auxiliary contacts up to 4 auxiliary contacts can be added to contactor and must be ordered separately.

Motor contactor CEM32.00; 60A(AC1); 32A; 15kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM32.00-24V-50/60Hz	004646100		520	1
CEM32.00-48V-50/60Hz	004646101		520	1
CEM32.00-110V-50/60Hz	004646102		520	1
CEM32.00-230V-50/60Hz	004646103		520	1
CEM32.00-400V-50/60Hz	004646104		520	1
CEM32.00-24V DC**	004646200		850	1
CEM32.00-220V DC**	004646201		850	1

For different configurations of auxiliary contacts up to 4 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)

Technical data on page 340

Motor contactor CEM40.00; 60A(AC1); 40A; 18.5kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM40.00-24V-50/60Hz	004647100		540	1
CEM40.00-48V-50/60Hz	004647101		540	1
CEM40.00-110V-50/60Hz	004647102		540	1
CEM40.00-230V-50/60Hz	004647103		540	1
CEM40.00-400V-50/60Hz	004647104		540	1
CEM40.00-24V DC**	004647200		850	1
CEM40.00-220V DC**	004647201		850	1

For different configurations of auxiliary contacts up to 4 auxiliary contacts can be added to contactor and must be ordered separately

** 24V DC (24...28 V DC), 220V DC (208...240V DC).

Motor contactor CEM50.00; 80A(AC1); 50A; 22kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM50.00-24V-50/60Hz	004648100		1105	1
CEM50.00-48V-50/60Hz	004648101		1105	1
CEM50.00-110V-50/60Hz	004648102		1105	1
CEM50.00-230V-50/60Hz	004648103		1105	1
CEM50.00-400V-50/60Hz	004648104		1105	1
CEM50.00-24V DC **	004648200		1240	1
CEM50.00-220V DC **	004648201		1240	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)

Motor contactor CEM65.00; 110A(AC1); 65A; 30kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM65.00-24V-50/60Hz	004649100		1120	1
CEM65.00-48V-50/60Hz	004649101		1120	1
CEM65.00-110V-50/60Hz	004649102		1120	1
CEM65.00-230V-50/60Hz	004649103		1120	1
CEM65.00-400V-50/60Hz	004649104		1120	1
CEM65.00-24V DC **	004649200		1240	1
CEM65.00-220V DC **	004649201		1240	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)

For auxiliary contact blocks, see page 274

Motor contactor CEM80.00; 110A(AC1); 80A; 37kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM80.00-24V-50/60Hz	004650100		1130	1
CEM80.00-48V-50/60Hz	004650101		1130	1
CEM80.00-110V-50/60Hz	004650102		1130	1
CEM80.00-230V-50/60Hz	004650103		1130	1
CEM80.00-400V-50/60Hz	004650104		1130	1
CEM80.00-24V DC **	004650200		1240	1
CEM80.00-220V DC **	004650201		1240	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.

** 24V DC (24...28 V DC), 220V DC (208...240V DC)

** Range of operating voltages is shown in technical part of catalogue

Technical data on page 340

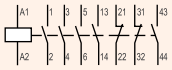
Motor contactor CEM95.00; 140A(AC1); 95A; 45kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM95.00-24V-50/60Hz	004651100		1450	1
CEM95.00-48V-50/60Hz	004651101		1450	1
CEM95.00-110V-50/60Hz	004651102		1450	1
CEM95.00-230V-50/60Hz	004651103		1450	1
CEM95.00-400V-50/60Hz	004651104		1450	1
CEM95.00-24V DC **	004651200		1500	1
CEM95.00-220V DC **	004651201		1500	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.
** 24V DC (24...28 V DC), 220V DC (208...240V DC)

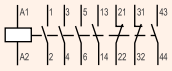
Motor contactor CEM105.00; 140A(AC1); 105A; 55kW(AC3)				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM105.00-24V-50/60Hz	004652100		1470	1
CEM105.00-48V-50/60Hz	004652101		1470	1
CEM105.00-110V-50/60Hz	004652102		1470	1
CEM105.00-230V-50/60Hz	004652103		1470	1
CEM105.00-400V-50/60Hz	004652104		1470	1
CEM105.00-24V DC **	004652200		1500	1
CEM105.00-220V DC **	004652201		1500	1

For different configurations of auxiliary contacts up to 6 auxiliary contacts can be added to contactor and must be ordered separately.
** 24V DC (24...28 V DC), 220V DC (208...240V DC)

For auxiliary contact blocks, see page 274

Motor contactor CEM112.22(E); 180A(AC1); 112A; 55kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM112.22-24V-50/60Hz	004653140		2400	1
CEM112.22--48V-50/60Hz	004653141			
CEM112.22--110V-50/60Hz	004653142			
CEM112.22--230V-50/60Hz	004653143			
CEM112.22--400V-50/60Hz	004653144			
CEM112E.22-28V AC/DC **	004646018			
CEM112E.22-130V AC/DC **	004646019			
CEM112E.22-250V AC/DC **	004646020			
CEM112E.22-415V AC/DC **	004646021			

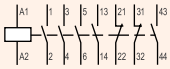
* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated

Motor contactor CEM150E.22; 225A(AC1); 150A; 75kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM150E.22-28V AC/DC **	004654240		2400	1
CEM150E.22-130V AC/DC **	004646023			
CEM150E.22-250V AC/DC **	004654241			
CEM150E.22-415V AC/DC **	004646025			

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated

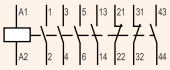
Technical data on page 340

Motor contactor CEM180.22(E); 225A(AC1); 180A; 90kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM180.22-24V-50/60Hz	004655140		3900	1
CEM180.22--48V-50/60Hz	004655141			
CEM180.22--110V-50/60Hz	004655142			
CEM180.22--230V-50/60Hz	004655143			
CEM180.22--400V-50/60Hz	004655144			
CEM180E.22-28V AC/DC **	004646029			
CEM180E.22-130V AC/DC **	004646026			
CEM180E.22-250V AC/DC **	004646027			
CEM180E.22-415V AC/DC **	004646028			

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated

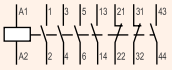
Motor contactor CEM250.22(E); 350A(AC1); 250A; 132kW(AC3)*

Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM250.22-24V-50/60Hz	004656140		6000	1
CEM250.22--48V-50/60Hz	004656141			
CEM250.22--110V-50/60Hz	004656142			
CEM250.22--230V-50/60Hz	004656143			
CEM250.22--400V-50/60Hz	004656144			
CEM250E.22-28V AC/DC **	004646030			
CEM250E.22-130V AC/DC **	004646031			
CEM250E.22-250V AC/DC **	004646032			
CEM250E.22-415V AC/DC **	004646033			

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated
** Range of operating voltages is shown in the technical part of catalogue

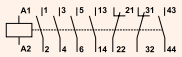
For auxiliary contact blocks, see page 274

Motor contactor CEM300.22(E), 410A(AC1), 300A, 160kW(AC3)*

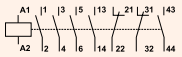
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM300E.22-28V AC/DC	004656300		6900	1
CEM300E.22-50V AC/DC	004656301			
CEM300E.22-72V AC/DC	004656302			
CEM300E.22-130V AC/DC	004656303			
CEM300E.22-250V AC/DC	004656304			
CEM300E.22-415V AC/DC	004656305			

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
**28V AC/DC (24...28V), 130V AC/DC (110...130V), 250V AC/DC (208...250V), 415V AC/DC (360...415V)
Surge suppressor is already integrated

Technical data on page 340

Motor contactor CEM450.22(E), 600A(AC1), 450A, 260kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM450E.22-255V AC/DC	004656306		12000	1

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
Surge suppressor is already integrated

Motor contactor CEM560.22(E), 700A(AC1), 560A, 300kW(AC3)*				
Type	Code No.	Wiring diagram	Weight [g]	Packaging [pcs]
CEM560E.22-255V AC/DC	004656307		12000	1

* Integrated auxiliary contacts: two side mounted auxiliary contact blocks 2 X (1NO + 1 NC)
Surge suppressor is already integrated

Accessories

Auxiliary contact block - front mounted						
Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
BCXMFE10	004641510	1 NO	CEM9-CEM105		15	1
BCXMFE01	004641501	1 NC	CEM9-CEM105		15	1
BCXMFAE10	004642510	1 NO - early-make	CEM9-CEM105		15	1
BCXMFRE01	004643510	1 NC - late-break	CEM9-CEM105		15	1
BCXMFE10S*	004646094	Special aux. Contact 1xNO	CEM9-CEM105		15	1
BCXMFE01S*	004646095	Special aux. Contact 1xNC	CEM9-CEM105		15	1

not for CEM7,5CN and CEM10CN!
available free aux. contact blocks places:
CEM 9 .... CEM 40: 4 contact blocks
CEM 50 .... CEM 105: 6 contact blocks
CEM 112 .... CEM 300: mounting not available - only lateral, see below

*Special aux. contacts (Au -gold) for low signals switching min. 1mA /17V

Technical data on page 341

Auxiliary contact block - lateral

Type	Code No.	Description	For use with	Wiring diagram	Weight [g]	Packaging [pcs]
BCXMLE11	004644511	1 NO - 1 NC (main)	CAEM4, CEM9-CEM250		15	1
BCXMLE20	004644520	2 NO (main)	CAEM4, CEM9-CEM250		15	1
BCXMRLE11	004645511	1 NO - 1 NC side mounted (upgraded)	CAEM4, CEM9-CEM250		15	1
BCXMRLE20	004645520	2 NO side mounted (upgraded)	CAEM4, CEM9-CEM250		15	1
BLRBE-11	004656308	1 NO - 1 NC side mounted (upgrade)	CEM450-CEM560		34	1
BLBE-11	004656325	1 NO - 1 NC side mounted (spare part)	CEM450-CEM560		34	1

not for CEM7,5CN and CEM10CN!
Main" lateral auxiliary contact block can be mounted on the front side of the contactor, it can be upgraded max. with one additional auxiliary contact block.

Max. number of auxiliary contacts together (top and side mounted):
max. 4: CEM9-CEM25, CAEM 4
max. 6: CEM32-CEM40
max. 8: CEM50-CEM105
max. 8: CEM112-CEM300

Mechanical interlock

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
BLIME 9-105	004643601	CEM9-CEM105	50	1
BLIME9-105 02*	004646093	CEM9-CEM105	69	1
BLIME 112-300E	004643602	CEM112(E)-CEM560(E)	150	1

*Mechanical interlock with integrated auxiliary contacts 2xNC

Technical data on page 341

Surge suppressor					
Type	Code No.	Coil voltage	For use with	Weight [g]	Packaging [pcs]
BAMRCE4	004642701	24-48 VAC	CEM9-CEM40	14	1
BAMRCE5	004642702	50-127 VAC	CEM9-CEM40	14	1
BAMRCE6	004642703	130-250 VAC	CEM9-CEM40	14	1
BAMRCE7	004642705	24-48 VAC	CEM50-CEM105	14	1
BAMRCE8	004642706	50-127 VAC	CEM50-CEM105	14	1
BAMRCE9	004642707	130-250 VAC	CEM50-CEM105	14	1
BAMDIE10	004643701	12-600 VDC	CEM9-CEM105	14	1
BAMRCE13	004642708	24-48 VAC	CEM112-CEM250	14	1
BAMRCE14	004642711	50-250 VAC	CEM112-CEM250	14	1
BAMVE5 255V/ACDC	004656320	100-255VAC	CEM450E-CEM560E	18	1

Terminal blocks				
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
TBE150	004646090	CEM112…CEM150	210	1
TBE180	004646091	CEM180	270	1
TBE300	004646092	CEM250…CEM300	575	1

Spare contacts*				
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
SCCEM450	004656323	CEM450(E)	1120	1
SCCEM560	004656324	CEM560(E)	1120	1

*1(pc) reference code includes 3 spare contacts (1 pc = 3 spare contacts -> 3 moving parts and 6 fixed parts)

Terminal cover				
Type	Code No.	For use with	Weight [g]	Packaging [pcs]
CCEM150	004646080	CEM150	231	1
CCEM180	004646081	CEM180	231	1
CCEM300	004646082	CEM300	231	1
CCEM560	004656309	CEM560	231	1

*1(pc) reference code includes 2 covers (1pc=top+bottom)

Overload relay

Overload relay RE27D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE27D-0,4	004642400	0,28-0,4	CEM09 ... CEM25	147	1
RE27D-0,63	004642401	0,4-0,63			
RE27D-0,8	004642402	0,56-0,8			
RE27D-1,2	004642403	0,8-1,2			
RE27D-1,8	004642404	1,2-1,8			
RE27D-2,8	004642405	1,8-2,8			
RE27D-4,0	004642406	2,8-4,0			
RE27D-6,3	004642407	4-6,3			
RE27D-8,0	004642408	5,6-8			
RE27D-10	004642409	7-10			
RE27D-12,5	004642410	8-12,5			
RE27D-15	004642411	10-15			
RE27D-17	004642412	11-17			
RE27D-23	004642413	15-23			
RE27D-32	004642414	22-32			

Overload relay RE67.1D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE67.1D-40	004643415	25-40	CEM32... CEM40	300	1
RE67.1D-50	004643416	32-50			

Overload relay RE67.2D					
Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE67.2D-57	004644417	40-57	CEM50 ... CEM80	310	1
RE67.2D-63	004644418	50-63			
RE67.2D-70	004644419	57-70			
RE67.2D-80	004644420	63-80			

Technical data on page 346

Overload relay RE117.1D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE117.1D-97	004645421	75-97	CEM95... CEM105	520	1
RE117.1D-112	004645422	90-112			

Overload relay RE117.2D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE117.2D-97	004646421	75-97	CEM112(E)	550	1
RE117.2D-112	004646422	90-112			

Overload relay RE317.2D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE317D-150	004647423	100-150	CEM150(E) ... CEM250(E)	900	1
RE317D-215	004647424	140-215			
RE317D-310	004647425	200-310			
RE317D-420	004656312	275-420	CEM450(E)	2000	

Technical data on page 346

Overload relay RE407D

Type	Code No.	Current setting range [A]	For use with	Weight [g]	Packaging [pcs]
RE407D-600	004656313	400-600	CEM560(E)	3600	1

Overload relay connection bars

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
GAE317-11D	004656310	CEM450(E)+RE317D-420	253	1
GAE407-1D	004656311	CEM560(E)+RE407D-600	461	1

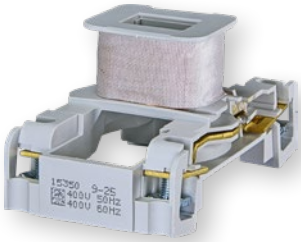
*1(pc) reference code includes 3 bars for one 3 pole connection

Overload relay mounting kits for rails TH35

Type	Code No.	For use with	Weight [g]	Packaging [pcs]
BF27D	004641901	RE27D	50	1
BF67.1D	004641902	RE67.1,	95	1
BF67.2D	004641904	RE67.2	95	1
BF117D	004641903	RE117.1D	110	1

Technical data on page 346

Individual coil for control voltage contactor

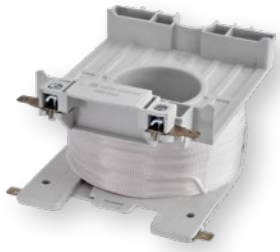


Individual coil for control voltage contactor					
Type	Code No.	AC; DC coil	For use with	Weight [g]	Packaging [pcs]
BCAE4-25-24 V-50/60 Hz*	004641810	AC	CEM9 - CEM 25	65	1
BCAE4-25-48 V-50/60 Hz*	004641811	AC			
BCAE4-25-110 V-50/60 Hz*	004641812	AC			
BCAE4-25-230 V-50/60 Hz*	004641813	AC			
BCAE4-25-400 V-50/60 Hz*	004641814	AC			
BCCE-25-24 V DC*	004642810	DC		120	
BCCE-25-48 V DC*	004642811	DC			
BCCE-25-110 V DC*	004642812	DC			
BCCE-25-220 V DC*	004642813	DC			
BCAE-40-24 V-50/60 Hz*	004641820	AC	CEM32 - CEM40	110	
BCAE-40-48 V-50/60 Hz*	004641821	AC			
BCAE-40-110 V-50/60 Hz*	004641822	AC			
BCAE-40-230 V-50/60 Hz*	004641823	AC			
BCAE-40-400 V-50/60 Hz*	004641824	AC			
BCCE-40-24 V DC*	004642820	DC		180	
BCCE-40-48 V DC*	004642821	DC			
BCCE-40-110 V DC*	004642822	DC			
BCCE-40-220 V DC*	004642823	DC			
BCAE-105-24 V-50/60 Hz	004641830	AC	CEM50 - CEM105	140	
BCAE-105-48 V-50/60 Hz	004641831	AC			
BCAE-105-110 V-50/60 Hz	004641832	AC			
BCAE-105-230 V-50/60 Hz	004641833	AC			
BCAE-105-400 V-50/60 Hz	004641834	AC			
BCCE-105-24 V DC	004642830	DC		220	
BCCE-105-48 V DC	004642831	DC			
BCCE-105-110 V DC	004642832	DC			
BCCE-105-220 V DC	004642833	DC			
BCAE-112-24 V-50/60 Hz	004641840	AC	CEM112	235	
BCAE-112-48 V-50/60 Hz	004641841	AC			
BCAE-112-110 V-50/60 Hz	004641842	AC			
BCAE-112-230 V-50/60 Hz	004641843	AC			
BCAE-112-400 V-50/60 Hz	004641844	AC			
BCAE-180-24 V-50/60 Hz	004641850	AC	CEM180	400	
BCAE-180-48 V-50/60 Hz	004641851	AC			
BCAE-180-110 V-50/60 Hz	004641852	AC			
BCAE-180-230 V-50/60 Hz	004641853	AC			
BCAE-180-400 V-50/60Hz	004641854	AC			
BCAE-250-24 V-50/60 Hz	004641860	AC	CEM250	675	
BCAE-250-48 V-50/60 Hz	004641861	AC			
BCAE-250-110 V-50/60 Hz	004641862	AC			
BCAE-250-230 V-50/60 Hz	004641863	AC			
BCAE-250-400 V-50/60 Hz	004641864	AC			

* Only AC coils can be fitted to AC controlled contactors & only DC coils can be fitted to DC controlled contactors.

Individual coil for control voltage contactor

Type	Code No.	AC/CD coil	For use with	Weight [g]	Packaging [pcs]
BCEE-150E-28 V	004646044	AC/DC	CEM112E - CEM150E	235	1
BCEE-150E-130 V	004646045				
BCEE-150E-250 V	004646046				
BCEE-150E-415 V	004646047				
BCEE-180E-28 V	004646048		CEM180E	400	
BCEE-180E-130 V	004646049				
BCEE-180E-250 V	004646050				
BCEE-180E-415 V	004646051				
BCEE-300E-28 V	004646052		CEM250E - CEM300E	670	
BCEE-300E-130 V	004646053				
BCEE-300E-250 V	004646054				
BCEE-300E-415 V	004646055				
BCEE-560E 255V-AC/DC	004656322		CEM450E - CEM560E	1360	1/16



Electronic modules for BCEE coils

Type	Code No.	AC/CD coil	For use with	Weight [g]	Packaging [pcs]
MEE-300 28V-AC/DC	004646070	AC/DC	BCEE-150E-28 V, BCEE-180E-28 V, BCEE-300E-28 V	96	1
MEE-300 110V-AC/DC	004646072		BCEE-150E-130 V, BCEE-180E-130 V, BCEE-300E-130 V		
MEE-300 250V-AC/DC	004646073		BCEE-150E-250 V, BCEE-180E-250 V, BCEE-300E-250 V		
MEE-300 415V-AC/DC	004646074		BCEE-150E-415 V, BCEE-180E-415 V, BCEE-300E-415 V		
MEE-560 255V-AC/DC	004656321		BCEE-560E-255V		

Motor protective circuit breakers

Motor protective circuit breakers MSP

MSP0

MSP1

Description
The MSP0, MSP1 motor starter protectors are compact motor starter protectors for currents up to 52 A which operate according to the current limiting principle. The devices are used for switching and protecting motors or other loads. They are fitted with instantaneous overcurrent releases and inverse-time delayed overload relay. Motor starter protectors and contactors can be combined to form fuseless starter combinations. The MSP0, MSP1 motor starter protectors are suitable for use in any climate.

Motor Starter Protectors
• for motor protection
- MSP0: 0,4...25 A
- MSP1: 22...52 A
The characteristic curves of these motor starter protectors are specially laid-out for the overload and short-circuit protection of motors. The inverse-time delayed releases ("a releases") are adjustable for setting the rated current of the motors to be protected. The instantaneous short-circuit releases ("n releases") are fixed-set to 12 times the value so as to assure faultless starting of the motors.

Motor protective circuit breaker MSP

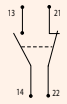
Type	Code No.	Rated current [A]	Thermal overload release [A]	Instantaneous overcurrent release [A]	Motor power [kW]	Weight [g]	Packaging [pcs]
MSP0-0,6	004646618	0,6	0,4…0,6	7,2	0,12/0,18	290	1
MSP0-1,0	004646619	1	0,6…1,0	12	0,25	290	1
MSP0-1,6	004646620	1,6	1,0…1,6	19	0,37/0,55	290	1
MSP0-2,4	004646621	2,4	1,6…2,4	29	0,75	290	1
MSP0-4,0	004646622	4	2,4…4,0	48	1,1/1,5	290	1
MSP0-6,0	004646623	6	4,0…6,0	72	2,2	290	1
MSP0-10	004646624	10	6,0…10	120	3/4	290	1
MSP0-16	004646625	16	10…16	190	7,5	290	1
MSP0-20	004646626	20	14…20	240	7,5	290	1
MSP0-25	004646627	25	18…25	300	11	290	1
MSP1-32	004646628	32	22…32	380	15	760	1
MSP1-40	004646629	40	28…40	480	18,5	760	1
MSP1-52	004646630	52	36…52	600	22	760	1

Technical data on page 352

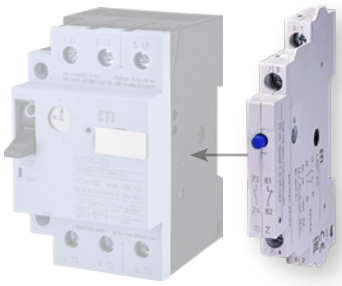
Accessories

Combinations:
Right hand side of MSP: An auxiliary contact and/or a short-circuit signalling contact
Left hand side of MSP: Undervoltage release or Shunt release

Short circuit trip indication

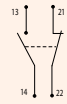
Type	Code No.	Description	Wiring diagram	Weight [g]	Packaging [pcs]
MSP-AS	004646617	1NO+1NC (AC-15: 3A/230V, 1.5A/400V, 1A/500V)		40	1

width= 9mm

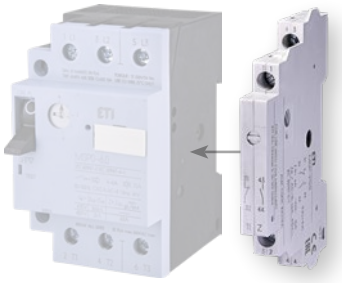


MSP-AS

Auxiliary contact

Type	Code No.	Description	Wiring diagram	Weight [g]	Packaging [pcs]
MSP-PS11	004646631	1NO+1NC (AC-15: 3A/230V, 1.5A/400V, 1A/500V)		40	1

width= 9mm

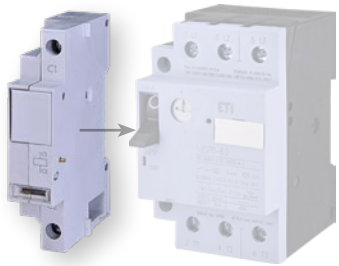


MSP-PS11

Shunt release

Type	Code No.	Rated voltage Un	Operation range	Weight [g]	Packaging [pcs]
MSP-A 230	004646632	230 VAC (220-230V 50Hz)	154-253 VAC	110	1
MSP-A 24	004646633	24 VAC (24V 50Hz, 24-60V DC)	16.8 - 26.4 VAC, 16.8 - 66VDC	110	1

width=18mm, operation range: 0.7-1.1*Un

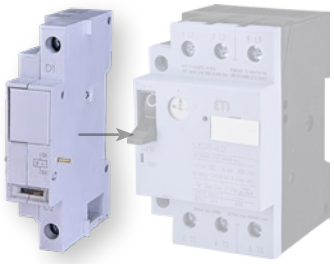


MSP-A 230

Undervoltage release

Type	Code No.	Rated voltage Un	Operation range (for keeping)	Weight [g]	Packaging [pcs]
MSP-U 240	004646634	240 V 50Hz	204-264 VAC	110	1

width=18mm, Falling(tripping) voltage: 0.35-0.7 Un, keeping voltage: 0.85-1.1Un.



MSP-U 240

Connection terminals

Type	Code No.	Description	Weight [g]	Packaging [pcs]
MSP-IZ2	004646635	busbar connection of 2 MSPs	50	1
MSP-IZ3	004646636	busbar connection of 3 MSPs	50	1
MSP-IZ4	004646637	busbar connection of 4 MSPs	100	1
MSP-TA1	004646638	3 phase line side terminal	110	1
MSP-TA2	004646639	3 phase line side terminal (in combination with MSP-IZ...)	50	1

MSP-IZ3

MSP-TA1

MSP-TA2

Technical data on page 352

Motor protective circuit breakers MPE

Rated current
0,16 - 32 A

Example of MPE configuration:

Advantages

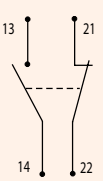
- With overload and short circuit protection
- Fixed short circuit release 13 x Iu
- With phase-failure sensitivity according to IEC/EN 60947-4-1
- With temperature compensation
- Can be used as main switch
- MPE25 up to 10A at 400/415V are self-protected
- MPE25 above 10A provide a breaking capacity of 50kA at 400/415V according to IEC/EN 60947-2
- MPE80 provide a breaking capacity of 60kA at 380V according to IEC/EN 60947-2

IE3 CONFORM

Motor protective circuit breaker MPE

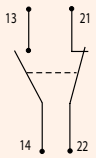
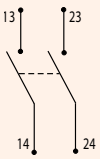
Type	Code No.	Operational inst. current Iu (A)	Setting overl. release Ir (A)	Short-circuit release Irm (A)	Weight [g]	Packaging [pcs]
MPE25-0,16	004648001	0,16	0,1-0,16	2,08	322	1
MPE25-0,25	004648002	0,25	0,16-0,25	3,25	322	1
MPE25-0,40	004648003	0,4	0,25-0,4	5,2	322	1
MPE25-0,63	004648004	0,63	0,4-0,63	8,2	322	1
MPE25-1,0	004648005	1	0,63-1,0	13	322	1
MPE25-1,6	004648006	1,6	1,0-1,6	20,8	322	1
MPE25-2,5	004648007	2,5	1,6-2,5	32,5	322	1
MPE25-4,0	004648008	4	2,5-4,0	52	322	1
MPE25-6,3	004648009	6,3	4,0-6,3	82	322	1
MPE25-10	004648010	10	6,3-10	130	322	1
MPE25-16	004648011	16	10-16	208	322	1
MPE25-20	004648012	20	16-20	260	322	1
MPE25-25	004648013	25	20-25	325	322	1
MPE25-32	004648014	32	25-32	416	322	1
MPE25-40	004648015	40	32-40	520	322	1
MPE80-50	004648016	50	40-50	650	1070	1
MPE80-65	004648017	65	50-65	845	1070	1
MPE80-80	004648018	80	65-80	1040	1070	1

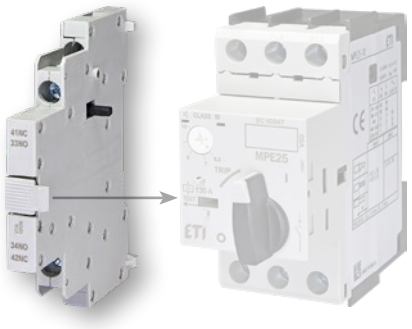
Front mountable auxiliary contact block, the 45mm widths - MPE remain unchanged

Type	Code No.	Wiring diagram	Auxiliary contacts NO, NC	Weight [g]	Packaging [pcs]
ACBFE-11	004648021		1, 1	20	1

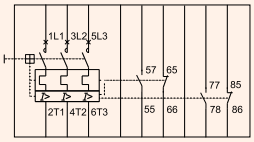
Technical data on page 356

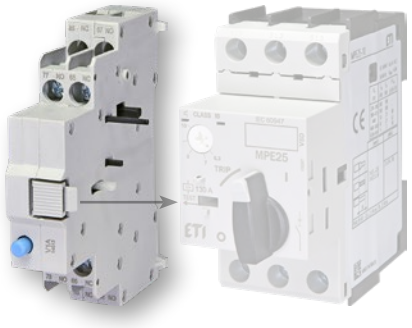
Left side mountable contact block, can be combined with front mountable auxiliary contact block

Type	Code No.	Wiring diagram	Auxiliary contacts NO, NC	Weight [g]	Packaging [pcs]
ACBSE-11	004648022		1, 1	38	1
ACBSE-20	004648023		2,0	38	1

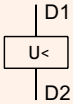


Trip indicating contact block, mounted on the left side

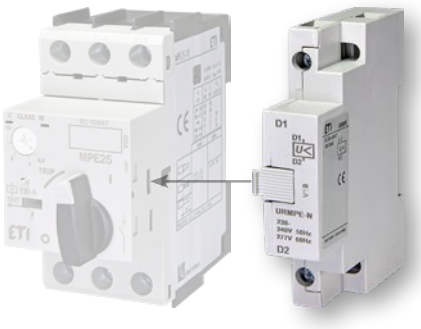
Type	Code No.	Wiring diagram	Notes	Weight [g]	Packaging [pcs]
TSBE	004648024		Separate tripped and short-circuit 1NC for each circuit. Allows mounting with lateral aux. contact block. Left side mounting. TBSE alarms, 1NO +	150	1



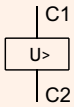
Undervoltage release, mounted on the right side

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
URMPE-N	004648027		230-240V AC	115	1
URMPE-U	004648028		400-415V AC		

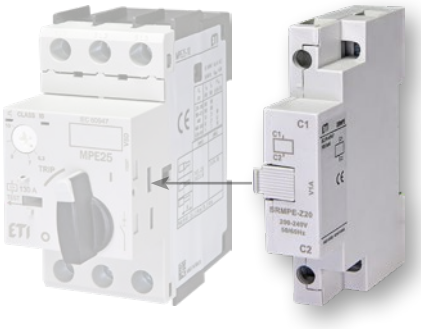
Pick-up voltage >0,85 x Ue Drop-out voltage 0,35-0,7 x Ue 100%DF



Shunt release, mounted on the right side

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
SRMPE-Z20	004648030		200-240V AC	115	1

Pick-up voltage 0,7 x Ue 100%DF



Technical data on page 356

Accessories

Type	Code No.	Description	Weight [g]	Packaging [pcs]
SCMPE	004648025	Scale cover	15	5
PLMPE	004648026	Push-in-lugs	25	2

Insulated enclosure with black/grey rotary handle, IP55

For use with	Code No.	Notes	Type	Weight [g]	Packaging [pcs]
MPE25 + ACBFE11 + ACBSE11 // ACBSE20 + PL..	004648032	with black/grey rotary handle with integrated PE(N) terminal lockable in OFF position with 3 padlocks two M25 metric cable entry knockout, top and bottom	MPEE55G	365	1
MPE25 + URMPE // SRMPE + ACBFE11 + ACBSE11 ali ACBSE20 + PL..	004648033		MLPEE55G	415	1

Insulated enclosure with red/yellow rotary handle, IP55

For use with	Code No.	Notes	Type	Weight [g]	Packaging [pcs]
MPE25 + ACBFE11 + ACBSE11 // ACBSE20 + PL..	004648034	with red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204 with integrated PE(N) terminal lockable in OFF position with 3 padlocks two M25 metric cable entry knockout, top and bottom	MPEE55G-E	365	1
MPE25 + URMPE // SRMPE + ACBFE11 + ACBSE11 or ACBSE20 + PL..	004648035		MLPEE55G-E	415	1

Neutral terminal

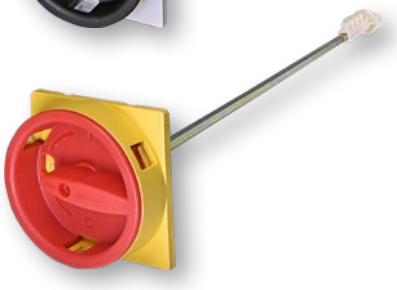
For use with	Code No.	Description	Type	Weight [g]	Packaging [pcs]
MPEE55G, MLPEE55G, MPEE55G-E & MLPEE55G-E	004648038	for connection of a 5th conductor	NL-MPEE	365	1

Flush mounting enclosure

Type	Code No.	colour	Description	Weight [g]	Packaging [pcs]
FMEE55	004648036	black	- for MPE mounting on panel door - degree of protection IP55 - moulded plastic front plate with rotary operating mechanism - lockable in OFF position - allows access. ACBFE-11, ACBSE-11 or ACBSE-20 and URMPE / SRMPE - allow installation of sig. lamp	200	1
FMEE55-E	004648037	red/yellow		200	1

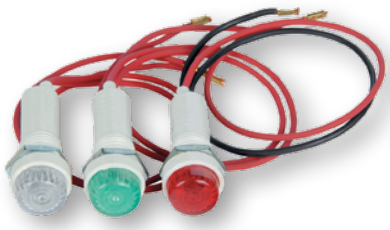
Door coupling rotary handle black/grey and red/yellow, IP55

Type	Code No.	colour	Notes	Weight [g]	Packaging [pcs]
RMMPE130 (130 mm)	004648039	black	- extension shaft, length 130 to 155mm - extension shaft, length 330 to 355mm - door coupling rotary handle black/grey - extension shaft can be cut ot any required length min. 80mm - thickness of panel door 1 to 3,5mm - for use of main switch IEC/EN60204 - ON/OFF/Tripped position - lockable in OFF pos. with 3 padlocks - the MPE can also be used turned 90⁰	76	1
RMMPE330 (330 mm)	004648040			114	
RMMPE130E (130 mm)	004648041	red/yellow		76	1
RMMPE330E (330 mm)	004648042			114	



Indicator light

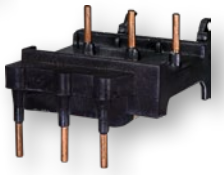
Type	Code No.	Notes	colour	Weight [g]	Packaging [pcs]
PLE230 PLE400	004648043 004648044	voltage: 210…230V voltage: 400…560V	red	17	10
PLE230G PLE400G	004648045 004648046	voltage: 210…230V voltage: 400…560V	green		
PLE230W PLE400W	004648047 004648048	voltage: 210…230V voltage: 400…560V	white		



Circuit breaker-contactor link module

Type	Code No.	Notes	For use with	Weight [g]	Packaging [pcs]
ECCMPE07	004648052	for electrical and mechanical linking motor protective circuit breaker MPE25 and contactor	CE07	27	1
ECCMPE25*	004648053		CEM9…25		

*For contactors with AC coil only!



Technical data on page 356

Motor protective circuit breaker MS25

Main application field: control (start-up, protection and switch-off) of AC electric motors with powers up to 11 kW (380/400 V) or other consumers up to 25 A; it can also be used as the main switch according to EN 60204 or VDE 0113 standards.

Versions:
- MS25 - with overload and short circuit protection

Manual control:
- START, STOP, push-buttons
- Test of release function (TEST)

- Phase-failure sensitivity according to IEC/EN 60947-4-1
- Automatic switch-off with thermal or magnetic release
- Control with under-voltage release or shunt release
- Isolating distance between contacts: 4.5 mm per contact place
- Hard wire or fine wire connection
- Simple and fast mounting by snap fitting on 35 mm wide mounting rail in compliance with EN 60715; fixing with two screws is also possible
- Vertical or horizontal operation position

Motor protective circuit breaker MS25

Type	Code No.	Operational inst. current Iu (A)	Setting overl. release Ir (A)	Weight [g]	Packaging [pcs]
MS25-0,16	004600010	0.16	0,1-0,16	255	1
MS25-0,25	004600020	0.25	0,16-0,25	255	1
MS25-0,40	004600030	0.4	0,25-0,4	255	1
MS25-0,63	004600040	0.63	0,4-0,63	255	1
MS25-1,0	004600050	1	0,63-1,0	255	1
MS25-1,6	004600060	1.6	1,0-1,6	255	1
MS25-2,5	004600070	2.5	1,6-2,5	255	1
MS25-4,0	004600080	4	2,5-4,0	255	1
MS25-6,3	004600090	6.3	4,0-6,3	255	1
MS25-10	004600100	10	6,3-10	255	1
MS25-16	004600110	16	10-16	255	1
MS25-20	004600120	20	16-20	255	1
MS25-25	004600320	25	20-25	255	1

Auxiliary switch for lateral mounting PS

Auxiliary switch for lateral mounting PS

Type	Code No.	Wiring diagram	Auxiliary contacts NO, NC	Weight [g]	Packaging [pcs]
PS 20	004600160		2,0	30	1/10
PS 01	004600150		0,1	30	1/10
PS 10	004600140		1,0	30	1/10
PS 11	004600130		1,1	30	1/10

Shunt release

Shunt release

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
A 230	004600170		220V-240V	30	1/10

Undervoltage release

Undervoltage release

Type	Code No.	Wiring diagram	actuating voltages	Weight [g]	Packaging [pcs]
U 230	004600180		220V-240V	30	1/10

Enclosure O Front plate CP

Enclosure O Front plate CP

Type	Code No.	IP	Weight [g]	Packaging [pcs]
O - 41	004600190	41	25	1
O - 55	004600200	55	25	1
CP - 41	004600210	41	20	1
CP - 55	004600220	55	20	1

O-IP41/55

CP-IP41/55

Technical data on page 365

Emergency stop push-button

Emergency stop push-button			
Type	Code No.	Weight [g]	Packaging [pcs]
NAT	004600270	15	1/20
NAT-lock	004600280	20	1/20

Padlocking feature Z

Padlocking feature Z			
Type	Code No.	Weight [g]	Packaging [pcs]
Z	004600260	30	1/10

Neutral link NL

Neutral link NL			
Type	Code No.	Weight [g]	Packaging [pcs]
NL	004600330	10	1/10

Signal lamp SS

Signal lamp SS				
Type	Code No.	Colour	Weight [g]	Packaging [pcs]
SS B 400V	004600230	white	10	1/10
SS R 400V	004600240	red	10	1/10
SS Z 400V	004600250	green	10	1/10

Modular contactor for installation into distribution boards

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1								
Type				**R20**	**R25 (2p)**	**R25 (4p)**	**R40**	**R63**	**RH11**
Main Contacts									
Rated insulation voltage U_i			V AC	440[2)]	440[2)]	440[2)]	440[2)]	440[2)]	440[2)]
Rated operation voltage U_e			V AC	250	440	440	440	440	440
Frequency of operations with AC1, AC3			1/h	300	300	300	600	600	600
Mechanical life			S x 10^6	1	1	1	1	1	1
Utilization category AC1									
Rated operational current I_e (=I_{th})	open at 60°C		A	20	25	25	40	60	-
Contact life			S x 10^6	0,1	0,1	0,1	0,1	0,1	-
Minimum switch voltage			V/mA	24/100	24/100	24/100	24/100	24/100	17/5
Short time current	10s-current		A	72	72	72	216	240	-
Power loss per pole at I_e/AC1			W	2	3	2	3	7	0,5
Utilization category AC3 Switching of three-phase motors									
Rated operational current I_e			A	-	-	9	27	30	-
Rated operational power	220V		kW	-	-	2,2	7,5	8	-
of three-phase motors	230-240V		kW	1,1[4)]		2,5	8	8,5	-
50-60Hz	380-415V		kW	-	-	4	12,5	15	-
Contact life AC 3			S x 10^6	-	-	0,15	0,15	0,15	-
Power consumption of coils									
AC operated	inrush		VA	7-9	7-9	20-25	33-45	33-45	-
	sealed		VA	2,2-4,2	2,2-4,2	4-6	6-8	6-8	-
			W	0,8-1,6	0,8-1,6	1,5-2,5	2-3,3	2-3,3	
Operation range of coils in multiples of control voltage Us	**(-40...+40°C)**			0,85-1,1	0,85-1,1	0,85-1,1	0,85-1,1	0,85-1,1	-
Short-circuit protection									
Coordination-type "1" according to IEC 947-4-1 max. fuse size	gG/gL		A	35	35	35	63	80	-
Cable cross-sections									
Main connector	solid or stranded		mm^2	1,5-10	1,5-10	1,5-10	2,5-25	2,5-25	0,5-2,5[3)]
	flexible		mm^2	1,5-6	1,5-6	1,5-6	2,5-16	2,5-16	0,5-2,5[3)]
	flexible with multicore cable end		mm^2	1,5-6	1,5-6	1,5-6	2,5-16	2,5-16	0,5-1,5
Clamps per pole				1	1	1	1	1	2
Magnetic coil	solid or stranded		mm^2	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	0,75-2,5	-
	flexible		mm^2	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	0,5-2,5	-
	flexible with multicore cable end		mm^2	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	0,5-1,5	-
Clamps per pole				1	1	1	1	1	-
Auxiliary Contacts									
Rated insulation voltage U_i[1)]			V AC	-	-	-	-	-	440[2)]
Thermal rated current I_{th}	40°C		[A]	-	-	-	-	-	10
Ambient temperature	60°C		[A]	-	-	-	-	-	6
Utilization category AC 15									
Rated operational current I_e	220-240V		[A]	-	-	-	-	-	3
	380-415V		[A]	-	-	-	-	-	2
	440V		[A]	-	-	-	-	-	1,6
Utilization category DC13									
Rated operational current I_e per pole	24-60V		[A]	-	-	-	-	-	2
	110V		[A]	-	-	-	-	-	0,4
	220V		[A]	-	-	-	-	-	0,1
Short circuit protection									
short-circuit current 1kA, contact welding not accepted max. fuse size	gG/gL		[A]	-	-	-	-	-	10
Switching time at control voltage U_s ±10%									
	make time		ms	7-16	7-16	9-15	11-15	11-15	-
	release time			6-12	6-12	4-8	6-13	6-13	-
	arc duration			10-15	10-15	10-15	10-15	10-15	-
Noise level (operation) acc. to EN ISO 3744 from front, distance 0,5 m			dB	16	16	8	<4	8	<4

1) Suitable for: earthed-neutral systems, overvoltage category I to IV, pollution degree 3 (standard-industry): U_{imp} 8kV.
2) Suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} 4kV.
3) Maximum cable cross-section with prepared conductor.
4) AC5b motor 2-pole 230 V 1,1 kW.

Utilization category DC1 (Switching of resisitive load, time constant L/R ≤ 1ms)

		NO contacts				NC contacts			
		1 pole	2 poles in series	3 poles in series	4 poles in series	1 pole	2 poles in series	3 poles in series	4 poles in series
		(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
R20	24V DC	20	20	-	-	15	15	-	-
	48V DC	18	20	-	-	13,5	15	-	-
	60V DC	17	20	-	-	12,5	15	-	-
	110V DC	4	10	-	-	3	7,5	-	-
	220V DC	0,4		-	-	0,3		-	-
R25	24V DC	25	25	25	25	18,5	18,5	18,5	18,5
	48V DC	22	25	25	25	16,5	18,75	18,5	18,5
	60V DC	18	25	25	25	13,5	18,75	18,5	18,5
	110V DC	5	16	25	25	3,5	12	18,5	18,5
	220V DC	0,5	4	10	15	0,4	3	7,5	11
R40	24V DC	40	40	40	40	30	30	30	30
	48V DC	25	40	40	40	18,5	30	30	30
	60V DC	19	30	40	40	14	24,5	30	30
	110V DC	7	17	31	40	5	12,5	23	30
	220V DC	0,7	5	15	20	0,5	3,5	11	15
R63	24V DC	63	63	63	63	47	47	47	47
	48V DC	26	44	63	63	19,5	33	47	47
	60V DC	21	36	63	63	15,5	27	47	47
	110V DC	8	18	34	63	6	13,5	25,5	47
	220V DC	0,7	6	16	21	0,5	4,5	12	15,5

Utilization category DC3 and DC5 (Switching of inductive loads, time constant L/R ≤ 15ms)

		NO contacts				NC contacts			
		1 pole	2 poles in series	3 poles in series	4 poles in series	1 pole	2 poles in series	3 poles in series	4 poles in series
		(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)
R20	24V DC	10	20	-	-	7,5	15	-	-
	48V DC	4	15	-	-	3	11	-	-
	60V DC	3	12	-	-	2	9	-	-
	110V DC	0,8	4	-	-	0,6	3	-	-
	220V DC	-		-	-	-		-	-
R25	24V DC	15	25	25	25	11	18,5	18,5	18,5
	48V DC	5	17	25	25	3,5	12,75	18,5	18,5
	60V DC	4	13	25	25	3	9,5	18,5	18,5
	110V DC	1	5	15	25	0,7	3,5	11	18,5
	220V DC	0,1	0,5	10	8	0,075	0,375	2	6
R40	24V DC	23	40	40	40	17	30	30	30
	48V DC	10	23	40	40	7,5	17	30	30
	60V DC	5	15	30	40	3,5	11	22,5	30
	110V DC	1,5	5	15	40	1,1	3,5	11	30
	220V DC	0,3	1	4	10	0,2	0,75	3	7,5
R63	24V DC	25	45	63	63	18,5	33,5	47	47
	48V DC	10	25	45	63	7,5	18,5	33,5	47
	60V DC	5	15	30	63	3,5	11	22,5	47
	110V DC	1,5	5	15	45	1,1	3,5	11	33,5
	220V DC	0,3	1	4	10	0,2	0,75	3	7,5

Switching of Lamps

Lamp Type	Power	Current	Capacitors	Max. lamps per pole at 230V 50Hz			
	[W]	[A]	µF	R20	R25	R40	R63
Incandescent lamps	60	0,27	-	22	28	58	85
	100	0,45	-	13	17	35	51
	200	0,91	-	7	8	17	25
	300	1,36	-	4	5	11	16
	500	2,27	-	3	3	7	10
	1000	4,5	-	1	1	3	5
Fluoroscent lamps, uncompensated or serial compensated	11	0,16	-	60	75	210	310
	18	0,37	2,7	25	30	90	140
	24	0,35	2,5	25	30	90	140
	36	0,43	3,4	20	25	70	140
	58	0,67	5,3	14	17	45	70
	65	0,67	5,3	13	16	40	65
	85	0,8	-	11	14	35	60
Fluoroscent lamps, dual-connection	11	0,07	-	2x100	2x110	2x220	2x250
	18	0,11	-	2x50	2x55	2x130	2x200
	24	0,14	-	2x40	2x44	2x110	2x160
	36	0,22	-	2x30	2x33	2x70	2x100
	58	0,35	-	2x20	2x22	2x45	2x70
	65	0,35	-	2x15	2x16	2x40	2x60
	85	0,47	-	2x10	2x11	2x30	2x40
Fluoroscent lamps, parallel compensated	11	0,16	2,0	30	30	100	140
	18	0,37	2,0	20	20	70	90
	24	0,35	3,0	15	15	55	75
	36	0,43	4,5	10	10	38	51
	58	0,67	7,0	6	6	25	30
	65	0,67	7,0	5	5	24	28
	85	0,8	8,0	4	4	18	23
Fluoroscent lamps, with serial electronic	18	0,09	-	40	40	100	150
	36	0,16	-	20	20	50	75
	58	0,25	-	15	15	30	55
	2x18	0,17	-	2x20	2x20	2x50	2x60
	2x36	0,32	-	2x10	2x10	2x25	2x30
	2x58	0,49	-	2x7	2x7	2x15	2x20
Transformers for metal halid low voltage lamps	20		-	40	52	110	174
	50		-	20	24	50	80
	75		-	13	16	35	54
	100		-	10	12	27	43
	150		-	7	9	19	29
	200		-	5	5	14	23
	300		-	3	4	9	14
Mercury-vapour lamps (high pressure lamps), uncompensated e. g. HQL, HPL	50	0,61	-	16	18	38	55
	80	0,8	-	12	14	28	40
	125	1,15	-	8	9	20	28
	250	2,15	-	4	5	11	15
	400	3,25	-	3	4	7	10
	700	5,4	-	1	2	4	6
	1000	7,5	-	1	1	3	4

Switching of Lamps

Lamp Type	Power	Current	Capacitors	Max. lamps per pole at 230V 50Hz			
	[W]	[A]	µF	R20	R25	R40	R63
Mercury-vapour lamps (high pressure lamps), compensated e. g. HQL, HPL	50	0,28	7	7	7	32	46
	80	0,41	8	5	5	25	35
	125	0,65	10	3	3	16	22
	250	1,22	18	2	2	8	12
	400	1,95	25	1	1	5	7
	700	3,45	45	1	1	3	4
	1000	4,8	60	-	-	2	3
Metal halide lamps uncompensated e. g. HQI, HPI, CDM	35	0,53	-	22	24	45	65
	70	1	-	12	14	24	35
	150	1,8	-	6	8	13	18
	250	3	-	4	5	8	12
	400	3,5	-	3	4	6	10
	1000	9,5	-	1	1	2	4
	2000	16,5	-	-	-	1	2
400 V per pole	2000	10,5	-	-	-	1	2
	3500	18	-	-	-	-	1
Metal halide lamps compensated e. g. HQI, HPI	35	0,25	6	8	8	38	50
	70	0,45	12	4	4	20	28
	150	0,75	20	2	2	12	17
	250	1,5	33	1	1	7	10
	400	2,1	35	1	1	5	7
	1000	5,8	95	-	-	2	3
	2000	11,5	148	-	-	1	1
400 V per pole	2000	6,5	58	-	-	1	2
	3500	11,6	100	-	-	-	1
Metal halide lamps with serial electronic (e.g. PCI) 50 -125 x I_{nlamps} for 0,6 ms	20	0,1	integrated	9	9	18	20
	35	0,2	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	0,7	integrated	4	4	8	10
Sodium-vapour lamps (low pressure lamps), uncompensated	35	1,5	-	7	9	22	30
	55	1,5	-	7	9	22	30
	90	2,4	-	4	6	13	19
	135	3,5	-	3	4	10	13
	150	3,3	-	3	4	10	13
	180	3,3	-	3	4	10	13
	200	3,3	-	3	4	10	13
Sodium-vapour lamps (low pressure lamps), compensated	35	0,31	20	3	3	12	16
	55	0,42	20	2	2	8	14
	90	0,63	30	1	1	5	9
	135	0,94	45	1	1	3	6
	150	1	40	1	1	3	6
	180	1,16	40	1	1	2	5
	200	1,32	25	-	-	2	4
Sodium-vapour lamps (high pressure lamps), uncompensated	150	1,8	-	5	6	11	22
	250	3	-	4	5	7	13
	330	3,7	-	3	4	6	10
	400	4,7	-	2	2	5	8
	1000	10,3	-	1	1	2	4
Sodium-vapour lamps (high pressure lamps), compensated	150	0,83	20	2	2	7	14
	250	1,5	33	1	1	4	8
	330	2	40	1	1	3	6
	400	2,4	48	1	1	2	5
	1000	6,3	106	-	-	1	2
Sodium-vapour lamps (high pressure lamps) with serial electronic (e.g. PCI) 50-125 x I_{nlamps} for 0,6 ms	20	0,1	integrated	9	9	18	20
	35	0,2	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	0,7	integrated	4	4	8	10
LED Lamps	max. inrush current of contactor [A]			195	233	424	565

Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

Type						RD20	RD25	RD40	RD63
General	Standards					IEC/EN 61095 , IEC/EN 60947-4-1, IEC/EN 60947-5-1			
	Module width					1	2	3	
	Mechanical endurance				op. c.	3 x 106		3 x 106	
	Ambient temperature				°C	-25 … +70(2NO, 4NO) -15 … +70 (1NO, 1NO+1NC,3NO,3NO+1NC) -15 … +55 (2NC, 1NC, 2NO+2NC,4NC)			
	Storage temperature				°C	-40 … +80			
	No. of contactors (side-by-side)		≤ 40 °C			max. 3			
			40 - 55 °C			max. 2			
			55 - 70 °C			max. 1 (ventilation modules or least 9 mm free space on each side)			
	Contact reliability					17 V; ≥ 50 mA			
	Min. distance of open contacts				mm	3,6			
	Power dissipation per pole				W	1,7	2,2	4	8
	Overload current withstand capability: 10s				A	72	68	176	240
	Max. back-up fuse for short-circuit protection gL			I_v	A	20	25	63	80
	Coordination type 2								
	Noise level (operation)				dB	20	20	20	20
	Vibration resistance according to IEC/EN 60068-2-6			a	g	switched off: 2 (Z and X axis) / switched on: 3 (Z axis) and 1 (X axis)			
	Shock resistance according to IEC/EN 6068-2-27			a	g	switched off: 10 (Z and X axis) / switched on: 15 (Z axis) and 2 (X axis)			
	Max. operating frequency	DC-1			op. c./h	300			
		AC-1/AC-3/AC-5b/AC-6b				600			
		AC-15				1200			
		no load				3000			
Main circuit	Rated insulation voltage			U_i	V	440	440		
	Rated impulse withstand voltage			U_{imp}	kV	4			
	Thermal current			I_{th}	A	20	25	40	63
	Rated operational voltage			U_e	V	400[3]	400		
	Rated frequency			f	Hz	50/60			
	Max. thermal current up to +55 °C			I_{th}	A	20	25	40	63
	Max. thermal current @ +70 °C			I_{th}	A	16	20	40	50
	Rated operational current	AC-1/AC-7a		I_e	A	20	25	40	63
		AC-3/AC-7b		I_e	A	9	8,5	22	30
		AC-5a	230 V	I_e	A	8,8	11,2	20	32
		AC-5b	230 V	I_e	A	8,8	9,7	17,6	22
		AC-6a	230 V	I_e	A	4	2,8	10,8	17,2
	Operational power AC-1/AC-7a	single-phase	230 V			3,7	5,4	8,7	13,3[4]
		three-phase	230 V	P_e	kW	-	9	16	24
		three-phase	400 V			-	16	26	40
	Electrical endurance	AC-1 / AC-7a			op. c.	200.000		100.000	
		AC-3 / AC-7b			op. c.	300.000	500.000	150.000	
		AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op. c.	100.000			
	Operational power AC-3/AC-7b	single-phase motor	230 V			1.3 -> NO[1]	1.3[2]	3.7[2]	5[2]
		three-phase motor	230 V	P_e	kW	-	2,2	5,5	8,5
		three-phase motor	400 V			-	4	11	15
	Switching of capacitors	AC-6b / AC-7c	230 V	C	µF	30	36	220	330
	Maximum operating frequency	AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op.c./h	600			

1) Make contacts are marked NO
2) Data for single-phase power are valid for versions -22, -20 and -02
3) Rated operational voltage for versions of contacts -10 and-01 is 230 V
4) Rated power (AC-1) for IK63-04: single-phase 230 V = 10.9 kW; three-phase 230 V = 18.9 kW; three-phase 400 V = 32.9 kW

Technical data

Type							RD20	RD25	RD40	RD63
Main circuit	Rated operational current	DC-1								
	1 pole		Ue = 24 V DC				20	25	40	63
			Ue = 110 V DC	I_e	A		6	6	4	4
			Ue = 220 V DC				0,6	0,6	1,2	1,2
	2 poles connected in series		Ue = 24 V DC				20	25	40	63
			Ue = 110 V DC	I_e	A		10	10	10	10
			Ue = 220 V DC				6	6	8	8
	3 poles connected in series		Ue = 24 V DC				-	25	40	63
			Ue = 110 V DC	I_e	A		-	20	30	35
			Ue = 220 V DC				-	15	20	30
	4 poles connected in series		Ue = 24 V DC				-	25	40	63
			Ue = 110 V DC	I_e	A		-	20	40	63
			Ue = 220 V DC				-	15	40	63
	Electrical endurance	DC-1				op. c.	100.000			
	Maximum operating frequency	DC-1				op.c/h	300			
	Terminal capacity		rigid	S	mm²		1 … 10		1.5 … 25	
			flexible				1 … 6		1.5 … 16	
	Screw						M3.5		M5	
	Screw Head						PZ1		PZ2	
	Tightening torque					Nm	1,2		3,5	
Auxiliary circuit	Rated operational voltage			U_e	V		230	400	400	400
	Rated insulation voltage			U_i	V		230	440	440	440
	Rated impulse withstand voltage			U_{imp}	kV		4			
	Thermal current			I_{th}	A		20	25	40	63
	Rated operational current AC-15	single-phase	230 V	I_e	A		6			
		single-phase	400 V				-	4		
	Electrical endurance	AC-15				op. c.	300.000	500.000	150.000	
Control circuit	Range of control voltage			U_c	%		85 … 110			
	Control voltages			U_c	V		12 … 230			
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5					kV	2			
	Coil consumption		switch-on			VA/W	2.1/2.1	2.6/2.6 [5]	5/5	5/5
			operation				2.1/2.1	2.6/2.6 [5]	5/5	5/5
	Make/break delays		make			ms	15 – 45	15 – 45	15 – 20	15 – 20
			break				20 – 50	20 – 70	35 – 45	35 – 45
	Terminal capacity		rigid	S	mm²		1 … 2.5		1 … 2.5	
			flexible				1 … 2.5		1 … 2.5	
	Screw						M 3.5		M3	
	Screw head						PZ1			
	Tightening torque					Nm	0,6			
Safety	MTTF - Mean time to failure MTTF = 1/λ = B10/(0,1 n_{op})					h	AC-1: 5.000 AC-3: 7.500	AC-1: 5.000 AC-3: 12.500	AC-1: 2.500 AC-3: 3.750	
	$MTTF_d$ - Mean time to failure dangerous $MTTF_d = 1/\lambda_d = B10_d/(0,1\ n_{op})$					h	AC-1: 6.666 AC-3: 10.000	AC-1: 6.666 AC-3: 16.666	AC-1: 3.333 AC-3: 5.000	
	B10 - Number of operating cycles until 10 % of devices fail					op. c.	AC-1: 150.000 AC-3: 225.000	AC-1: 150.000 AC-3: 375.000	AC-1: 75.000 AC-3: 112.500	
	$B10_d$ - Number of operating cycles until 10 % of device dangerous $B10_d$ = B10/ratio of dangerous failures					op. c.	AC-1: 200.000 AC-3: 300.000	AC-1: 200.000 AC-3: 500.000	AC-1: 100.000 AC-3: 150.000	
	λ - Failure rate λ = (0,1 n_{op})/B10					1/h	AC-1: 0,0002 AC-3: 0,000133	AC-1: 0,0002 AC-3: 0,00008	AC-1: 0,0004 AC-3: 0,000266	
	λ_d - Failure rate dangerous $\lambda_d = (0,1\ n_{op})/B10_d$					1/h	AC-1: 0,00015 AC-3: 0,0001	AC-1: 0,00015 AC-3: 0,00006	AC-1: 0,0003 AC-3: 0,0002	
	Ratio of dangerous failures					%	75			
	n_{op} - Operating cycles (operating cycles/h)					op.c/h	300			

5) Coil consumption for version -04 is 3.8 VA/3.8 W

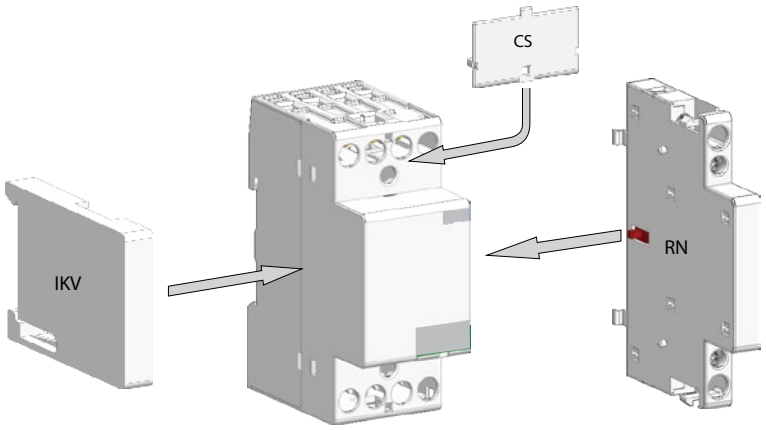
Data according to IEC 947-4-1, IEC 947-5-1, VDE 0660, EN 60947-4-1, EN 60947-5-1

Type						R 20-R	RD 20-R	R 25-R	R D25-R
General	Standards					IEC/EN 61095 , IEC/EN 60947-4-1, IEC/EN 60947-5-1			
	Module width					1		2	
	Mechanical endurance				op. c.	3 x 106			
	Ambient temperature				°C	-25 … +70 (2NO, 4NO) -15 … +70 (1NO, 1NO+1NC,3NO,3NO+1NC) -15 … +55 (2NC, 1NC, 2NO+2NC,4NC)			
	Storage temperature				°C	-40 … +80			
	No. of contactors (side-by-side)		≤ 40 °C			max. 3	max. 3	no limit	max. 3
			40 - 55 °C			max. 2	max. 2		max. 2
			55 - 70 °C			max. 1 (ventilation modules or least 9 mm free space on each side)			
	Contact reliability					17 V; ≥ 50 mA			
	Min. distance of open contacts				mm	3,6			
	Power dissipation per pole				W	1,7	1,7	2,2	2,2
	Overload current withstand capability: 10s				A	72	72	68	68
	Max. back-up fuse for short-circuit protection gL Coordination type 2			I_v	A	20	20	25	25
	Noise level (operation)				dB	30	20	30	20
	Vibration resistance according to IEC/EN 60068-2-6			a	g	switched off: 2 (Z and X axis) / switched on: 3 (Z axis) and 1 (X axis)			
	Shock resistance according to IEC/EN 6068-2-27			a	g	switched off: 10 (Z and X axis) / switched on: 15 (Z axis) and 2 (X axis)			
	Max. operating frequency	DC-1			op. c./h	300			
		AC-1/AC-3/AC-5b/AC-6b				600			
		AC-15				1200			
		no load				3000			
Main circuit	Rated insulation voltage			U_i	V	440		440	
	Rated impulse withstand voltage			U_{imp}	kV	4			
	Thermal current			I_{th}	A	20	20	25	25
	Rated operational voltage			U_e	V	400 [3]	400 [3]	400	400
	Rated frequency			f	Hz	50/60			
	Max. thermal current up to +55 °C			I_{th}	A	20	20	25	25
	Max. thermal current @ +70 °C			I_{th}	A	20	16	20	20
	Rated operational current	AC-1/AC-7a		I_e	A	20	20	25	25
		AC-3/AC-7b		I_e	A	NO: 9, NC: 6		8,5	
		AC-5a	230 V	I_e	A	8,8	8,8	11,2	11,2
		AC-5b	230 V	I_e	A	8,8	8,8	9,7	9,7
		AC-6a	230 V	I_e	A	4	4	2,8	2,8
	Operational power AC-1/AC-7a	single-phase	230 V			3,7	3,7	5,4	5,4
		three-phase	230 V	P_e	kW	-	-	9	9
		three-phase	400 V			-	-	16	16
	Electrical endurance	AC-1/AC-7a			op. c.	200.000			
		AC-3/AC-7b			op. c.	300.000		500.000	
		AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op. c.	100.000			
	Operational power AC-3/AC-7b	single-phase motor	230 V	P_e	kW	1.3 only for NO [1]	1.3 only for NO [1]	1.3 [2]	1.3 [2]
		three-phase motor	230 V			-	-	2,2	2,2
		three-phase motor	400 V			-	-	4	4
	Switching of capacitors	AC-6b	230 V	C	µF	30	30	36	36
	Maximum operating frequency	AC-5a / AC-5b / AC-6a / AC-6b / AC-7c			op.c./h	600			

1) Make contacts are marked NO
2) Data for single-phase power are valid for versions -22, -20 and -02
3) Rated operational voltage for versions of contacts -10 and-01 is 230 V
4) Rated power (AC-1) for IK63-04: single-phase 230 V = 10.9 kW; three-phase 230 V = 18.9 kW; three-phase 400 V = 32.9 kW

Technical data

Type							R 20-R	RD 20-R	R 25-R	RD 25-R
Main circuit	Rated operational current	DC-1								
	1 pole		Ue = 24 V DC				20	20	25	25
			Ue = 110 V DC	I_e	A		6			
			Ue = 220 V DC				0,6			
	2 poles connected in series		Ue = 24 V DC				20		25	
			Ue = 110 V DC	I_e	A		10			
			Ue = 220 V DC				6			
	3 poles connected in series		Ue = 24 V DC				-	-	25	25
			Ue = 110 V DC	I_e	A		-	-	20	20
			Ue = 220 V DC				-	-	15	15
	4 poles connected in series		Ue = 24 V DC				-	-	25	25
			Ue = 110 V DC	I_e	A		-	-	20	20
			Ue = 220 V DC				-	-	15	15
	Electrical endurance	DC-1				op. c.	100.000			
	Maximum operating frequency	DC-1				op.c./h	300			
	Terminal capacity		rigid	S		mm^2	1 … 10			
			flexible				1 … 6			
	Screw						M3.5			
	Screw Head						PZ1			
	Tightening torque					Nm	1,2			
Auxiliary circuit	Rated operational voltage			U_e		V	230	230	400	400
	Rated insulation voltage			U_i		V	230	230	440	440
	Rated impulse withstand voltage			U_{imp}		kV	4			
	Thermal current			I_{th}		A	20	20	25	25
	Rated operational current AC-15	single-phase	230 V	I_e		A	6			
		single-phase	400 V				4			
	Electrical endurance					op. c.	300.000		500.000	
Control circuit	Range of control voltage			U_c		%	85 … 110			
	Control voltages			U_c		V	12 … 230			
	Surge immunity test (1.2/50 µs), acc. to IEC/EN 61000-4-5					kV	2			
	Coil consumption	switch-on (handle in A)				VA/W	12/10	2.1/2.1	33/25	2.6/2.6
		switch-on (handle in 1)					6/3.8	2.1/2.1	10/5	2.6/2.6
		operation					2.8/1.2	2.1/2.1	5.5/1.6	2.6/2.6
	Make/break delays		make			ms	15 – 25	15 – 45	10 – 30	15 – 45
			break				10 – 30	20 – 50	10 – 30	20 – 70
	Terminal capacity		rigid	S		mm^2	1 … 2.5			
			flexible				1 … 2.5			
	Screw						M3			
	Screw head						PZ1			
	Tightening torque					Nm	0,6			
Safety	MTTF - Mean time to failure $MTTF = 1/\lambda = B10/(0,1\ n_{op})$					h	AC-1: 5.000 AC-3: 7.500		AC-1: 5.000 AC-3: 12.500	
	$MTTF_d$ - Mean time to failure dangerous $MTTF_d = 1/\lambda_d = B10_d/(0,1\ n_{op})$					h	AC-1: 6.666 AC-3: 10.000		AC-1: 6.666 AC-3: 16.666	
	B10 - Number of operating cycles until 10 % of devices fail					op. c.	AC-1: 150.000 / AC-3: 225.000		AC-1: 150.000 / AC-3: 375.000	
	$B10_d$ - Number of operating cycles until 10 % of device dangerous $B10_d$ = B10/ratio of dangerous failures					op. c.	AC-1: 200.000 AC-3: 300.000		AC-1: 200.000 AC-3: 500.000	
	λ - Failure rate $\lambda = (0,1\ n_{op})/B10$					1/h	AC-1: 0,0002 AC-3: 0,000133		AC-1: 0,0002 AC-3: 0,00008	
	λ_d - Failure rate dangerous $\lambda_d = (0,1\ n_{op})/B10_d$					1/h	AC-1: 0,00015 AC-3: 0,0001		AC-1: 0,00015 AC-3: 0,00006	
	Ratio of dangerous failures					%	75			
	n_{op} - Operating cycles (operating cycles/h)					op.c./h	300			



RA/RD 25

Technical data					
Type					**RN**
Standards					IEC/EN 60947-5-1
Module width					1/2
Rated insulation voltage U_i			U_i	V	500
Rated impulse withstand voltage U_{imp}			U_{imp}	kV	4
Thermal current			I_{th}	A	6
Rated operational voltage			U_e	V	230
					400
Rated operational current					
	AC-15	$U_e = 230$ V	I_e	A	6
		$U_e = 400$ V			4
Electrical endurance				op. c.	50.000
Mechanical endurance				op. c.	3×10^6
Min. distance of open contacts				mm	4
Contact reliability					12 V; ≥ 5 mA
Power loss per pole				W	0,3
Weight				kg	0,035
Max. back-up fuse for short-circuit protection gL					
Coordination type 2			I_v	A	6
Terminal capacity		rigid	S	mm^2	1...2.5
		flexible			1...2.5
Screw					M3
Screw head					PZ1
Tightening torque				Nm	0,6

Technical data

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Incandescent lamps (tungsten filament)	60	0,26	–	33	33	65	85
	100	0,44	–	20	20	40	50
	200	0,87	–	10	10	20	25
	500	2,17	–	3	3	8	10
	1000	4,35	–	1	1	4	5
Fluorescent lamps. uncorrected or series correction	18	0,37	2,7	22	24	90	140
	24	0,35	2,5	22	24	90	140
	36	0,43	3,4	17	20	65	95
	58	0,67	5,3	14	17	45	70
Fluorescent lamps. lead-lag circuit	2 x 18	0,11	–	2 x 30	2 x 40	2 x 100	2 x 150
	2 x 24	0,14	–	2 x 24	2 x 31	2 x 78	2 x 118
	2 x 36	0,22	–	2 x 17	2 x 24	2 x 65	2 x 95
	2 x 58	0,35	–	2 x 10	2 x 14	2 x 40	2 x 60
Fluorescent lamps. parallel correction	18	0,12	4,5	7	8	48	73
	24	0,15	4,5	7	8	48	73
	36	000	4,5	7	8	48	73
	58	0,32	7	4	5	31	47
Fluorescent lamps with electronic ballast units (EVG)	18	0,09	–	25	35	100	140
	36	0,16	–	15	20	52	75
	58	0,25	–	14	19	50	72
	2 x 18	0,17	–	2 x 12	2 x 17	2 x 50	2 x 70
	2 x 36	0,32	–	2 x 7	2 x 10	2 x 26	2 x 38
	2 x 58	0,49	–	2 x 7	2 x 9	2 x 25	2 x 36
High-pressure mercury-vapour lamps. uncorrected	50	0,61	–	14	18	38	55
	80	001	–	10	13	29	42
	125	1,15	–	7	9	20	29
	250	2,15	–	4	5	10	15
	400	3,25	–	2	3	7	10
	700	005	–	1	2	4	6
	1000	008	–	1	1	3	4
High-pressure mercury-vapour lamps. parallel correction	50	0,28	7	4	5	31	47
	80	0,41	8	4	5	27	41
	125	0,65	10	3	4	22	33
	250	1,22	18	1	2	12	18
	400	1,95	25	1	1	9	13
	700	3,45	45	–	–	5	7
	1000	005	60	–	–	4	5
Halogen metal-vapour lamps. uncorrected	35	0,53	–	18	22	43	60
	70	001	–	10	12	23	32
	150	002	–	5	7	12	18
	250	003	–	3	4	7	10
	400	004	–	3	3	6	9
	1000	010	–	1	1	2	3
	2000	16,5	–	–	–	1	1
Halogen metal-vapour lamps, parallel correction	35	0,25	6	5	6	36	50
	70	0,45	12	2	3	18	25
	150	0,75	20	1	1	11	15
	250	002	33	–	1	6	9
	400	003	35	–	1	6	8
	1000	006	95	–	–	2	3
	2000	012	148	–	–	1	2

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	18	20
	35	000	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	001	integrated	4	4	8	10
Transformers for halogen metal-vapour lamps	20	–	–	40	52	110	174
	50	–	–	20	24	50	80
	75	–	–	13	16	35	54
	100	–	–	10	12	27	43
	150	–	–	7	9	19	29
	200	–	–	5	6	14	23
	300	–	–	3	4	9	14
High-pressure sodium-vapour lamps. uncorrected	150	002	–	5	6	17	22
	250	003	–	3	4	10	13
	400	005	–	2	2	6	8
	1000	10,3	–	–	1	3	3
High-pressure sodium-vapour lamps. parallel correction	150	0,83	20	1	1	11	16
	250	002	33	–	1	6	10
	400	002	48	–	–	4	6
	1000	006	106	–	–	2	3
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	18	20
	35	000	integrated	6	6	11	13
	70	0,36	integrated	5	5	10	12
	150	001	integrated	4	4	8	10
Low-pressure sodium-vapour lamps. uncorrected	18	0,35	–	22	27	71	90
	35	002	–	7	9	23	30
	55	002	–	7	9	23	30
	90	002	–	4	5	14	19
	135	004	–	3	4	10	13
	180	003	–	3	4	10	13
Low-pressure sodium-vapour lamps. parallel correction	18	0,35	5	6	7	44	66
	35	0,31	20	1	1	11	16
	55	0,42	20	1	1	11	16
	90	0,63	26	1	1	8	12
	135	0,94	45	–	–	5	8
	180	1,16	40	–	–	4	7

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				RD20	RD25	RD40	RD63
Fluorescent lamps LUMILUX T5 with electronic ballast unit (EVG)	22	0,11	FC	22	30	80	110
	40	0,21		12	15	40	60
	55	0,28		8	12	30	45
	14	0,08	HE	30	40	105	150
	21	0,11		22	30	80	115
	28	0,14		18	22	60	90
	35	0,18		14	18	48	70
	24	0,12	HO	20	26	70	100
	39	0,20		12	16	42	62
	49	0,24		10	14	35	52
	54	0,27		9	13	32	47
	80	0,39		6	8	22	32
	2 x 22	0,23	2 x FC	2 x 11	2 x 15	2 x 40	2 x 55
	2 x 40	0,42		2 x 6	2 x 7	2 x 20	2 x 30
	2 x 55	0,55		2 x 4	2 x 6	2 x 15	2 x 22
	2 x 14	0,15	2 x HE	2 x 15	2 x 20	2 x 52	2 x 75
	2 x 21	0,22		2 x 11	2 x 15	2 x 40	2 x 57
	2 x 28	0,28		2 x 9	2 x 11	2 x 20	2 x 45
	2 x 35	0,36		2 x 7	2 x 9	2 x 24	2 x 35
	2 x 24	0,24	2 x HO	2 x 10	2 x 13	2 x 35	2 x 50
	2 x 39	0,39		2 x 6	2 x 8	2 x 21	2 x 31
	2 x 49	0,48		2 x 5	2 x 7	2 x 17	2 x 26
	2 x 54	0,54		2 x 4	2 x 6	2 x 16	2 x 23
	2 x 80	0,74		2 x 3	2 x 4	2 x 11	2 x 16

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
Incandescent lamp (tungsten filament)	60	0,26	–	33	33	33	33
	100	0,44	–	20	20	20	20
	200	0,87	–	10	10	10	10
	500	2,17	–	3	3	3	3
	1000	4,35	–	1	1	1	1
Fluorescent lamps uncorrected or series correction	18	0,37	2,7	22	22	24	24
	24	0,35	2,5	22	22	24	24
	36	0,43	3,4	17	17	20	20
	58	0,67	5,3	14	14	17	17
Fluorescent lamps lead-lag circuit	2 x 18	0,11	–	2 x 30	2 x 30	2 x 40	2 x 40
	2 x 24	0,14	–	2 x 24	2 x 24	2 x 31	2 x 31
	2 x 36	0,22	–	2 x 17	2 x 17	2 x 24	2 x 24
	2 x 58	0,35	–	2 x 10	2 x 10	2 x 14	2 x 14
Fluorescent lamps parallel correction	18	0,12	4,5	7	7	8	8
	24	0,15	4,5	7	7	8	8
	36	000	4,5	7	7	8	8
	58	0,32	7	4	4	5	5

Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
Fluorescent lamps with electronic ballast units (EVG)	18	0,09	–	25	25	35	35
	36	0,16	–	15	15	20	20
	58	0,25	–	14	14	19	19
	2 x 18	0,17	–	2 x 12	2 x 12	2 x 17	2 x 17
	2 x 36	0,32	–	2 x 7	2 x 7	2 x 10	2 x 10
	2 x 58	0,49	–	2 x 7	2 x 7	2 x 9	2 x 9
High-pressure mercury-vapour lamps uncorrected	50	0,61	–	14	14	18	18
	80	001	–	10	10	13	13
	125	1,15	–	7	7	9	9
	250	2,15	–	4	4	5	5
	400	3,25	–	2	2	3	3
	700	005	–	1	1	2	2
	1000	008	–	1	1	1	1
High-pressure mercury-vapour lamps. parallel correction	50	0,28	7	4	4	5	5
	80	0,41	8	4	4	5	5
	125	0,65	10	3	3	4	4
	250	1,22	18	1	1	2	2
	400	1,95	25	1	1	1	1
	700	3,45	45	–	–	–	–
	1000	005	60	–	–	–	–
Halogen metal-vapour lamps uncorrected	35	0,53	–	18	18	22	22
	70	001	–	10	10	12	12
	150	002	–	5	5	7	7
	250	003	–	3	3	4	4
	1000	010	–	1	1	1	1
	2000	16,5	–	–	–	–	–
Halogen metal-vapour lamps, parallel correction	35	0,25	6	5	5	6	6
	70	0,45	12	2	2	3	3
	150	0,75	20	1	1	1	1
	250	002	33	–	–	1	1
	400	003	35	–	–	1	1
	1000	006	95	–	–	–	–
	2000	11,5	148	–	–	–	–
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	9	9
	35	000	integrated	6	6	6	6
	70	0,36	integrated	5	5	5	5
	150	001	integrated	4	4	4	4
Transformers for halogen metal-vapour lamps	20	–	–	40	40	52	52
	50	–	–	20	20	24	24
	75	–	–	13	13	16	16
	100	–	–	10	10	12	12
	150	–	–	7	7	9	9
	200	–	–	5	5	6	6
	300	–	–	3	3	4	4
High-pressure sodium-vapour lamps, uncorrected	150	002	–	5	5	6	6
	250	003	–	3	3	4	4
	400	005	–	2	2	2	2
	1000	10,3	–	–	–	1	1

Technical data

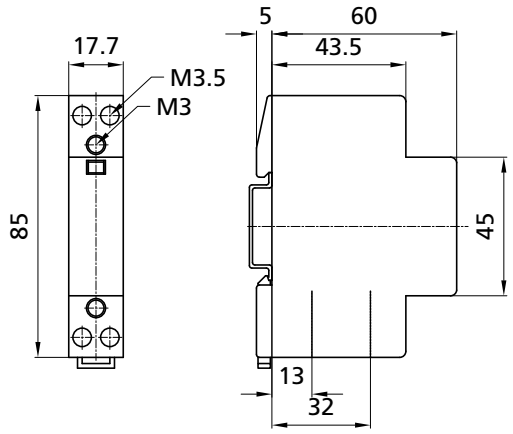
Type	Power (W)	Current (A)	C (µF)	Max. number of lamps per pole at 230 V 50 Hz			
				R20-R	RD20-R	R25-R	RD25-R
High-pressure sodium-vapour lamps, parallel correction	150	0,83	20	1	1	1	1
	250	002	33	–	–	1	1
	400	002	48	–	–	–	–
	1000	006	106	–	–	–	–
Halogen metal-vapour lamps with electronic ballast unit PCI 50-125 x In lamp for 0.6 ms	20	000	integrated	9	9	9	9
	35	000	integrated	6	6	6	6
	70	0,36	integrated	5	5	5	5
	150	001	integrated	4	4	4	4
Low-pressure sodium-vapour lamps, uncorrected	18	0,35	–	22	22	27	27
	35	002	–	7	7	9	9
	55	002	–	7	7	9	9
	90	002	–	4	4	5	5
	135	004	–	3	3	4	4
	180	003	–	3	3	4	4
Low-pressure sodium-vapour lamps, parallel correction	18	0,35	5	6	6	7	7
	35	0,31	20	1	1	1	1
	55	0,42	20	1	1	1	1
	90	0,63	26	1	1	1	1
	135	0,94	45	–	–	–	–
	180	1,16	40	–	–	–	–
Fluorescent lamps LUMILUX T5 with electronic ballast unit (EVG)	22	0,11	FC	22	22	30	30
	40	0,21		12	12	15	15
	55	0,28		8	8	12	12
	14	0,08	HE	30	30	40	40
	21	0,11		22	22	30	30
	28	0,14		18	18	22	22
	35	0,18		14	14	18	18
	24	0,12	HO	20	20	26	26
	39	000		12	12	16	16
	49	0,24		10	10	14	14
	54	0,27		9	9	13	13
	80	0,39		6	6	8	8
	2 x 22	0,23	2 x FC	2 x 11	2 x 11	2 x 15	2 x 15
	2 x 40	0,42		2 x 6	2 x 6	2 x 7	2 x 7
	2 x 55	0,55		2 x 4	2 x 4	2 x 6	2 x 6
	2 x 14	0,15	2 x HE	2 x 15	2 x 15	2 x 20	2 x 20
	2 x 21	0,22		2 x 11	2 x 11	2 x 15	2 x 15
	2 x 28	0,28		2 x 9	2 x 9	2 x 11	2 x 11
	2 x 35	0,36		2 x 7	2 x 7	2 x 9	2 x 9
	2 x 24	0,24	2 x HO	2 x 10	2 x 10	2 x 13	2 x 13
	2 x 39	0,39		2 x 6	2 x 6	2 x 8	2 x 8
	2 x 49	0,48		2 x 5	2 x 5	2 x 7	2 x 7
	2 x 54	0,54		2 x 4	2 x 4	2 x 6	2 x 6
	2 x 80	0,74		2 x 3	2 x 3	2 x 4	2 x 4

LED lamps, Power supplies for LEDs

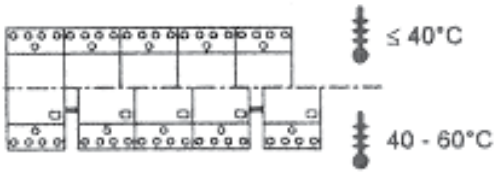
RD20, RD20-R, R20-R	RD25, RD25-R, R25-R	RD40	RD63
max. 2,4 A per pole	max. 3,8 A per pole	max. 11 A per pole	max. 18 A per pole

Dimensions

R20

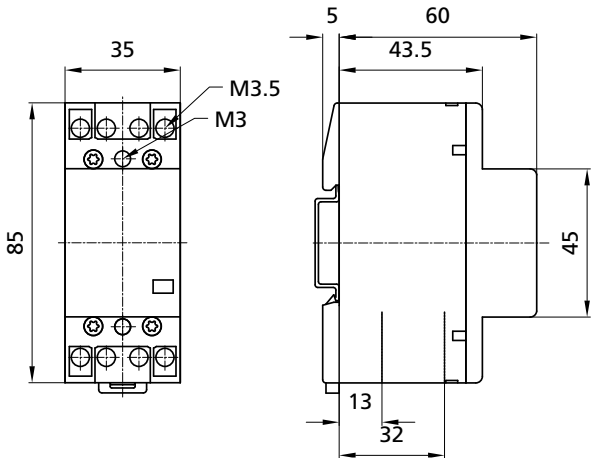


Distance piece

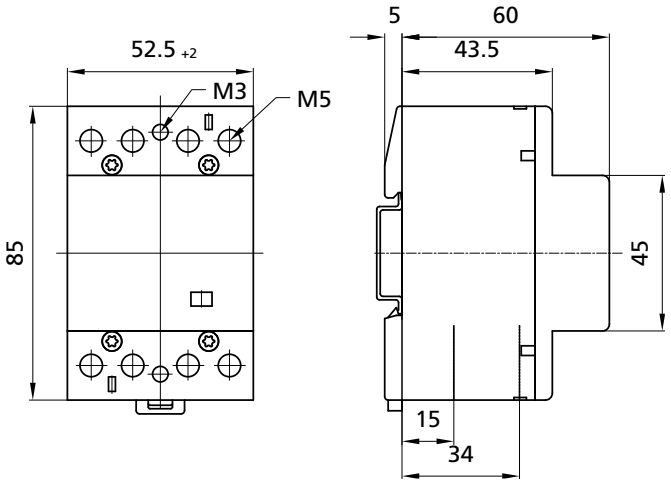


Distance piece is used where ambient temperature is higher than 40°C. Piece width is 1/2 module (8,8 mm)

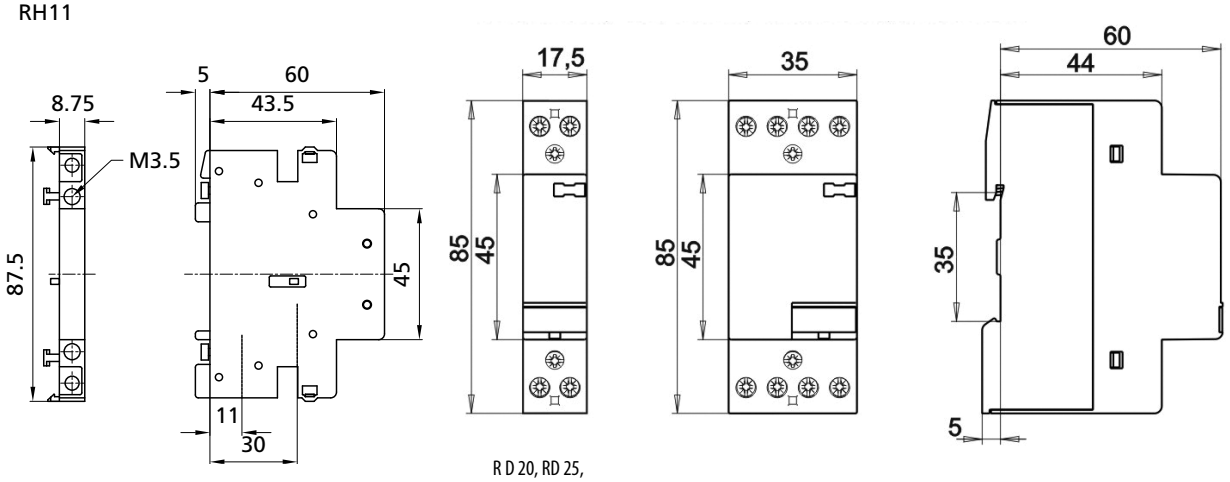
R25



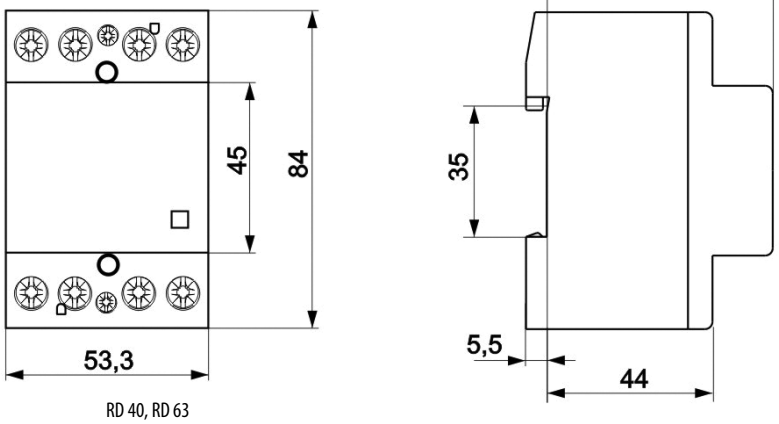
R40,R63



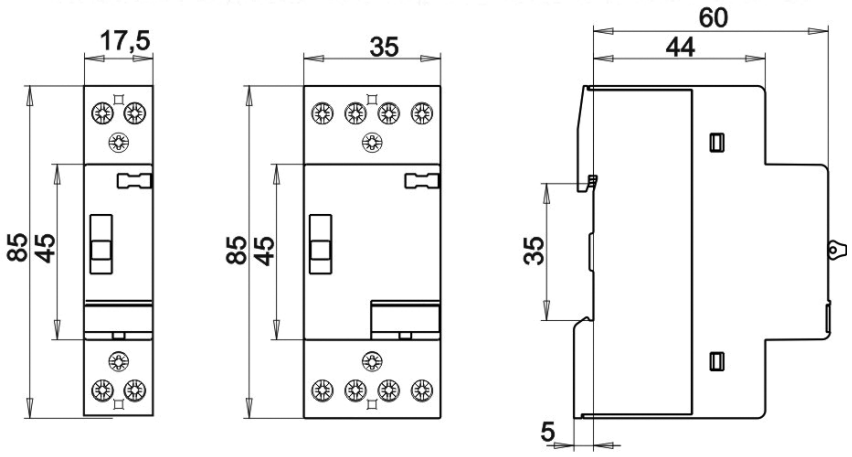
RH11



R D 20, RD 25,

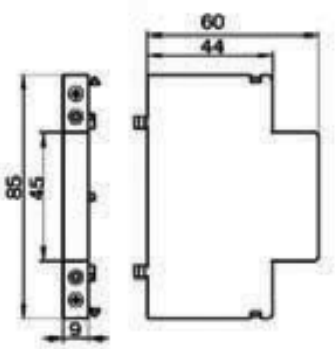


RD 40, RD 63

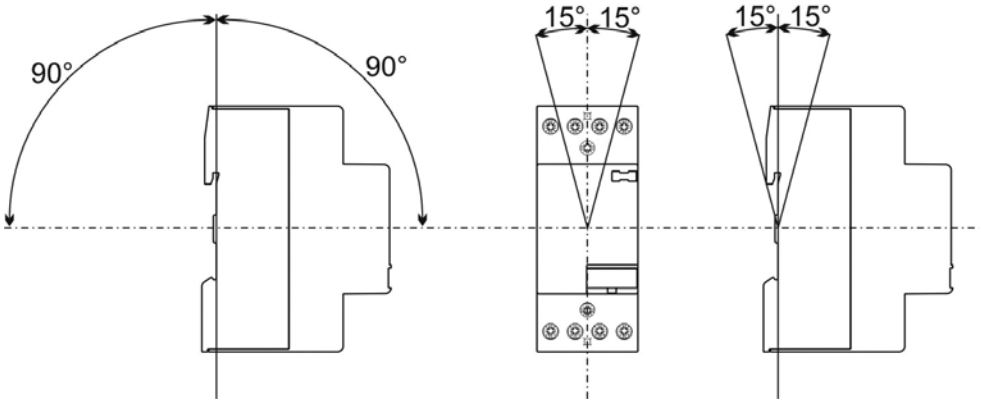


RD 20 - R, RD 25 - R

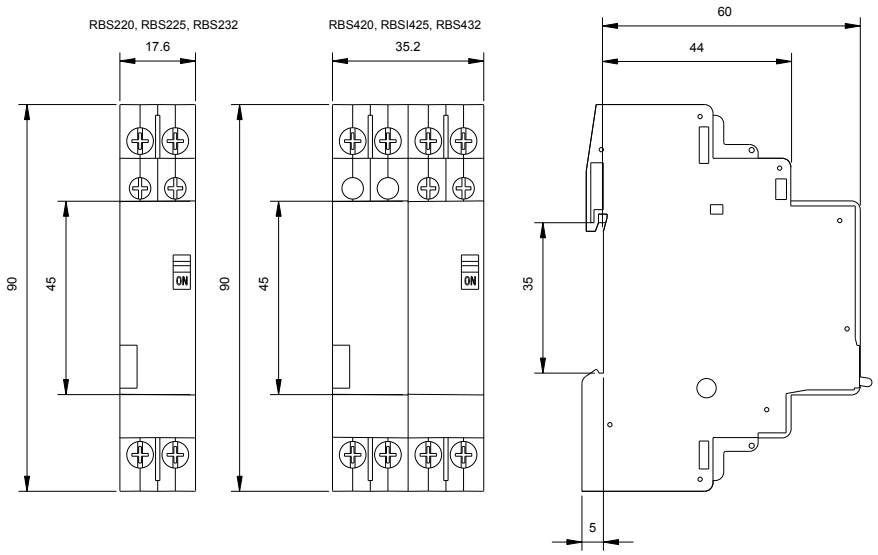
RN auxiliary switch

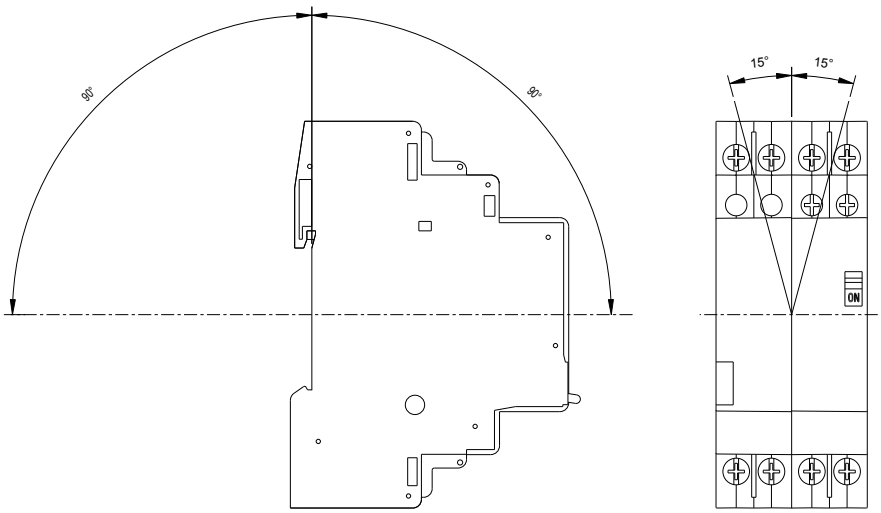


Mounting position



Bistable Switch RBS





Technical data								
Type			RBS220	RBS225	RBS232	RBS420	RBS425	BI432
Standards			IEC/EN 60669-2-2					
Manual control			✓					
Control with impulse voltage			✓					
Indication			With actuator					
Protection degree accordance to IEC/EN 60529			IP 20					
Module width			1			2		
Ambient temperature		°C	-25…+55					
Storage temperature		°C	-30…+80					
Max. resistance to humidity			95 % RH @ +55 °C					
Min. contact reliability			10 V / 100 mA					
Max. shock resistance accordance to IEC/EN 60068-2-27		g	15					
Max. vibration resistance accordance to IEC/EN 60068-2-6		g	3					
Min. distance of open contacts		mm	>3					
Distance between contacts and coil		mm	>6					
Mechanical endurance		cycles	106					
Max. back-up fuse for short-circuit protection (gL)		A	20	25	32	20	25	32
Power dissipation per pole		W	1,5	2	3	1,5	2	3
Rated control voltages	Uc	V	AC: 24, 230, other on request					
Rated frequency of control voltage	fc	Hz	50 / 60					
Range of control voltage	Uc	%	90…110					
Coil consumption – inrush		VA/W	18 / 13					
Coil consumption – hold		VA/W	9 / 4					
Min. impulse duration at Uc		ms	50					
Min. impulse duration at 0,85 Uc		ms	100					
Min. duration between two impulses		ms	150					
Max. number of impulses per minute			15		7,5	15		7,5
Max. impulse duration at Uc			1 hour					
Rated impulse voltage	Uimp	kV	4					
Thermal current	Ith	A	20	25	32	20	25	32
Rated insulation voltage	Ui	V	440					
Rated operational voltage	Ue	V	440					
Rated frequency	fe	Hz	50 / 60					
Rated operational current for cosφ = 0,6 acc. to IEC/EN 60669-2-2	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-1 acc. to IEC/EN 60947-4-1	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-7a acc. to IEC/EN 61095 – Slightly inductive loads in household appliances and similar applications	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	Ie	A	20 / 440 V	25 / 440 V	32 / 440 V	20 / 440 V	25 / 440 V	32 / 440 V
Rated operational current for AC-22 acc. to IEC/EN 60947-3			20 / 230 V	25 / 230 V	32 / 230 V	20 / 230 V	25 / 230 V	32 / 230 V
Switching of mixed resistive and inductive loads, including moderate overloads	Ie	A	16 / 440 V	20 / 440 V	25 / 440 V	16 / 440 V	20 / 440 V	25 / 440 V
Rated operational current for AC-23 acc. to IEC/EN 60947-3 Switching of motor loads or other highly inductive loads	Ie	A	16 / 230 V / 1-phase	20 / 230 V / 1-phase	25 / 230 V / 1-phase	16 / 230 V / 1-phase 16 / 230 V / 3-phase 16 / 400 V / 3-phase	20 / 230 V / 1-phase 20 / 230 V / 3-phase 20 / 400 V / 3-phase	25 / 230 V / 1-phase 25 / 230 V / 3-phase 25 / 400 V / 3-phase

Technical data

Type			RBS220	RBS225	RBS232	RBS420	RBS425	BI432
Rated operational current for AC-3 acc. to IEC/EN 60947-4-1 Squirrel-cage motors: starting, switching off motors during running	Ie	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
						6,3 / 230 V / 3-phase	8,7 V / 230 V / 3-phase	11,5 / 230 V / 3-phase
						6,6 / 400 V / 3-phase	8,5 / 400 V / 3-phase	11,3 / 400 V / 3-phase
Rated operational current for AC-7b acc. to IEC/EN 61095 Motor-loads for household applications	Ie	A	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase	7 / 230 V / 1-phase	8 / 230 V / 1-phase	10 / 230 V / 1-phase
						6,3 / 230 V / 3-phase	8,7 V / 230 V / 3-phase	11,5 / 230 V / 3-phase
						6,6 / 400 V / 3-phase	8,5 / 400 V / 3-phase	11,3 / 400 V / 3-phase
Rated operational current for AC-6a acc. to IEC/EN 60947-4-1 Switching of transformers having inrush current peaks of not more than 30 times peak of rated current	Ie	A	3 / 230 V	3,6 / 230 V	4,5 / 230 V	3 / 230 V	3,6 / 230 V	4,5 / 230 V
			1,5 / 400 V	1,8 / 400 V	2,2 / 400 V	1,5 / 400 V	1,8 / 400 V	2,2 / 400 V
Rated operational current for AC-6b acc. to IEC/EN 60947-4-1 – Switching of capacitor banks	C	µF	100 µF / 230 V					
Rated operational current for DC-1 acc. to IEC/EN 60947-4-1 – Non-inductive or slightly inductive loads, resistance furnances	Ie	A	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 V / 1p	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 V / 1p
Rated operational current for DC-3 acc. to IEC/EN 60947-4-1 – Shunt-motors: starting, plugging, inching	Ie	A	10 / 24 V / 1p	15 / 24 V / 1p	25 / 24 V / 1p	10 / 24 V / 1p	15 / 24 V / 1p	25 / 24 V / 1p
Rated operational current for DC-5 acc. to IEC/EN 60947-4-1 – Series-motors: starting, plugging, inching	Ie	A	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p
Rated operational current for DC-21 acc. to IEC/EN 60947-3 – Switching of resistive loads including moderate overloads	Ie	A	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 / V 1p	20 / 24 V / 1p	25 / 24 V / 1p	32 / 24 / V 1p
Rated operational current for DC-22 acc. to IEC/EN 60947-3 – Switching of mixed resistive and inductive loads, including moderate overloads	Ie	A	16 / 24 V / 1p	20 / 24 V / 1p	25 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p	25 / 24 V / 1p
Rated operational current for DC-23 acc. to IEC/EN 60947-3 – Switching of highly inductive loads (e.g. series motors)	Ie	A	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p	10 / 24 V / 1p	16 / 24 V / 1p	20 / 24 V / 1p
Rated operational current for AC-5a acc. to IEC/EN 60947-4-1 – Switching of electric discharge lamp controls	Ie	A	16 / 230 V					
Rated operational current for AC-5b acc. to IEC/EN 60947-4-1 – Switching of incandescent lamps	Ie	A	10 / 230 V					
Rated operational current for fluorescent lamps acc. to IEC/EN 60669-2-2	Ie	A	16 / 230 V					
Fluorescent / energy saving / compact lamps with electronic control gear	Ie	A	2 / 230 V					
Electrical endurance for all utilization categories		cycles	105					
Terminal capacity for main circuit	S	mm^2	1…10 rigid / flexible					
Screw for main circuit			M4					
Screw-head for main circuit			(±) PZ2					
Tightening torque for main circuit		Nm	1,2					
Terminal capacity for control circuit	S	mm^2	1…4 rigid / flexible					
Screw for control circuit			M3					
Screw-head for control circuit			(±) PZ1					
Tightening torque for control circuit		Nm	0,6					

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Incandescent lamps and halogen lamps	11	0,05	-				
	15	0,07	-	133	133	167	233
	18	0,08	-	111	111	139	194
	20	0,09	-	100	100	125	175
	25	0,11	-	80	80	100	140
	28	0,12	-	71	71	89	125
	30	0,13	-	67	67	83	117
	33	0,14	-	61	61	76	106
	35	0,15	-	57	57	71	100
	40	0,17	-	50	50	63	88
	42	0,18	-	48	48	60	83
	46	0,2	-	43	43	54	76
	48	0,21	-	42	42	52	73
	50	0,22	-	40	40	50	70
	53	0,23	-	38	38	47	66
	57	0,25	-	35	35	44	61
	60	0,26	-	33	33	42	58
	70	0,3	-	29	29	36	50
	75	0,33	-	27	27	33	47
	77	0,34	-	26	26	32	45
	80	0,35	-	25	25	31	44
	100	0,44	-	20	20	25	35
	116	0,5	-	17	17	22	30
	120	0,52	-	17	17	21	29
	150	0,65	-	13	13	17	23
	160	0,7	-	13	13	16	22
	200	0,87	-	10	10	13	18
	205	0,89	-	10	10	12	17
	230	1	-	9	9	11	15
	300	1,3	-	7	7	8	12
	400	1,74	-	5	5	6	9
	500	2,17	-	4	4	5	7
	750	3,26	-	3	3	3	5
	1000	4,35	-	2	2	3	4
	1500	6,52	-	1	1	2	2
	2000	8,7	-	1	1	1	2

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Transformators for low-voltage halogen lamps (electromagnetic and electronic)	10	0,04	-	100	100	200	300
	20	0,09	-	50	75	100	150
	30	0,13	-	33	50	67	100
	40	0,17	-	25	38	50	75
	50	0,22	-	20	30	40	60
	60	0,26	-	17	25	33	50
	70	0,3	-	14	21	29	43
	80	0,35	-	13	19	25	38
	90	0,39	-	11	17	22	33
	100	0,44	-	10	15	20	30
	150	0,65	-	7	10	13	20
	200	0,87	-	5	8	10	15
	300	1,3	-	3	5	7	10
	400	1,74	-	3	4	5	8
Compact fluorescent lamps with internal ballasts	3	0,04	-	133	167	250	333
	5	0,06	-	80	100	150	200
	6	0,07	-	67	83	125	167
	7	0,08	-	57	71	107	143
	8	0,09	-	50	63	94	125
	9	0,1	-	44	56	83	111
	10	0,11	-	40	50	75	100
	11	0,12	-	36	45	68	91
	12	0,13	-	33	42	63	83
	13	0,14	-	31	38	58	77
	14	0,15	-	29	36	54	71
	15	0,16	-	27	33	50	67
	16	0,18	-	25	31	47	63
	17	0,19	-	24	29	44	59
	18	0,2	-	22	28	42	56
	20	0,21	-	20	25	38	50
	21	0,22	-	19	24	36	48
	22	0,23	-	19	23	34	45
	23	0,24	-	17	22	33	43
	24	0,25	-	17	21	31	42
	25	0,26	-	16	20	30	40
	26	0,27	-	15	19	29	38
	27	0,124	-	15	19	28	37
	30	0,15	-	13	17	25	33
	33	0,155	-	12	15	23	30
	35	0,164	-	11	14	21	29
	40	0,2	-	10	13	19	25
	50	0,24	-	8	10	15	20
	70	0,312	-	6	7	11	14

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Compact fluorescent lamps with external electromagnetic ballasts - uncorrected	5	0,05	-	70	120	180	240
	2x5	0,07	-	50	86	129	171
	7	0,05	-	70	120	180	240
	2x7	0,07	-	50	86	129	171
	9	0,06	-	58	100	150	200
	2x9	0,08	-	44	75	113	150
	10	0,07	-	50	86	129	171
	11	0,08	-	44	75	113	150
	13	0,08	-	44	75	113	150
	16	0,1	-	35	60	90	120
	18	0,12	-	29	50	75	100
	2x18	0,21	-	17	29	43	57
	21	0,12	-	29	50	75	100
	22	0,2	-	18	30	45	60
	24	0,15	-	23	40	60	80
	26	0,15	-	23	40	60	80
	28	0,15	-	23	40	60	80
	32	0,22	-	16	27	41	55
	36	0,21	-	17	29	43	57
	38	0,21	-	17	29	43	57
	40	0,21	-	17	29	43	57
	58	0,32	-	11	19	28	38
Compast fluorescent lamps with external electromagnetic ballasts - parallel corrected	5	0,05	2	40	50	60	75
	2x5	0,07	2	40	50	60	75
	7	0,05	2	40	50	60	75
	2x7	0,07	2	40	50	60	75
	9	0,06	2	40	50	60	75
	2x9	0,08	2	40	50	60	75
	10	0,07	2	40	50	60	75
	11	0,08	2	40	50	60	75
	13	0,08	2	40	50	60	75
	16	0,1	2	40	50	60	75
	18	0,12	4,5	18	22	27	33
	2x18	0,21	4	20	25	30	38
	21	0,12	3	27	33	40	50
	22	0,2	4,5	18	22	27	33
	24	0,15	4,5	18	22	27	33
	26	0,15	4,5	18	22	27	33
	28	0,15	3,5	23	29	34	43
	32	0,22	4	20	25	30	38
	36	0,21	4,5	18	22	27	33
	38	0,21	4,5	18	22	27	33
	40	0,21	4,5	18	22	27	33
	58	0,32	7	11	14	17	21

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Compact fluorescent lamps with external electronic ballasts	5	0,03	-	100	200	300	400
	7	0,04	-	75	150	225	300
	9	0,05	-	60	120	180	240
	2x9	0,09	-	33	67	100	133
	10	0,05	-	60	120	180	240
	2x10	0,09	-	33	67	100	133
	11	0,07	-	43	86	129	171
	2x11	0,12	-	25	50	75	100
	13	0,07	-	43	86	129	171
	2x13	0,12	-	25	50	75	100
	14	0,08	-	38	75	113	150
	2x14	0,15	-	20	40	60	80
	16	0,07	-	43	86	129	171
	17	0,1	-	30	60	90	120
	2x17	0,18	-	17	33	50	67
	18	0,09	-	33	67	100	133
	2x18	0,17	-	18	35	53	71
	22	0,13	-	23	46	69	92
	2x22	0,21	-	14	29	43	57
	24	0,12	-	25	50	75	100
	2x24	0,23	-	13	26	39	52
	3x24	0,32	-	9	19	28	38
	4x24	0,43	-	9	14	21	28
	26	0,12	-	25	50	75	100
	2x26	0,24	-	13	25	38	50
	28	0,14	-	21	43	64	86
	32	0,16	-	19	38	56	75
	2x32	0,31	-	10	19	29	39
	36	0,16	-	19	38	56	75
	2x36	0,31	-	10	19	29	39
	38	0,17	-	18	35	53	71
	2x38	0,35	-	9	17	26	34
	40	0,2	-	15	30	45	60
	2x40	0,39	-	8	15	23	31
	42	0,2	-	15	30	45	60
	2x42	0,41	-	7	15	22	29
	55	0,27	-	11	22	33	44
	2x55	0,52	-	6	12	17	23
	57	0,28	-	11	21	32	43
	2x57	0,57	-	5	11	16	21
	60	0,31	-	10	19	29	39
	2x60	0,61	-	5	10	15	20
	70	0,34	-	9	18	26	35
	80	0,38	-	8	16	24	32
	2x80	0,76	-	4	8	12	16
	85	0,42	-	7	14	21	29
	100	0,46	-	7	13	20	26
	120	0,58	-	5	10	16	21
	150	0,69	-	4	9	13	17

Technical data

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Fluorescent lamps with external electromagnetic ballasts - uncorrected	4	0,17	-	94	94	94	94
	6	0,16	-	100	100	100	100
	8	0,15	-	107	107	107	107
	10	0,17	-	94	94	94	94
	11	0,16	-	100	100	100	100
	13	0,17	-	94	94	94	94
	14	0,4	-	40	40	40	40
	15	0,33	-	48	48	48	48
	16	0,2	-	80	80	80	80
	18	0,37	-	43	43	43	43
	20	0,38	-	42	42	42	42
	22	0,37	-	43	43	43	43
	25	0,29	-	55	55	55	55
	30	0,37	-	43	43	43	43
	32	0,43	-	37	37	37	37
	36	0,43	-	37	37	37	37
	38	0,43	-	37	37	37	37
	40	0,43	-	37	37	37	37
	58	0,67	-	24	24	24	24
	65	0,67	-	24	24	24	24
	75	0,67	-	24	24	24	24
	80	0,8	-	20	20	20	20
	85	0,8	-	20	20	20	20
	100	0,96	-	17	17	17	17
	125	0,94	-	17	17	17	17
Fluorescent lamps with external electromagnetic ballasts - parallel corrected	4	0,09	2	40	50	60	75
	6	0,08	2	40	50	60	75
	8	0,08	2	40	50	60	75
	10	0,09	2	40	50	60	75
	11	0,08	2	40	50	60	75
	13	0,09	2	40	50	60	75
	14	0,2	4,5	18	22	27	33
	15	0,17	4,5	18	22	27	33
	16	0,1	2,5	32	40	48	60
	18	0,19	4,5	18	22	27	33
	20	0,19	4,5	18	22	27	33
	22	0,19	5	16	20	24	30
	25	0,15	3,5	23	29	34	43
	30	0,24	4,5	18	22	27	33
	32	0,29	5	16	20	24	30
	36	0,29	4,5	18	22	27	33
	38	0,29	4,5	18	22	27	33
	40	0,29	4,5	18	22	27	33
	58	0,46	7	11	14	17	21
	65	0,46	7	11	14	17	21
	75	0,46	6	13	17	20	25
	80	0,57	7	11	14	17	21
	85	0,57	8	10	13	15	19
	100	0,66	10	8	10	12	15
	125	0,65	18	4	6	7	8

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Series circuit for two fluorescent lamps with external electromagnetic ballast - uncorrected	2x4	0,34	-	47	47	47	47
	2x6	0,32	-	50	50	50	50
	2x8	0,3	-	53	53	53	53
	2x10	0,34	-	47	47	47	47
	2x11	0,32	-	50	50	50	50
	2x13	0,34	-	47	47	47	47
	2x14	0,8	-	20	20	20	20
	2x15	0,66	-	24	24	24	24
	2x16	0,4	-	40	40	40	40
	2x18	0,74	-	22	22	22	22
	2x20	0,76	-	21	21	21	21
	2x22	0,74	-	22	22	22	22
	2x25	0,58	-	28	28	28	28
	2x30	0,74	-	22	22	22	22
	2x32	0,86	-	19	19	19	19
	2x36	0,86	-	19	19	19	19
	2x38	0,86	-	19	19	19	19
	2x40	0,86	-	19	19	19	19
	2x58	1,34	-	12	12	12	12
	2x65	1,34	-	12	12	12	12
	2x75	1,34	-	12	12	12	12
	2x80	1,6	-	10	10	10	10
	2x85	1,6	-	10	10	10	10
	2x100	1,92	-	8	8	8	8
	2x125	1,88	-	9	9	9	9
Series circuit for two fluorescent lamps with external electromagnetic ballast - parallel corrected	2x4	0,17	2	40	50	60	75
	2x6	0,16	2	40	50	60	75
	2x8	0,15	2	40	50	60	75
	2x10	0,17	2	40	50	60	75
	2x11	0,16	2	40	50	60	75
	2x13	0,17	2	40	50	60	75
	2x14	0,4	4,5	18	22	27	33
	2x15	0,33	4,5	18	22	27	33
	2x16	0,2	2,5	32	40	48	60
	2x18	0,37	4,5	18	22	27	33
	2x20	0,38	4,5	18	22	27	33
	2x22	0,37	5	16	20	24	30
	2x25	0,29	3,5	23	29	34	43
	2x30	0,37	4,5	18	22	27	33
	2x32	0,43	5	16	20	24	30
	2x36	0,43	4,5	18	22	27	33
	2x38	0,43	4,5	18	22	27	33
	2x40	0,43	4,5	18	22	27	33
	2x58	0,67	7	11	14	17	21
	2x65	0,67	7	11	14	17	21
	2x75	0,67	6	13	17	20	25
	2x80	0,8	7	11	14	17	21
	2x85	0,8	8	10	13	15	19
	2x100	0,96	10	8	10	12	15
	2x125	0,94	18	4	6	7	8

Technical data

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Lead-lag circuit for fluorescent lamps with external electromagnetic ballasts - series corrected	2x18	0,26	2,7	62	62	62	62
	2x36	0,48	4,5	33	33	33	33
	2x40	0,48	4,5	33	33	33	33
	2x58	0,78	7	21	21	21	21
	2x65	0,78	7	21	21	21	21
	2x80	0,96	9	17	17	17	17
	2x85	0,96	9	17	17	17	17
	2x125	1,2	18	13	13	13	13
Fluorescent lamps with external electronic ballasts	4	0,03	-	100	200	300	400
	6	0,033	-	91	182	273	364
	2x6	0,06	-	50	100	150	200
	8	0,04	-	75	150	225	300
	2x8	0,08	-	38	75	113	150
	10	0,05	-	60	120	180	240
	2x10	0,09	-	33	67	100	133
	11	0,06	-	50	100	150	200
	13	0,07	-	43	86	129	171
	14	0,08	-	38	75	113	150
	2x14	0,15	-	20	40	60	80
	3x14	0,21	-	14	29	43	57
	4x14	0,28	-	11	21	32	43
	15	0,08	-	38	75	113	150
	2x15	0,13	-	23	46	69	92
	16	0,07	-	43	86	129	171
	2x16	0,14	-	21	43	64	86
	3x16	0,2	-	15	30	45	60
	4x16	0,28	-	11	21	32	43
	18	0,09	-	33	67	100	133
	2x18	0,17	-	18	35	53	71
	3x18	0,24	-	13	25	38	50
	4x18	0,31	-	10	19	29	39
	19	0,11	-	27	55	82	109
	2x19	0,22	-	14	27	41	55
	20	0,11	-	27	55	82	109
	2x20	0,22	-	14	27	41	55
	21	0,11	-	27	55	82	109
	2x21	0,22	-	14	27	41	55
	22	0,11	-	27	55	82	109
	2x22	0,23	-	13	26	39	52
	24	0,12	-	25	50	75	100
	2x24	0,22	-	14	27	41	55
	3x24	0,33	-	9	18	27	36
	4x24	0,43	-	7	14	21	28
	25	0,15	-	20	40	60	80
	2x25	0,28	-	11	21	32	43
	28	0,14	-	21	43	64	86
	2x28	0,27	-	11	22	33	44
	30	0,14	-	21	43	64	86
	2x30	0,27	-	11	22	33	44
	32	0,17	-	18	35	53	71

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
Fluorescent lamps with external electronic ballasts	2x32	0,35	-	9	17	26	34
	34	0,17	-	18	35	53	71
	2x34	0,35	-	9	17	26	34
	35	0,17	-	18	35	53	71
	2x35	0,34	-	9	18	26	35
	36	0,16	-	19	38	56	75
	2x36	0,31	-	10	19	29	39
	3x36	0,46	-	7	13	20	26
	38	0,15	-	20	40	60	80
	2x38	0,31	-	10	19	29	39
	39	0,19	-	16	32	47	63
	2x39	0,36	-	8	17	25	33
	40	0,21	-	14	29	43	57
	2x40	0,42	-	7	14	21	29
	45	0,24	-	13	25	38	50
	2x45	0,46	-	7	13	20	26
	49	0,24	-	13	25	38	50
	2x49	0,46	-	7	13	20	26
	50	0,25	-	12	24	36	48
	2x50	0,48	-	6	13	19	25
	51	0,22	-	14	27	41	55
	2x51	0,42	-	7	14	21	29
	54	0,26	-	12	23	35	46
	2x54	0,52	-	6	12	17	23
	55	0,28	-	11	21	32	43
	2x55	0,55	-	5	11	16	22
	58	0,25	-	12	24	36	48
	2x58	0,48	-	6	13	19	25
	65	0,25	-	12	24	36	48
	2x65	0,48	-	6	13	19	25
	70	0,3	-	10	20	30	40
	2x70	0,57	-	5	11	16	21
	73	0,38	-	8	16	24	32
	2x73	0,7	-	4	9	13	17
	80	0,4	-	8	15	23	30
	2x80	0,76	-	4	8	12	16
High pressure mercury vapour lamps with external electromagnetic ballasts - uncorrected	50	0,6	-	17	27	27	27
	80	0,8	-	13	20	20	20
	125	1,2	-	8	13	13	13
	250	2,2	-	5	7	7	7
	400	3,3	-	3	5	5	5
	700	5,4	-	2	3	3	3
	1000	7,5	-	1	2	2	2

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
High pressure mercury vapour lamps with external electromagnetic ballasts - parallel corrected	50	0,3	7	11	14	17	21
	80	0,4	8	10	13	15	19
	125	0,6	10	8	10	12	15
	250	1,2	18	4	6	7	8
	400	1,8	25	3	4	5	6
	700	3,4	40	2	3	3	4
	1000	4,8	60	1	2	2	3
High pressure mercury vapour lamps which do not require ballasts	160	0,8	-	10	11	14	20
	250	1,2	-	6	7	9	13
	500	2,4	-	3	4	5	7
Metal halide lamps with external electromagnetic ballasts - uncorrected	35	0,5	-	16	32	32	32
	70	1	-	8	16	16	16
	100	1,2	-	7	13	13	13
	150	1,8	-	4	9	9	9
	250	3	-	3	5	5	5
	400	4,6	-	2	3	3	3
	600	6,2	-	1	3	3	3
	1000	9,7	-	1	2	2	2
	2000	12,2	-	0	1	1	1
Metal halide lamps with external electromagnetic ballasts - parallel corrected	35	0,23	6	13	17	20	25
	70	0,42	12	7	8	10	13
	100	0,55	12	7	8	10	13
	150	0,77	20	4	5	6	8
	250	1,26	32	3	3	4	5
	400	2	45	2	2	3	3
	600	3	65	1	2	2	2
	1000	5	85	0	1	1	2
	2000	10,5	125	0	0	1	1
Metal halide lamps with external electronic ballasts	20	0,11	-	27	55	82	109
	35	0,21	-	14	29	43	57
	2x35	0,38	-	8	16	24	32
	50	0,29	-	10	21	31	41
	70	0,38	-	8	16	24	32
	2x70	0,71	-	4	8	13	17
	100	0,56	-	5	11	16	21
	150	0,72	-	4	8	13	17
	250	1,3	-	2	5	7	9
	400	2	-	1	3	5	6
	1000	5	-	0	1	2	2
	2000	6	-	0	1	2	2

Lamps' type	Power (P) [W]	Current (I) [A]	Capacitor (C) [µF]	Maximum number of lamps per pole at 230 V, 50 Hz			
				RBS216	RBS220, RBS420	RBS225, RBS425	RBS232, RBS432
High pressure sodium vapour lamps with external electromagnetic ballasts - uncorrected	35	0,53	-	25	30	30	30
	50	0,8	-	16	20	20	20
	70	1	-	13	16	16	16
	100	1,2	-	11	13	13	13
	150	1,8	-	7	9	9	9
	250	3	-	4	5	5	5
	400	4,4	-	3	4	4	4
	600	6,2	-	2	2	2	2
	1000	10,3	-	1	1	1	1
High pressure sodium vapour lamps with external electromagnetic ballasts - parallel corrected	35	0,22	6	13	17	20	25
	50	0,3	8	10	13	15	19
	70	0,4	12	7	8	10	13
	100	0,55	12	7	8	10	13
	150	0,77	20	4	5	6	8
	250	1,26	32	3	3	4	5
	400	2	45	2	2	3	3
	600	2,9	65	1	1	2	2
	1000	5,1	100	0	0	1	1
High pressure sodium vapour lamps with external electronic ballasts	35	0,21	-	14	29	43	57
	50	0,25	-	12	24	36	48
	70	0,38	-	8	16	24	32
	100	0,56	-	5	11	16	21
	150	0,72	-	4	8	13	17
	250	1,3	-	2	5	7	9
	400	2	-	2	3	5	6
	600	3,1	-	1	2	3	4
	1000	5	-	0	1	2	2
Low pressure sodium vapour lamps with external electromagnetic ballasts - uncorrected	18	0,4	-	25	40	40	40
	35	0,6	-	15	27	27	27
	55	0,6	-	15	27	27	27
	90	0,9	-	10	18	18	18
	135	0,9	-	10	18	18	18
	180	0,9	-	10	18	18	18
Low pressure sodium vapour lamps with external electromagnetic ballasts - parallel corrected	18	0,35	5	16	20	24	30
	35	0,28	20	4	5	6	8
	55	0,35	20	4	5	6	8
	90	0,55	26	3	4	5	6
	135	0,8	40	2	3	3	4
	180	1	40	2	3	3	4
Low pressure sodium vapour lamps with ECG	35	0,16	-	19	38	56	75
	55	0,25	-	12	24	36	48
LED lamps Power supplies for LEDs	-	-	-	max. 2 A per pole	max. 6 A per pole	max. 9 A per pole	max. 12 A per pole

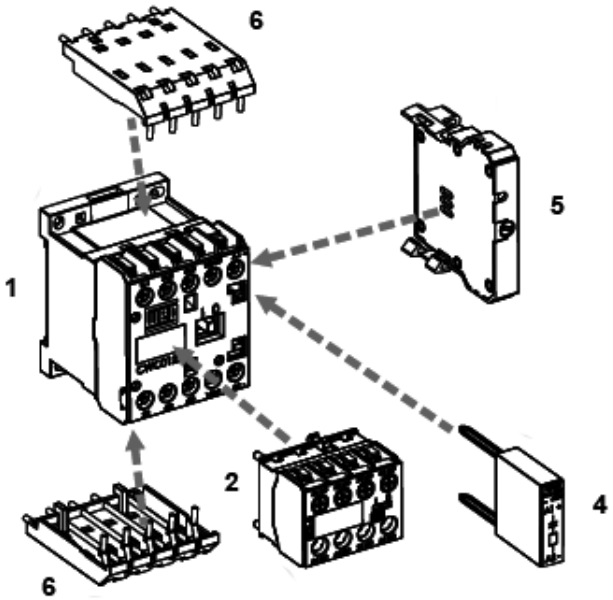
Miniature contactors CE and CEC

Technical data

Type			CE07	CEC07	CEC09	CEC012	CEC016	CECA0	CAE04
Standards			IEC/EN 60 947, DIN VDE 0660, UL, CSA						
Rated insulation voltage U_i according to IEC/EN 60947, DIN VDE 0660		V	415 V			690 V			415 V
Rated impulse withstand voltage U_{imp}			4 kV						
Rated operational frequency			25 - 400 Hz						
Degree of protection									
Main circuits			IP20						
Control circuits and auxiliary contacts			IP20						
Ambient temperature									
Operating temperature			-25 ... +55°C						
Storage temperature			-55 ... +80°C						
Altitude									
Normal values			< 3000 m						
90% I_e/80% U_e			3000 ... 4000 m						
80% I_e/75% U_e			4000 ... 5000 m						
Overvoltage category / Pollution degree			III/3						
Climatic proofing			IEC 60 680-2						
Number of main poles			3			3		4	4
Rated operational voltage U_e			400-415 V			690 V			400-415 V
Conv. thermal current I_{th} at < 55°C									
rated operational current I_e/AC-1			16 A	18 A	20 A	22 A	22 A	10 A	16 A
AC3 Utilization category									
Rated operational power									
230 V		kW	1,5	1,5	2,2	3	4	-	-
400/415 V		kW	3	3	4	5,5	7,5	-	-
440 V		kW	-	3,7	4,5	5,5	7,5	-	-
500 V		kW	-	3,7	4,5	5,5	7,5	-	-
690 V		kW	-	3,7	5,5	7,5	7,5	-	-
AC4 Utilization category									
Rated operational current I_e AC-4 ($U_e \leq 440V$)				2,8	3,5	4,5	5		
Short circuit rating, max. fuse gG (A)			16	20	20	25	25	6	6
Max. electrical operating frequency									
AC-1		Ops/h	50			300		-	-
AC-3		Ops/h	300			600		-	-
AC-4		Ops/h	250			300		-	-
no load		Ops/h	2000			2500		2500	2500
Mechanical life span		Ops x 10^6				10			
Electrical life span		Ops x 10^6	0,8	1,4	1,3	1,2	1,1	1	1
Maximum number of auxiliary contacts			-			5		-	-
Rated operational current I_e									
AC-15	220-230 V	A	-	-	-	-	-	10	6
	380-400 V	A	-	-	-	-	-	6	4
	415 V	A	-	-	-	-	-	5	-
	500 V	A	-	-	-	-	-	4	-
	690 V	A						2	
DC-13	24 V	A	-	-	-	-	-	6,0	2,5
	48 V	A	-	-		-	-	4,0	1,5
	110 V	A	-	-		-	-	2	0,7
	220 V	A	-	-		-	-	0,7	0,35
Auxiliary contacts reliability								U_e min=17 V, I_e min=5 mA	U_e min=24 V, I_e min=30 mA
Terminal capacity		mm^2	1 x / 2 x (0,5...2,5)						
Tightening torque		Nm	0,8			1...1,5			0,8

Technical data

Type				CE07	CEC07	CEC09	CEC012	CEC016	CECA0	CAE04
Terminal capacity										
			mm^2	1 x / 2 x (0,5...2,5)						
Tightening torque			Nm	0,8	1...1,5					0,8
Control circuit										
Power consumption of the coil	AC	Closing	VA	20	30					20
		Cos φ			0,8					
		Closed	VA	3,3...5,5	2...3					3,3...5,5
		Cos φ		0,2	0,27					0,2
	DC		W	-	2,6...3,7					-
Switching time	Closing/opening (AC)		ms	9...30 / 5...25	8...20 / 6...13					9...30 / 5...25
	Closing/opening (DC)		ms	-	35...45 / 7...12					-
	Coils rated voltage		V	12-660 VAC	12-660 VAC / 12-440 VDC					12-660 VAC
	Coil operational limits				0,85...1,1					



1 - Mini contactor

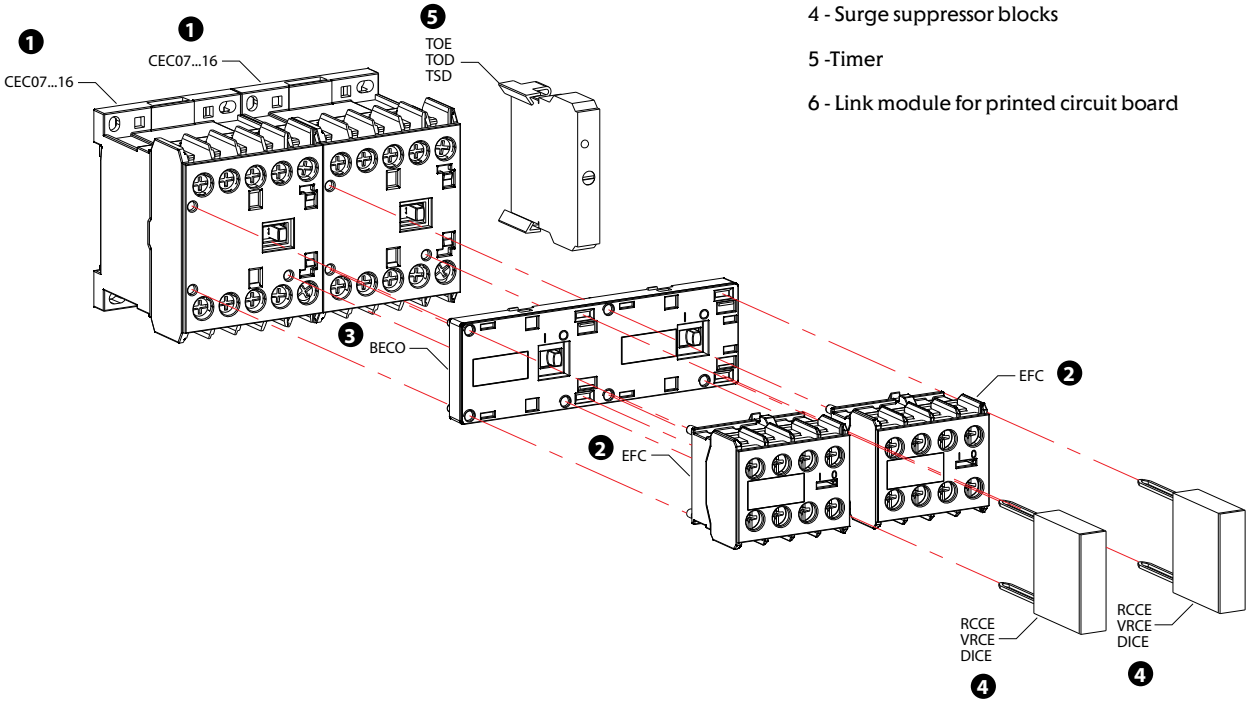
2 - Auxiliary frontal contacts block

3 - Mechanical interlock block

4 - Surge suppressor blocks

5 -Timer

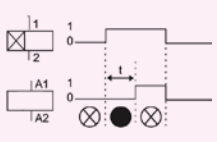
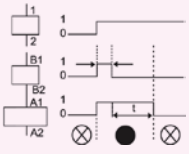
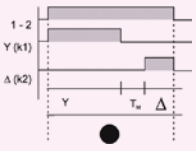
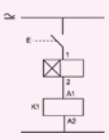
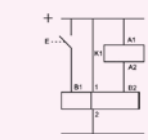
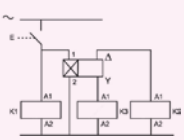
6 - Link module for printed circuit board



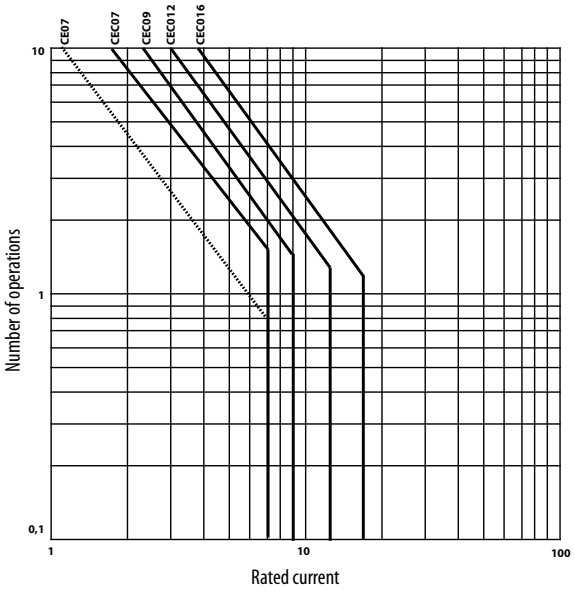
Auxiliary contact block			
Standards			IEC 60947-5-1, IEC 60947-4-1
Rated Insulation voltage Ui	IEC, VDE 0660		1000
Rated operational voltage Ue	IEC, VDE 0660	(V)	690
Conv. thermal current Ith		A	10
Rated operational current (Ie)			
AC-15(IEC 60947-5-1)	Ue ≤ 240V	(A)	10
	380-400V	(A)	6
	415-440V	(A)	6
	500V	(A)	4
	660-690V	(A)	-
UL, CSA 1)			A600
DC-13(IEC 60947-5-1)	24V	(A)	1,5
	60V	(A)	0,5
	110V	(A)	0,4
	220-240V	(A)	0,4
UL, CSA 1)			Q600
Short circuit protection max. fuse gL/gG		(A)	10
Control circuit reliability		(V / mA)	17 / 5
Electrical life span		c. op.	1.000.000
Mechanical life span		c. op.	10.000.000
Nr. of conductors and cross section	Stranded without end sleeve	mm^2	2x (0,5...2,5)
Tightening torque		Nm	0,8...1,5

Electronic timer blocks TOE, TOD, TSD				
Inputs	Rated insulation voltage (U_i)		V	300
	Supply voltage (U_e)	1 - 2 terminals	V	24...240 V AC/DC 50/60 Hz (TOE)
				24...60 V AC/DC 50/60 Hz (TOD)
				100...60 V AC/DC 50/60 Hz (TOD)
				220-240 V AC 50/60 Hz (TSD)
				110-130 V AC (TSD)
				24-28 V AC 50/60 Hz (TSD)
	Command (Uc) (only TOD)	2 - B1 terminals	V	24...60 V AC/DC 50/60 Hz (TOD)
				100...240 V AC/DC 50/60 Hz (TOD)
	Voltage limits			0,85 - 1,1 x U_c -> AC
				0,8 - 1,25 x U_c -> DC
	Consumption		mA	≤ 5
Time adjustment	Min. time for Reset		ms	100
	Min. command time (only TOD)		ms	50
	Setting accuracy (% of the full scale value)		%	+/-5
	Repeat accuracy		%	+/-1
	Changeover time Y - Δ		ms	50

Diagrams

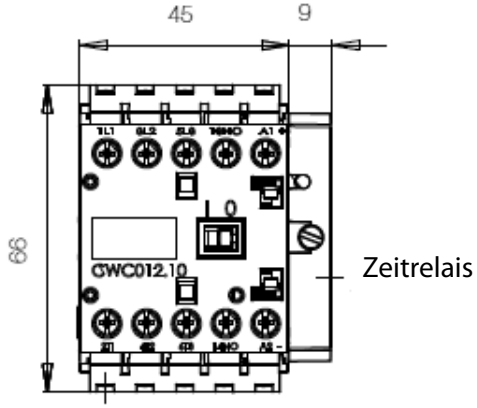
Function	ON Delay TOE		OFF Delay TOD		Star - delta TSD	
Functional diagram						
LED on ●						
LED off ⊗						
Schemes	Terminals		Terminals		Terminals	
	1		(+)1		1	
	2		B1		2	
			(-)2		D	
			B2		Y	

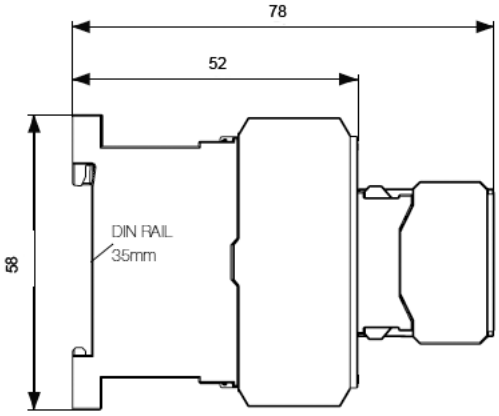
Diagram

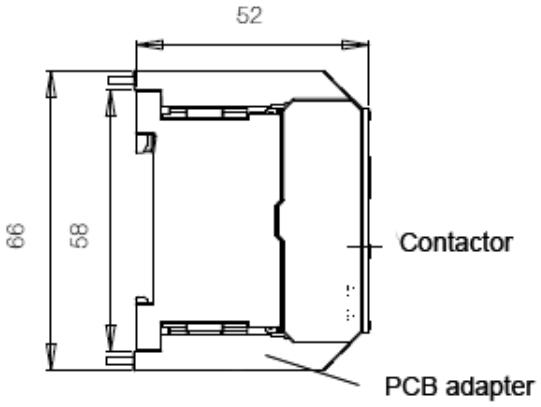


Dimensions

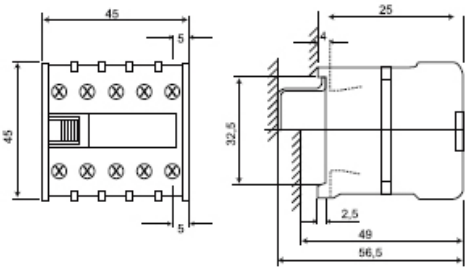
CEC - Dimensions with PCB adapter



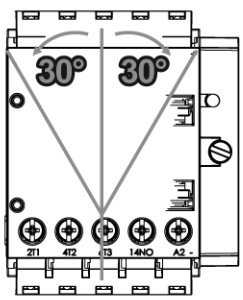


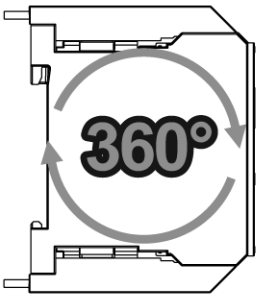


CE07



Mounting





Motor contactor CES

CES contactors

Contact endurance of the main contacts
The characteristic curves show the contact endurance of contactors when switching resistive and inductive three-phases loads (AC-1/AC-3) depending on the breaking current and the rated operational voltage. It is assumed that the control devices operate randomly, i.e. not in synchronism with the phase angle of the supply system.

The rated operational current I_e for AC-4 duty (breaking 6 times the rated operational current) is selected for a contact endurance of approximately 200,000 operating cycles.

If a shorter endurance is sufficient, the rated operational current I_e/ AC-4 can be increased.

If mixed operation is involved, i.e. normal switching (breaking of rated operational current in AC-3 duty) with intermittend inching (breaking multiples of the rated operational current in AC-4 duty) the contact endurance can be calculated approximately from the following equation:

$$X = \frac{A}{1 + \frac{C}{100}\left(\frac{A}{B} - 1\right)}$$

Legend to the equation:
X Contact endurance for mixed operation in operating cycles
A Contact endurance for normal operation (Ia=Ie) in operating cycles
B Contact endurance for inching (Ia= multiple of Ie) in operating cycles
C Percentage of inching operations in total operations

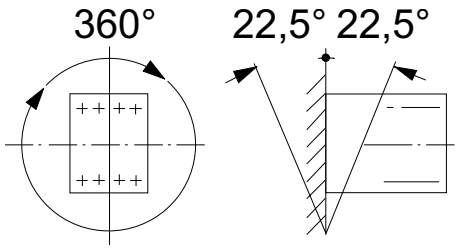
Short-circuit protection of CES 6 to CES 105 contactors without overload relay
Fuses, utilization category gG
or miniature circuit-breaker with C-characteristics

Technical data

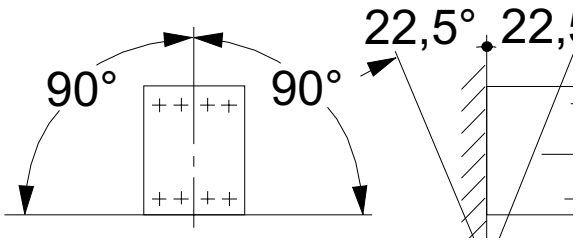
Contactor	Type		CES 6	CES 9	CES 12	CES 18	CES 25	CES 32
Main circuit								
With fuses								
- acc. to IEC 60947-4-1	Type of coordination "1"[1]	A	32	32	32	32	63	63
	Type of coordination "2"[1]	A	20	20	25	25	40	40
- weld-free[2]	$I_k \geq 100 \times I_e$	A	10	10	10	10	16	16
With miniature circuit breaker	C-characteristic	A	16	16	25	25	--	--
Auxiliary circuit (short circuit current $I_k \geq 1$ kA)								
Contactor	Size		0 ... 1					
	Type		CES 6 ... CES 32					
With fuses		A	16					
		A	6, if overload relay auxiliary contacts are in the contactor coil circuit					
with miniature circuit-breaker		A	10					
with C-characteristics		A	3, if overload relay auxiliary contacts are in the contactor coil circuit					
Contactor	**Type**		**CES 40**	**CES 45**	**CES 65**	**CES 75**	**CES 85**	**CES 105**
Main circuit								
With fuses								
- acc. to IEC 60947-4-1	Type of coordination "1"[1]	A	80	80	160	160	250	250
	Type of coordination "2"[1]	A	63	63	100	100	125	160
- weld-free[2]	$I_k \geq 100 \times I_e$	A	25	25	63	80	125	125
With miniature circuit breaker	C-characteristic	A	--	--	--	--	--	--
Auxiliary circuit (short circuit current $I_k \geq 1$ kA)								
Contactor	Size		0 ... 4					
	Type		CES 40 ... CES 105					
With fuses		A	16					
		A	6, if overload relay auxiliary contacts are in the contactor coil circuit					
with miniature circuit-breaker		A	10					
with C-characteristics		A	3, if overload relay auxiliary contacts are in the contactor coil circuit					

[1] In accordance with IEC 60947-4-1:
Type of coordination "1": Destruction of contactor and overload relay is admissible. Contactor and/or overload relay must be replaced if necessary.
Type of coordination "2": No damage can be tolerated on the overload relay, but contact welding on the contactor is permitted if the contacts can easily be separated.
[2] Test conditions according to IEC 60947-4-1.

Mounting position

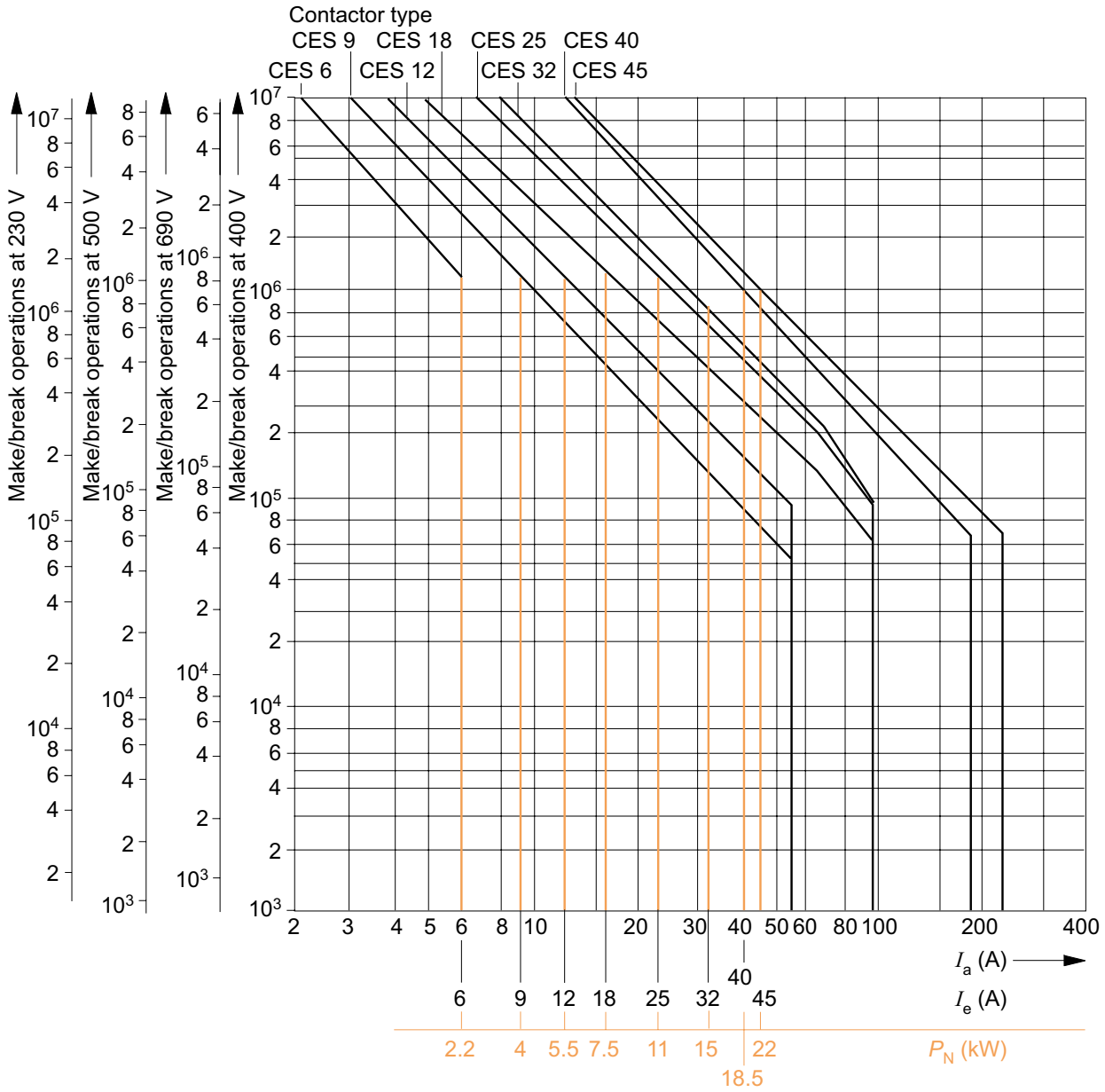


CES 6 to CES 32 (AC operation)



CES 6 to CES 32 (DC operation)
CES 40 to CES 105 (AC operation)

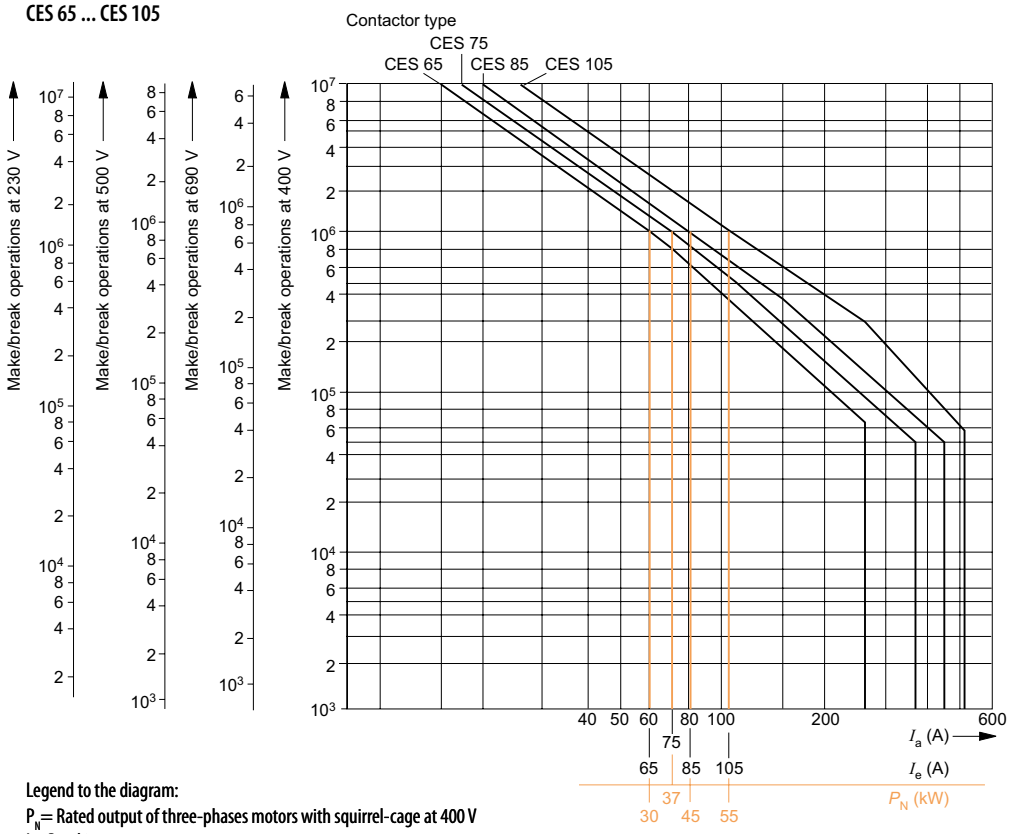
CES 6 ... CES 45



Legend to the diagram:
P_N = Rated output of three-phases motors with squirrel-cage at 400 V
I_a = Breaking current
I_e = Rated operational current

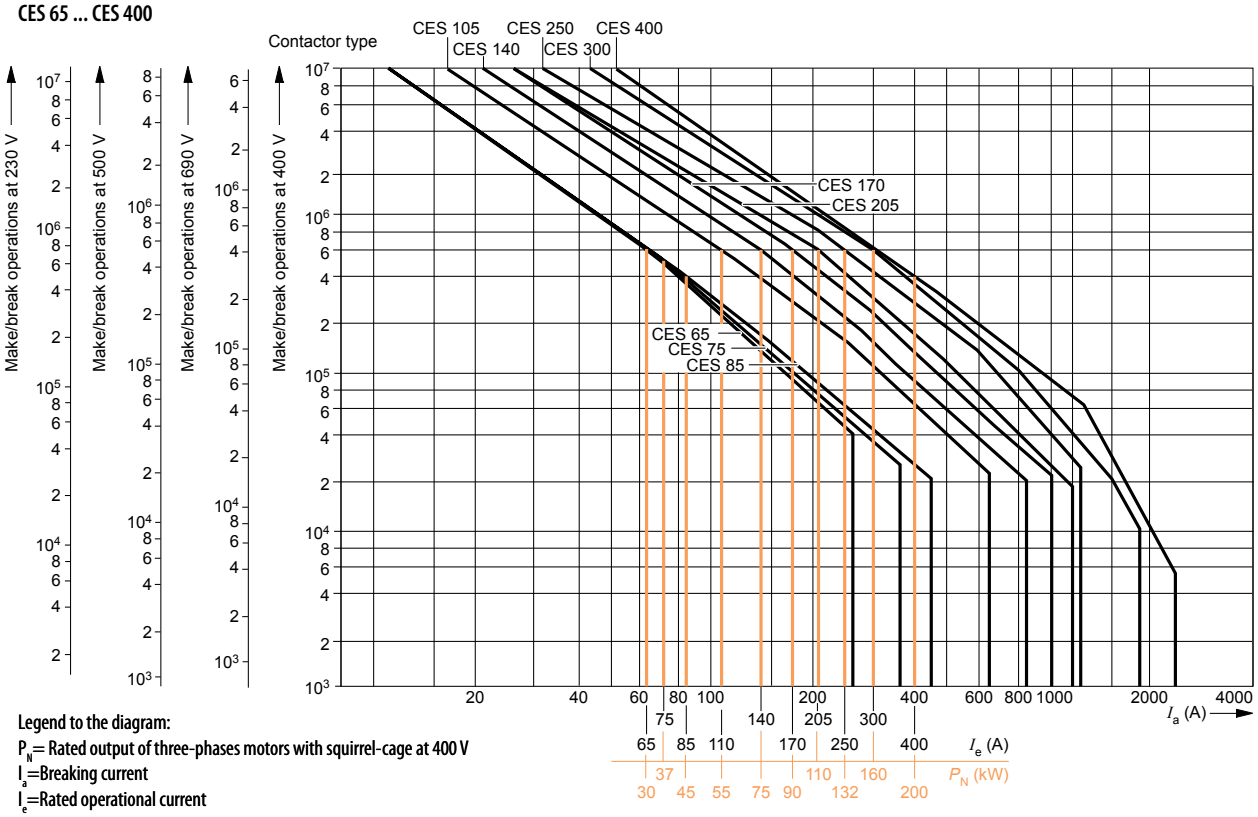
CES contactors

CES 65 ... CES 105



Legend to the diagram:
P_N = Rated output of three-phases motors with squirrel-cage at 400 V
I_a = Breaking current
I_e = Rated operational current

CES 65 ... CES 400



Legend to the diagram:
P_N = Rated output of three-phases motors with squirrel-cage at 400 V
I_a = Breaking current
I_e = Rated operational current

Technical data

Contactor	Type			CES 6 ... CES 18	CES 25, CES 32
General data					
Mechanical endurance	Basic units		Operating cycles	15 Mio	
	Auxiliary contact blocks			10 Mio	
Rated insulation voltage U_i (pollution degree 3)			V	690	
Rated impulse withstand voltage U_{imp}			kV	8	
Protective separation[1] **between coil and main contacts**			V	≤ 500	≤ 690
Permissible ambient temperature[2]			°C	-25 to +55 in operation, -50 to +80 when stored	
Degree of protection	acc. to IEC 60947-1			IP 20	
Power consumption of the coils				(with cold coil) and 1.0 x U_s	
AC operation			Hz	50/60	
	closing		VA	77/71	
	cos φ			0.81/0.75	
	closed		VA	11/9	
	cos φ			0.28/0.27	
DC operation	closing = closed		W	6.2	
Permissible residual current of the electronics (at 0-Signal)				$\leq 8\ mA \times \frac{220\ V}{U_s}$ AC operation	$\leq 1.25\ mA \times \frac{220\ V}{U_s}$ DC operation
Coil voltage tolerance				0.8 ... 1.1 x U_s	
Operating times at 0.8 to 1.1 x Us	Break time = opening time + arcing time			(Values are applicable with the coil in cold state and at operating temperature)	
AC operation	closing time		ms	8 ... 35	10 ... 35
	opening time		ms	4 ... 18	5 ... 20
DC operation	closing time		ms	20 ... 170	35 ... 180
	opening time		ms	10 ... 25	10 ... 25
Arcing time			ms	10	10
Operating times at 1.0 x U_s					
AC operation	closing time		ms	10 ... 25	10 ... 25
	opening time		ms	5 ... 18	5 ... 20
DC operation	closing time		ms	30 ... 70	40 ... 80
	opening time		ms	12 ... 20	10 ... 20
Shock resistance	Rectangular pulse	AC	g/ms	7.7/5 & 4.4/10	5.5/5 & 3.2/10
		DC	g/ms	9.3/5 & 5.4/10	5.8/5 & 3.4/10
	Sine pulse	AC	g/ms	12/5 & 6.8/10	8.7/5 & 5.1/10
		DC	g/ms	14.7/5 & 8.5/10	9/5 & 5.3/10
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible	**Main conductor:**				
	solid		mm^2	2 x (0.5 ... 1); 2 x (1 ... 2.5); 1 x 4	2 x (2.5 ... 6)
	finely stranded with end sleeve		mm^2	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)	2 x (0.5 ... 1); 2 x (1.5 ... 4)
	Pin-end connector (DIN 46 231)		mm^2	1 x (1 ... 2.5)	1 x (1 ... 6)
	solid or stranded		AWG	2 x (18 ... 12)	2 x (14 ... 10)
	Terminal screw			M3.5	M4
	Auxiliary conductor:				
	solid		mm^2	2 x (0.5 ... 1); 2 x (1 ... 2.5)	2 x (0.5 ... 1); 2 x (1 ... 2.4)
	finely stranded with end sleeve		mm^2	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)
	Pin-end connector (DIN 46 231)		mm^2	2 x (1 ... 1.5)	2 x (1 ... 1.5)
	solid or stranded		AWG	2 x (18 ... 12)	2 x (18 ... 12)
Specified tightening torque of the terminal screws	**Main conductor:**			0.8 ... 1.4 Nm (7 ... 12 lb.in)	1 ... 1.5 Nm (8.8 ... 13 lb.in)
	Auxiliary conductor			0.8 ... 1.4 Nm (7 ... 12 lb.in)	0.8 ... 1.4 Nm (7 ... 12 lb.in)
Operating frequency z in operating cycles per hour (o.c./h)				Operation: AC	Operation: DC	Operation: AC	Operation: DC
Contactors without overload relay	No-load operating frequency		1/h	10000	1500	5000	1500
	Rated duty at AC-1		1/h	1500	1500	1500	1500
	at AC-2 and AC-3		1/h	1000	1000	750	750
	at AC-4		1/h	250	250	250	250
Contactor with overload relay (mean value)			1/h	15		15	

[1] Acc. to IEC 60947-1, Annex N.

[2] When CES 6 to CES 32 AC operated contactors are mounted in rows, the minimum gap between them must be 5 mm when the coil voltage is 1.1 x U_s, the ambient temperature ≥ 45 °C and the load factor of all relays is 100 %.

Technical data

Contactor	Type			CES 40		CES 45	
General data							
Mechanical endurance	Basic units		Operating cycles	10 Mio			
	Auxiliary contact blocks			10 Mio			
Rated insulation voltage U_i (pollution degree 3)			V	690			
Rated impulse withstand voltage U_{imp}			kV	8			
Protective separation[1] **between coil and main contacts**			V	≤ 415			
Permissible ambient temperature			°C	-25 to +55 in operation, -50 to +80 when stored			
Degree of protection	acc. to IEC 60947-1			IP 00			
Power consumption of the coils				(with cold coil) and 1.0 x U_s			
AC operation			Hz	50/60			
	closing		VA	121/117			
	p.f.			0.79/0.72			
	closed		VA	16.5/13			
	p.f.			0.27/0.28			
Coil voltage tolerance				0.8 ... 1.1 x U_s			
Operating times at 0.8 to 1.1 x Us	Break time = opening time + arcing time						
AC operation[2]	closing time		ms	13 ... 57			
	opening time		ms	5 ... 10			
Arcing time			ms	10			
Operating times at 1.0 x U_s							
AC operation[2]	closing time		ms	13 ... 32			
	opening time		ms	5 ... 10			
Shock resistance	Rectangular pulse	AC	g/ms	5.7/5 & 3.3/10			
		DC	g/ms	5.7/5 & 3.3/10			
	Sine pulse	AC	g/ms	9/5 & 5.2/10			
		DC	g/ms	9/5 & 5.2/10			
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible)	**Main conductor:**			Front terminal connected 	Back terminal connected 	Both terminal connected: Front terminal 	Back terminal
	solid		mm²	1 ... 16	1 ... 16	1 ... 16	1 ... 16
	finely stranded without end sleeve		mm²	2.5 ... 16	1.5 ... 16	2.5 ... 10	1.5 ... 16
	finely stranded with end sleeve		mm²	1 ... 16	1 ... 16	1 ... 10	1 ... 16
	standed		mm²	2.5 ... 25	1.5 ... 25	2.5 ... 10	1.5 ... 25
	Pin-end connector (DIN 46 231)		mm²	1 ... 6	1 ... 6	1 ... 6	1 ... 6
	solid or stranded		AWG	14 ... 3	16 ... 3	14 ... 6	16 ... 3
	Terminal screw			M5	M5	M5	M5
	Auxiliary conductor:						
	solid		mm²	2 x (0.5 ... 1); 2 x (1 ... 2.5)			
	finely stranded with end sleeve		mm²	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)			
	Pin-end connector (DIN 46 231)		mm²	2 x (1 ... 1.5)			
	solid or stranded		AWG	2 x (18 ... 12)			
Specified tightening torque of the terminal screws	**Main conductor:**			2.5 ... 3.0 Nm (22 ... 26.5 lb.in)			
	Auxiliary conductor			0.8 ... 1.4 Nm (7 ... 12 lb.in)			
Operating frequency z in operating cycles per hour (o.c./h)				Operation:		Operation:	
				AC	DC	AC	DC
Contactors without overload relay	No-load operating frequency		1/h	5000	on request	5000	on request
	Rated duty at AC-1		1/h	1200	1200	1200	1200
	at AC-2		1/h	600	600	600	600
	at AC-3		1/h	600	600	600	600
	at AC-4		1/h	250	250	200	600
Contactor with overload relay (mean value)			1/h	15		15	

[1] Acc. to IEC 60947-4-1, Annex N.

[2] The opening time delay of the NO contacts and the closing time of the NC contacts are increased when the contactor coil is protected against voltage peaks (diode 6 to 9 times; diode combination 2 to 6 times, varistor + 2 to 5 ms).

Technical data

Contactor	Type			CES 65	CES 75	CES 85	CES 105
General data							
Mechanical endurance	Operating cycles			10 million (AC operation)			
Rated insulation voltage U_i (pollution degree 3)			V	1000			
Rated impulse withstand voltage U_{imp}			kV	8			
Protective separation[1] **between coil and main contacts**			V	≤ 500		≤ 690	
Permissible ambient temperature			°C	-25 to +55 in operation, -50 to +80 when stored			
Degree of protection	acc. to IEC 60947-1			IP 00/oper type, operating mechanism IP40			
Power consumption of the coils				(with cold coil) and 1.0 x U_s			
AC operation			Hz	50/60			
	closing		VA	225/192		398/345	
	p.f.			0.6/0.54		0.5/0.4	
	closed		VA	24/16		46/29	
	p.f.			0.29/0.29		0.23/0.24	
Coil voltage tolerance				0.8 ... 1.1 x U_s			
Operating times at 0.8 to 1.1 x Us	Break time = opening time + arcing time						
AC operation[2]	closing time		ms	15 ... 40		20 ... 50	
	opening time		ms	5 ... 25		5 ... 30	
Arcing time			ms	10 ... 15			
Operating times at 1.0 x U_s							
AC operation[2]	closing time		ms	17 ... 30		22 ... 35	
	opening time		ms	5 ... 25		5 ... 30	
Shock resistance	Rectangular pulse	AC	g/ms	11.2/5 & 6/10		8.4/5 & 4.8/10	
		DC	g/ms	10.7/5 & 6.2/10 (14.5 & 7.7/10)[1]		8.3/5 & 4.75/10	
	Sine pulse	AC	g/ms	17.6/5 & 10.3/10		13.2/5 & 7.5/10	
		DC	g/ms	16.8/5 & 9.7/10 (22/5 & 12/10)[1]		13/5 & 7.4/10	
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible)	**Main conductor:** - with box terminal			Front terminal connected 	Back terminal connected 	Both terminal connected: Front terminal  Back terminal	
	solid		mm^2	6 ... 16	1 ... 16	1 ... 16	1 ... 16
	finely stranded without end sleeve		mm^2	10 ... 35	1.5 ... 16	1.5 ... 16	1.5 ... 16
	finely stranded with end sleeve		mm^2	6 ... 35	1 ... 16	1 ... 16	1 ... 16
	standed		mm^2	16 ... 50	1.5 ... 25	1.5 ... 25	1.5 ... 25
	solid or stranded		mm^2	10 ... 1/0	16 ... 3	16 ... 3	16 ... 3
	Terminal screw			M6			
	Tightening torque - without box terminal			4 ... 6 Nm (36 ... 52 lb. in)			
	finely stranded with cable lug		mm^2	10 ... 35[2]			
	standed with cable lug		mm^2	10 ... 50[2]			
	solid or stranded		AWG	7 ... 1/0			
	Terminal bar (max. width)		mm	12			
	Terminal screw			M6 x 20			
	Tightening torque			4 ... 6 Nm (36 ... 52 lb. in)			
	Auxiliary conductor:						
	solid		mm^2	2 x (0.5 ... 1); 2 x (1 ... 2.5); 1 x 4			
	finely stranded with end sleeve		mm^2	2 x (0.5 ... 1); 2 x (0.75 ... 2.5)			
	Pin-end connector (DIN 46 231)		mm^2	2 x (1 ... 1.5)			
	solid or stranded		AWG	2 x (18 ... 12)			
	Tightening torque		mm^2	0.8 ... 1.4 Nm (7 ... 12 lb. in)			

[1] In accordance with IEC 60947-1, Annex N.

[2] The opening time delay of the NO contacts and the closing time of the NC contacts are increased when the contactor coil is protected against voltage peaks (diode 6 to 9 times; diode combination 2 to 6 times, varistor + 2 to 5 ms).

Technical data

Contactors			Type	CES 140	CES 170	CES 205	CES 250	CES 300	CES 400
Rated power AC-3, 400V			KW	75	90	110	132	160	200
Rated operational current I_e	40° C AC-1		A	160	210	220	300	320	500
at 400V,	AC-3		A	140	170	205	250	300	400
at 400V,	AC-4		A	68	75	96	110	125	150
Conventional thermal current Ith	400V, +40° C		A	160	210	220	300	300	400
Ambient Temperature	Operation		°C	-25 ... +55					
	Storage		°C	-25 ... +70					
Humidity				+40°C no more than 50%, +25°C no more than 90%					
Altitude without derating			m	≤2000					
Mechanical Life			mil. cycles	4	4	4	4	4	4
Electrical Life			mil. cycles	0,6	0,6	0,6	0,6	0,6	0,4
Max. Operating Frequency without overload relay	at AC- 3		cycles/hr.	1200	600	600	600	600	600
	at AC- 4		cycles/hr.						
Rated insulation voltage U_i			V	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage U_{imp}			kV	8	8	8	8	8	8
Power consumption of the coils	AC operation	Closing	VA	550	910	910	1430	1430	2450
		Cos φ		0,45	0,38	0,38	0,34	0,34	0,21
		Closed	VA	39	58	58	84	84	115
		Cos φ		0,24	0,26	0,26	0,24	0,24	0,33
Coil type				AC 50/60Hz 24V, 110V, 220V, 380V					
Operating range o f coil	at Us AC		x Us	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1	0.8-1.1
AC operation at 1xU_s	Opening		ms	8…30	8…30	8…30	8…30	8…30	8…20
	Closing		ms	20…50	20…50	20…50	20…50	20…50	17…65
Conductor cross-selections (screw connection; 1 or 2 conductor connection possible	Main conductor:								
	finely stranded with cable lug		mm^2	35 ... 95		50 ... 240			
	stranded with cable lug		mm^2	50 ... 120		70 ... 240			
	solid or stranded		AWG	1/0 ... 250 MCM		2/0 ... 500 MCM			
	Terminal bar (max. with)		mm	20 x 3		25 x 3			
	Terminal screw			M8 x 25		M10 x 30			
	Tightening torque		Nm	10 ... 14		14 ... 24			
Degrees of Protection				IP00					
Short circuit protection without overload relay	Coordination type 2		A	225	315	315	355	450	460
Auxiliary switch block pre-mounted in side			1NO+1NC	√	√	√	√	√	√
			2NO+2NC	√	√	√	√	√	√
			4NO+4NC	√	√	√	√	√	√
Auxiliary switch block in addition - Top mounted			NO/NC	x					
Auxiliary switch block	Rated insulation voltage Ui		V	690					
	Rated impulse withstand voltage Uimp		kV	6					
	Rated current capacity			AC-15: 360VA; DC-13 33W					
	Conventional thermal current Ith		A	10					
Dimensions (AC - Operation) H / B; Width			mm	≤120 mm	≤ 135mm		≤ 145mm		≤ 160mm
Mounting				Screw mounted, Vertical +/- 22.5°C					
Main circuit Terminal screw type				Busbar - Hex head					
Certificates & Standards				CE, RoHS					

Technical data

Contactor	Type			CES 6	CES 9	CES 12	CES 18	CES 25	CES 32
Load ratings of the contactors with AC									
Thermal load	10 s current[1]		A	90	90	96	96	176	176
Power loss per conducting path	at I_e/AC-3		W	0.6	0.6	1.1	1.1	1.6	1.6
AC-1 duty, switching resistive load[2]									
Rated operational currents I_e	at 40 °C to	690 V	A	25	25	25	25	38	38
	at 55 °C to	690 V	A	20	20	20	20	32	32
Minimum conductor cross-section at I_e load	at 40 °C		mm^2	4	4	4	4	10	10
	at 55 °C		mm^2	4	4	4	4	10	10
AC-2 and AC-3 duty									
Rated operational currents I_e	up to	400 V	A	6	9	12	18	25	32
		500 V	A	6	9	12	16	17	32
		690 V	A	6	6.6	8.8	12.2	12.2	27
Max. rating of slipring or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	1.5	2.4	3.3	4	5.5	8.5
		400 V	kW	2.2	4	5.5	7.5	11	15
		500 V	kW	3	5.5	7.5	9	11	21
		690 V	kW	4	5.5	7.5	11	11	23
AC-4 duty (contact endurance approx. 200.000 operating cycles Ia = 6 x I_e)									
Rated operational currents I_e	up to	400 V	A	3.1	3.3	4.3	7.7	8.5	15.6
		690 V	A	3.1	3.3	4.3	7.7	8.5	15.6
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	0.8	0.85	1.15	2	2.2	4.3
Max. permitted rated operational current I_e/AC-4 = ^ I_e/AC-3 up to 500 V with endurance and operating frequency		400 V	kW	1.15	1.4	1.9	3.5	4	7.5
		690 V	kW	1.9	2.4	3.3	6	6.6	13
Contactor	**Type**			**CES 40**	**CES 45**	**CES 65**	**CES 75**	**CES 85**	**CES 105**
Load ratings of the contactors with AC									
Thermal load	10 s current[1]		A	400	400	360	500	800	800
Power loss per conducting path	at I_e/AC-3		W	2.0	2.5	3.5	6	7.5	10
AC-1 duty, switching resistive load[2]									
Rated operational currents I_e	at 40 °C to	690 V	A	65	65	90	100	105	105
	at 55 °C to	690 V	A	55	55	80	90	100	105
Minimum conductor cross-section at I_e load	at 40 °C		mm^2	16	16	35	35	50	50
	at 55 °C		mm^2	16	16	25	35	35	35
AC-2 and AC-3 duty									
Rated operational currents I_e	up to	400 V	A	40	45	65	75	85	105
		500 V	A	32	38	40	63	75	85
		690 V	A	27	27	40	63	75	75
		1000 V	A	--	--	6	6	30	30
Max. rating of slipring or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	11	15	18.5	22	26	37
		400 V	kW	18.5	22	30	37	45	55
		500 V	kW	21	25	30	41	50	59
		690 V	kW	23	23	39	56	67	67
		1000 V	A	--	--	--	--	39	39
AC-4 duty (contact endurance approx. 200.000 operating cycles Ia = 6 x I_e)									
Rated operational currents I_e	up to	400 V	A	18.5	24	28	34	42	54
		690 V	A	18.5	24	28	34	42	54
		1000 V	A	--	--	--	23	23	34
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	5.2	7.3	8.5	10.3	12	16.3
Max. permitted rated operational current I_e/AC-4 = ^ I_e/AC-3 up to 500 V with endurance and operating frequency		400 V	kW	9	12.6	14.7	17.9	22	28.4
		690 V	kW	15.5	20.8	24.3	29.5	38	49
		1000 V	kW	--	--	--	30	30	45
Contactor	**Type**			**CES 140**	**CES 170**	**CES 205**	**CES 250**	**CES 300**	**CES 400**
Load ratings of the contactors with AC									
Thermal load	10 s current[1]		A	1140	1360	1640	2500	2500	3400
Power loss per conducting path	at I_e/AC-3		W	14	14	20	16	23	40
AC-1 duty, switching resistive load[2]									
Rated operational currents I_e	at 40 °C to	690 V	A	170	230	240	325	325	425
	at 55 °C to	690 V	A	160	210	220	300	300	400
Minimum conductor cross-section at I_e load	at 40 °C		mm^2	70	120	120	185	185	2x150
	at 55 °C		mm^2	70	95	120	185	185	240
AC-2 and AC-3 duty									
Rated operational currents I_e	up to	500 V	A	140	170	205	250	300	400
		690 V	A	110	170	170	250	250	400
		1000 V	A	42	68	68	95	95	180
Max. rating of slipring or squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	45	56	66	82	96	131
		400 V	kW	75	95	115	142	168	232
		500 V	kW	98	118	145	178	210	289
		690 V	kW	105	163	163	245	245	397
		1000 V	A	65	90	90	132	132	250
AC-4 duty (contact endurance approx. 200.000 operating cycles Ia = 6 x I_e)									
Rated operational currents I_e	up to	690 V	A	68	75	96	110	125	150
		1000 V	A	34	42	42	57	57	80
Ratings of squirrel-cage motors at 50 and 60 Hz	at	230 V	kW	21	23	30	35	40	49
Max. permitted rated operational current I_e/AC-4 = ^ I_e/AC-3 up to 500 V with endurance and operating frequency		400 V	kW	36	40	52	61	69	85
		690 V	kW	63	69	90	105	119	147
		1000 V	kW	45	55	55	75	75	110

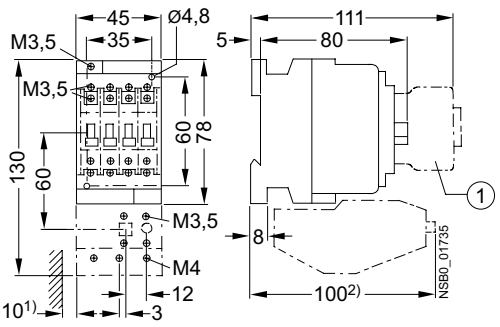
[1] Acc. to IEC 60947-4-1.

[2] Industrial furnaces and electric heaters with resistance heating for example (higher current during heating-up allowed for).

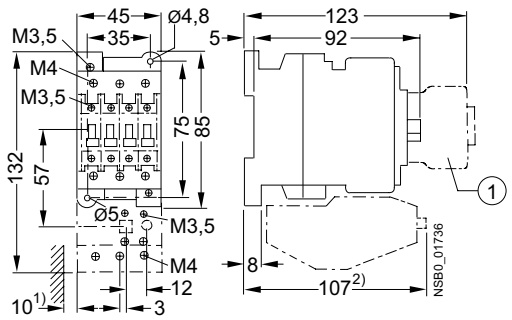
Dimensional drawings

AC operation

CES 6 ... CES 18



CES 25 ... CES 32



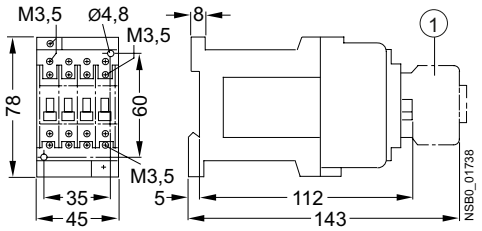
(1) Auxiliary switch block

1) Minimum clearance from the earthed parts.

2) Dimension for the square OFF-button (stroke 3 mm). Dimension for the round RESET-button (stroke 2.5 mm) less then 2.5 mm.

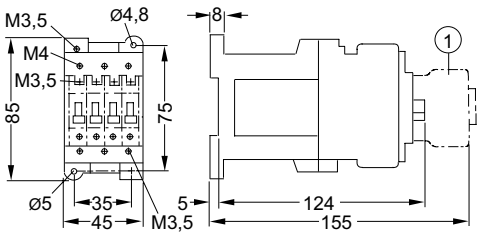
DC operation

CES 6 ... CES 18



(1) Auxiliary switch block

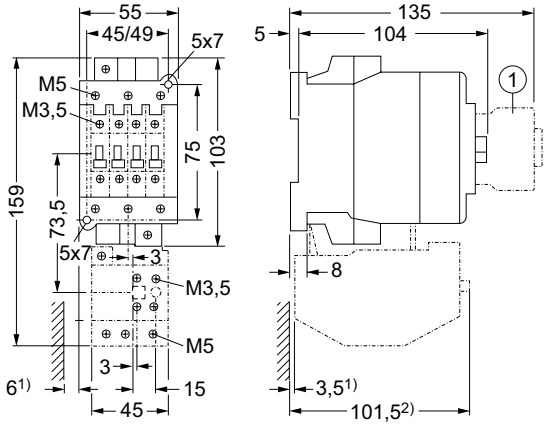
CES 25 ... CES 32



(1) Auxiliary switch block

- Clearance when mounted in rows:
  When CES 6 to CES 32 AC operated contactors are mounted in rows, the minimum gap between them must be 5 mm when the coil voltage 1.1 x U_s the ambient temperature ≥ 45 °C and the load factor of all relays is 100 %.

CES 40 ... CES 45

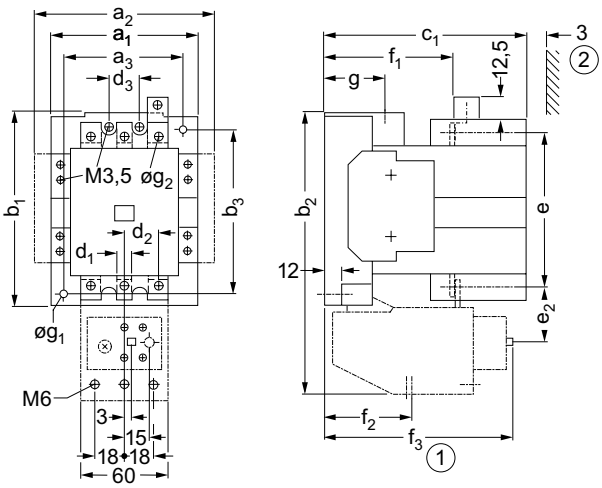


(1) Auxiliary switch block

1) Minimum clearance from the earthed parts.

2) Dimension for the square OFF-button (stroke 3 mm). Dimension for the round RESET-button (stroke 2.5 mm) less then 2.5 mm.

CES 65 ... CES 140

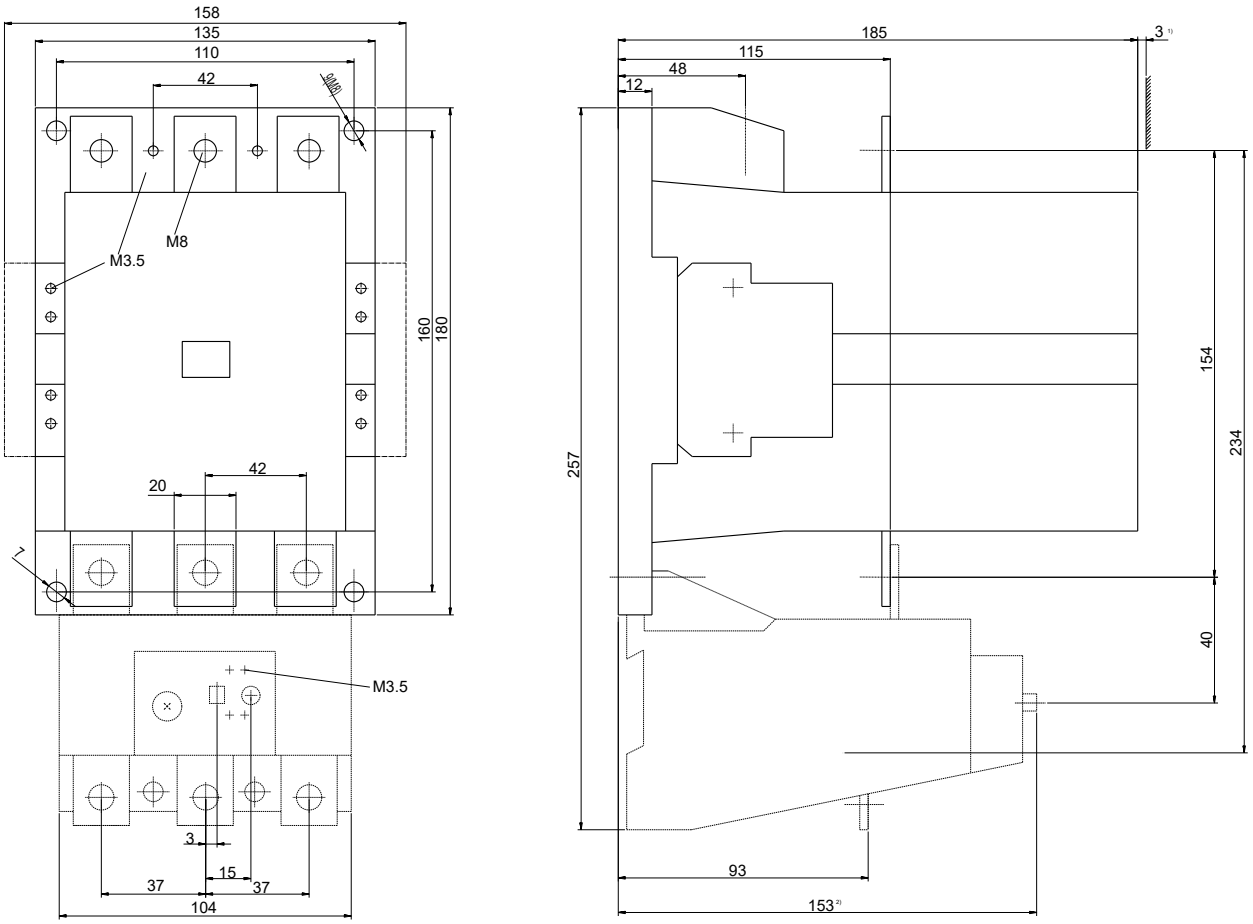


(1) Dimension for the square OFF-button (stroke 3 mm) Dimension for the round RESET-button (stroke 2.5 mm) less then 2.5 mm.

(2) Minimum clearance from insulated components 3 mm Minimum clearance from earthed components 10 mm

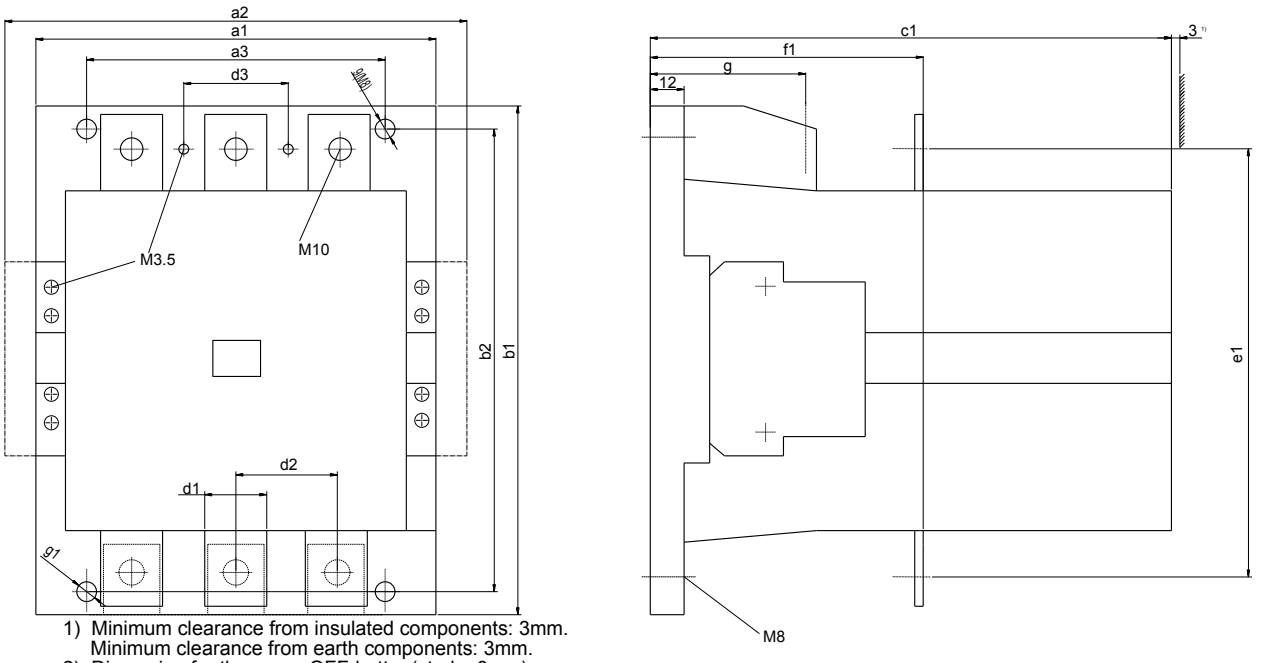
	a1	a2	a3	b1	b2	b3	c1	d1	d2	d3	e	e2	f1	f2	f3	g1	g2
CES 65 CES 75	90	113	70	117	175	100	123	8	26.5	25	94	80	63	122	28	4.8	6.1 (M6)
CES 85	100	123	80	133	194	110	140	8	26.5	25	107	89	63	122	39	5.5	6.1 (M6)
CES 105	100	123	80	133	194	110	140	10.5	26.5	25	116	89	63	122	39	5.5	6.1 (M6)
CES 140	120	143	100	150	232	130	150	20	42	37	139	40.5	93	80	146	6.3	9 (M)

CES 170 ... CES 205



1) Minimum clearance from insulated components: 3mm.
Minimum clearance from earth components: 3mm.
2) Dimension for the quqre OFF-button(stroke 3mm).
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm.

CES 250 ... CES 400



1) Minimum clearance from insulated components: 3mm.
Minimum clearance from earth components: 3mm.
2) Dimension for the quqre OFF-button(stroke 3mm).
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm.

	a1	a2	a3	b1	b2	c1	d1	d2	d3	(c1)[1]	e1	f1	g	g1
CES 250 - CES 300	145	168	120	200	180	198	25	48	48	198	168	132	58	9
CES 400	160	183	130	200	180	222	25	48	48	222	178	150	65	9

Only the same mechanical size contactors can be connected with mechanical interlock!		
	Mechanical interlock offset setting	
	Q1, Q2	Y (mm)
CES-MIL 65-300	CES 65...75	0
	CES 85...105	8
	CES 140	8
	CES 170...205	16
CES -MIL 400	CES400	-

Y (mm) mechanical interlock offset setting

Auxiliary contacts for CES contactors Technical Data

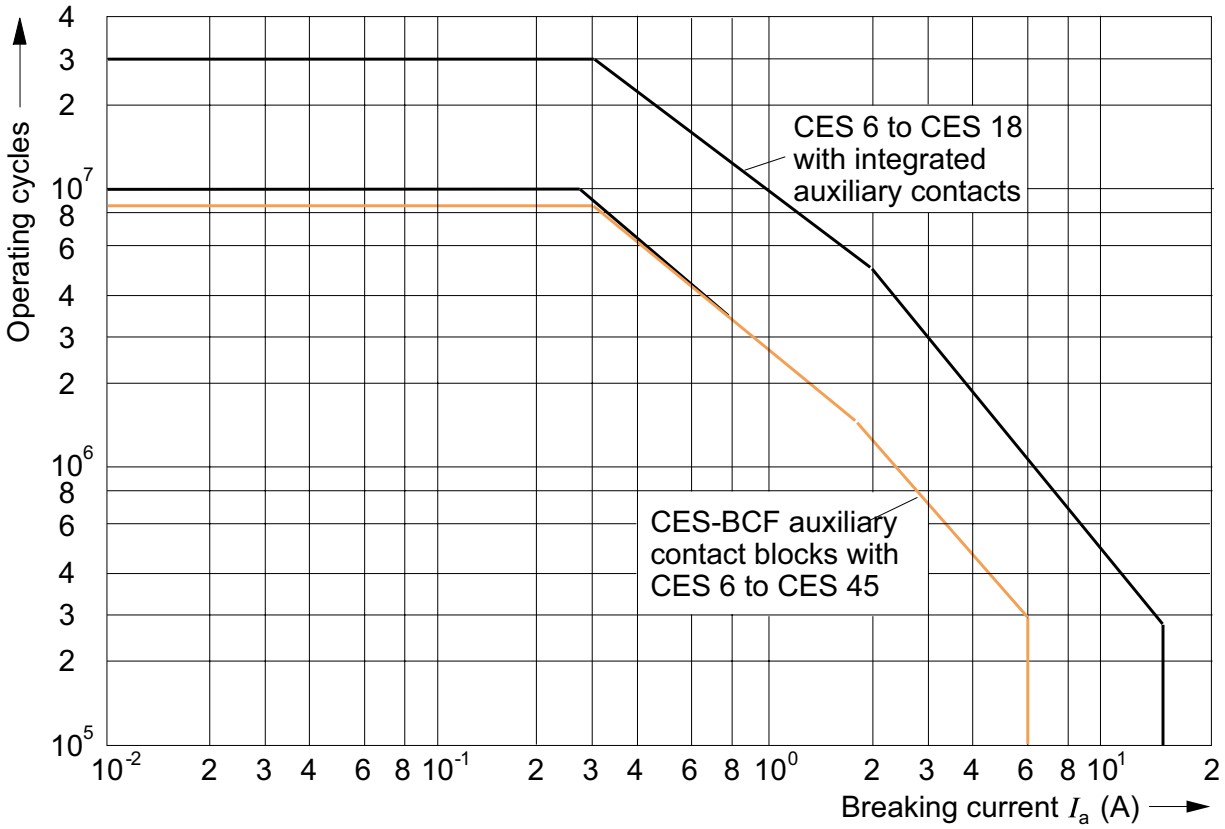
Type			CES 6 ... CES 32[1]	CES 6 ... CES 18[2]	CES 40, CES 45[1]	CES 65 ... CES 400
Rated insulation voltage U_i (pollution degree 3)		V	690	690	690	1000
Conventional free-air thermal current I_{th} = rated operational current I_e		A	10	10	10	10
AC duty **Rated operational current** I_e / AC-15/AC-14 at rated operational voltage U_e	24 V	A	6	10	10	10
	110 V	A	6	10	10	10
	125 V	A	6	10	10	10
	220 V	A	6	10	6	6
	230 V	A	5,6	9,6	5,6	5,6
	380 V	A	4	6	4	4
	400 V	A	3,8	5,5	3,6	3,6
	500 V	A	2,5	4	2,5	2,5
	660 V	A	2	2	2,5	2,5
	690 V	A	1,8	1,8	2,3	2,3
DC duty **Rated operational current I_e/DC-12** at rated operational voltage U_e	24 V	A	10	10	--	--
	48 V	A	10	10	--	--
	110 V	A	5,5	2,1	--	--
	125 V	A	--	--	--	--
	220 V	A	1,2	0,8	--	--
	440 V	A	0,28	0,6	--	--
	600 V	A	0,14	0,6	--	--
Rated operational current I_e/DC-13 at rated operational voltage U_e	24 V	A	10	10	--	--
	48 V	A	4,6	5	--	--
	110 V	A	0,8	0,9	--	--
	125 V	A	--	--	--	--
	220 V	A	0,3	0,45	--	--
	440 V	A	0,11	0,25	--	--
	600 V	A	0,08	0,2	--	--

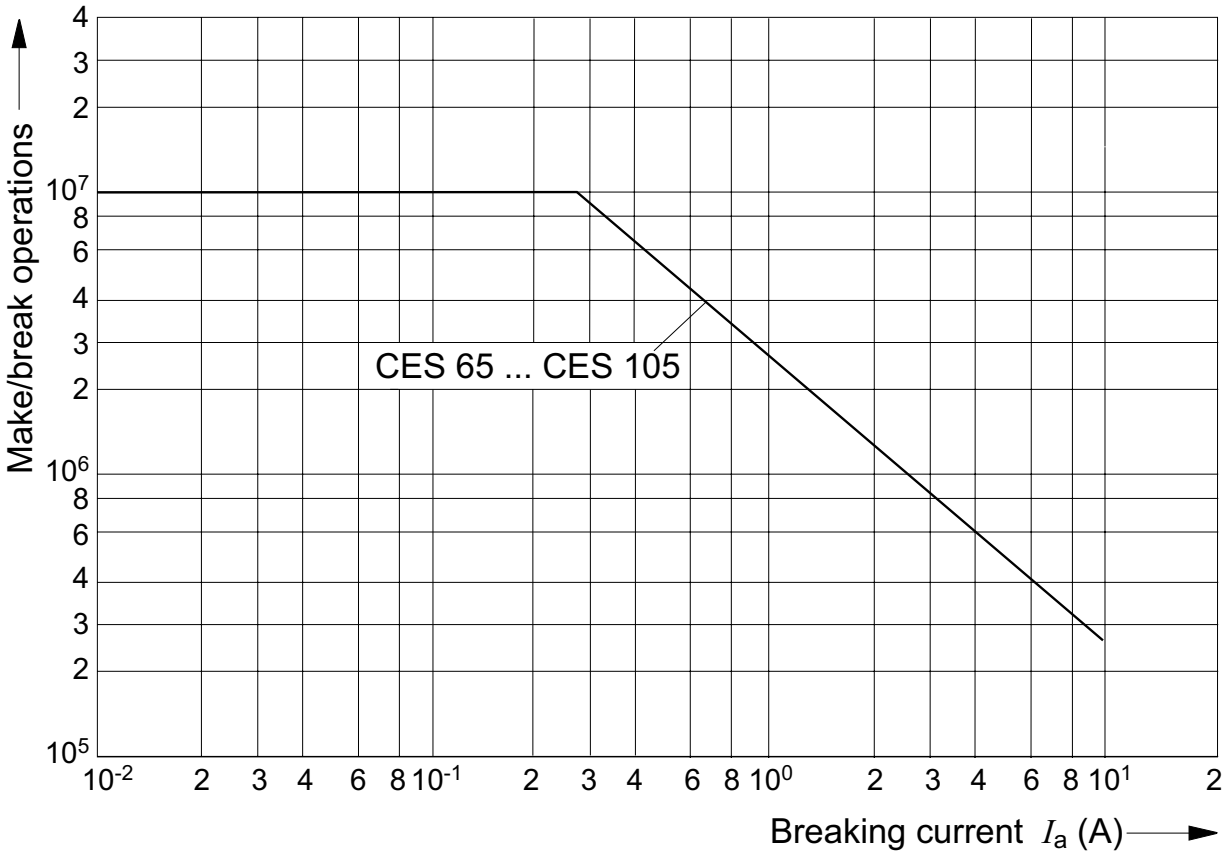
[1] Mountable auxiliary contact blocks.

[2] Integrated auxiliary contacts.

	AC operation for 0.8…1.1Us		DC operation for 0.85…1.1Us		Arcing time
	opening delay	closing delay	opening delay	closing delay	
CES 6	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 9	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 12	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 18	5 … 25	8 … 35	10 … 25	20 … 170	10
CES 25	5 … 25	10 … 35	10 … 25	35 … 180	10
CES 32	5 … 25	10 … 35	10 … 25	35 … 180	10
CES 40	5 … 25	13 … 57	13 … 17	54 … 182	10
CES 45	5 … 25	13 … 57	13 … 17	54 … 182	10
CES 65	5 … 25	15 … 40	100 … 120	15 … 88	10 … 15
CES 75	5 … 25	15 … 40	100 … 120	15 … 88	10 … 15
CES 85	5 … 30	20 … 50	90 … 140	20 … 90	10 … 15
CES 105	5 … 30	20 … 50	90 … 140	20 … 90	10 … 15
CES 140	8 … 30	20 … 50	-	-	10 … 15
CES 170	8 … 30	20 … 50	-	-	10 … 15
CES 205	8 … 30	20 … 50	-	-	10 … 15
CES 250	8 … 30	20 … 50	-	-	10 … 15
CES 300	8 … 30	20 … 50	-	-	10 … 15
CES 400	8 … 20	17 … 65	-	-	10 … 15

Contact endurance of the auxiliary contacts





Thermal overload relays, CLASS 10A

According to IEC 60947-4-1

Type		CES-RT0	CES-RT1	CES-RT2	CES-RT3
General data					
Trip class		CLASS 10A (2s < t_A ≤ 10s at 7.2 x I_e from cold state)			
Phase failure sensitivity by differential phase shift		✓	✓	✓	✓
Changeover to automatic reset		✓	✓	✓	✓
RESET button with trip-free feature		✓	✓	✓	✓
Temperature compensation		✓	✓	✓	✓
Switch position indicator		✓	✓	✓	✓
Test button actuates the NO and NC contacts		✓	✓	✓	✓
Terminal for contactor coil		✓	✓	✓	✗ [1)]
Permissible ambient temperature	°C	-25 ... +55			
Degree of protection acc. to IEC 60947-1		IP00/open or IP20			
Shock resistance	g/ms	8/10			
Main circuit					
Rated insulation voltage U_i (Pollution degree 3)	AC/DC V	690			
Rated impulse withstand voltage U_{imp}	kV	6			
Type of current, frequency range		DC; AC ≤ 400 Hz			
Conductor cross-sections					
Terminal screw		M4	M5	M4	M5
solid or stranded	mm^2	2.5 ... 6	1.5 ... 25	1.5 ... 25	2.5 ... 35
finely stranded with end sleeve	mm^2	1.5 ... 4	1 ... 16	1 ... 16	1.5 ... 25
Flat bars	mm	--	--	--	--
Tightening torque	Nm	1 ... 1.5	2.5 ... 3	2.5 ... 3	2.5 ... 3
	lb.in	9 ... 13	22 ... 26.5	22 ... 26.5	22 ... 26.5
Power loss per conduction path (max.)					
at lowest value	W (VA)	0.9	1.2	1.2	2.6
at highest value of the setting range	W (VA)	2.25	3	3	4
Auxiliary circuit					
Auxiliary contacts		1 NO + 1 NC			
Conductor cross-sections					
Terminal screw		M3.5			
solid or stranded	mm^2	2 x (0.5 ... 1)/2 x (1 ... 2.5)			
finely stranded with end sleeve	mm^2	2 x (0.5 ... 1)/2 x (0.75 ... 2.5)			
Tightening torque	Nm	0.8 ... 1.4			
	lb.in	7 ... 12			
Rated insulation voltage Ui (pollution degree 3)		Unequal potential (NO + NC)	Equal potential (NO + NC connected as changeover contact)	Unequal potential (NO + NC)	Equal potential (NO + NC connected as changeover contact)
	V	400	690	400	690
Rated impulse withstand voltage U_{imp}	kV	6			
Switching capacity		AC-15:			
Rated operational voltage U_e	V	24; 60; 125; 230; 400; 500; 690;			
Rated operational current I_e	A	2; 1.5; 1.25; 1.15; 1.1; 1; 0.8			
Conventional thermal current I_{th}	A	6			
Short-circuit protection		Fuses, utilization category gG 6A or miniature circuit-breaker with C-characteristics 3A			

According to IEC 60947-4-1

Main circuit			CES-RT4							
Current seting [Suggested]		**A**	**90-120**	**110-135**	**120-150**	**135-160**	**150-180**	**170-205**	**160-250**	**250-400**
Tripping class		Class	10A							
Protection functions	Tripping due to overload		✓							
	Tripping due to phase unbalance		✓							
	Tripping due to phase failure		✓							
	Phase failure sensitivity by differential phase shift		✓ (according to IEC60947-4-1)							
	Temperature compensation		✓							
Functions	Test button		✓							
	Reset button		Manual and Automatic RESET							
	Switch position indicator		✓							
	Terminal A2 for contactor coil connection		×							
Functions	Operation	°C	-25 ... +55							
	Storage/transport	°C	-25 ... +70							
	Temperature compensation	°C	≤ 70							
Altitude without derating		m	≤2000							
Rated insulation voltage Ui (polution degree 3)		V	1000							
Rated impulse withstand voltage Uimp		kV	6							
Type of current, frequency range			DC, AC ≤ 400Hz							
Degree of protection			IP00							
Touch protection			Finger-safe (with accessories)							
Resistance to extreme climates - air humidity		%	< 90%, 25° C; < 50%, 40° C							
Mounting			stand-alone mounting (the terminal busbar should fit contactor terminal)							
Terminals	Main current terminals		Busbar - Hex head							
	Auxiliary contact terminal		Remain as existing							
Max. wire diameter size	Single wire	mm^2	50 ... 120						≤200 A: 185, >200 :240	
	Stranded wire	mm^2								
	finely stranded with end sleeve	mm^2	25 ... 95						- - - -	
	Terminal size	[mm x mm]	20 x 3						20 x 3 / 2 x 30 x 5	
Auxiliary circuit										
Number of NO contacts			1	1	1	1	1	1	1	1
Number of NC contacts			1	1	1	1	1	1	1	1
Rated insulation voltage Ui (polution degree 3)		V	≥400							
Rated impulse withstand voltage Uimp		kV	6							
Conventional thermal current Ith		A	6							
Rated operational current Ie AC-15		A	Ue=220V, Ie=1.15A;Ue=380V, Ie=1.1A							
Dimensions H / B / T ; Width		mm			≤ 104mm		≤ 104mm		≤ 150mm	
Certificates & Standards			CE, RoHS							

Thermal overload relays, CLASS 10A

Short circuit protection with fuses for motor feeders with short-circuit currents up to 50 kA at 690V, 50/60 Hz[1)]
Permissible short-circuit fuses for motor starters consisting of overload relay and contactor, contactor assembly

Technical data according to IEC 60947-4-1

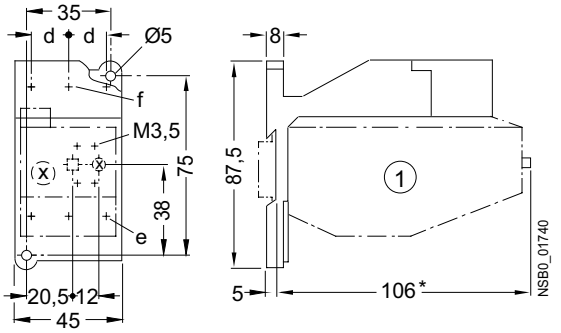
Setting range	Fuse links				
	Fuses, utilization category gG		Fuses, utilization category aM	Fuses acc.to British Standards BS 88 Type T	
	Type of coordination[2)]		Type of coordination[2)]	Type of coordination[2)]	
	"1"	"2"	"2"	"1"	"2"
A	A	A	A	A	A
CES-RT0					
0.1 ... 0.16	35	0.5 slow[3)]	--	25	--
0.16 ... 0.25	35	1[3)]	--	25	
0.25 ... 0.4	35	1.6[3)]	--	25	
0.4 ... 0.63	35	2	--	25	2
0.63 ... 1	35	4	--	25	4
1 ... 1.6	35	6	--	25	6
1.6 ... 2.5	35	6	--	25	10
2.5 ... 4	35	10	--	25	10
4 ... 6.3	35	16	--	25	16
6.3 ... 10	35	25	--	25	20
8 ... 12.5	35	25	--	25	20
12.5 ... 18	35	25	--	25	25
CES-RT1					
6.3 ... 10	63	25		63	25
10 ... 16	63	35	20	63	35
16 ... 25	63	50	40	63	50
25 ... 32	63	50	50	63	50
Setting range	Fuse links				
	Fuses, utilization category gG		Fuses, utilization category aM	Fuses acc.to British Standards BS 88 Type T	
	Type of coordination[2)]		Type of coordination[2)]	Type of coordination[2)]	
	"1"	"2"	"2"	"1"	"2"
A	A	A	A	A	A
CES-RT2					
16 ... 25	80	50		100	10
25 ... 36	80	80		100	10
36... 45	80	80	--	100	16
CES-RT3					
40 ... 57	160	125	63	160	100
57 ... 70	160	125	63	160	100
70 ... 88	250	160	100	160	125
88 ... 105	250	200	125	160	200
CES-RT4					
90 ... 120	315	224	125	315	224
110 ... 135	315	224	160	315	224
120 ... 150	315	224	160	315	224
135 ... 160	355	224	160	355	224
150 ... 180	355	224	200	355	224
160 ... 250	500	400	250	500	400
250 ... 400	800	500	400	800	500

[1)] Voltage tolerance +5 %.
[2)] Coordination of short-circuit equipment according to IEC 60947-4-1:
Type of coordination "1":
The contactor or starter must not endanger persons or the installation in the event of a short-circuit.
They do not need to be suitable for further operation without repair and the renewal of parts.
Type of coordination "2":
The contactor or starter must not endanger persons or the installation and must be suitable for further use.
There is a danger of contact welding.
[3)] D-fuse links $U_N = 500$ V

Thermal overload relays, CLASS 10A

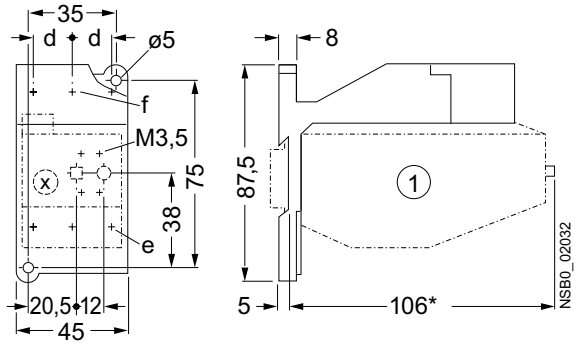
Dimensional drawings

CES-RT0, CES-RT1, with stand-alone adapter



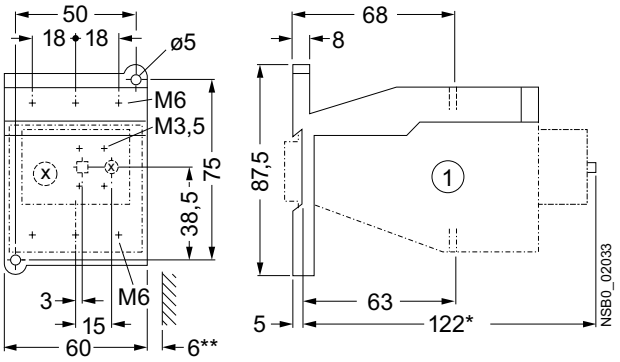
	d	e	f
CES-RT0 & CES-AD-RT0	10	M4	M3.5
CES-RT1 & CES-AD-RT1	14.3	M5	M4

CES-RT2 with CES-AD-RT2 stand-alone adapter

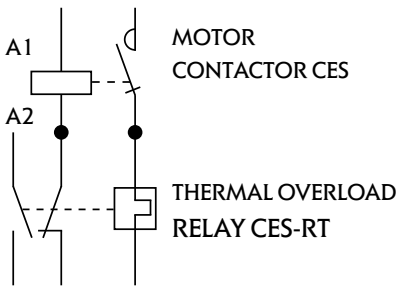


	d	e	f
CES-RT2 & CES-AD-RT2	18.5	M5	M5

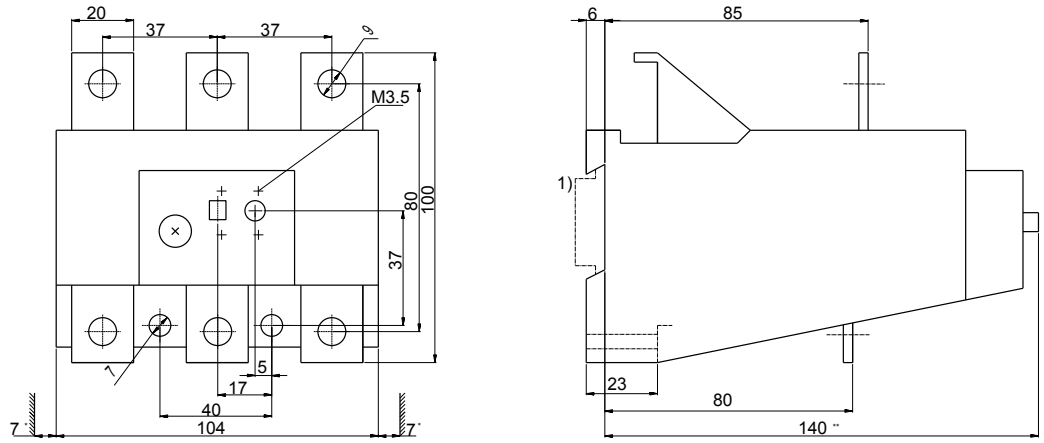
CES-RT3 with CES-AD-RT3 stand-alone adapter



APPLICATION NOTE:



CES-RT4 120, 135, 150

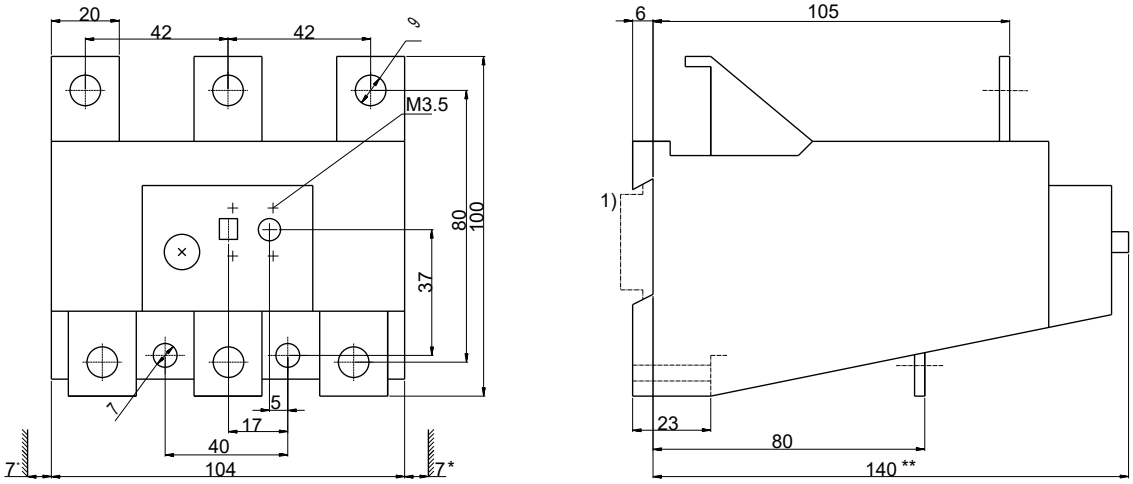


* Dimension for the ground engaging component

** Dimension for the suqre OFF-button(storke 3mm)
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm

1) For 35mm standard (DIN) mounting rail

CES-RT4 160, 180

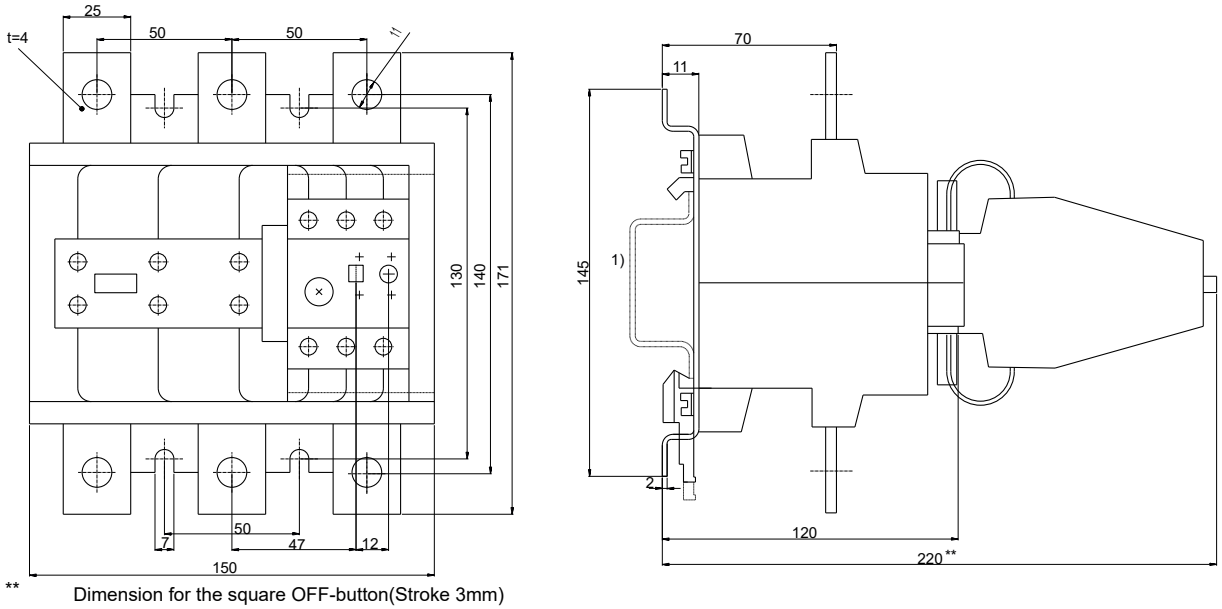


* Dimension for the ground engaging component

** Dimension for the suqre OFF-button(storke 3mm)
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm

1) For 35mm standard (DIN) mounting rail

CES-RT4 250, 400



** Dimension for the square OFF-button(Stroke 3mm)
Dimension for the round RESET-button(Stroke 2.5mm) less 2.5mm

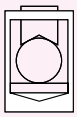
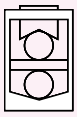
1) For 35mm standard (DIN) mounting rail

Motor contactor CEM

Contactors CEM up to 132 kW Technical Data

type		CEM 9	CEM 12	CEM 18	CEM 25	CEM 32	CEM 40	CEM 50	CEM 65	CEM 80	CEM 95	CEM 105	CEM 112E	CEM 150E	CEM 180E	CEM 250E	CEM 300E
Standards		IEC/EN 60 947, DIN VDE 0660															
Rated insulation voltage Ui (V) to IEC/EN 60 947, DIN VDE 0660		1000 V															
Rated impulse withstand voltage Uimp		6 kV						8 kV									
Rated operational frequency		25 - 400 Hz															
Degree of protection		Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)															
Main circuits		IP20				IP10							IP00				
Control circuits and auxiliary contacts		IP20															
Ambient temperature Operating temperature		-25 ... +55 °C															
Storage temperature		-55 ... +80 °C															
Altitude																	
Normal values 90 % Ie/80 % Ue 80 % Ie/75 % Ue		≤ 3000 m 3000 ... 4000 m 4000 ... 5000 m															
Overvoltage category/Pollution degree		III/3															
Climatic proofing		IEC 68-2															
Main circuits																	
Number of poles		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Rated operation voltage Ue		690 V						1000V									
Conv. thermal current Ith at ≤ 55°C																	
Rated operational current Ie/AC-1		25 A	25 A	32 A	45 A	60 A	60 A	90 A	110 A	110 A	140 A	140 A	180 A	225 A	225 A	350A	410A
AC-3 Duty																	
Rated operational power																	
230 V kW		2,2	3	4	6,5	9	11	15	18,5	22	25	30	30	45	55	75	90
400 V kW		**4**	**5,5**	**7,5**	**11**	**15**	**18,5**	**22**	**30**	**37**	**45**	**55**	**55**	**75**	**90**	**132**	**160**
415-440 V kW		4,5	5,5	9	12,5	15	22	30	37	45	55	55	55	90	110	150	185
500 V kW		5,5	7,5	10	15	18,5	25	30	40	45	55	65	75	90	110	160	200
690 V kW		5,5	7,5	10	15	18,5	30	33	45	45	55	65	80	80	132	200	200
Short circuit rating																	
max. fuse gG (A)		25	35	35	50	63	80	100	125	125	160	200	224	250	250	400	500
max. electrical operating frequency																	
AC-1	Ops/h	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	600	600	600
AC-3	Ops/h	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	600	600	600	600	600
AC-4	Ops/h	360	360	360	360	360	360	200	200	200	200	200	150	150	150	150	150
no load	Ops/h	9000	9000	9000	9000	9000	9000	5000	5000	5000	5000	5000	4000	4000	4000	4000	4000
Mechanical life span	Ops x 10^6	10															
Electrical life span	Ops x 10^6	1,6	1,8	1,2				1,1					1,0				
Control circuit																	
Rated insulation voltage	Ui (V)	1000 V															
Nominal voltages	Us 50 Hz (V)	24 - 690 V															
Nominal voltages	Us 60 Hz (V)	24 - 690 V															
Nominal voltages	Us DC (V)	12 - 440 V															
Pick-up and drop-out values																	
Pick-up x	Us (V)	0,8 - 1,1				0,8 - 1,1			0,8 - 1,1					0,8 - 1,1			
Drop-out x	Us (V)	0,35 - 0,55				0,4 - 0,6			0,4 - 0,6					0,3 - 0,5			
Power consumption of the coil	**50/60 Hz**																
Pick-up	(VA)	70				98			255				213		214	229	
	(cos φ)	0,85				0,69			0,32				0,71		0,68	0,73	
Sealing	(VA)	4...7,2				6,6...12,3			13,1...19,1				14,8		14,5	14,1	
	(cos φ)	0,28				0,34			0,54				0,26		0,27	0,26	
Power consumption of the coil, DC coils																	
Pick-up	(W)	3,8...7,5				240			340				166		154	171	
Sealing	(W)	3,8...7,5				6			6,5				2,4		2,4	2,5	
Power dissipations																	
PD per pole @ I_e AC-3	(W)	0,2	0,3	0,8	1	1,3	1,5	2,1	3,6	5,5	6,9	8,4	6,2	11,1	13,8	17,9	25,7
PD of coils, AC coils	(W)	2,0	2,0	2,0	2,0	4,2	4,2	10,3	10,3	10,3	10,3	10,3	3,9	3,9	3,9	3,7	3,7
PD of coils, DC coils	(W)	7,5	7,5	7,5	7,5	6	6	6,5	6,5	6,5	6,5	6,5	2,4	2,4	2,4	2,5	2,5

Contactors CEM up to 132 kW Technical Data

Type		CEM 9 to CEM 18	CEM25	CEM32 and CEM40	CEM50 and CEM80	CEM95 and CEM105	CEM112E and CEM 150E	CEM180E	CEM250E and CEM300E
Main terminal capacity (mm²)									
Solid, stranded and finely stranded without end sleeve		2x (1... 2,5) 2x (2,5...6) 2x (0,25...2,5)	2x (1... 2,5) 2x (2,5... 10) 2x (1...2,5)						
Finaly stranded with end sleeve		2x (2,5...6) 2x (13...16)	2x (2,5...10) 2x (13...17)						
One conductor on top									
Stranded				0,75...16	1...35	1,5...50			
Stranded with end sleeve				0,75...16	1...35	1,5...50			
Stranded without end sleeve				1...16	1,5...35	2,5...50			
Finaly stranded				1...16	1,5...35	2,5...50			
One conductor on bottom									
Solid				1...16	2,5...35	4...35			
Stranded with end sleeve				1... 16	2,5...35	4...35			
Stranded without end sleeve				1,5...16	6...35	6...35			
Finaly stranded				1,5...16	6...35	6...35			
Two conductors		**on top**							
Solid				0,75...16	1...35	1,5...50			
Stranded with end sleeve				0,75...16	1...35	1,5...50			
Stranded without end sleeve				1...16	1,5...35	2,5...50			
Finaly stranded				1...16	1,5...35	2,5...50			
Two conductors		**on bottom**							
Solid				1...16	2,5...35	4...35			
Stranded with end sleeve				1...16	2,5...35	4...35			
Stranded without end sleeve				1,5...16	6...35	6...35			
Finaly stranded				1,5...16	6...35	6...35			
Solid and stranded with end sleeve Bar							2 x (25...70) 2 x (15x3)	2 x (50...120) 2 x (20x3)	2 x (50...150) 2 x (30x5)
Tightening torque (N.m)		1...1,9	1,6...3	2,5...4	4...6	5...6,5	10	13	17

Auxiliary contacts

Type			CEM9	CEM12	CEM18	BCXMFE...	BCXMLE ...
Rated insulation voltage Ui							
acc. IEC/EN 60 947		(V)		1000		1000	
Rated operational voltage Ue		(V)		690		690	
Conv. thermal current Ith		(A)		20		10	
Rated operational current Ie							
AC-15	220 - 240 V	(A)		10		6	
	380 - 400 V	(A)		6		4	
	415 V	(A)		5		3,5	
	500 V	(A)		4		2,5	
DC-13	24 V	(A)		6		6	
	48 V	(A)		4		4	
	110 V	(A)		2		2	
	220 V	(A)		0,7		0,7	
Making capacity Im							
AC-15/AC-11	Ue ≤ 400 V 50/60 Hz	(A)		250		90	
DC-13/DC-11	Ue ≤ 220 V DC	(A)		250		90	
Breaking capacity Ic							
AC-15/AC-11	Ue ≤ 400 V 50/60 Hz	(A)		250		60	
DC-13/DC-11	Ue ≤ 220 V DC	(A)		2		0,95	
Short circuit protection							
max. fuse gG		(A)		16		10	
Control circuit reliability				Ie min. = 5 mA, Ue min. = 17 V			
Electrical life span		Ops		10^6			
Mechanical life span		Ops		15 x 10^6			
Impedance /pole		mR		2,5			

Power Circuit - CEM 450-560

Three pole version			CEM450	CEM560
Rated thermal current Ith (temp ≤ 55 °C)		(A)	600	700
Rated operational current Ie AC-3 (Ue ≤ 440V)		(A)	450	560
Rated operational voltage Ue	acc. IEC / VDE 0660	(V)	1000	1000
	acc. UL / CSA	(V)	-	-
Rated insulation voltage Ui (pollution degree 3)	acc. IEC / VDE 0660	(V)	1000	1000
	acc. UL / CSA	(V)	-	-
Rated impluse withstand voltage Uimp (acc. IEC 60947-1)		(kV)	8	8
Maximum continuous current AC-1 (temp ≤ 55 °C)		(A)	600	690
Rated operational current Ie AC-4 (Ue ≤ 440V)		(A)	280	345
Frequency limits		(Hz)	25...400	25...400
Making capacity (RMS) (IEC 60947)		(A)	5600	6300
Breaking capacity (RMS) (IEC 60947)	(Ue ≤ 400V)	(A)	4480	5040
	(Ue = 500V)	(A)	4480	5040
	(Ue = 550V)	(A)	4009	4511
	(Ue = 690V)	(A)	3000	3380
Short-time current	1 seg	(A)	8544	10626
	5 seg	(A)	5733	7128
	10 seg	(A)	4500	5600
	30 seg	(A)	2990	3726
	1 min	(A)	2208	2748
(at temp ≤ 40 °C)	3 min	(A)	1391	1716
No current flowing during recovery time.	Recovery time	(min.)	10	10
Electrical Endurance at Ie AC-3 (IEC 60947)		ops. (million)	0,6	0,6
Protection against short-circuits with fuses. Without TOR				
Coordination type "1"	gL/gG	(A)	1000	1260
Coordination type "2"	gL/gG	(A)	630	800
Without welding	gL/gG	(A)	500	500
Short-circuit Interrupting Capacity CSA	600V - acc. UL/	(kA)	-	
Impedance per pole		(mΩ)	0,2	0,2
Power dissipation per pole	AC-1	(W)	72	98
	AC-3	(W)	41	63
Insulation resistance between adjacent poles, poles and earth and between input and output			> 10MΩ	
Degree of protection (acc. VDE 0160 - Part 100)	Main terminals		IP00	
	Coil terminals		IP20	
Relative Humidity			5 to 95% at 40°C (non-condensing)	
Mounting			Screw to panel	

AC - Utilisation Category for CEM 450-560

Utilisation category AC-1			CEM450	CEM560
Rated thermal current Ith (temp ≤ 55 °C)		(A)	600	690
Max. Operational current at ambient temperature of. (up to 690V)"	55 °C	(A)	600	690
	70 °C	(A)	370	420
	75 °C	(A)	-	-
Max. Operational power (q ≤ 55 °C) (Three-phase resistors)	220 / 230 V	(kW)	228	263
	380 / 400 V	(kW)	395	454
	415 / 440 V	(kW)	431	496
	500 V	(kW)	520	597
	575 / 600 V	(kW)	598	687
	660 / 690 V	(kW)	685	788
Cable size		(mm^2)	2 x (50x5)	
Current values for connection of	2 poles in parallel		Ie x 1,7	
	3 poles in parallel		Ie x 2,4	
Percentage of the max. operational current at	600 ops./h	(%)	100	100
	1200 ops./h	(%)	80	80
	3000 ops./h	(%)	-	-

AC - Utilisation Category for CEM 450-560

Utilisation category AC-3			CEM450	CEM560
Operational current Ie (temp ≤ 55°C)	Ue ≤ 440 V	(A)	450	560
	500 V	(A)	415	465
	550 V	(A)	380	420
	690 V	(A)	315	397
	1000 V	(A)	200	235
"Max. Operational power Three-phase motors (50/60 Hz)"	220 / 230 V	(kW)	150	185
		(HP)	200	250
	380 / 400 V	(kW)	260	300
		(HP)	350	400
	415 / 440 V	(kW)	260	300
		(HP)	350	400
	500 V	(kW)	260	330
		(HP)	350	450
	660 / 690 V	(kW)	300	370
		(HP)	400	500
	1000 V	(kW)	260	330
		(HP)	350	450
Percentage of the max. operational current at	600 ops./h	(%)	100	100
	1200 ops./h	(%)	75	75
	3000 ops./h	(%)	-	-

Electronic Control Circuit - AC 50/60Hz / DC						
Coils with electronic module			CEM112 / 150	CEM180 / 215	CEM250 / 300	CEM450/560
Rated insulation voltage Ui (pollution degree 3)	acc. IEC / VDE 0660	(V)	1000			
	acc. UL / CSA	(V)	600			-
Standard voltages		(V)				110-255 V 50/60 Hz / DC
Voltage Operating limits - acc. IEC 60947-1						
Coil Operating Limits		xUs	0.8...1.1	0.8...1.1	0.8...1.1	0.8....1.1
	Pick-up	xUs	0.6 ... 0.75	0.6 ... 0.75	0.6 ... 0.75	0.6 ... 0.75
	Drop-out	xUs	0.4 ... 0.6	0.4 ... 0.6	0.4 ... 0.6	0.4 ... 0.6
Consumption - AC (at 1,0 x Us and cold coil)						
Electronic coils (at 60Hz)	Magnetic circuit closed	(VA)	16.3	21.5	35.2	38.5
	Power factor		0.26	0.27	0.26	0.26
	Thermal power dissipation	(W)	4.2	5.8	9.2	10.0
	Magnetic circuit closing	(VA)	322	426	518	700
	Power factor		0.71	0.68	0.73	-
Consumption - DC (at 1,0 x Us and cold coil)						
Electronic coils at DC	Magnetic circuit closed	(W)	12.5	12.5	12.5	25
	Magnetic circuit closing	(W)	415	375	380	780
Opening and closing times (Values at Us)						
Between coil energization and:	NO contact closing	(ms)	40...70	40...70	65...85	80...110
Between coil de-energization and:	NO contact opening	(ms)	50...70	55...75	40...65	50...90
Mechanical endurance		ops.	10 million	10 million	10 million	3 million
Maximum rate	No load	ops./h	1000	1000	1000	1000
	AC1 and AC3 at rated power	ops./h	600	600	600	300
	AC4 at rated power	ops./h	150	150	150	150

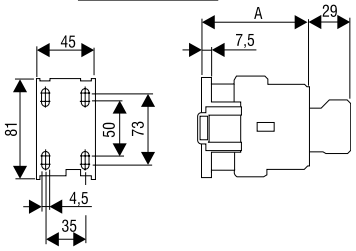
AC - Utilisation Category for CEM 450-560				
Utilisation category AC-4			**CEM450**	**CEM560**
Operational current Ie AC-4	Ue ≤ 440 V	(A)	280	345
	500 V	(A)	211	220
	690 V	(A)	160	195
	1000 V	(A)	100	125
Operational power Three-phase motors (50/60 Hz) (200.000 operations)	220 / 230 V	(kW)	75	90
		(HP)	100	125
	380 / 400 V	(kW)	150	185
		(HP)	200	250
	415 / 440 V	(kW)	150	185
		(HP)	200	250
	500 V	(kW)	130	185
		(HP)	200	250
	660 / 690 V	(kW)	150	185
		(HP)	200	250
	1000 V	(kW)	132	150
		(HP)	175	200
Max. Operational current Ie (Ue ≤ 400 V) (35.000 operations)		(A)	450	560
Max. Operational power (Ue ≤ 380/400 V)		(kW)	260	300
Maximum frequency of switching		(ops./h)	350	400

DC - Utilisation Category for CEM450-560			
Utilisation category DC-1 (L/R ≤ 1 ms)		**CEM450**	**CEM560**
Ue (V)	Poles in serie	Max. Operational current Ie (A)	
24V	1	450	560
	2	600	690
	3	600	690
110V	1	225	280
	2	450	560
	3	600	690
220V	1	45	56
	2	300	345
	3	600	690
440V	1	-	-
	2	150	172
	3	300	345

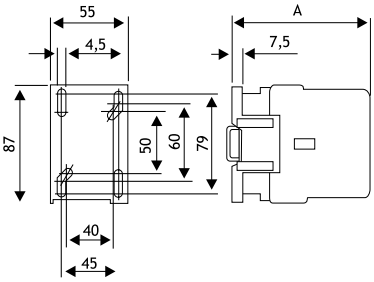
DC - Utilisation Category for CEM450-560			
Utilisation category DC-3 / DC-5 (L/R ≤ 15 ms)		**CEM450**	**CEM560**
Ue (V)	Poles in serie	Max. Operational current Ie (A)	
24V	1	350	450
	2	450	560
	3	450	560
110V	1	200	260
	2	350	400
	3	400	450
220V	1	30	35
	2	160	200
	3	300	345
440V	1	-	-
	2	50	65
	3	150	180

Dimensions

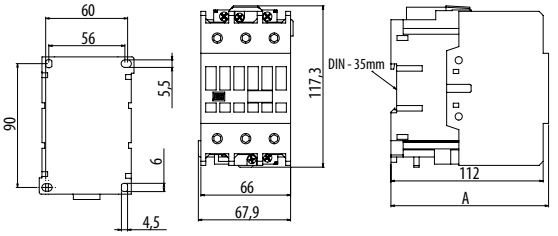
	AC	DC
CAEM4	A=85	A=115
CEM9	A=85	A=115
CEM12	A=85	A=115
CEM18	A=85	A=115
CEM25	A=87	A=117



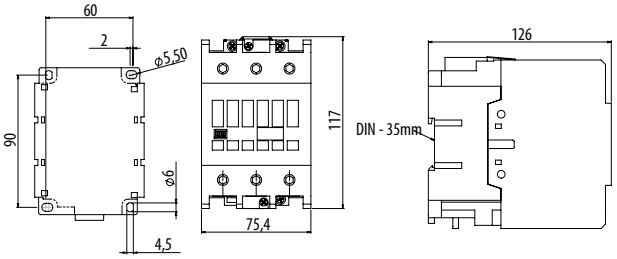
	AC	DC
CEM32	A=98	A=134
CEM40	A=98	A=134



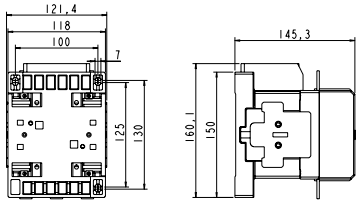
	AC/DC
CEM50	A=116
CEM65	A=116
CEM80	A=116



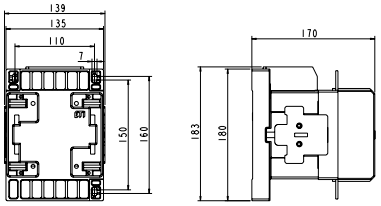
	AC/DC
CEM95	A=126
CEM105	A=126



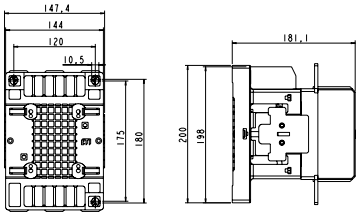
CEM112(E)
CEM150E



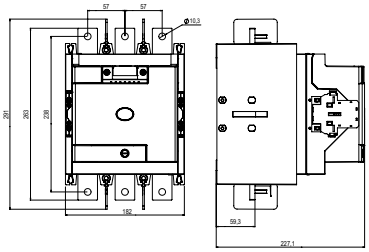
CEM180(E)

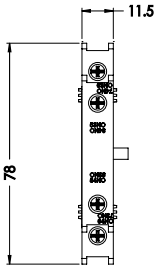


CEM250(E)
CEM300(E)

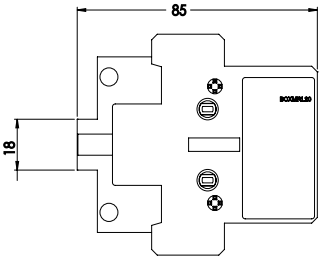


CEM 450(E)
CEM 560(E)

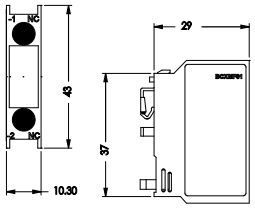




BCXMLE

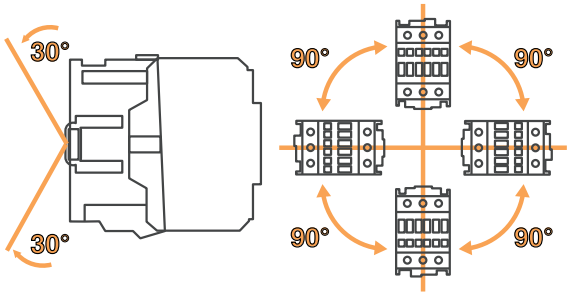


BCXMFE

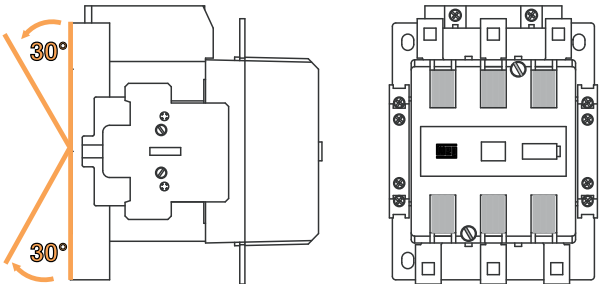


Mounting position

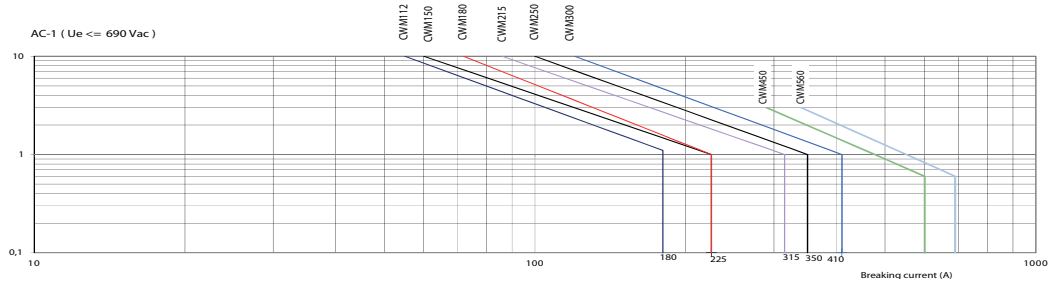
CEM9...105

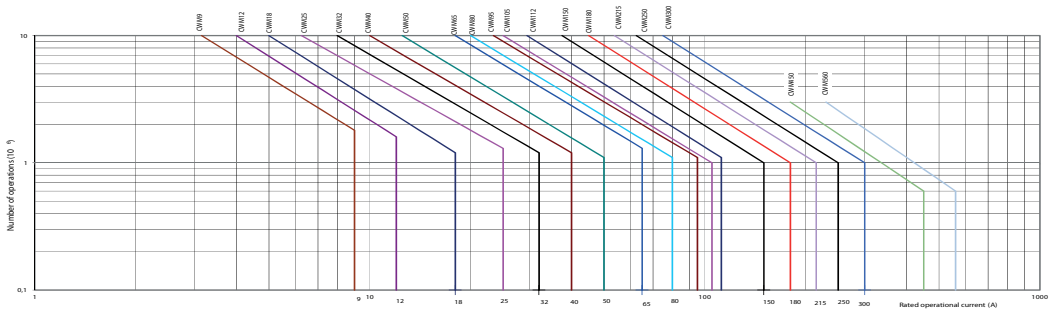


CEM112...300



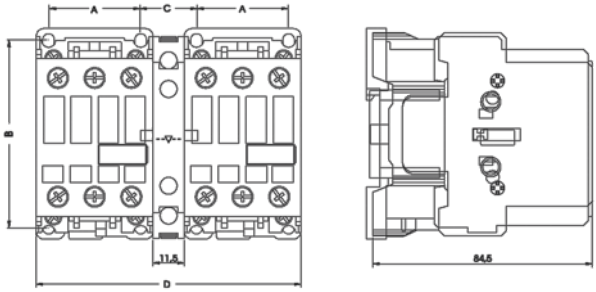
Diagram





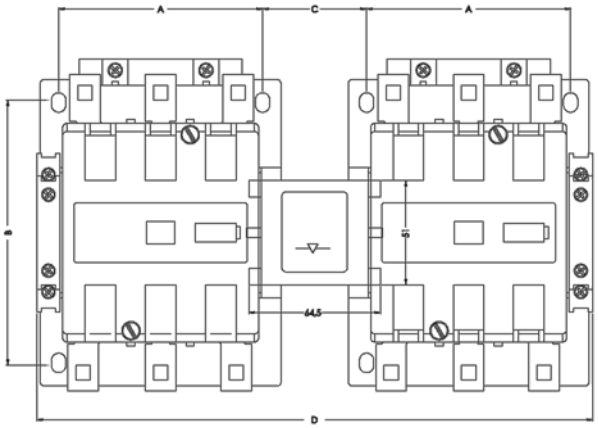
Dimensions

BLIME9-105



Contactors	A	B	C	D
CEM9...25	35	72,5	22	102
CEM32...40	45	79	22	122
CEM50...80	57	90	22	144
CEM95...105	57	90	29	162

BLIME 112-300E



Contactors	A	B	C	D
CEM112...150	100	130	51	272,5
CEM180	110	160	58,5	303,5
CEM250...300	120	180	57	325,4
CEM250...300	175	196	57	414

Mechanical interlocks BLIME: Contactor sizes & compatibility		
		Same size Q1=Q2
BLIME 9-105	004643601	CEM9…CEM105
BLIME 112-300E	004643602	CEM112(E)-CEM300(E)

AC coils		Different size	
		Q1	Q2
BLIME 9-105	004643601	CEM9…CEM105	CEM9…CEM105
BLIME 112-300E	004643602	CEM112…CEM150	CEM112…CEM150
		CEM250…300	CEM250…300

DC coils		Different size	
		Q1	Q2
BLIME 9-105	004643601	CEM9…18	CEM9…18
BLIME 9-105	004643601	CEM32…40	CEM32…40
BLIME 9-105	004643601	CEM50…CEM105	CEM50…CEM105

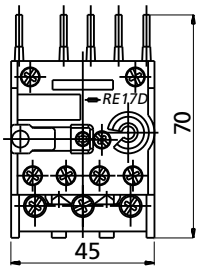
AC&DC coils		Different coil	
		C1	C2
BLIME 9-105	004643601	CEM50…105 DC coil	CEM9…105 AC coil

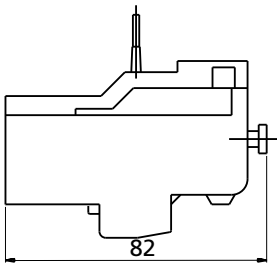
Overload relay

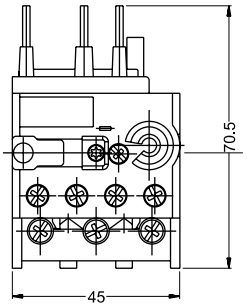
- phase-failure sensitivity to IEC/EN 60947-4-1, DIN VDE 0660T.102
- tripping class 10 according to standard 60947-4-1
- temperature compensation
- auxiliary contact 1NO/1NC
- hand/auto/reset

PIN from auxiliary contactor

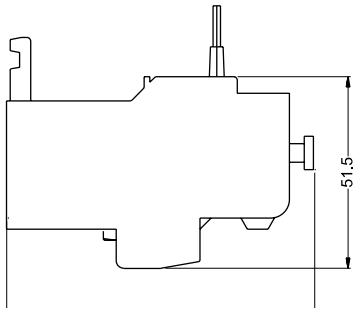
T1 T2 T3 PIN from coil from contactor



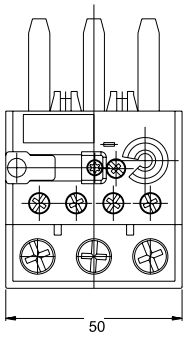


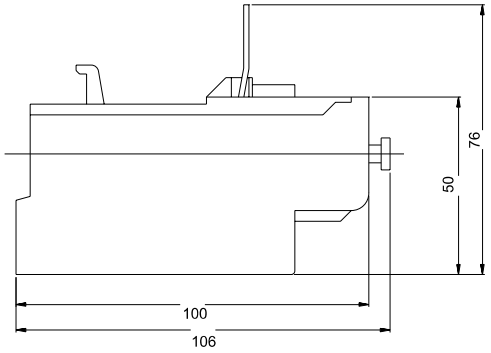


RE17D

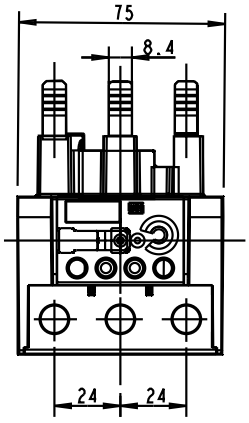


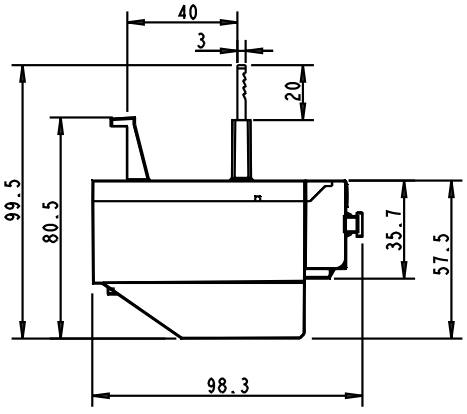
RE27D





RE67D





RE117.1D

RE Thermal Overload Relays in Contactor Assemblies for Wye-Delta Starters

When using thermal overload relays in conjunction with contactor assemblies for wye-delta starters, it should be taken into consideration that only 0.58 (√3 / 3) x the motor current flows through the main contactor. An overload relay mounted on the main contactor must be set to the same multiple of the motor current.

A second overload relay may be mounted on the wye contactor if it is desired the load to be optimally protected in wye operation. The wye current is 1/3 of the rated motor current. The relay must then be set to this current.

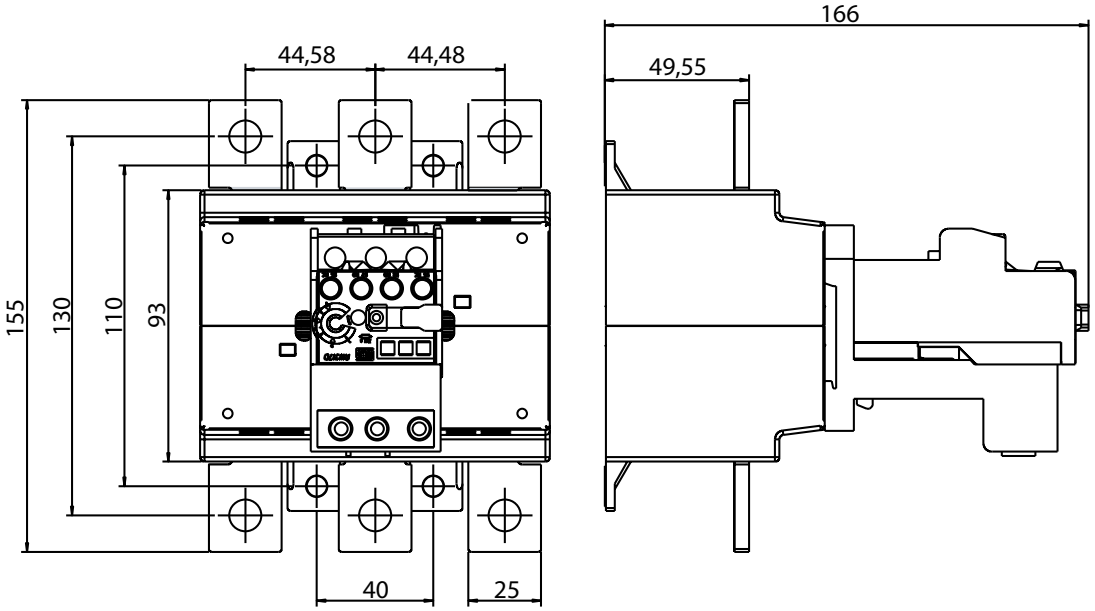
Protection Against Short-Circuit

The RE thermal overload relays must be protected against short-circuits by fuses or circuit breakers.

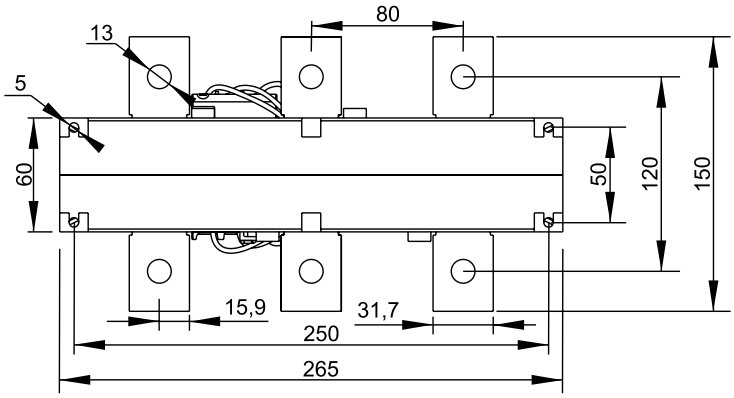
Ambient Air Temperature Compensation

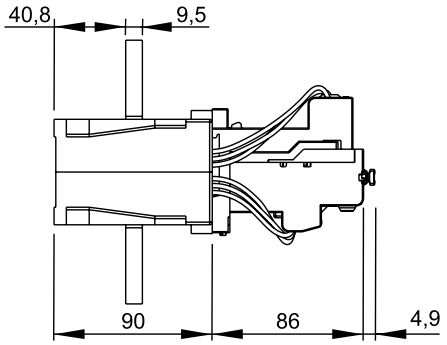
RE thermal overload relays are temperature compensated. Its trip point is not affected by temperature, and it performs consistently at the same value of current. The time-current characteristics of REs refer to a stated value of ambient air temperature within the range of -20 °C to +60 °C and are based on no previous loading of the overload relay (i.e. from an initial cold state). For ambient air temperature within the range of +60 °C up +80 °C (maximum ambient air temperature), the current correction factor shown in the table below should be applied:

Ambient air temperature [°C]	Current correction factor
65	0,94
70	0,87
75	0,81
80	0,73



RE317D

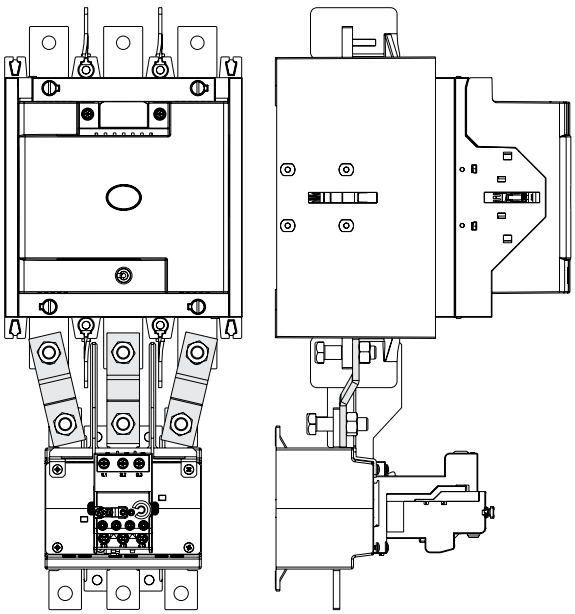




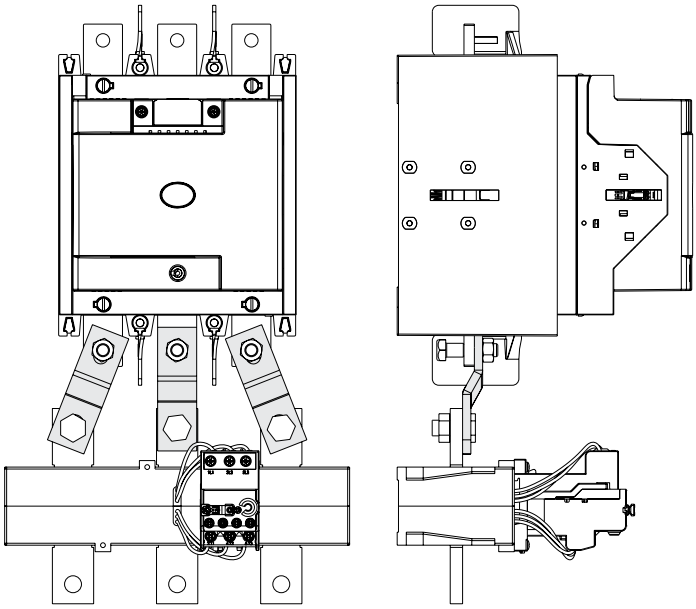
RE407D

overload relay current setting	recommended fuse gG (A)
0,28-0,4	2
0,4-0,63	2
0,56-0,8	2
0,8-1,2	4
1,2-1,8	6
1,8-2,8	6
2,8-4	10
4-6,3	16
5,6-8	20
7-10	25
8-12,5	25
10-15	35
11-17	35
15-23	50
22-32	63
25-40	80
32-50	100
40-57	100
50-63	100
57-70	125
63-80	125
75-97	200
90-112	250
100-150	315
140-215	355
200-310	500
275-420	710
400-600	1000

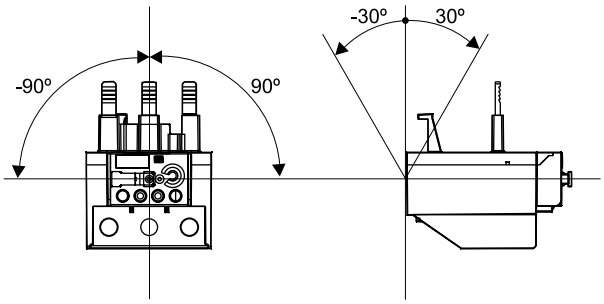
CEM450E/560E + RE317D (200...420A)



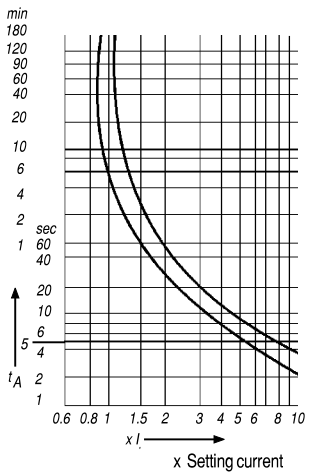
CEM450E/560E + RE407D (400...600A)



Mounting position for RE17D to RE117D



RE...D Tripping characteristic



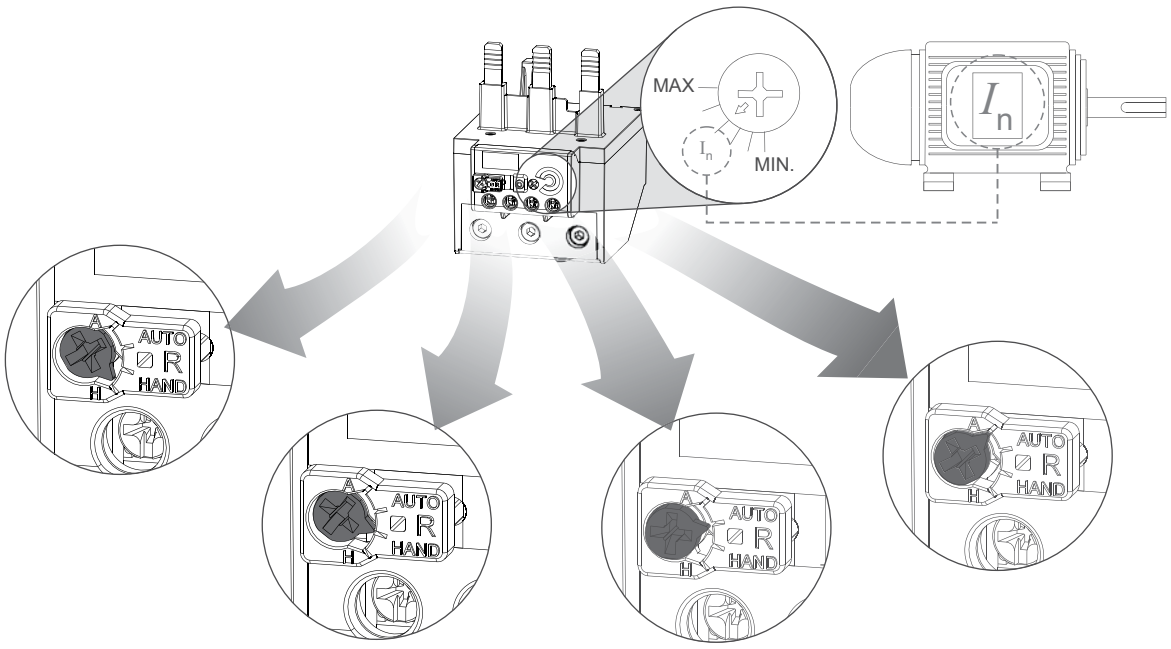
These tripping characteristics show mean values of the tolerance range at 20°C ambient temperature starting from cold. They show the tripping times in relation to the response current. At operational temperature, the tripping time of the overload relay drops to approximately 25 % of the shown.

Overload relay								
Type			**RE17D**	**RE27D**	**RE67D**	**RE117D**	**RE317D**	**RE407D**
General technical data								
Standards			IEC/EN 60 947, DIN VDE 0660					
Current setting		(A)	0,28 - 17	0,28 - 32	25 - 80	75 - 112	100 - 420	400 - 840
Tripping Class acc. to IEC 60947-4-1			10					
Temperature compensation			continuous					
Rated insulation voltage Ui acc. IEC/EN 60 947/DIN VDE 0660		(V)	690				1000	
Rated impulse withstand voltage Uimp		(kV)	6				8	
Rated operational frequency		(Hz)	0 - 400				50/60	
Degree of protection			IP 20					
Protection against direct contact from the front when actuated by a perpendicular test fi nger (IEC 536)			finger and back-of-hand proof					
Ambient temperature Operating temperature		°C	-25 ... +60					
Storage temperature		°C	-40 ... +70					
Power dissipation (value of setting range)	lower	(W)	**0,9**		1,5	2,3	1	
	higher	(W)	1,4	1,7	4,7		1,9	
Aux. Contacts impedance (pole)		mR	2,5					
Terminal capacity								
solid		mm^2	2x 1,5 - 6		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
flexible without cable		mm^2	2x 1,5 - 6		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
flexible with cable lug		mm^2	2x 1,5 - 6		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
stranded		mm^2	2x 1,5 - 10		1x 6 -35	1x 25 - 35	2x35-120 (100-215A) 2x95-150 (200-420A)	-
busbar		mm	-		-	-	max 2x (25 x 5)	max 2x (60 x 10)
Tightening torque		Nm	2,3		4	6	141 (100-215A) 230 (200-420A)	230
Auxiliary contacts								
Rated insulation voltage Ui acc. IEC/EN 60 947/DIN VDE 0660		(V)	690					
Rated operational voltage Ue		(V)	690					
Rated thermal current Ith		(A)	6					
Rated operational current Ie AC-15	24 V	(A)	4					
	60 V	(A)	3,5					
	125 V	(A)	3					
	230 V	(A)	2					
	400 V	(A)	1,5					
	500 V	(A)	0,5					
	690 V	(A)	0,3					
Rated operational current Ie DC-13	24 VDC	(A)	1					
	60 VDC	(A)	0,5					
	110 VDC	(A)	0,25					
	220 VDC	(A)	0,1					
Terminal capacity	Terminal screw		M3,5 x 10 Philips					
	Cable size	mm^2	2 x 1-2,5					
	AWG-wire		16-12					
Tightening torque		Nm	1,5					

Minimum fuse size for the protection of three-phase motors.
The maximum size is governed by the requirements of the associated switchgear or overload relay.

Motor rating			230 V			400 V			500 V			690 V		
			Rated motor current	Fuse		Rated motor current	Fuse		Rated motor current	Fuse		Rated motor current	Fuse	
				Starting direct	Y/Δ		Starting direct	Y/Δ		Starting direct	Y/Δ		Starting direct	Y/Δ
[kW]	cosφ	η(%)	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
0,06	0,7	58	0,37	2	-	0,21	2	-	0,17	2	-	0,12	2	-
0,09	0,7	60	0,54	2	-	0,31	2	-	0,25	2	-	0,18	2	-
0,12	0,7	60	0,72	4	2	0,41	2	-	0,3	2	-	0,24	2	-
0,18	0,7	62	1,04	4	2	0,6	2	-	0,48	2	-	0,35	2	-
0,25	0,7	62	1,4	4	2	0,8	4	2	0,7	2	-	0,5	2	-
0,37	0,72	66	2	6	4	1,1	4	2	0,9	2	2	0,7	2	-
0,55	0,75	69	2,7	10	4	1,5	4	2	1,2	4	2	0,9	4	2
0,75	0,79	71	3,2	10	4	1,9	6	4	1,5	4	2	1,1	4	2
1,1	0,81	74	4,6	10	6	2,6	6	4	2,1	6	4	1,5	4	2
1,5	0,81	74	6,3	16	10	3,6	6	4	2,9	6	4	2,1	6	4
2,2	0,81	78	8,7	20	10	5	10	6	4	10	4	2,9	10	4
3	0,82	80	11,5	25	16	6,6	16	10	5,3	16	6	3,8	10	4
4	0,82	83	14,8	32	16	8,5	20	10	6,8	16	10	4,9	16	6
5,5	0,82	86	19,6	32	25	11,3	25	16	9	20	16	6,5	16	10
7,5	0,82	87	26,4	50	32	15,2	32	16	21,1	25	16	8,8	20	10
11	0,84	87	38	80	40	21,7	40	25	17,4	32	20	12,6	25	16
15	0,84	88	51	100	63	29,3	63	32	23,4	50	25	17	32	20
18,5	0,84	88	63	125	80	36	63	40	28,9	50	32	20,9	32	25
22	0,84	92	71	125	80	41	80	50	33	63	32	23,8	50	25
30	0,85	92	96	200	100	55	100	63	44	80	50	32	63	32
37	0,86	92	117	200	125	68	125	80	54	100	63	39	80	50
45	0,86	93	141	250	160	81	160	100	65	125	80	47	80	63
55	0,86	93	173	250	200	99	200	125	79	160	80	58	100	63
75	0,86	94	233	315	250	134	200	160	107	200	125	78	160	100
90	0,86	94	279	400	315	161	250	200	129	200	160	93	160	100
110	0,86	94	342	500	400	196	315	200	157	250	160	114	200	125
132	0,87	95	401	630	500	231	400	250	184	250	200	134	250	160
160	0,87	95	486	630	630	279	400	315	224	315	250	162	250	200
200	0,87	95	607	800	630	349	500	400	279	400	315	202	315	250
250	0,87	90	-	-	-	437	630	500	349	500	400	253	400	315
315	0,87	96	-	-	-	544	800	630	436	630	500	316	500	400
400	0,88	96	-	-	-	683	1000	800	547	800	630	396	630	400
450	0,88	96	-	-	-	769	100	800	615	800	630	446	630	630
500	0,88	97	-	-	-	-	-	-	-	-	-	491	630	630
560	0,88	97	-	-	-	-	-	-	-	-	-	550	800	630
630	0,88	97	-	-	-	-	-	-	-	-	-	618	800	630

The rated motor currents apply to normal, internal-ventilated and enclosed fan-cooled three-phase motors at 1500 rpm.
D.O.L. Starting: Maximum starting current 6 x rated motor current. Maximum starting time 5 seconds.
Y/D-starting: Maximum starting current 2 x rated motor current. Maximum starting time 15 seconds.
Set the overload relay in the phase lead to 0,58 x rated motor current.
Rated fuse currents for Y/D-starting also apply to three-phase motors with slip-ring rotors.
Use a larger fuse if the rated current or starting current is higher and/or if the starting time is longer.
The table applies to "slow" or "gL" fuse (VDE 0636)
By NH fuse with aM characteristics, select fuse size to match rated current.



	A AUTO HAND H	A AUTO HAND H	A AUTO HAND H	A AUTO HAND H
97-98 NO	MANUAL RESET - Device must be reset manualy after overload by pushing the button. Relay must cool down before reset. - Testing not available in this mode.	MANUAL RESET AND TEST - Device must be reset manualy after overload by pushing the button. Relay must cool down before reset. - Test function available in this mode.	AUTOMATIC RESET AND TEST - Automatic reset of thermal protection, after cool down. - Test circuit is available.	AUTOMATIC RESET - Automatic reset of thermal protection, after cool down. - Testing not available in this mode.
95-96 NC				

Motor protective circuit breaker MSP

Technical data		according to IEC 60947-1; IEC 60947-2; IEC 60947-4-1							
Type		MSP0				MSP1			
General data									
Number of poles		3				3			
Max. rated current I_n									
• motor protection	A	25				52			
Permissible ambient temperature									
• at full rated current	°C	-20 ... +55							
• in storage	°C	-50 ... +80							
Rated operational voltage U_e	V	690							
Rated frequency	Hz	50/60							
Rated insulation voltage U_i	V	750							
Rated impulse withstand voltage U_{imp}	kV	6							
Utilization category									
• to IEC 60947-2 (motor starter protectors)		A							
• to IEC 60947-4-1 (motor starters)		AC-3							
Mechanical endurance									
• up to 25 A	Operating cyles	100000				100000			
• 25 A upwards		--				30000			
Number of operating cycles/h (on load)	1/h	25				25			
Degree of protection with open terminals/with conductors connected		IP00/IP20							
Temperatures compensation to IEC 60947-4-1		✓							
Phase failure sensitivity to IEC 60947-4-1		✓							
Power loss P_v per breaker									
I_n	A	0,6	4	6	25	2,4	6	25	63
P_v	W	5	6	7	9	8	7	14	23

Auxiliary contacts				
Utilization category		AC-15		
Rated operational voltage U_e	AC V	230	400	500
Rated operational current I_e	A	3	1.5	1
Utilization category		DC-13		
Rated operational voltage U_e DC L/R200 ms	DC V	24	60	220
Rated operational current I_e	A	2.3	0.7	0.3

Type		MSP0	MSP1
Cross-section for main conductors			
Solid or stranded	mm^2	2 x (1 ... 6)	1 x 1.5 ... 2 x 16 or 1 x 25 + 1 x 10
Finely stranded with end sleeve	mm^2	2 x (1 ... 4)	1 x 1.5 ... 2 x 10 or 1 x 16 + 1 x 10
Cross-sections for auxiliary and control connecting leads			
Solid or stranded	mm^2	1 x 0.5 ... 2 x 2.5	--
Finely stranded with end sleeve	mm^2	1 x 0.5 ... 2 x 1.5	--

Rated short-circuit breaking capacity

The table shows the rated ultimate short-circuit breaking capacity I_{cu} and the rated service short-circuit breaking capacity I_{cs} for the MSP motor starter protectors with respect to rated current I_n and reated operational voltage U_e.

Infeed is permitted at top or bottom without reduction of rated data. In the short-circuit proof areas, I_{cu} is at least 100 kA. A backup fuse is therefore not necessary.

In the other areas, when the short-circuit current at the installation point exceeds the rated short-circuit breaking capacity given in the table for the motor starter protectors, the motor starter protector must be protected by a backup fuse. See the following table for the maximum reated current for the backup
fuse. With a backup fuse according to the table, the maximum short-circuit current is permitted to equal the rated breaking capacity of the backup fuse.

Motor Starter Protectors	Rated current In	Up to AC 240 V			Up to AC 415 V			Up to AC 440 V			Up to AC 500 V			Up to AC 690 V		
		I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)	I_{cu}	I_{cs}	Max. Backup fuse (gL/gG)
Type	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MSP0	≤ 1 A	Short-circuit proof up to 100 kA, backup														
	1.6 A	fuse is not necessary												2	2	20
	2.4 A										10 (50)	10 (50)	35	2	2	35
	3.2 & 4 A							10 (50)	10 (50)	50	3 (50)	3 (50)	50	2	2	50
	5 & 6 A							5 (50)	5 (50)	63	3 (50)	3 (50)	63	2	2	63
	8 & 10 A				10 (50)	10 (50)	80	5 (50)	5 (50)	80	3 (5)	3 (5)	80	2	2	80
	13 & 16 A				6 (50)	6 (50)	80	5 (30)	5 (30)	80	3 (5)	3 (5)	80	2	2	80
	20 & 25 A	10 (50)	10 (50)	100	6 (50)	6 (50)	80	5 (30)	5 (30)	80	3 (5)	3 (5)	80	2	2	80
MSP1	≤ 2.4 A	Short-circuit proof up to 100 kA, backup														
	4 A	fuse is not necessary												4	4	80
	6 A											50		4	4	100
	10 A								50		10	5	160	4	4	125
	16 A							25	13	200	10	5	160	4	4	125
	25 A					50		25	13	200	10	5	200	4	4	160
	32 & 52 A				35	17	200	25	13	200	10	5	200	4	4	160

Relation between short-circuit breaking capacity I, related power factor and minimum short-circuit making capacity to IEC 60947-2.		
Short-circuit breaking capacity	Power factor cos φ	Short-circuit making capacity
A		
I ≤ 3000	0.9	1.42 x I
3000 < I ≤ 4500	0.8	1.47 x I
4500 < I ≤ 6000	0.7	1.5 x I
6000 < I ≤ 10000	0.5	1.7 x I
10000 < I ≤ 20000	0.3	2.0 x I
20000 < I ≤ 50000	0.25	2.1 x I
50000 < I	0.2	2.2 x I

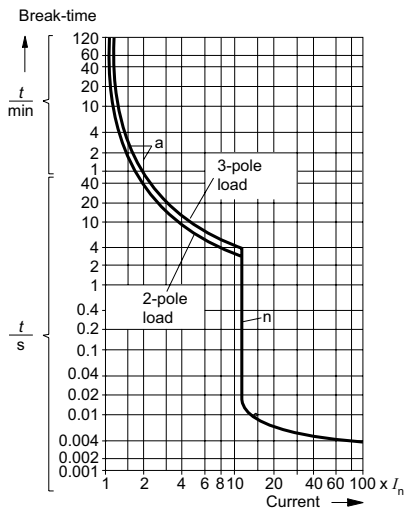
Curves

Characteristic curves

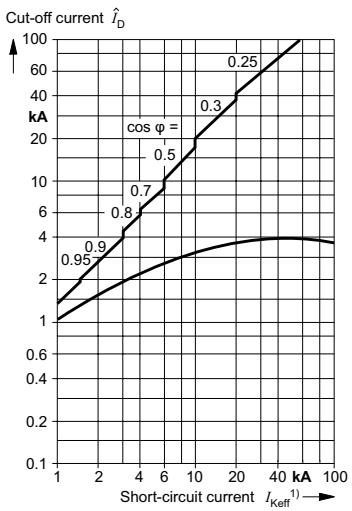
The characteristic curves are obtained in the cold state and 3-pole loading.
At operating temperature, the tripping time of the thermal releases drops by about 25 %. With 3-pole loading, the deviation in tripping time for 3 times the current and upwards is ±20 %.

Characteristic curves for MSP0

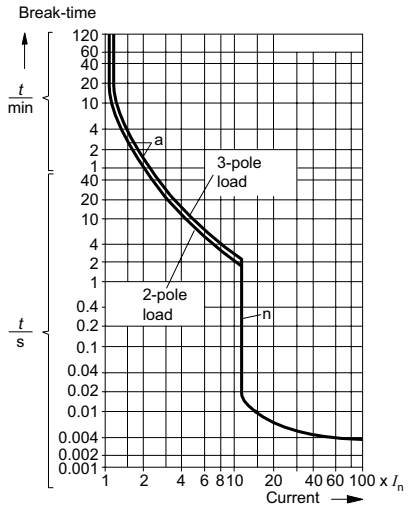
The characteristic curves shown here apply for a MSP0-6 motor starter protector with a rated current of 6 A, a current setting range of 4 to 6 A and a tripping current for the instantaneous overcurrent release of 72 A, at a rated voltage of AC 50 Hz, 400 V.



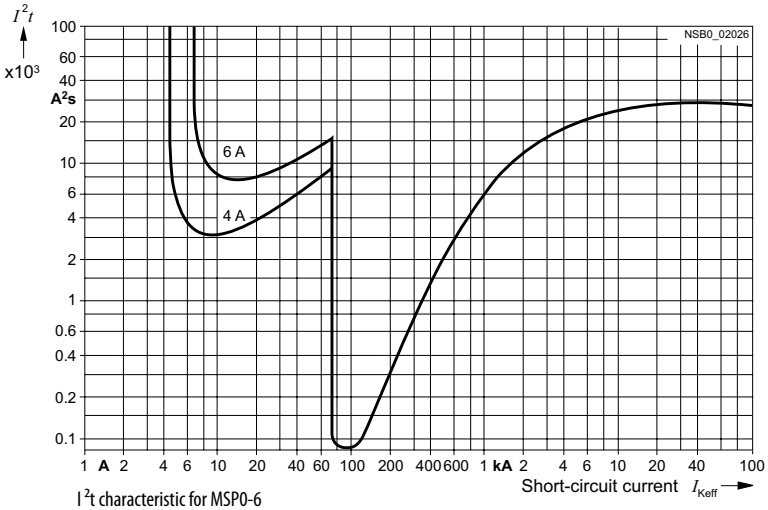
Schematic representation of the time/current characteristic for MSP0



Current limiting characteristic for MSP0-6



Schematic representation of the time/current characteristic for MSP1



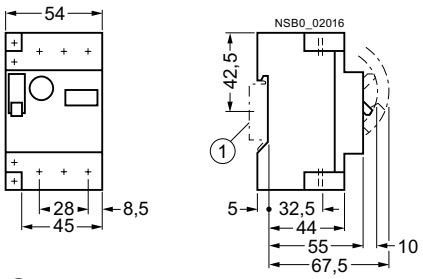
I²t characteristic for MSP0-6

Characteristic curves for MSP1

The characteristic curves shown here apply for a motor starter protector with a rated current of 25 A and a tripping current for the instantaneous overcurrent release of 300 A, at a rated voltage of AC 50 Hz, 400 V.

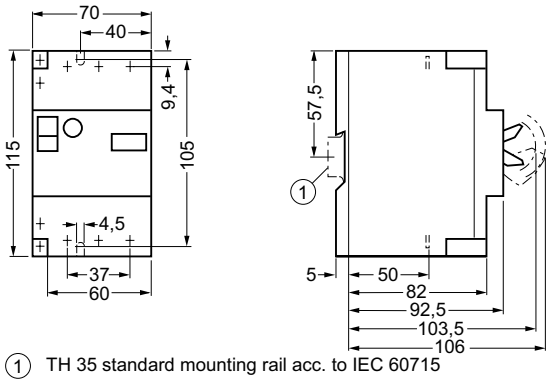
Dimensions

MSP0



1 TH 35 standard mounting rail acc. to IEC 60715

MSP1

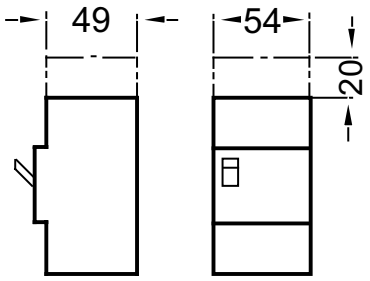


1 TH 35 standard mounting rail acc. to IEC 60715

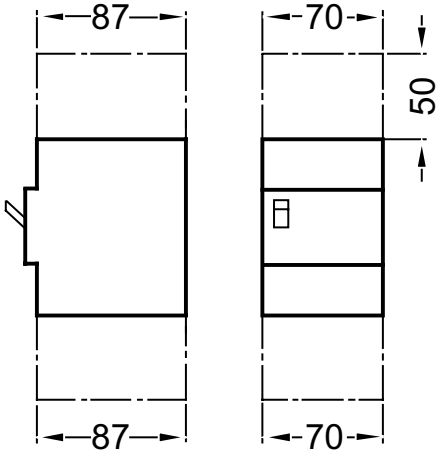
Space required above arc chutes

Minimum clearance with rated voltage to adjacent parts as well as non-insulated live parts.
The spacing of minimum 1 cm with MSP0 and minimum 2 cm with MSP1 between large-surface covers and arc openings should be observed.

MSP0



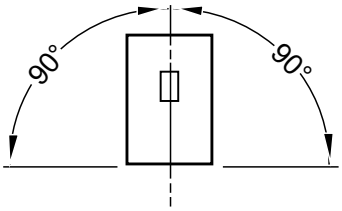
MSP1



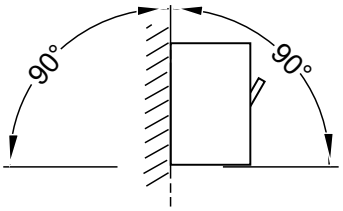
Uninsulated conductors must be insulated within the space required above arc chutes.

Permissible mounting position

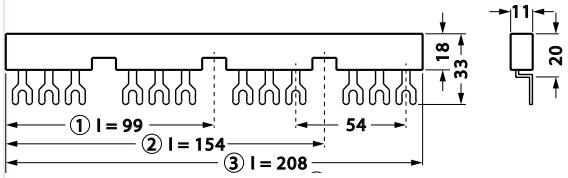
MSP0, MSP1 motor starter protectors permissible mounting position due to the position of the operating parts



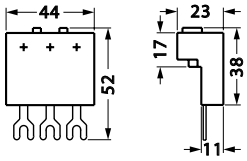
Front view



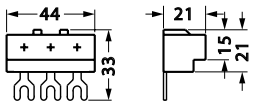
Lateral view



three-phase busbar
① For 2 devices: MSP-IZ2
② For 3 devices: MSP-IZ3
③ For 4 devices: MSP-IZ4



MSP-TA2
three-phase feed-in terminal, type I



MSP-TA1
three-phase feed-in terminal, type II

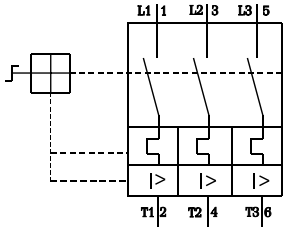
Motor protective circuit breaker MPE

General technical data

				MPE25	MPE80
Operational inst. current I_u			A	0,16 ... 40	50 ... 80
Rated short-circuit capacity			kA	50	60
Standards				IEC/EN 60 947	
Climatic proffing				damp heat, constant to IEC 60 068-2-3 damp heat, cyclical to IEC 60 068-2-30	
Ambient temperature	Storage		°C	-50 ... +80	
	Open		°C	-20 ... +70	
	Enclosed		°C	-20 ... +35	
Mounting position				any position	
Degree of protection				IP20	
Protection against direct contact				IP20	
Shock resistance to IEC 60 068-2-27			g	15	
Altitude			m	2000	
Conductor cross-section for main circuit	solid & stranded		mm^2	1 x (1,5 ... 6) / 2 x (1,5 ... 6)	1 x (1,5 ... 35) / 2 x (2,5 ... 35)
Tightening torque	main circuits		Nm	2,0...2,5	6
	control circuits		Nm	1,0...1,25	
Main contacts					
Rated impulse withstand voltage U_{imp}			kV	6	
Overvoltage categ./pollution degree				III/3	
Rated operational voltage U_e			V	690	
Rated operational current I_e			A	25 or setting current of overload release	
Rated frequency			Hz	50/60	
Current heat losses, 3-pole at oper. T			W	5 (MPE25-0,1 - MPE25-0,63)	
			W	6 (MPE25-1 - MPE25-6,3)	
			W	7 (MPE25-10)	
			W	8 (MPE25-16 - MPE25-25)	
			W	10 (MPE25-32)	
Life span, mechanical / electrical			Ops.	100.000 / 100.000	50.000 / 25.000
Maximum operating frequency			Ops./h	15	
Releases					
Temperature compensation			°C	-20 ... +60	
Adjustable overload releases			x Iu	0,6 - 1	
Fixed short circuit releases			x Iu	12	
Phase failure sensitivity				IEC/EN 60 947-4-1	
Auxiliary contacts					
Rated impulse withstand voltage			kV	6	
Overvoltage category/pollution degree				III/3	
Rated operational voltage			V	690 (250 -> ACBFE...)	
Rated operational current					
AC-15	24V	I_e	A	6 (2 -> ACBFE)	
	230V	I_e	A	4 (0,5 -> ACBFE)	
	380V-415V	I_e	A	3 (Ø -> ACBFE)	
	440V-500V	I_e	A	2 (Ø -> ACBFE)	
DC-13	24V	I_e	A	2 (1 -> ACBFE)	
	60V	I_e	A	0.5 (0,15 -> ACBFE)	
	110V	I_e	A	0.5 (Ø -> ACBFE)	
	220V	I_e	A	0.25 (Ø -> ACBFE)	
Control circuit reliability at U_e				U_{min} = 17V, I_{min} = 5mA	
	Fault probability			< 1 fault in 1 milion operations	
Short-circuit rating without welding	Fuse gG		A	10	
Conductors cross-section for auxiliary and control circuits	solid or stranded		mm^2	1 x (0,5 ... 2,5) / 2 x (0,5 ... 2,5)	

Max. operational power

type	max. operational power (kW) AC 3				operational inst. current Iu (A)	setting overl. release Ir (A)	short-circuit release Irm (A)
	400V 415V	440V	500V	690V			
MPE25-0,16	-	-	-	0.06	0.16	0,1-0,16	1.9
MPE25-0,25	0.06	0.06	0.06	0.12	0.25	0,16-0,25	3
MPE25-0,40	0.09	0.12	0.12	0.18	0.4	0,25-0,4	4,8
MPE25-0,63	0.12	0.18	0.25	0.25	0.63	0,4-0,63	7,5
MPE25-1,0	0.25	0.25	0.37	0.55	1	0,63-1,0	12
MPE25-1,6	0.55	0.55	0.75	1.1	1.6	1,0-1,6	19
MPE25-2,5	0.75	1.1	1.1	1.5	2.5	1,6-2,5	30
MPE25-4,0	1.5	1.5	2.2	3	4	2,5-4,0	48
MPE25-6,3	2.2	3	3	4	6.3	4,0-6,3	75
MPE25-10	4	4	4	7.5	10	6,3-10	120
MPE25-16	7.5	9	9	12.5	16	10-16	190
MPE25-20	9	11	12.5	15	20	16-20	240
MPE25-25	12.5	12.5	15	22	25	20-25	300
MPE25-32	15	15	18.5	30	32	25-32	384

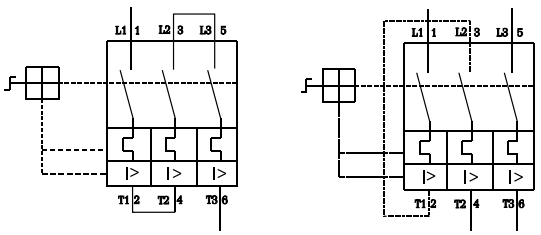


With 3 pole loading, deviation of short circuit release current can be +/-20% (acc. to 60947-2).

Technical data

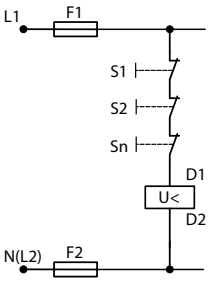
Tripping devices			
Rated operational voltage	Ue	V	200-415V
Conductor cross-section for main circuit	solid or stranded	mm^2	1 x (0,5 to 2,5) / 2 x (0,5 to 2,5)
Shunt Releases			
Operating range		x Us	0,7 - 1,1
Power consumption	Pull	VA	10
	Sealing	VA	4.5
Undervoltage Releases			
Pick-up voltage		x Us	0,85 - 1,1
Drop-out voltage		x Us	0,7 - 0,35

MPE25 wired 1- or 2-pole

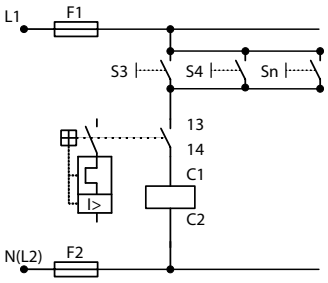


Typical circuits

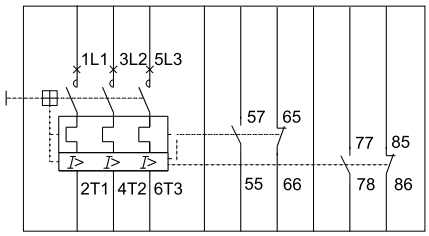
Undervoltage release
URMPE



Shunt release
SRMPE



Trip Signalling Block
TSBE

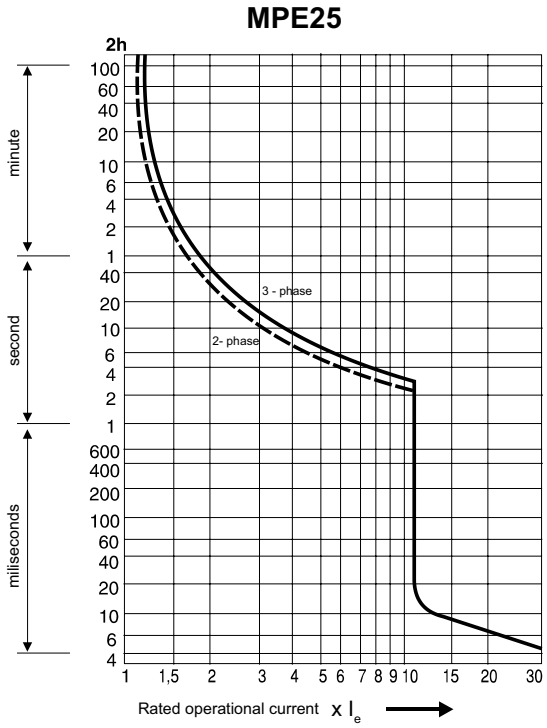


Altitude - Factor of Correction

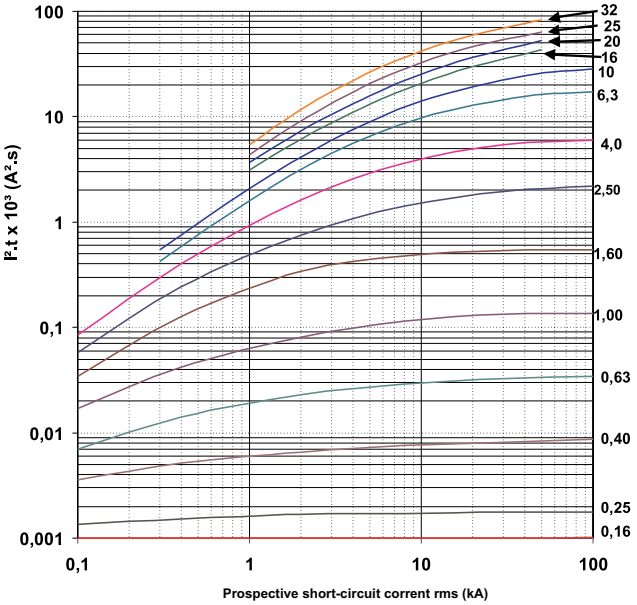
Altitude (above the sea level) - h	Rated operational voltage U_e	Factor of correction I_u
h < 2000m	690V	1 x I_n
2000m < h < 3000m	550V	0,96 x I_n
3000m < h < 4000m	480V	0,93 x I_n
4000m < h < 5000m	420V	0,90 x I_n

Curves

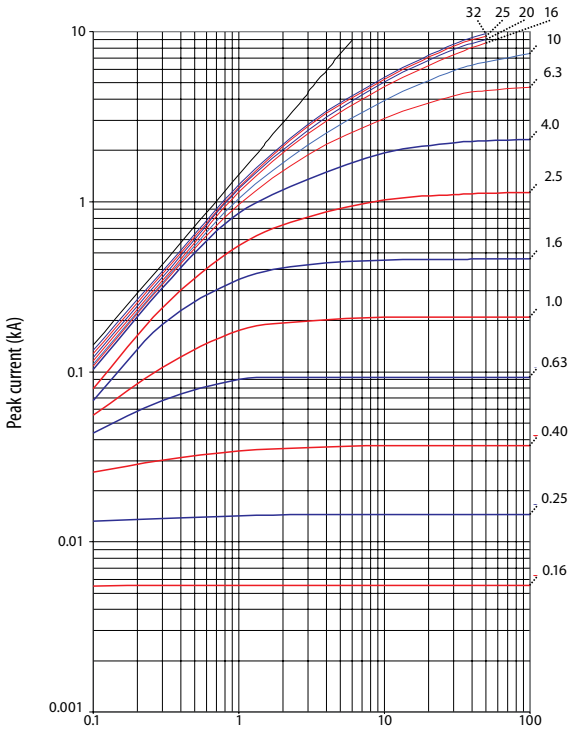
The tripping characteristics show the tripping time of the circuit-breakers in relation to the current. They show mean values of the tolerance ranges at an ambient temperature of 20 °C, starting from cold. The tripping time of the overload releases at operational temperature is reduced to approximately 25% of the values shown. Under normal operational conditions, all three phases of the MPE25 should be loaded.

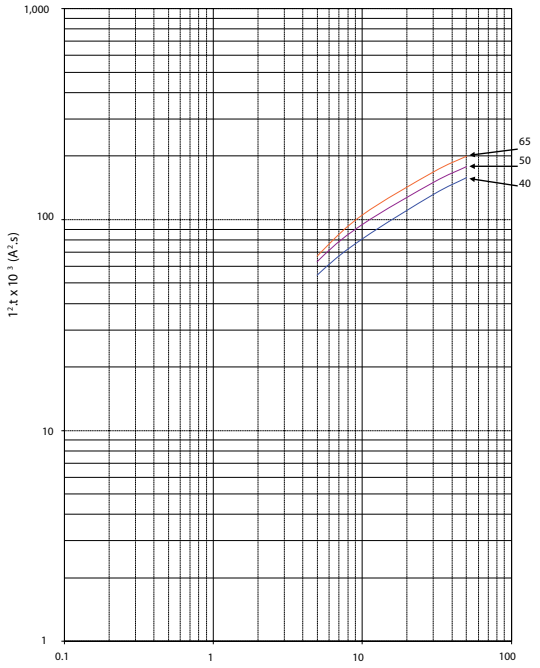


MPE25 I-t diagram



MPE25 Let-through characteristics at 415V





MPE80 Let-through characteristics at 415V

Breaking capacity of motor protective circuit breakers MPE25

Icc = Prospective short-circuit current
Icu = Rated ultimate short-circuit breaking capacity
Ics = Rated service short-circuit breaking capacity

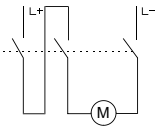
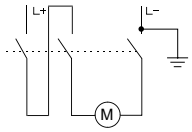
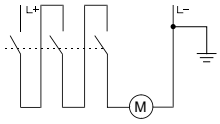
I_u	230V			400V			690V		
	Icu	Ics	max. fuse gG	Icu	Ics	max. fuse gG	Icu	Ics	max. fuse gG
A	kA	kA	A	kA	kA	A	kA	kA	A
0.16	100	100	-	100	100	-	100	100	-
0.25	100	100	-	100	100	-	100	100	-
0.4	100	100	-	100	100	-	100	100	-
0.63	100	100	-	100	100	-	100	100	-
1	100	100	-	100	100	-	100	100	-
1.6	100	100	-	100	100	-	100	100	-
2.5	100	100	-	100	100	-	8	8	25 (1)
4	100	100	-	100	100	-	6	3	32 (1)
6.3	100	100	-	100	100	-	6	3	50 (1)
10	100	100	-	100	100	-	6	3	50 (1)
16	100	100	-	50	25	100 (1)	4	3	63 (1)
20	100	100	-	50	25	125 (1)	4	3	63 (1)
25	100	100	-	50	25	125 (1)	4	3	63 (1)
32	100	100	-	50	25	125 (1)	4	3	63 (1)

Note: (1)Fuse required if the prospective short-circuit current exeeds the rated ultimate short circuit breaking capacity (Icc>Icu)

The MPE 25 switching of direct current

The MPE circuit breakers for alternating current are able to switch direct current. However, you are obliged to observe the maximum permissible DC voltage per conducting path. In case of higher voltages, series connection of 2 or 3 conducting parts is required. The response characteristics of the overload releases remain unchanged. The response thresholds of the short-circuit releases are increased with direct current by approximately 35%.

The following table shows suggestions for switching direct current:

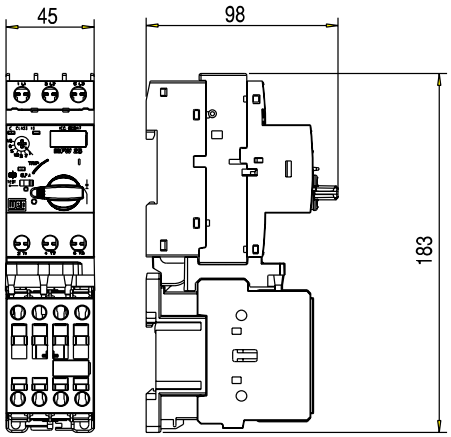
Recommended Connection	Highest Permissible Direct Voltage	Explanation
	150V DC	**2-poles switching** **Ungrounded system** If ground fault can be excluded, or if every ground is immediately corrected (via ground-fault monitoring), the maximum permissible DC voltage can be multiplied by 3
	300V DC	**2-poles switching** **Grounded system** The grounded pole should be assigned to the individual conducting path so that in the event of a ground fault there are always 2 conducting paths in series
	450V DC	**1-pole switching** **Grounded system** 3 conducting paths in series. The grounded pole should be assigned to the unswitched conducting path.

DC short-circuit breaking capacity (time constant <=5ms)

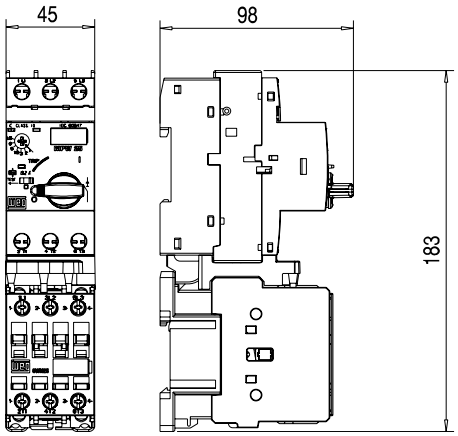
- 1 conducting path DC 150V	10kA
- 2 conducting paths in series DC 350V	10kA
- 3 conducting paths in series DC 350V	10kA

Dimensions

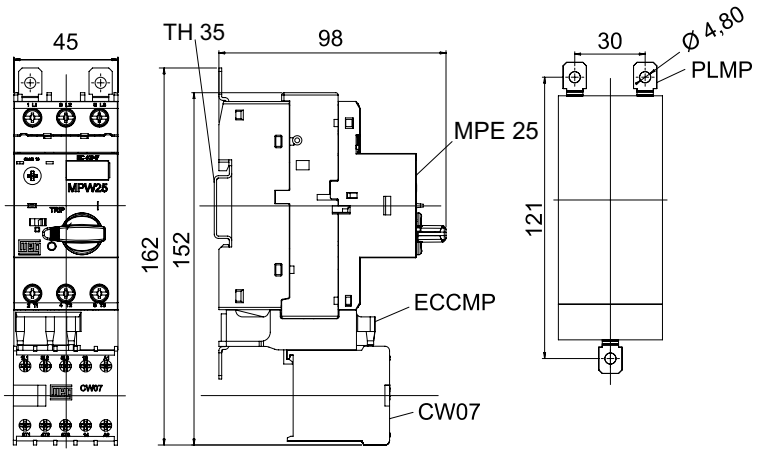
MPE25 + CEM9...CEM18



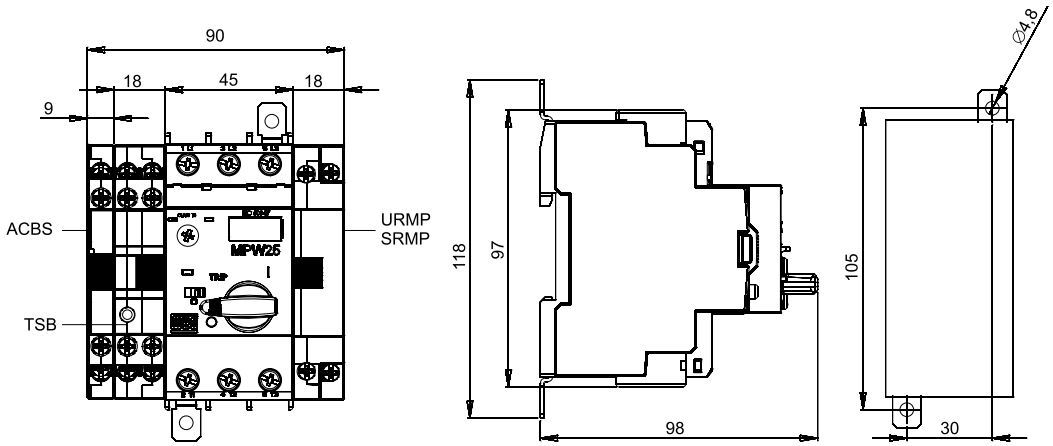
MPE25 + CEM25



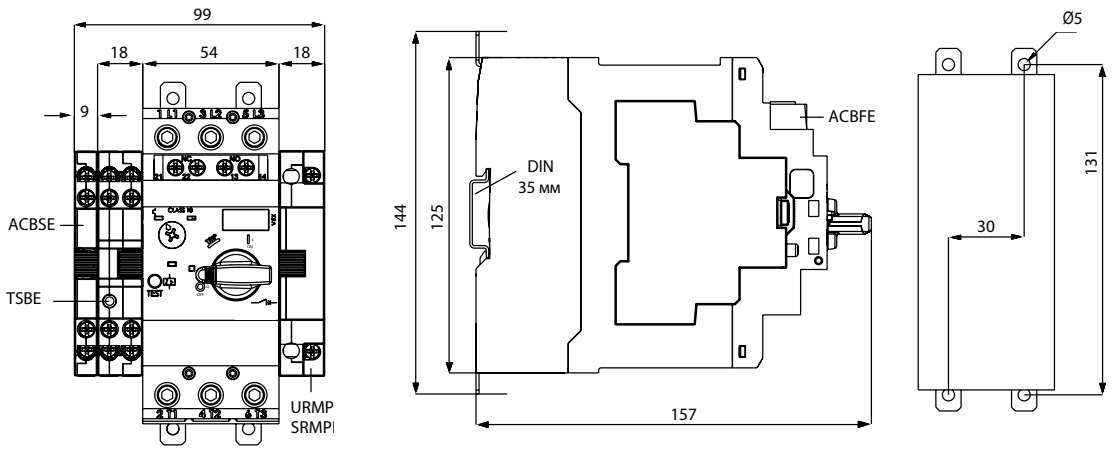
MPE25+ CE07



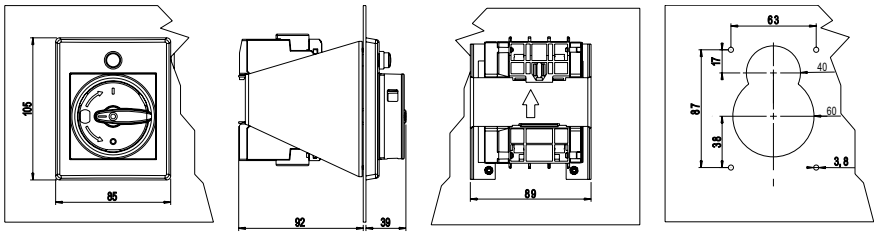
MPE25 + Accessories



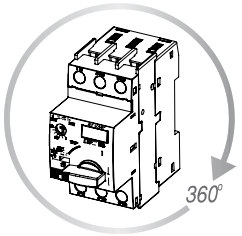
MPE80 + Accessories



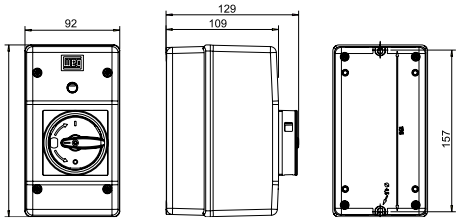
Frontal plate FMEE55E



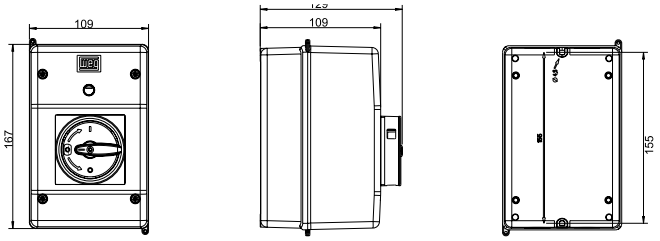
Mounting position



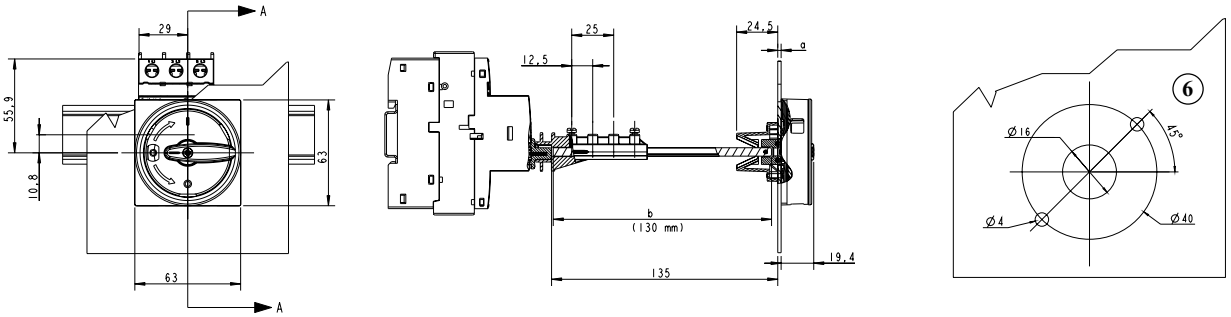
Insulated Enclosure - MPEE55



Insulated Enclosure - MLPEE55



Door coupling rotary handle RMMPE



Motor protective circuit breaker MS25

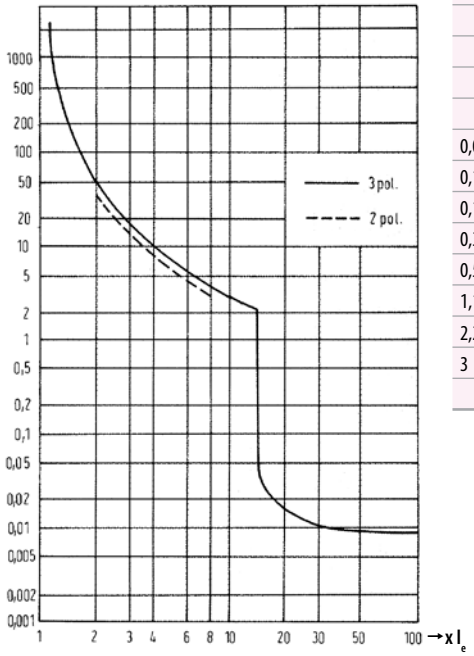
Technical data - General		
Standards		IEC/EN 60947-2, IEC/EN 60947-4-1, IEC/EN 60947-5-1, IEC/EN 60204
Climatic class		constant damp heat acc. to IEC 60068-2-78 cyclic damp heat acc. to IEC 60068-2-30
Degree of protection		IP20, after terminals covering IP20
Ambient temperature	°C	-25 … +60
Storage temperature	°C	-25 … +70
Temperature range of thermal compensation for overload release	°C	-5 … +40
Mechanical and electrical endurance		100,000
Shock resistance acc. to IEC 68-2-27	g	20
Vibration resistance acc. to IEC 68-2-6		5 g - f = 5 … 150 Hz
Overvoltage category / pollution degree		III / 3
Rated insulation voltage Ui	V	690
Rated impulse withstand voltage Uimp	kV	6
Weight	kg	0.252

Technical data - Main circuit			
Designation of connection terminals			1 - L1 ; 3 - L2 ; 5 - L3 ; 2 - T1 ; 4 - T2 ; 6 - T3
Terminal capacity	rigid	S (mm^2)	0.75 … 6
	flexible		0.75 … 4
Screw			with self-lifting clamp, protected against falling out
Screw head			PZ2
Tightening torque		Nm	1,8
Max. operational voltage	Ue	V	690
Setting range		A	0.1 - 0.16 (MS25); 0.16 - 0.25 (MS25); 0.25 - 0.4; 0.4 - 0.63; 0.63 - 1; 1 - 1.6; 1.6 - 2.5; 2.5 - 4; 4 - 6.3; 6.3 - 10; 10 - 16; 16 - 20; 20 - 25
No. of poles			3
Operating current of thermal	I		1.05 Ir < I ≤ 1.20 Ir
overload release			Ir. …set value
Sensitivity to phase failure			✓
Operating current of magnetic	I		11 In< I ≤ 13 In ± 20 %
overload release			In…upper setting limit
Power dissipation on pole at load with In	P	W	2 - 2.5
Utilization category	IEC/EN 60947-4-1		AC-3
	IEC/EN 60947-2		A
Trip class acc. to IEC/EN 60947-4-1			10A

MS25 motor protection switches, rated ultimate short-circuit breaking capacity Icu and max. back-up fuses if prospective short-circuit current Icp exceeds Icu:

Type	Operating current of short-circuit release (A)	Rated ultimate short-circuit breaking capacity Icu (kA)				Max. back-up fuse, if Icp > Icu (gL) (A)			
		230 V	400 V	500 V	690 V	230 V	400 V	500 V	690 V
MS 25 - 0,16	2	50	50	50	50	No back-up fuse required			
MS 25 - 0,25	3	50	50	50	50				
MS 25 - 0,4	5	50	50	50	50				
MS 25 - 0,63	8	50	50	50	50				
MS 25 - 1	12	50	50	50	50				
MS 25 - 1,6	20	50	50	50	50				
MS 25 - 2,5	33	50	50	3	2,5			25	20
MS 25 - 4	44	50	50	3	2,5			35	25
MS 25 - 6,3	75	50	50	3	2,5			50	35
MS 25 - 10	120	50	6	3	2,5		80	50	35
MS 25 - 16	160	6	4	2,5	2	80	80	63	35
MS 25 - 20	230	6	4	2,5	2	80	80	63	50
MS 25 - 25	270	6	4	2,5	2	80	80	63	50

Tripping characteristic



Switch selection for motor protection

Standard motor power						Setting range
Single-phase	3-phase					
220 V	220 V	380 V				
230 V	230 V	400 V	440 V	500 V	660 V	
240 V	240 V	415 V			690 V	
kW						A
		0,02			0,06	0,1 ... 0,16
		0,06	0,06	0,06	0,09	0,16 ... 0,25
	0,06	0,09	0,12	0,12	0,18	0,25 ... 0,4
	0,09	0,12	0,18	0,25	0,25	0,4 ... 0,63
0,06 ... 0,09	0,09 ... 0,12	0,18 ... 0,25	0,25	0,37	0,37 ... 0,55	0,61 ... 1
0,12	0,18 ... 0,25	0,37 ... 0,55	0,37 ... 0,55	0,55 ... 0,8	0,75 ...1,1	1 ... 1,6
0,18 ... 0,25	0,37	0,75 ... 1,1	0,75 ... 1,1	1,1	1,5	1,6 ... 2,5
0,37	0,55 ... 0,8	1,1 ... 1,5	1,5	1,5 ... 2,2	2,2 ... 3	2,5 ... 4
0,55 ... 0,75	1,1 ... 1,5	2,2 ... 2,5	2,2 ... 3	3	4	4 ... 6,3
1,1 ... 1,5	1,5 ... 2,5	3 ... 4	4 ... 5	4 ... 5,5	5,5 ... 7,5	6,3 ... 10
2,2	3 ... 4	5 ... 7,5	5,5 ... 9	7,5 ... 9	11	10 ... 16
3	5,5	9	11	11 ... 12,5	15	16 ... 20
	5,5 ... 7,5	11 ... 12,5	12,5	15	18,5	20 ... 25

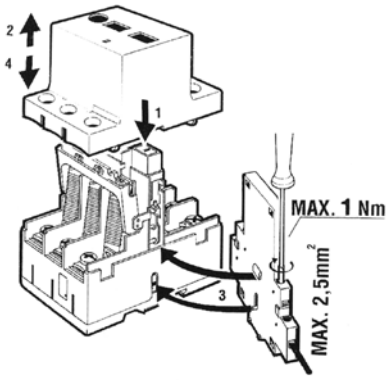
MST25 motor protection switches and max. back-up fuses for short-circuit protection:

Type	Max. back-up fuse Ue <400 V gL (A)
MST 25 - 0,4	1
MST 25 - 0,63	2
MST 25 - 1	2
MST 25 - 1,6	4
MST 25 - 2,5	6
MST 25 - 4	16
MST 25 - 6,3	20
MST 25 - 10	25
MST 25 - 16	35
MST 25 - 20	50
MST 25 - 25	50

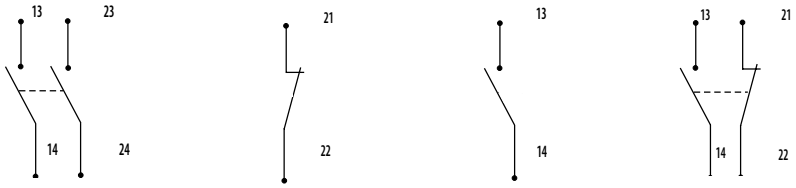
Accessories

Auxiliary switch for lateral mounting PS		
Rated insulation voltage U_i	V	500V
Thermal current I_{th}	A	6 A
Rated operational current at AC-15 230V/400V/500V I_e	A	3,5 A /2 A /1,5 A
Terminal capacity	mm^2	0,75 - 2,5 mm^2
Tightening torque	Nm	1

PS mounting

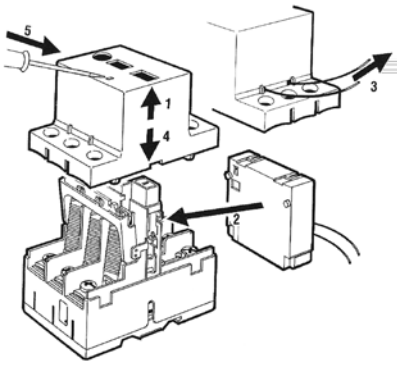


PS desigantion of contacts



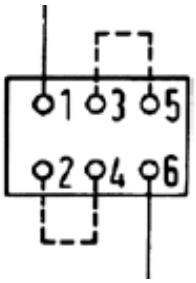
Under-voltage release U Shunt release A		
Control voltages Uc	V	220 - 240
Rated frequency f	Hz	50 - 60

Mounting of UV and shunt release

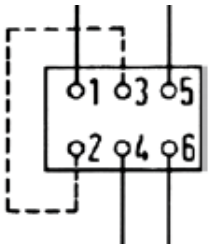


Connection diagram

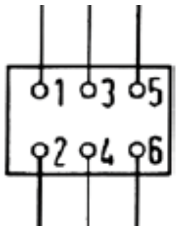
1-p



2-p

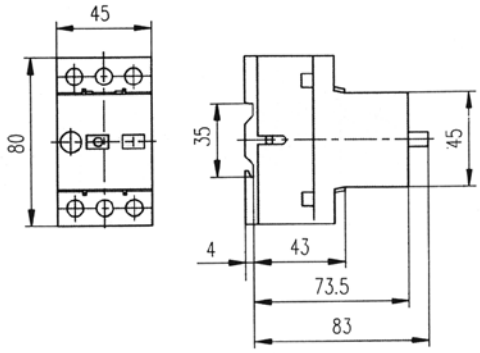


3-p

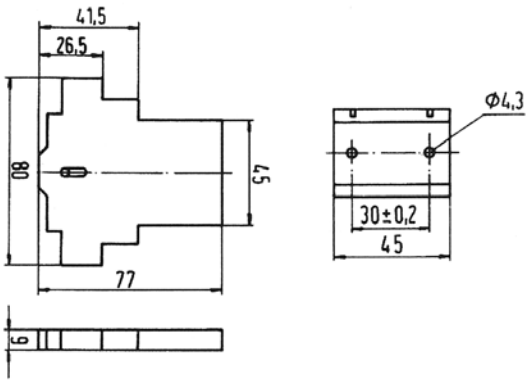


Dimensions

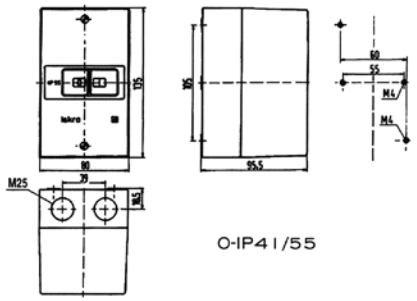
MS25, MST25



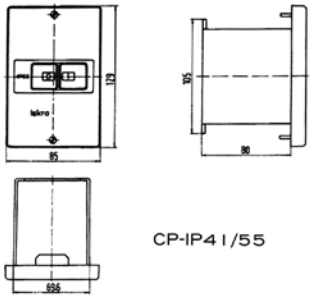
Auxiliary switch PS



Insulated Enclosure O,
Front plate CP



O-IP41/55



CP-IP41/55