

CMA 98 1250 to 5500 A

DC Poles
CMA 98 1250,
CMA 98 1600,
CMA 98 2000,
CMA 98 2560
CMA 98 3000
CMA 98 5000
CMA 98 5500.

**AC Poles,
consult us**



Purpose

Ensuring the division into sections of a track portion by opening a bi-stable motorised energy-storing contactor on DC distribution circuits, line tracks for trolley buses, tramways, protection coupons for metros, and so on,...
Lifting and handling: insulation of a travelling crane supplied with DC current,...

CMA front cover

- Mechanical signalling light gives the position of the contactor (opened/closed).
- Mechanical light signals the status of the spring.
- Lever for stretching the spring for manual control.
- Mechanical push-buttons (closing and opening).

Options

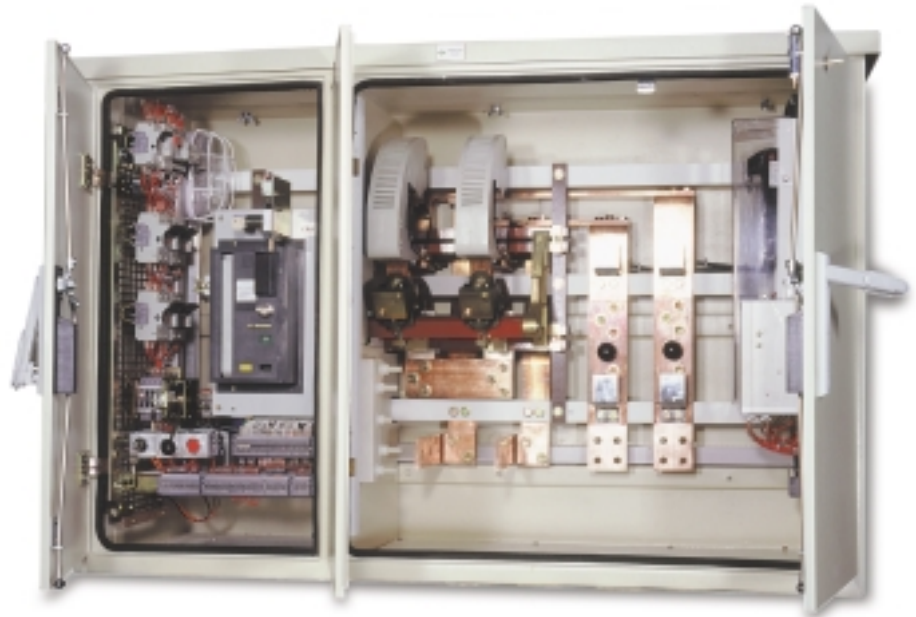
- Motorization of the stretching of the spring.
- Mechanical locking in opened position by a RONIS, TRAYVOU, PROFALUX, etc., type lock
Equipment locked in opened position:
 - Key is free,
 - No electrical control allowed.
- Padlocking system (padlock not provided).
- Locking of the Local/Remote control by a RONIS, TRAYVOU, PROFALUX, etc. type lock and shutter preventing the access to the local push button.
 - Manual control locked: key is free.
 - Manual control freed: Key is trapped,
No electrical control allowed.
- Opening of the contactor by a "lacking voltage" coil. This one provokes the opening of the contactor when the supplied voltage is reduced to 35% to 70% of its nominal value.
- Instant action, or delayed on request.
- Draw-out energy-storing control.
- Possible combination of poles of different ratings on the same contactor.
- Possible placement in panels:
 - metallic,
 - in polyester .

* number of keys provided: 2

FERRAZ SHAWMUT
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mersen

Shunt contactor and protection coupon



Energy-storing control with abrupt closing, independent from the operating speed of the operator

Description of the operating mode

Energy-storing control with abrupt closing, independent from the operating speed of the operator

Manual version only

These contactors have a control lever to stretch the energy-storing spring and an anti-pumping device. When the energy is stored by the spring, there are two possibilities for closing the contactor.

Closing by push-button

Once the energy is accumulated by the spring, a local action on the push-button is sufficient to close the contactor. This one closes and remains mechanically latched. Should you wish so, the spring can be re-stretched after that closing which allows successively and without bringing any energy:

- to open,
- to close,
- and to open again the contactor.

Opening

Since the contactor is closed, only a local action on the opening push-button is sufficient to open the contactor. This one opens under the pressure of the contacts and return springs.

Automatic closing

Once the energy is accumulated by the spring, the contactor closes. In this specific case, the system won't provide any local push-button. Moreover, there won't be any possibility to stretch again the spring in order to make, as in the previous case:

- to open,
- to close,
- an opening.

As for the opening, this one remains unchanged (by a local push-button).

Manual and electrical version

Adapting an electrical control device on a manual control equipment is easy since the needed space is already integrated into the CMA dimensions. (However, this adaptation has to be done in our workshops.)

The energy-storage of the spring is achieved by the adjunction of a universal motor and of a reducer device with gearing with mechanical anti-pumping system, in case of maintained order.

Once the energy is stored by the spring there are 2 possibilities to close the contactor.

Closing by PB and Closing Electromagnet EE

Remote closing with a closing electromagnet with current emission.

Local closing with the closing push button located on the panel board.

The spring is again automatically stretched after the closing of the CMA which allows successively and without bringing any energy:

- to open,
- to close,
- to open again the contactor.

Opening by PB and EA

Remote opening by a voltage-triggered releaser EA.

Local opening with the opening push-button located on the board panel.

Automatic closing

As soon as the energy is stored by the spring, the contactor closes. In this specific case, the system will provide neither a local closing push-button nor a closing electromagnet EE (the supply of the motor is switched-off by a limit switch) and there is no possibility to stretch again the spring in order to make, as in the previous case:

- an opening,
- a closing,
- an opening.

As for the opening, this one remains unchanged (by a local push-button or by the opening electromagnet).

Optical signalling of the board panel

Status of the spring:

- Yellow: not stretched,
- Blue: stretched (energy is stored).

Position indicator of the CMA:

- Red: closed,
- Green: opened.

Description of the operating mode

Energy-storing control with abrupt closing, independent from the operating speed of the operator

Options

Motorization of the stretching of the energy-storing spring

Padlocking of the CMA in opened position

- by a RONIS, PROFALUX,... type lock and with the adder of auxiliary contacts (1NO + 1NC).
- by a padlock (not supplied).

Condemnation of the PB of the board panel

- by a shutter that can be padlocked (padlock not supplied).
- by a RONIS, PROFALUX,... type lock with auxiliary contacts (1 NO + 1 NC) in order to inhibit the remote orders and shutter preventing the access to the PB.

Stopped closing FE

Only for " manual control" or " electrical without automatic closing" versions of CMA.

Operating voltage from 0.35 to 0.85 Un.

Remote release mechanism

Two types of release mechanisms allow the remote opening of the CMA.

- A release mechanism in case of current emission EA provokes the instant opening of the CMA.
- A release mechanism at minimum voltage MV or MVR provokes the opening of the CMA when its supplied voltage decreases to a value between 35 and 70% of its nominal value.

MV : instant action.

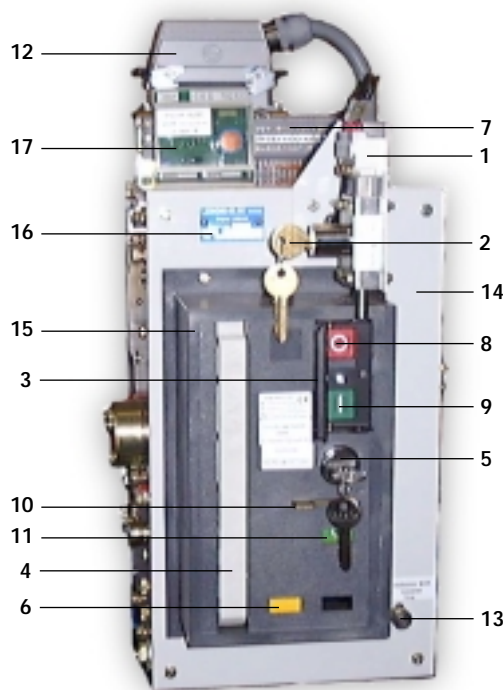
MVR : delayed action of 250 ms or 0.6 s (AC supply).

Other delaying devices on request.

Draw-out control

(Manual or electrical) draw-out energy-storing control.

Board panel functions



- 1 Auxiliary contacts (1NO + 1NC) associated to the local/distance lock.
- 2 Local/distance lock (condemnation of the local controls: key is free).
- 3 Shutter preventing the access to the PB. (padlockable if no local/distance lock).
- 4 Control lever for stretching the accumulation spring.
- 5 Lock for padlocking the equipment in opened position (key is free: equipment is locked).
- 6 Spring position indicator:
-yellow = spring not stretched
-blue = spring stretched
- 7 Connecting box (position contact information).
- 8 Local opening PB.
- 9 Local closing PB.
- 10 Padlocking in opened position.
- 11 Equipment status signalling:
-green= equipment opened
-red = equipment closed
- 12 Pin for sectioning the accumulation control block.
- 13 Pull for inhibition of the lacking voltage coil (MV or MVR) in manual mode.
- 14 Front mask.
- 15 Board panel.
- 16 ID label (reference to mention in any correspondence).
- 17 Electronic system for delayed action of the lacking voltage coil.

Power circuit

Particularities for currents greater than 2000 A, the power circuit is made of 2 separated parts assembled on the same axis and linked to a same mechanism.

- A "thermal" part:
Composed of blow-out poles mounted in parallel on a single section where the nominal current passes.
- A "break" part:
Composed of magnetic blow-out poles and blow-out cages with metallic plates.

At the time of the opening, the thermal poles open before the blow-out poles and the break is ensured by these magnetic blow-out poles.

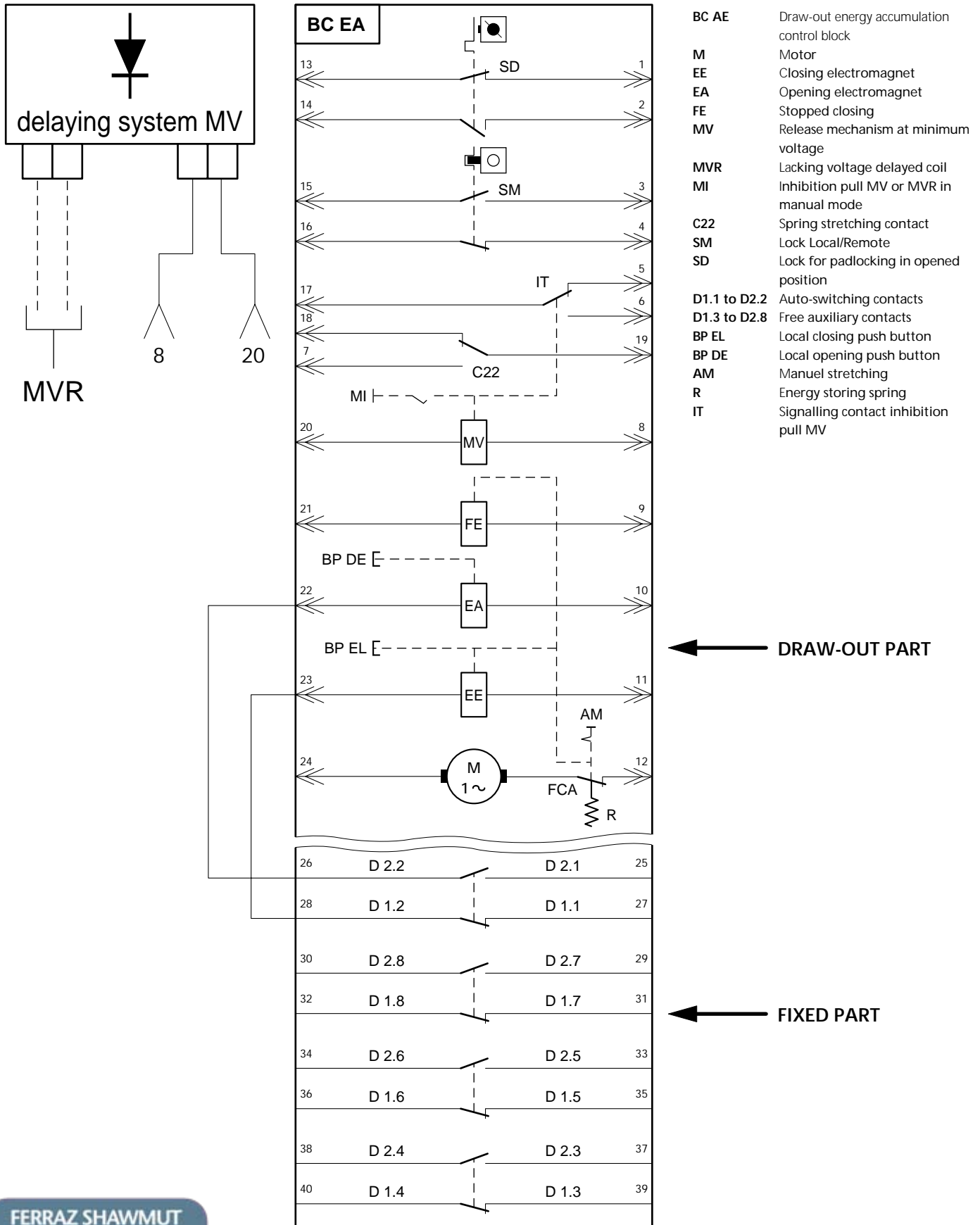
All the contacts are in copper with special silver pad for currents from 1250 to 6000 A.

- Possibility to have opening poles without overlapping.

Description of the operating mode

Control circuit of the energy-storing motorised contactor

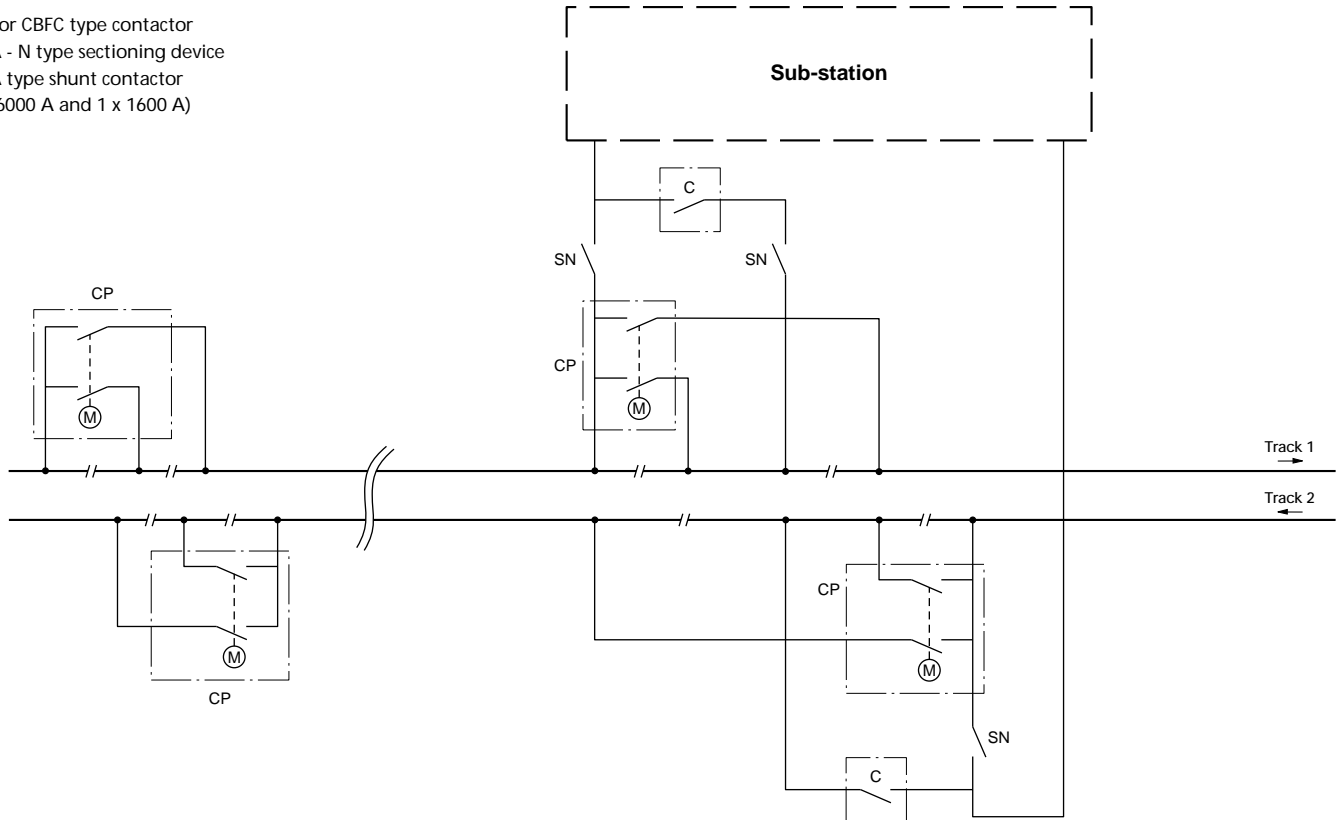
Drawing representing all the possible options for non-draw-out versions in AC current



Examples of simplified applications

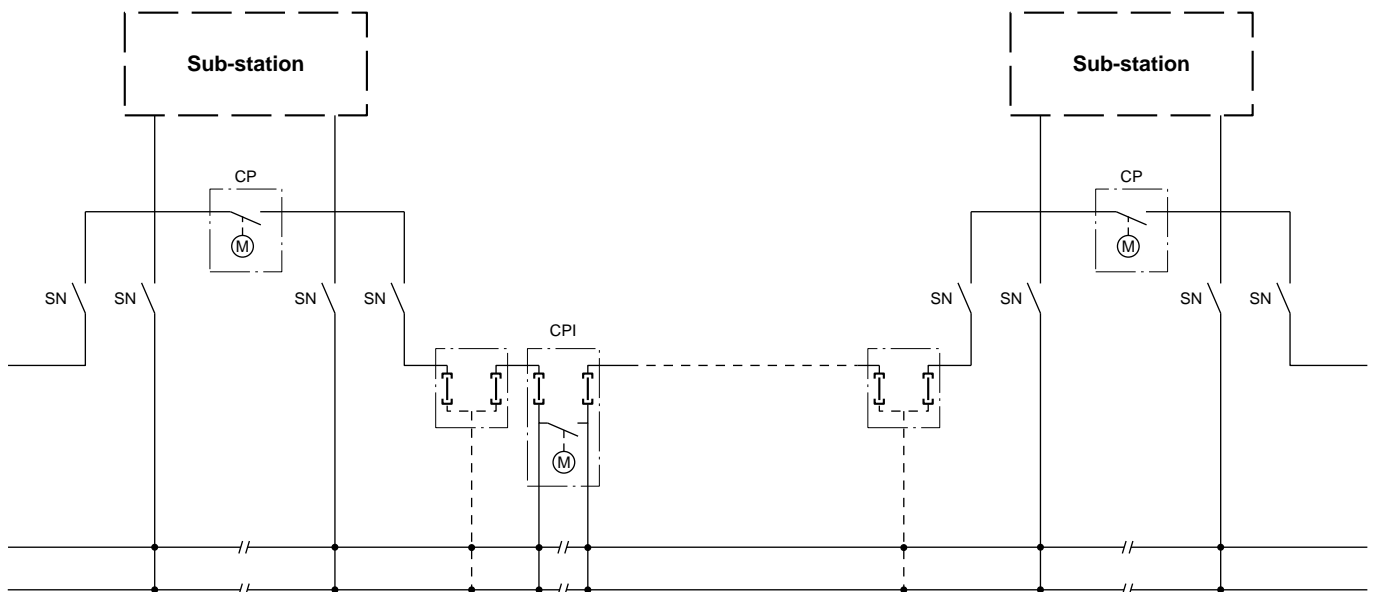
“HEAVY” Metro

- C CBC or CBFC type contactor
- SN CMA - N type sectioning device
- CP CMA type shunt contactor (1 x 6000 A and 1 x 1600 A)



Tramway

- CP CMA type shunt contactor
- CPI CMA type shunt contactor
- SN CMA - N type manual sectioning device



Energy-storing motorised contactor

U_e : 750 and upto 1200 V $\overline{\text{---}}$

Power circuit		CMA Type 98												
		2560 ^(*)				3200 ^(*)				5000 ^(*) (*)				
Thermal nominal current ⁽¹⁾ DC_1	A	2560				3200				5000				
Nominal voltage of use	V _{cc}	1000				1000				1000				
Duty voltage	V _{cc}	750				750				750				
Short-time current t ≤ 40°C														
	5 s	KA	24			48			68					
	10 s	KA	18			34			47					
	15 s	KA	15			27			38					
	30 s	KA	10			19			27					
	1 min	KA	8			14			19					
	3 min	KA	5			8			12					
	10 min	KA	4			5			7					
Bipolar current switch-off rating ⁽⁵⁾	voltage	V	500	700	1000	1500	500	700	1000	1500	500	700	1000	1500
	L/R=15 ms	KA	30	23	18	6.6	30	23	18	6.6	30	23	18	6.6
	L/R=20 ms	KA	18			18			18					
Tetrapolar current switch-off rating ⁽⁶⁾	voltage	V	1000	2000	3000	1000	2000	3000	1000	2000	3000	1000	2000	3000
	L/R=15 ms	KA	30	19	5	30	19	5	30	19	5	30	19	5
Current switch-on rating	L/R = 5 ms	KA	60			60			100					
Dielectric voltage			8 kV - 50 Hz - 1 mn				8 kV - 50 Hz - 1 mn				8 kV - 50 Hz - 1 mn			

Control circuit														
Nominal voltages	AC 50 - 60 Hz	V	48 - 127 - 220/230 - 380 ⁽³⁾											
	DC	V	24 - 48 - 110 - 220 ⁽³⁾											
Power absorbed by the motor														
	AC	VA	175			175			175					
	DC	W	150			150			150					
Closing electromagnet														
AC	inrush	VA	320			320			320					
	duty	VA	50			50			50					
DC	inrush	W	300			300			300					
	duty	W	50			50			50					
Opening electromagnet														
AC 50-60Hz	inrush	VA	100			100			100					
DC	inrush ≤ 220 V	W	30			30			30					
	500 V	W	275			275			275					
Electrical insulation/earth			2.5 kV - 50 Hz - 1 mn				2.5 kV - 50 Hz - 1 mn				2.5 kV - 50 Hz - 1 mn			

Stopped closing FE														
Operating voltage		V	from 0.35 to 0.85 Un											
Assigned voltages	AC 50 Hz	V	24 - 48 - 127 - 220 - 380 - 415 - 500 ⁽³⁾											
	AC 60 Hz	V	24 - 48 - 127 - 220 - 380 - 415 - 500 ⁽³⁾											
	DC	V	24 - 48 - 110 - 120 - 220 - 440 - 500 ⁽³⁾											
Consumption														
AC	inrush	VA	23			23			23					
	duty	VA	10			10			10					
DC	± 220 V	W	6			6			6					
	440 - 550 V	W	21			21			21					
	500 V	W	21			21			21					

Release mechanism at minimum voltage														
Assigned voltages Un														
	AC 50 Hz	V	24 - 48 - 110/127 - 220 - 380 - 415 - 500 ⁽³⁾											
	AC 60 Hz	V	24 - 48 - 110/127 - 220 - 380 ⁽³⁾											
	DC	V	24 - 48 - 110 - 120 - 220 - 440 - 500 ⁽³⁾											
Operating voltage			from 0.35 to 0.7 Un ⁽²⁾											
Absorbed power														
AC	inrush	VA	23			23			23					
	duty	VA	10			10			10					
DC	inrush ≤ 220 V	W	6			6			6					
	440 - 500 V	W	21			21			21					

Average time of operation													
Closing time of the contactor ⁽⁴⁾ at Un	ms	50										50	
Opening time of the contactor at Un	ms	50										50	

Auxiliary contacts 3 NO + 3 NC														
Thermal current I _{th}	A	20				20				20				
Current switch-off rating														
AC cos φ = 0.3 / 500 V	A	6			6			6						
DC	110 V	A	2.5			2.5			2.5					
	250 V	A	0.8			0.8			0.8					
Electrical insulation/earth			2.5 kV - 50 Hz - 1 mn				2.5 kV - 50 Hz - 1 mn				2.5 kV - 50 Hz - 1 mn			

(1) in open air.

(2) closing of the contactor is ensured from 0.85 Un.

(3) for other voltages, consult us.

(4) opening time is measured from the supply of the closing coil until the separation of the main contacts.

(5) 2 blow-out poles.

(6) 4 blow-out poles (2 on the positive line and 2 on the negative line).

(7) 5500 A: lower section C = 15 mm..

* Association of thermal poles and magnetic blow-out poles.

• Temperature factor to be applied to the poles or to the current controlled according to the ambient temperature (around the contactor):

1.04	40 < t < 45°C
1.08	45 < t ≤ 50°C
1.12	50 < t ≤ 55°C
1.19	55 < t ≤ 60°C