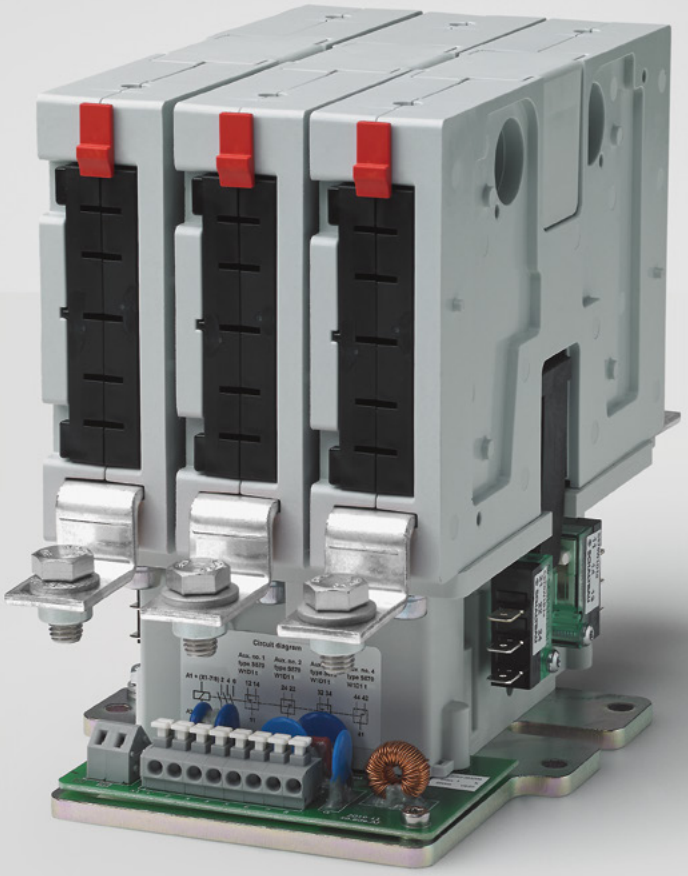
SCHALTBAU



CF

1-, 2-, 3-, 4-, 5- and 6-pole
uni- and bi-directional DC and AC
NO and/or NC power contactors
up to 3,000 volts and 400 amps

1- to 6-pole uni- and bi-directional DC and AC power contactors

Multi-pole, modular and compact switchgear for modern power converters

The CF series from Schaltbau is an extremely modular switchgear concept. Variants with 1 to 6 main contacts are available. If required, these can be individually configured as normally open or normally closed contacts. Mixed configurations are also possible. The contact system is suitable for DC with full bi-directionality and AC up to 400 Hz. This means that different requirements can be flexibly realised. The high switching functionality and reliability allow practical and economical use.

The patented and exclusively permanent-magnetic arc-handling enables a compact design. This saves space and reduces weight. The combination of innovative technology, compactness and versatility makes the CF series particularly suitable for use in railway and industrial applications. Thanks to its unique modularity, the product family comprises a large number of different design variants, tailored to a wide range of applications.

Features

Innovative design

- Newly developed, innovative switching chambers: These can be configured as normally open contacts, normally closed contacts or in combination as changeover contacts. A mixed configuration of normally open and normally closed contacts is also possible
- Main contact configuration: DC uni- or bi-directional, AC up to 400 Hz
- Effective arc handling - no critical current range and only minimal wear on the main contact system thanks to permanent magnetic blowout
- High making capacity, for normally open and normally closed contacts alike
- Monostable and bistable drives available. Bistable drives only require energy for the switching process. This reduces heat dissipation
- Modular, compact, low total cost of ownership (TCO)

Compact dimensions – high power range

- Minimum dimensions for length, width and height in this performance class. The shorter »S« versions have one drive, the longer »W« versions have two drives.
- 3,000 V AC / 400 A max., DC uni-/bi-directional, AC up to 400 Hz. The rated insulation voltage is 3,600 V max.

Application-dependent, innovative arc chamber design with ceramic, plastic or metal extinguishing elements

The modern arc chamber design is optimised for use in different applications. The efficient arc chamber inserts are available with ceramic, plastic or metal extinguishing elements:

- Ceramic: DC for high switching requirements
- Plastic: DC or AC for low switching requirements
- Metal: AC for high switching requirements

4 auxiliary switches for diagnosis and switching status monitoring

CF contactors are equipped with a maximum of 4 auxiliary contacts. The contact status is mapped via snap-action switches with positive opening. S870 series snap-action switches with a changeover contact, positive opening and silver or gold contacts are used. The auxiliary switches are also mirror contacts in accordance with IEC 60947-4-1, Annex F.

Low energy consumption and low heating thanks to sophisticated coil saving circuit

The pull-in behaviour is controlled by a PWM controller independent of the coil voltage and temperature applied. This ensures a safe and low-bounce switch-on. In holding mode the PWM controller regulates the coil current. This significantly reduces power consumption and heating. At the same time the reliability of the contactor is increased.

Easy maintenance

- Tool-free inspection of the main contacts
- Tool-free replacement of the arcing chamber inserts
- Simple replacement of individual switching chambers thanks to modularity

Reliable, robust and economical

Modular contactors from the CF series are available in numerous variants and are designed for voltages of up to 3,000 volts and continuous currents of up to 400 amps per switching chamber. Among other features, the robust switchgear has a high making and breaking capacity and a high short-time withstand current. This ensures long operational reliability. Depending on the application, there are different requirements for electromechanical components. The CF contactors are very robust and by that able to withstand most shock and vibration requirements, IEC 60077-2 is met anyway.

Applications

Power contactor for railway vehicles, DC up to 3,000 volts:

- Main contactor for drive converters
- Main contactor for auxiliary converters (HBU)
- Main battery contactor in hybrid or battery electric vehicles

Switchgear for a wide range of mobile and stationary applications, DC up to 3,000 volts:

- Rail: Locomotives and multiple-unit trains
- Industry: Photovoltaic systems, wind turbines, cranes, welding systems, mining

Switchgear for AC applications up to 3,000 volts:

- Switching permanently excited traction motors 3 AC, 400 Hz
- Activation of the brake actuator for DC drives
- Starters, compressors, motors
- PV systems

Switchgear for configuring electrical systems, DC or AC up to 3,000 volts:

- Selection of one of several power supply sources
- Configuration of filters for multi-system operation
- Connecting/disconnecting DC links

Standards

IEC 60077-2
Railway applications – Electric equipment for rolling stock – Part 2: Electrotechnical components; General rules

IEC 62497-1
Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment

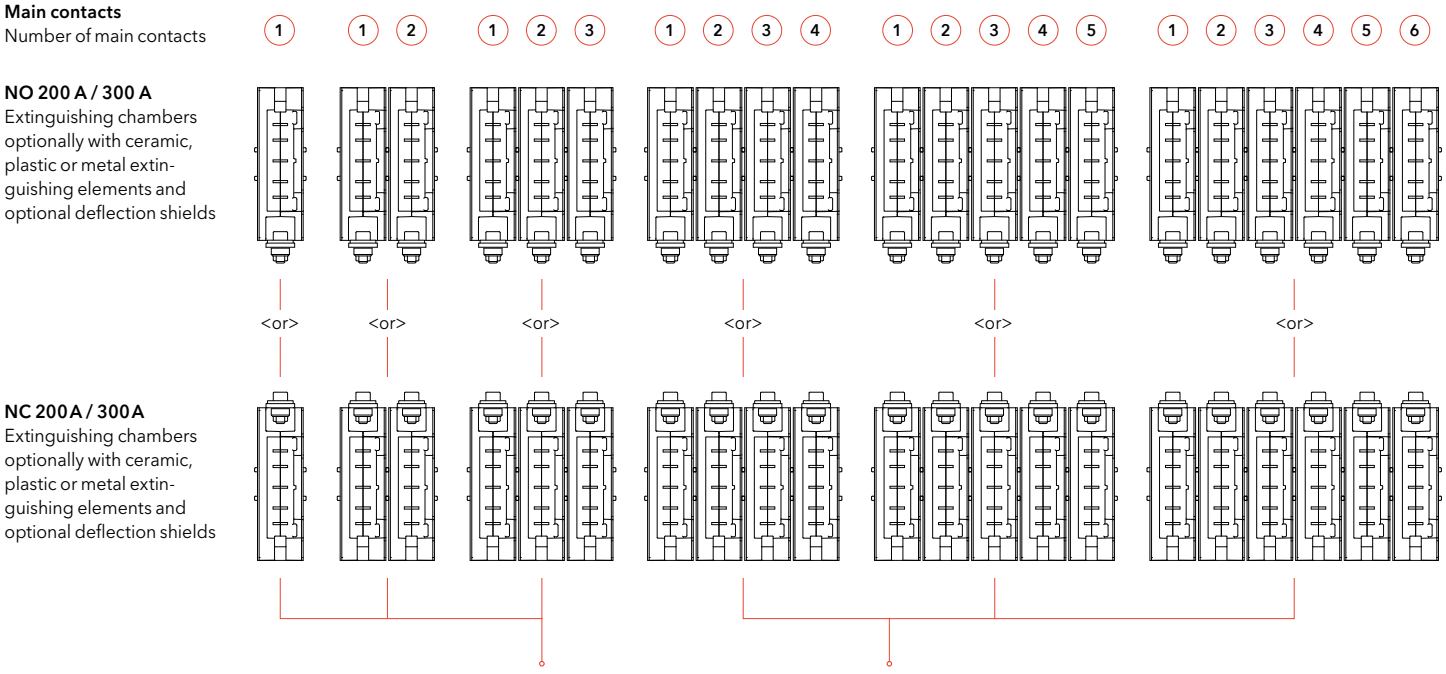
IEC 62236-3-2
Railway applications – Electromagnetic compatibility – Part 3-2: Rolling stock – Apparatus

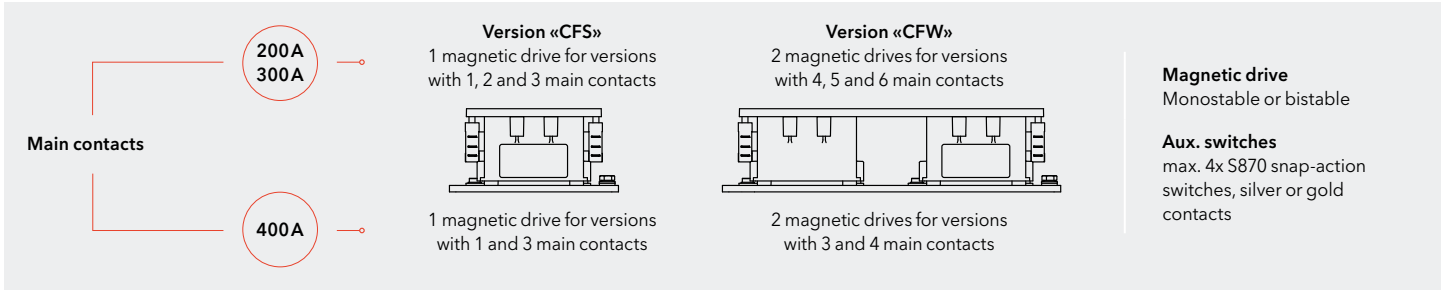
IEC 61373
Railway applications – Rolling stock equipment – Shock and vibration tests

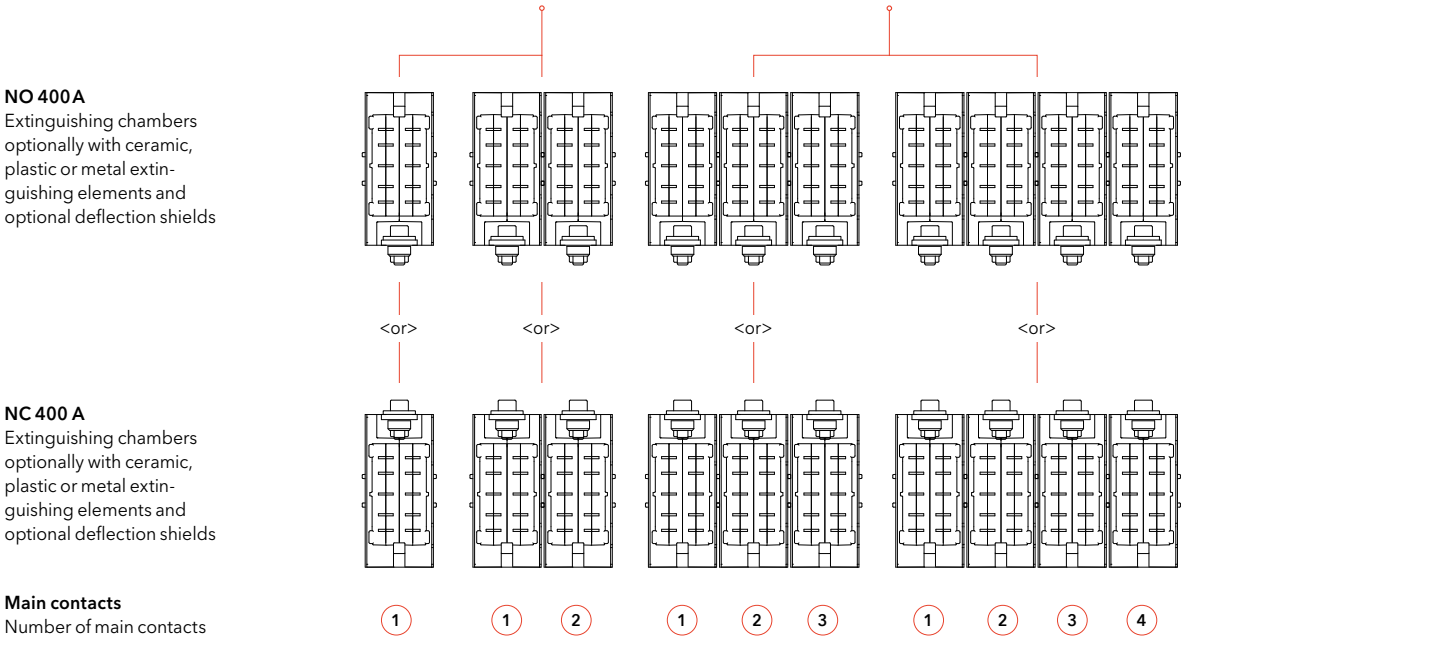
Configuration – A contactor tailored to your needs

Maximum modularity – whether as NO or NC contactors or in mixed configurations: The multi-pole contactors in the CF series offer countless variation options and are perfect for your application. The contactors can be configured with a maximum of 6 main contacts of 200 or 300 amps each. Versions with a maximum of 4 switching chambers are available for main contacts with 400 amps.

Depending on the switching requirements, three different arcing chambers are available.
Magnet drives are available monostable or bistable for many control voltages. Four reliable Schaltbau S870 series snap-action switches, each with a changeover contact and positive opening, are available for monitoring the switching status.







Specifications – 1-pole power contactors for AC and DC, U_n up to 3,000 V and I_{th} up to 600 A

Baureihe CF	Switching chamber for I_{th}	**200 A**	**300 A**	**400 A**
Type of voltage	DC / AC AC	uni-directional / 50 Hz < 400 Hz	uni-directional / 50 Hz < 400 Hz	bi-directional / ≤ 50 Hz < 400 Hz
Main contacts configuration	Number of poles / configuration	1 ... 6x / SPST-NC or SPST-NO	1 ... 6x / SPST-NC or SPST-NO	1 ... 4x / SPST-NC or SPST-NO
Electrical data according to IEC 60077-2				
Nominal voltage	U_n	1,500 V | 3,000 V	1,500 V | 3,000 V	1,500 V | 3,000 V
Rated insulation voltage	U_i/U_{Nm}	3,600 V	3,600 V	3,600 V
Rated impulse withstand voltage	U_{imp}/U_{Ni}	15 kV | 25 kV	15 kV | 25 kV	15 kV | 25 kV
Pollution degree / Overvoltage category		PD3 / OV3	PD3 / OV3	PD3 / OV3
Switching overvoltages	@ U_e/U_r = 1.500 V / @ U_e/U_r = 3.000 V	< 6 kV / < 12 kV	< 6 kV / < 12 kV	< 6 kV / < 12 kV
Conventional thermal current	I_{th}	200 A	300 A / 230 A *	400 A
Component category		B	B	B
Rated short-circuit making capacity I_{cm}	NO / NC	4 kA / 1.8 kA	4 kA / 1.8 kA	4 kA / 2.5 kA
Rated short-circuit breaking capacity I_{cn}				
T1 = 1 ms, DC, U_e/U_r	1,500 V / 3,000 V	600 A / 50 A	600 A / 50 A	500 A / 70 A
T15 = 1 ms, DC, U_e/U_r	1,500 V / 3,000 V	200 A / upon request	200 A / upon request	200 A / 20 A
cosφ = 0.8, AC ≤ 50 Hz, Ue/Ur	1,500 V / 3,000 V	---	---	900 A / 450 A
cosφ = 0.8, AC ≤ 400 Hz, Ue/Ur	1,500 V / 3,000 V	300 A / 50 A	300 A / 50 A	800 A / upon request
cosφ = 1, AC ≤ 50 Hz, Ue/Ur	1,500 V / 3,000 V	---	---	1,130 A / 670 A
cosφ = 1, AC ≤ 400 Hz, Ue/Ur	1,500 V / 3,000 V	600 A / 400 A	600 A / 400 A	800 A / 180 A
Rated short-time withstand current I_{cw} @ T < 100 ms	DC AC	NO: 3.5 kA / NC: 3.5 kA NO: 4 kA / NC: 3.5 kA	NO: 3.5 kA / NC: 3.5 kA NO: 4 kA / NC: 3.5 kA	NO: 4 kA / NC: 3.5 kA NO: 4 kA / NC: 3.5 kA
Critical current range		None	None	None
Main contacts				
Contact material		$AgSnO_2$		
Terminals	Connection per main contact	1x M8		
Torque		10 Nm		
Auxiliary switches				
Number max. / configuration		4x max. / S870		
Mirror contact function	IEC 60947-4-1, annex F	●		
Contact material		Silver, gold		
Switching capacity		16 A @ 24 V / 13.5 A @ 80 V / 7 A @ 110 V (t = 5 ms, DC)		
Terminals		Flat tabs 6.3 x 0.5 mm		
Magnetic drive				
Coil voltage	U_S	24 / 36 / 72 / 110 V DC		
Control inputs (only coil version N, B)	U_{St} / I_{St}	8 ... 400 V / 1 mA (failsafe, version N only)		
Operating range		0.7 ... 1.25 x U_S		
Pollution degree / Overvoltage category		PD3 / OV2		
Coil power dissipation	@ U_S and T_a = 20 °C; per drive	Pull-in: 200 W / Holding: 10 W		
Pull-in time	typical @ T_a = 20 °C	100 ms		
Drop-off voltage	typical @ T_a = 20 °C	0.1 x U_S		
Drop-off time	typical @ T_a = 20 °C	40 ms		
Frequency of operation	@ 1,25 x U_S and T_a = 20 °C	Mechanical: 240 operations/hour max. / electrical: 30 operations/hour max.		
Coil suppression		Suppressor diode		
Coil terminals		Cage clamp		
Degree of protection		IP00		
Mechanical endurance		> 1.000.000 operating cycles		
Vibration / shock	IEC 61373	Category 1, class B		
Mounting position		horizontal / vertical		
Environmental conditions	Operating/Storage temperature Altitude/Humidity (IEC 50125-1)	-40 °C ... +70 °C / -40 °C ... +85 °C < 2,000 m above sea level / < 75 % yearly average		
Approvals		CE		
Weight	Number of poles 1/2/3/4/5/6	2.8 / 3.8 / 4.9 / 7.5 / 8.7 / 9.7 kg	2.8 / 3.8 / 4.9 / 7.5 / 8.7 / 9.7 kg	3.0 / 4.2 / 7.1 / 8.3 / --- / --- kg

* only for 3, 4, 5 and 6 pole NC contactors

Ordering key – 1 to 6-pole bidirectional DC and AC contactors for 200 A and 300 A

CFW6-15-121212121212N-AM-41

Series, contact system

CFS	CF contactor with one actuator for versions with 1, 2 and 3 main contacts NO/NC á 200 A/300 A
CFW	CF contactor with two actuators for versions with 4, 5 and 6 main contacts NO/NC á 200 A/300 A

Number of main contacts

1 ... 6	Total number of main contacts

Nominal voltage

15	U_n = 1,500 V
30	U_n = 3,000 V

Main contact #1

1 ... 4	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1
2 ... L	Configuration: See table «Configuration of main contacts»

Main contact #2

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2:---
2 ... L, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Main contact #3

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2:---
2 ... L, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Main contact #4

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2:---
2 ... L, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Main contact #5

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2---
2 ... L, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Main contact #6

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2:---
2 ... L, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Deflection shields

Y	End deflection shield right*1
N	---

Auxiliary switches, type

Snap-action swiches S870, silver contacts	**1**
Snap-action swiches S870, gold contacts	**2**

Auxiliary switches, number

1 to 4 auxiliary switches, see circuit diagram for position	**1 ... 4**

Coil design

Monostable (standard)	**M**
Monostable with switching input for activation	**N**
Bistable with 2 switching inputs for activation*3	**B**

Magnetic drive, coil voltage

24 V DC, Tolerance –30 ... +25 %	**A**
36 ... 48 V DC, Tolerance –30 ... +25 %	**B**
110 V DC, Tolerance –30 ... +25 %	**C**
72 V DC, Tolerance –30 ... +25 %	**E**

Configuration of main contacts 200 A/300 A

Main contacts	Continuous thermal current				Arc chamber insert		
Configuration	300 A	200 A	300 A	200 A	Ceramics	Plastic	Metal
DC	uni-directional	uni-directional	---	---	•	•	---
AC	50 Hz	50 Hz	400 Hz	400 Hz	---	•	•

2	•				•		
3	•					•	
5		•			•		
6		•				•	
8			•			•	
9			•				•
M				•		•	
C				•			•
K	•						•
L		•					•

*1 Deflection shields:
- Mandatory for voltages > 1,500 V and if minimum distances to conductive parts cannot be maintained.
- Main contact with disconnector plate mounted on the left-hand side
- Select the "Y" option to configure a deflection shield as a termination

*2 The value "0" must be provided for non-configured/unnecessary main contacts.

*3 Only coil version bistable:
An auxiliary switch is required to monitor the switching status.
Position 1 is reserved for this purpose. This auxiliary switch is always permanently provided for monitoring the switching status and is not available to the customer.

Note: Presented in this catalogue are only stock items which can be supplied in short delivery time.
For some variants minimum quantities apply.
Please do not hesitate to ask for the conditions.
Special variants: If you need a special variant of the contactor, please do not hesitate to contact us. Maybe the type of contactor you are looking for is among our many special designs. If not, we can also supply customized designs.
In this case, however, minimum order quantities apply.

Ordering key – 1 to 4-pole bidirectional DC and AC contactors for 400 A

CFW4-15-121212120000N-AM-41

Series, contact system

CFS	CF contactor with one actuator for versions with 1 and 2 main contacts NO/NC á 200 A/300 A
CFW	CF contactor with two actuators for versions with 3 and 4 main contacts NO/NC á 200 A/300 A

Number of main contacts

1 ... 4	Total number of main contacts

Nominal voltage

15	U_n = 1,500 V
30	U_n = 3,000 V

Main contact #1

1 ... 4	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1
D ... N	Configuration: See table «Configuration of main contacts»

Main contact #2

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2:---
D ... N, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Main contact #3

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2:---
D ... N, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Main contact #4

1 ... 4, 0	Contact system: **1**:NO/**2**:NO+DS*1/**3**:NC/**4**:NC+DS*1/**0***2:---
D ... N, 0	Configuration: See table «Configuration of main contacts»/**0***2:---

Main contact #5

0	Contact system: **0**: ---
0	Configuration:: **0**: ---

Main contact #6

0	Contact system: **0**: ---
0	Configuration: **0**: ---

Deflection shields

Y	End deflection shield right*1
N	---

Auxiliary switches, type

Snap-action swiches S870, silver contacts	**1**
Snap-action swiches S870, gold contacts	**2**

Auxiliary switches, number

1 to 4 auxiliary switches, see circuit diagram for position	**1 ... 4**

Coil design

Monostable (standard)	**M**
Monostable with switching input for activation	**N**
Bistable with 2 switching inputs for activation*3	**B**

Magnetic drive, coil voltage

24 V DC, Tolerance –30 ... +25 %	**A**
36 ... 48 V DC, Tolerance –30 ... +25 %	**B**
110 V DC, Tolerance –30 ... +25 %	**C**
72 V DC, Tolerance –30 ... +25 %	**E**

Configuration of main contacts 400 A

Main contacts	Continuous thermal current		Arc chamber insert		
Configuration	400 A	400 A	Ceramics	Plastic	Metal
DC	bi-directional	---	•	•	---
AC	50 Hz	400 Hz	---	•	•
D	•		•		
E	•			•	
G		•		•	
H		•			•
N	•				•

*1 Deflection shields:
- Mandatory for voltages > 1,500 V and if minimum distances to conductive parts cannot be maintained.
- Main contact with disconnector plate mounted on the left-hand side
- Select the "Y" option to configure a deflection shield as a termination

*2 The value "0" must be provided for non-configured/unnecessary main contacts.

*3 Only coil version bistable:
An auxiliary switch is required to monitor the switching status.
Position 1 is reserved for this purpose. This auxiliary switch is always permanently provided for monitoring the switching status and is not available to the customer.

Note: Presented in this catalogue are only stock items which can be supplied in short delivery time. For some variants minimum quantities apply. Please do not hesitate to ask for the conditions.

Special variants: If you need a special variant of the contactor, please do not hesitate to contact us. Maybe the type of contactor you are looking for is among our many special designs. If not, we can also supply customized designs. In this case, however, minimum order quantities apply.

Dimension diagrams – 1-, 2-, 3-pole CFS NO contactors with main contacts 200 A/300 A and 1 magnetic drive

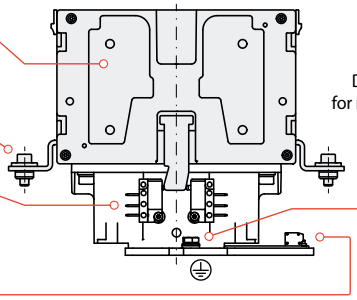
Switching chamber NO for I_{th} = 200 A/300 A
Arc chamber with inserts made of ceramic, plastic or metal

Main contact terminals M8
1x M8, 10 Nm max.

Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

8 pole terminal block X1
Coil- and control terminals

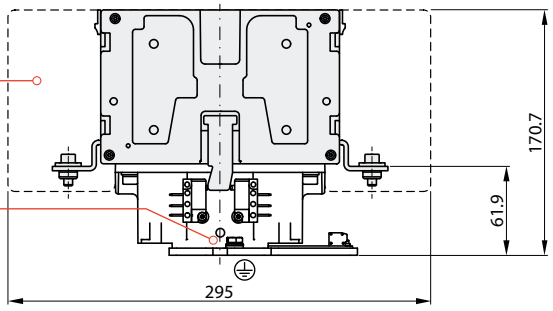
Versions U_n = 1,500 V



Deflection shields for nominal voltages > 1.500 V

M6, 3 Nm max.

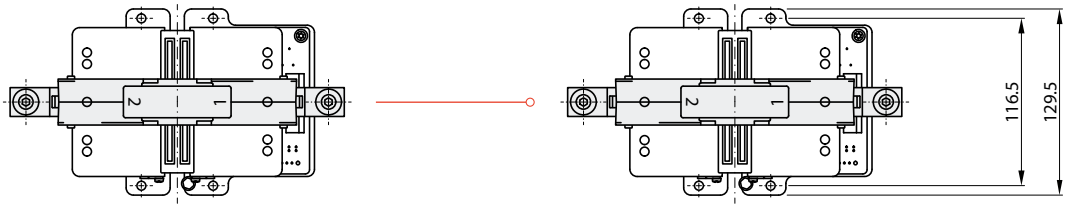
Versions U_n = 3,000 V



1 main contact SPST-NO, I_{th} = 200 A/300 A, 1 magnetic drive

Configuration: CFS1-15-00xx00000000N-xx-xx CFS1-30-00xx00000000N-xx-xx

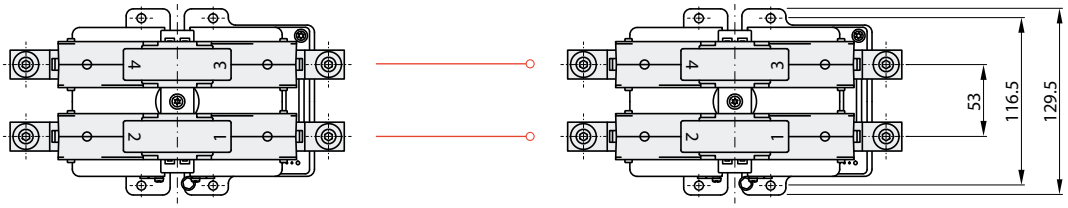
1-pole version



2 main contactse SPST-NO, I_{th} = 200 A/300 A, 1 magnetic drive

Configuration: CFS2-15-xx00xx000000N-xx-xx CFS2-30-xx00xx000000N-xx-xx

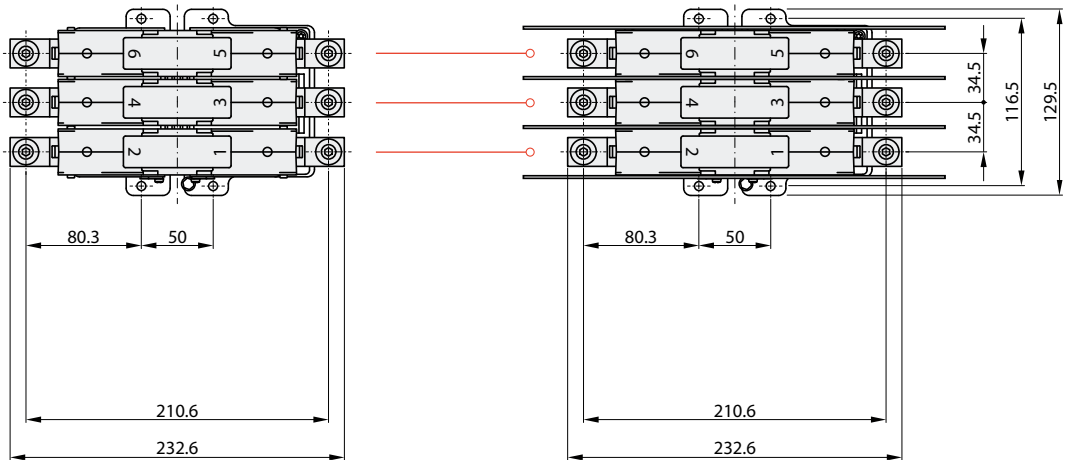
2-pole version



3 main contactse SPST-NO, I_{th} = 200 A/300 A, 1 magnetic drive

Configuration: CFS3-15-xxxxxx000000N-xx-xx CFS3-30-xxxxxx000000Y-xx-xx

3-pole version

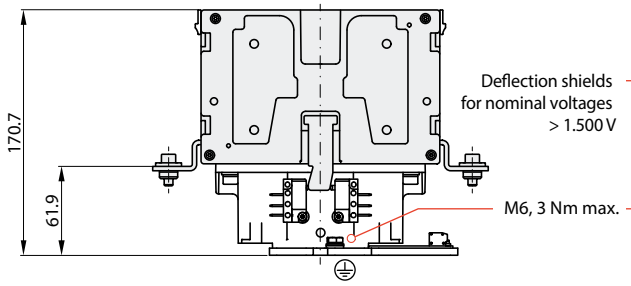


NO contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

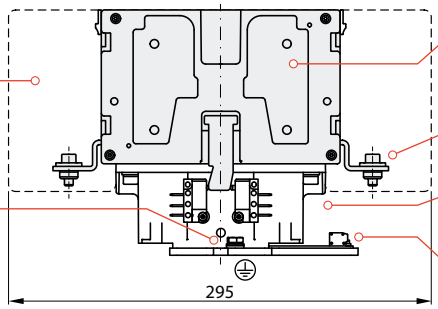
Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Dimension diagrams – 4-, 5-, 6-pole CFW NO contactors with main contacts 200 A/300 A and 2 magnetic drives

Versions U_n = 1,500 V



Versions U_n = 3,000 V



Switching chamber NO for I_{th} = 200 A/300 A
Arc chamber with inserts made of ceramic, plastic or metal

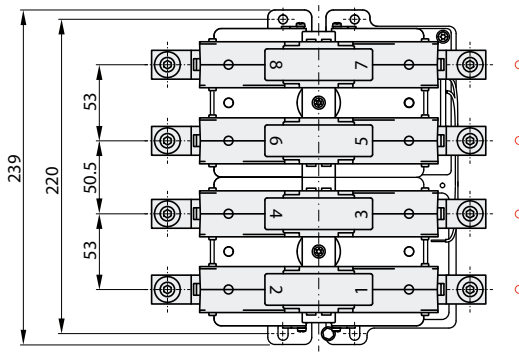
Main contact terminals M8
1x M8, 10 Nm max.

Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

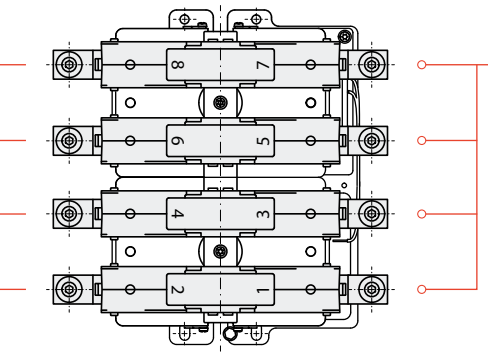
8 pole terminal block X1
Coil- and control terminals

4 main contactse SPST-NO, I_{th} = 200 A/300 A, 2 magnetic drive

Configuration: CFW4-15-xx00xxxx00xxN-xx-xx



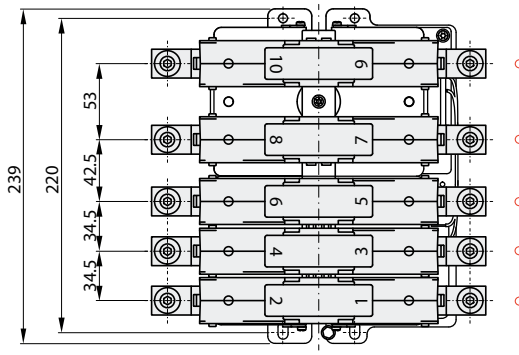
CFW4-30-xx00xxxx00xxN-xx-xx



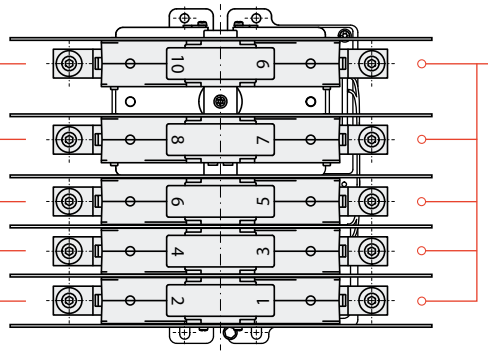
4-pole version

5 main contactse SPST-NO, I_{th} = 200 A/300 A, 2 magnetic drive

Configuration: CFW5-15-xxxxxxxx00xxN-xx-xx



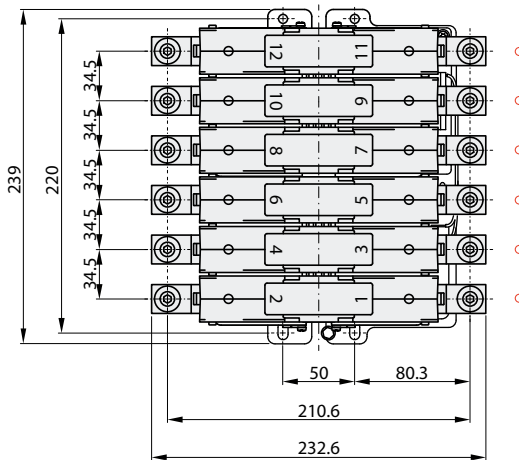
CFW5-30-xxxxxxxx00xxY-xx-xx



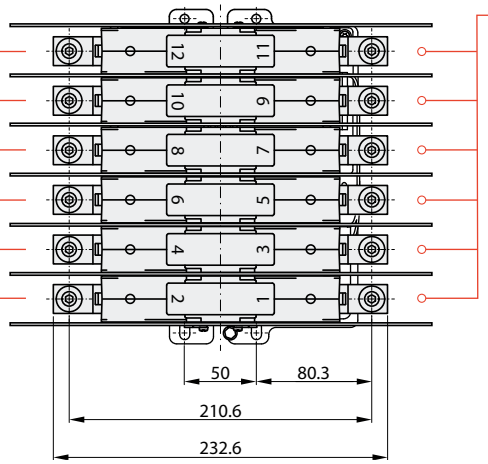
5-pole version

6 main contactse SPST-NO, I_{th} = 200 A/300 A, 2 magnetic drive

Configuration: CFW6-15-xxxxxxxxxxxxN-xx-xx



CFW6-30-xxxxxxxxxxxxY-xx-xx



6-pole version

NO contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Dimension diagrams – 1-, 2-, 3-pole CFS NC contactors with main contacts 200 A/300 A and 1 magnetic drive

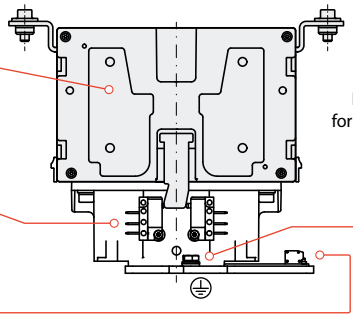
Main contact terminals M8
1x M8, 10 Nm max.

Switching chamber NC for I_{th} = 200 A/300 A
Arc chamber with inserts made of ceramic, plastic or metal

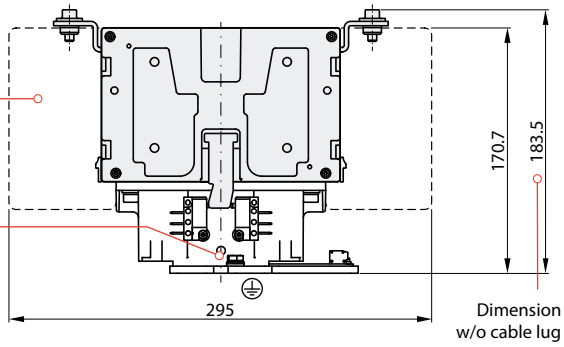
Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

8 pole terminal block X1
Coil- and control terminals

Versions U_n = 1,500 V



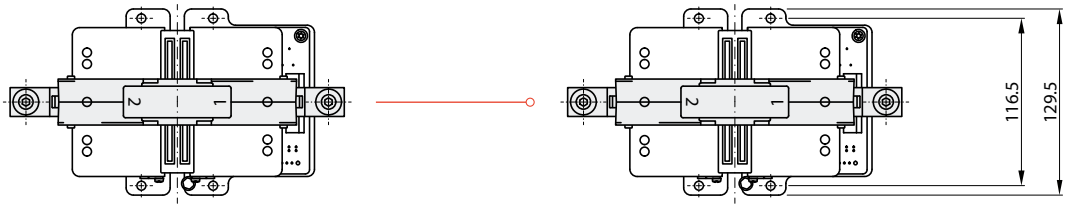
Versions U_n = 3,000 V



1 main contact SPST-NC, I_{th} = 200 A/300 A, 1 magnetic drive

Configuration: CFS1-15-00xx00000000N-xx-xx CFS1-30-00xx00000000N-xx-xx

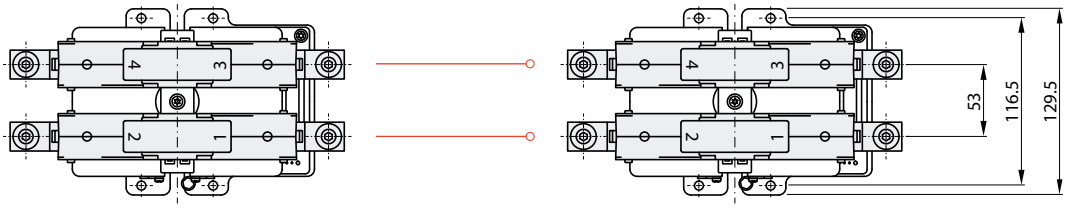
1-pole version



2 main contactse SPST-NC, I_{th} = 200 A/300 A, 1 magnetic drive

Configuration: CFS2-15-xx00xx000000N-xx-xx CFS2-30-xx00xx000000N-xx-xx

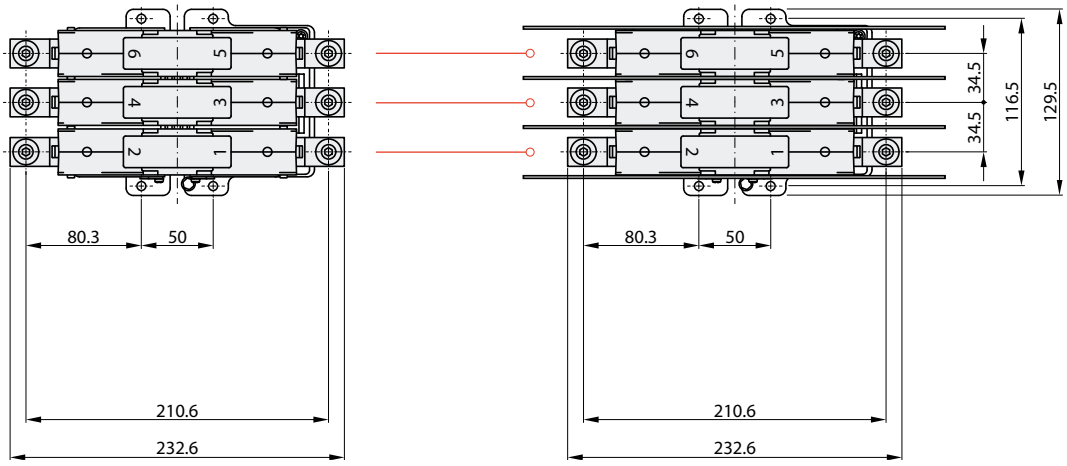
2-pole version



3 main contactse SPST-NC, I_{th} = 200 A/300 A, 1 magnetic drive

Configuration: CFS3-15-xxxxxx000000N-xx-xx CFS3-30-xxxxxx000000Y-xx-xx

3-pole version

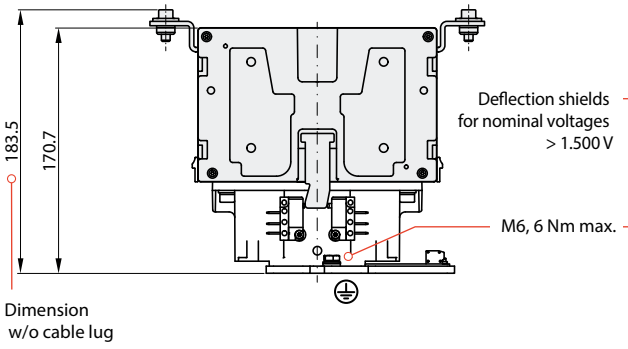


ⓘ NC contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

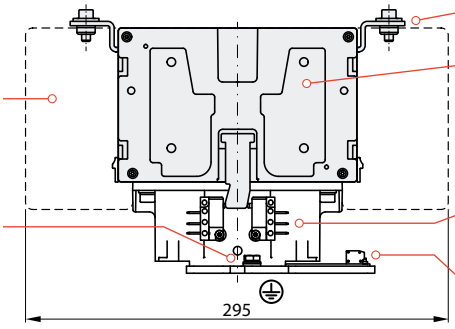
ⓘ Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Dimension diagrams – 4-, 5-, 6-pole CFW NC contactors with main contacts 200 A/300 A and 2 magnetic drives

Versions U_n = 1,500 V



Versions U_n = 3,000 V



Main contact terminals M8
1x M8, 10 Nm max.

Switching chamber NC for I_{th} = 200 A/300 A
Arc chamber with inserts made of ceramic, plastic or metal

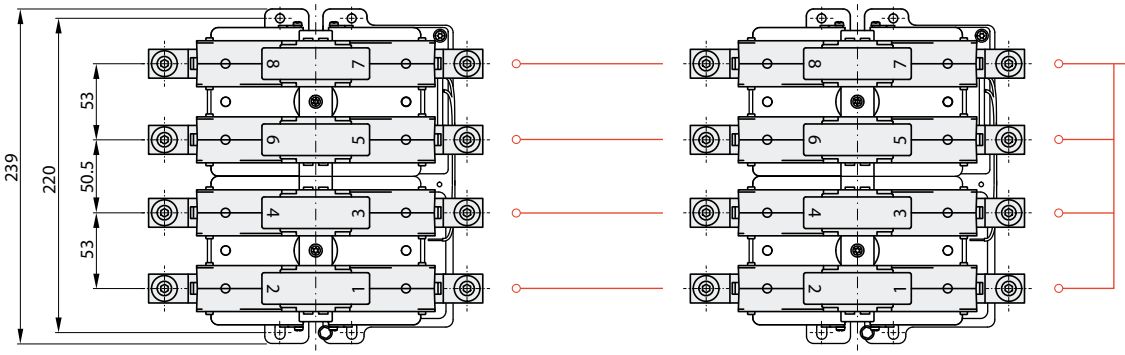
Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

8 pole terminal block X1
Coil- and control terminals

4 main contactse SPST-NC, I_{th} = 200 A/300 A, 2 magnetic drive

Configuration: CFW4-15-xx00xxxx00xxN-xx-xx

CFW4-30-xx00xxxx00xxN-xx-xx

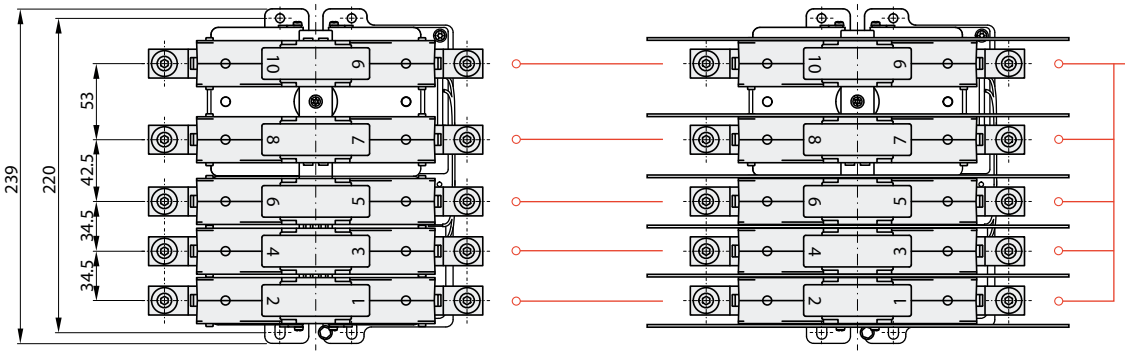


4-pole version

5 main contactse SPST-NC, I_{th} = 200 A/300 A, 2 magnetic drive

Configuration: CFW5-15-xxxxxxxx00xxN-xx-xx

CFW5-30-xxxxxxxx00xxY-xx-xx

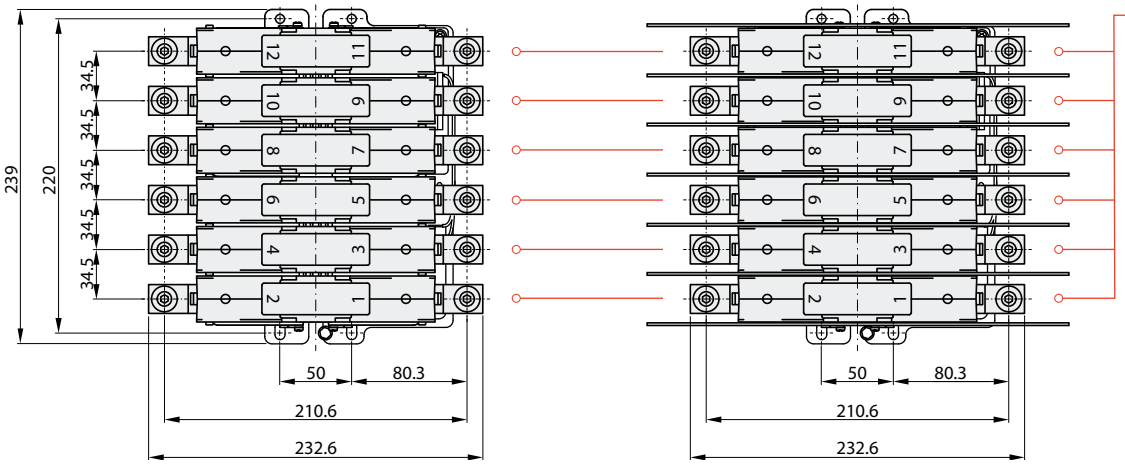


5-pole version

6 main contactse SPST-NC, I_{th} = 200 A/300 A, 2 magnetic drive

Configuration: CFW6-15-xxxxxxxxxxxxN-xx-xx

CFW6-30-xxxxxxxxxxxxY-xx-xx



6-pole version

NC contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Dimension diagrams – 1-, 2-, 3-pole CFS NO contactors with main contacts 400 A and 1 magnetic drive

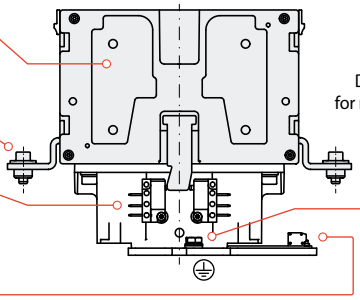
Switching chamber NO for I_{th} = 400 A
Arc chamber with inserts made of ceramic, plastic or metal

Main contact terminals M8
1x M8, 10 Nm max.

Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

8 pole terminal block X1
Coil- and control terminals

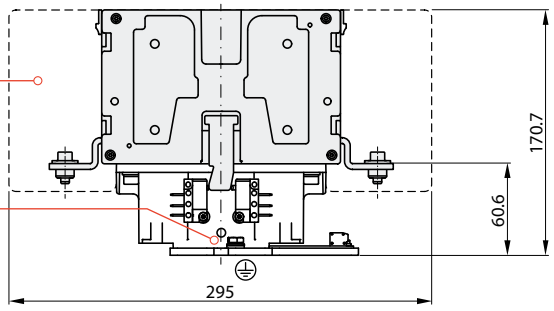
Versions U_n = 1,500 V



Deflection shields for nominal voltages > 1.500 V

M6, 3 Nm max.

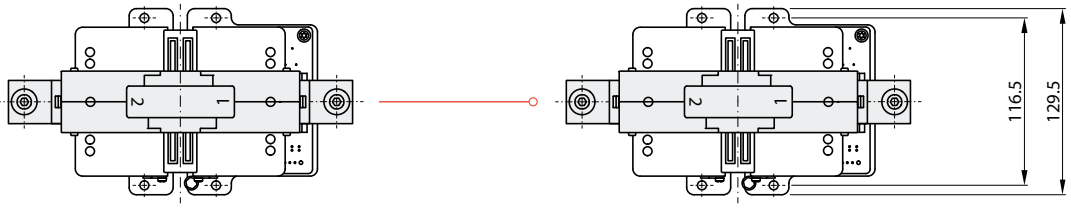
Versions U_n = 3,000 V



1 main contact SPST-NO, I_{th} = 400 A, 1 magnetic drive

Configuration: CFS1-15-00xx00000000N-xx-xx CFS1-30-00xx00000000N-xx-xx

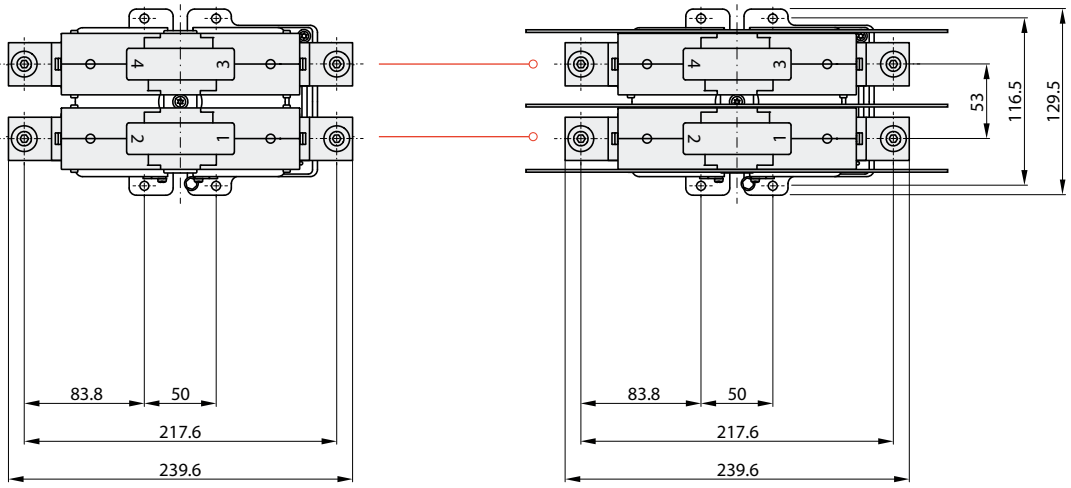
1-pole version



2 main contactse SPST-NO, I_{th} = 400 A, 1 magnetic drive

Configuration: CFS2-15-xx00xx000000N-xx-xx CFS2-30-xx00xx000000Y-xx-xx

2-pole version

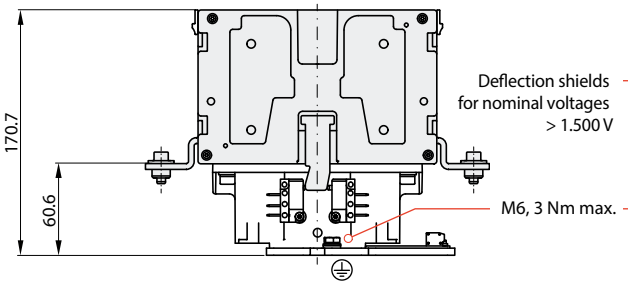


ⓘ NO contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

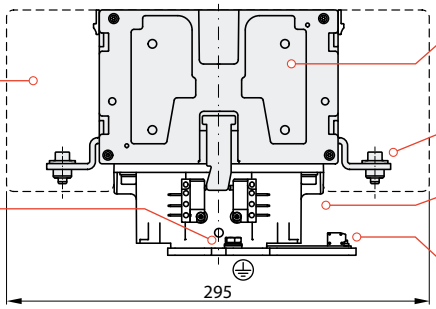
ⓘ Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Dimension diagrams – 4-, 5-, 6-pole CFW NO contactors with main contacts 400 A and 2 magnetic drives

Versions U_n = 1,500 V



Versions U_n = 3,000 V



Switching chamber NO for I_{th} = 400 A
Arc chamber with inserts made of ceramic, plastic or metal

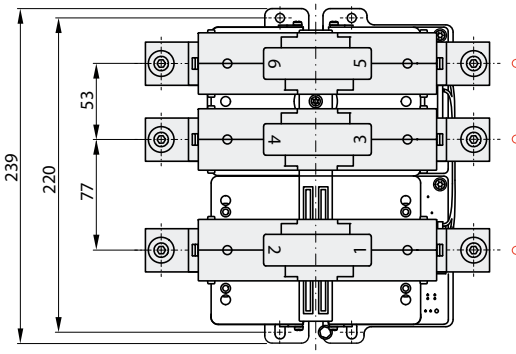
Main contact terminals M8
1x M8, 10 Nm max.

Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

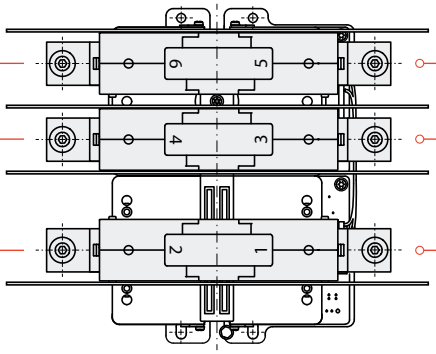
8 pole terminal block X1
Coil- and control terminals

3 main contactse SPST-NO, I_{th} = 400 A, 2 magnetic drive

Configuration: CFW3-15-00xx00xx00xxN-xx-xx



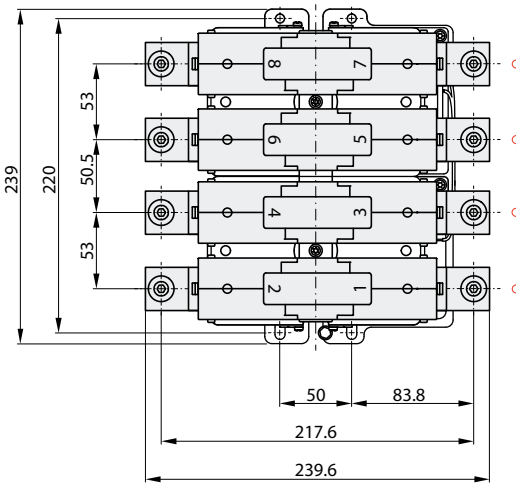
CFW3-30-00xx00xx00xxY-xx-xx



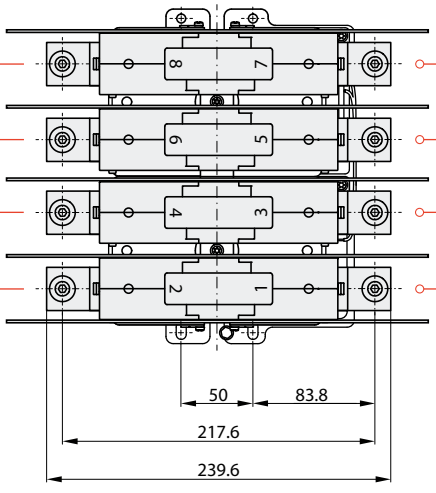
3-pole version

4 main contactse SPST-NO, I_{th} = 400 A, 2 magnetic drive

Configuration: CFW4-15-xx00xxxx00xxN-xx-xx



CFW4-30-xx00xxxx00xxY-xx-xx



4-pole version

NO contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Dimension diagrams – 1-, 2-, 3-pole CFS NC contactors with main contacts 400 A and 1 magnetic drive

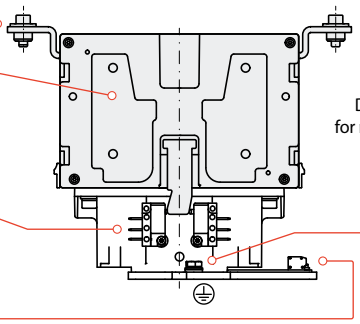
Main contact terminals M8
1x M8, 10 Nm max.

Switching chamber NC for I_{th} = 400 A
Arc chamber with inserts made of ceramic, plastic or metal

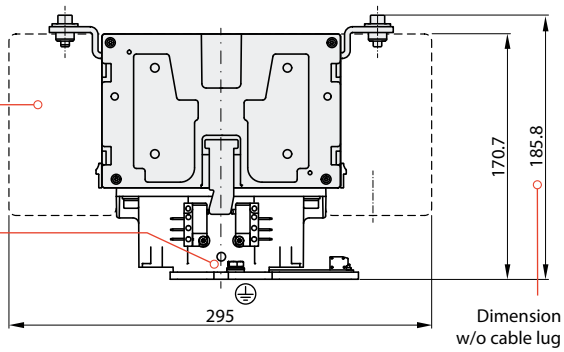
Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

8 pole terminal block X1
Coil- and control terminals

Versions U_n = 1,500 V



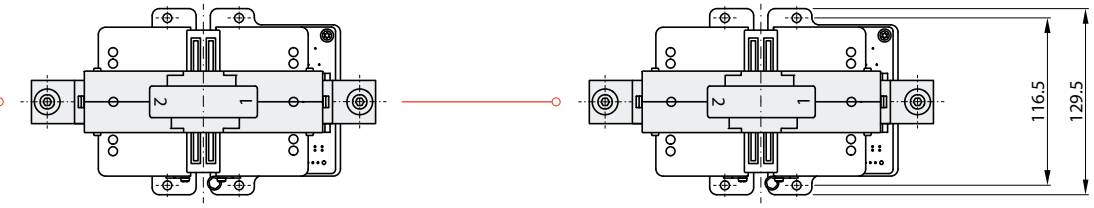
Versions U_n = 3,000 V



1 main contact SPST-NC, I_{th} = 400 A, 1 magnetic drive

Configuration: CFS1-15-00xx00000000N-xx-xx CFS1-30-00xx00000000N-xx-xx

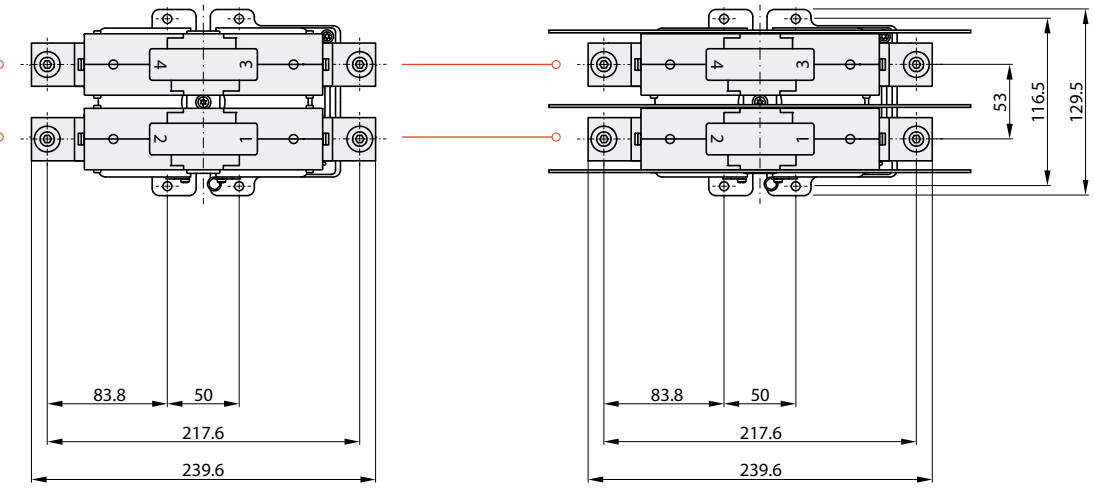
1-pole version



2 main contactse SPST-NC, I_{th} = 400 A, 1 magnetic drive

Configuration: CFS2-15-xx00xx000000N-xx-xx CFS2-30-xx00xx000000Y-xx-xx

2-pole version

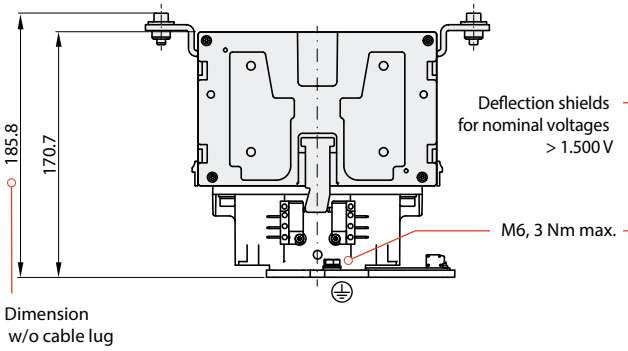


ⓘ NC contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

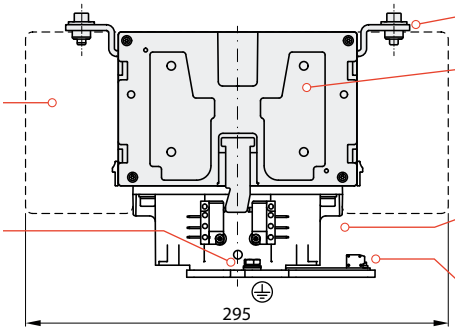
ⓘ Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Dimension diagrams – 4-, 5-, 6-pole CFW NC contactors with main contacts 400 A and 2 magnetic drives

Versions U_n = 1,500 V



Versions U_n = 3,000 V



Main contact terminals M8
1x M8, 10 Nm max.

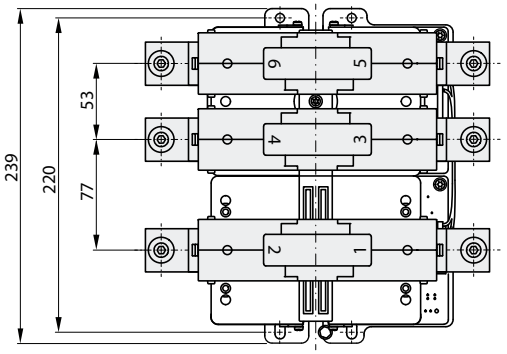
Switching chamber NC for I_{th} = 400 A
Arc chamber with inserts made of ceramic, plastic or metal

Auxiliary switches
1 ... 4 snap-action-switches, S870 series, SPDT, Flat-tabs 6.3 x 0.8 mm

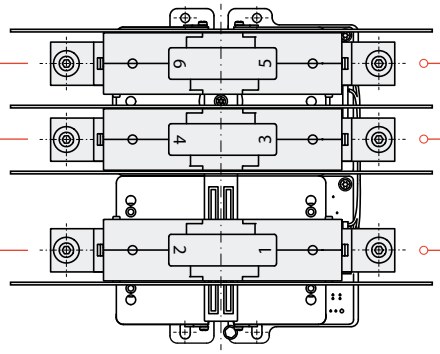
8 pole terminal block X1
Coil- and control terminals

4 main contactse SPST-NC, I_{th} = 400 A, 2 magnetic drive

Configuration: CFW3-15-00xx00xx00xxN-xx-xx



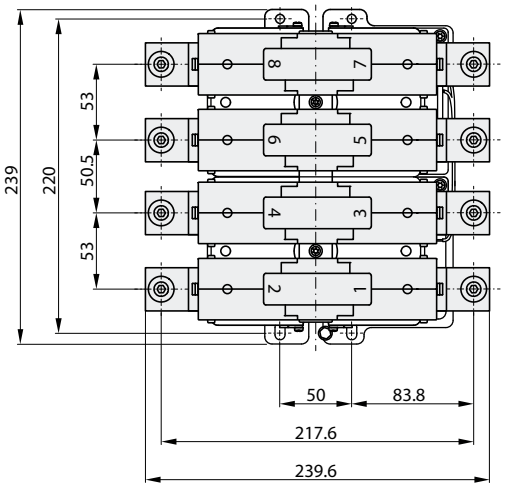
CFW3-30-00xx00xx00xxY-xx-xx



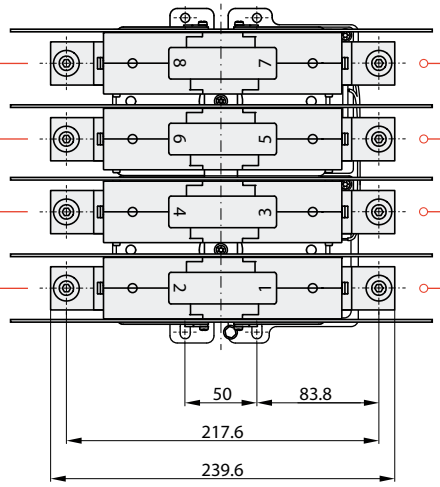
3-pole version

5 main contactse SPST-NC, I_{th} = 400 A, 2 magnetic drive

Configuration: CFW4-15-xx00xxxx00xxN-xx-xx



CFW4-30-xx00xxxx00xxY-xx-xx



4-pole version

NC contactors are shown. Mixed configurations with normally open and normally closed contacts are also possible, see order code on page 5.

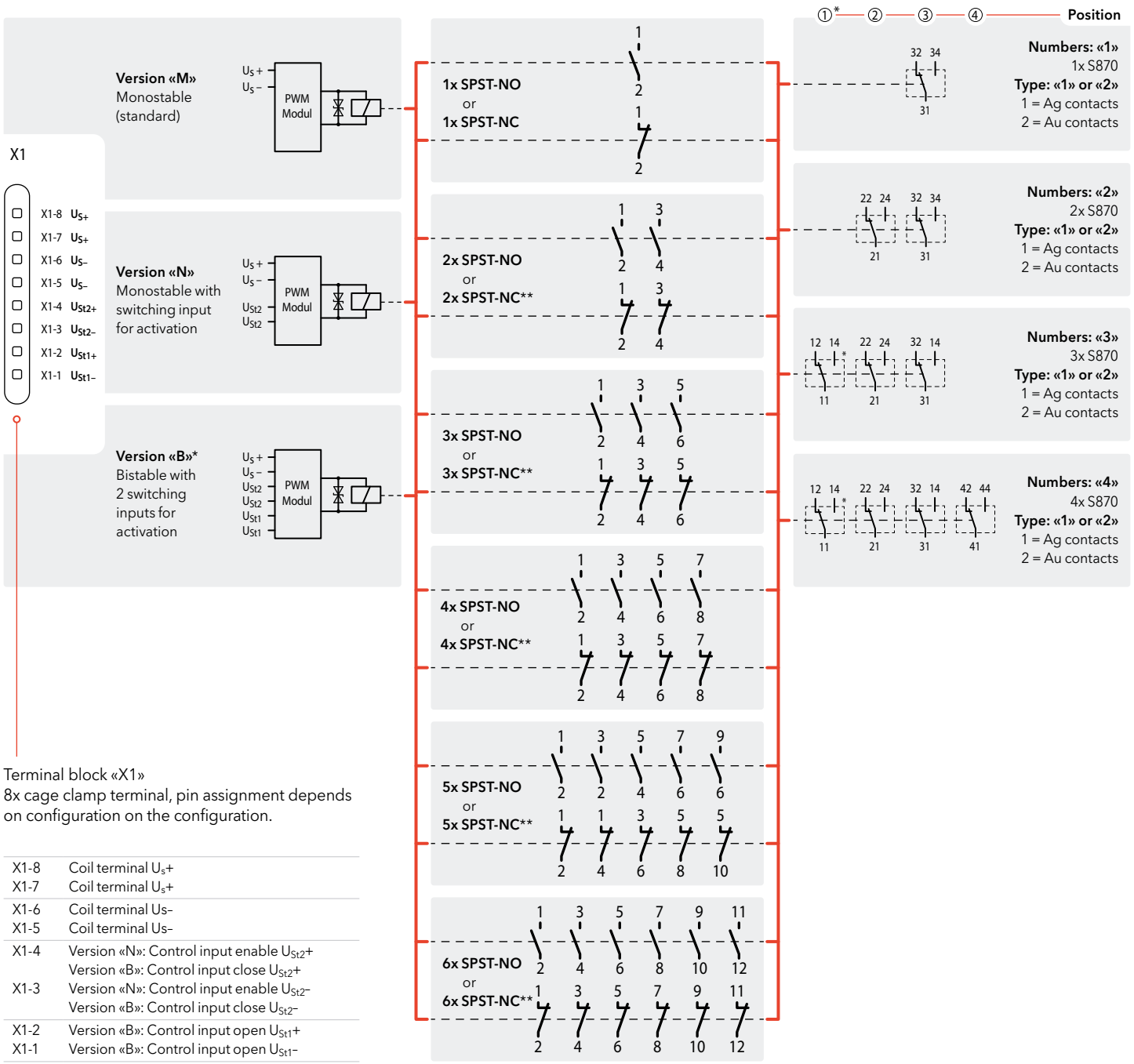
Deflection shields must be provided to maintain the clearance and creepage distances and for rated voltages >1,500 V.

Circuit diagram

Magnetic drive: Coil design, terminals

Main contacts: 1 ... 6, NO or NC**

Aux. switches: Position, numbers, types

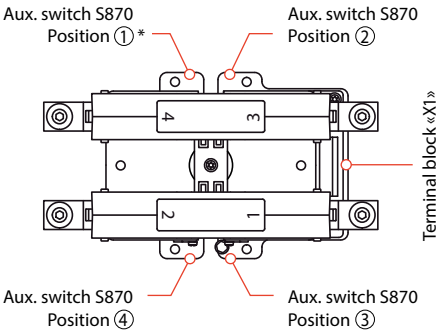


Terminal block «X1»
8x cage clamp terminal, pin assignment depends on configuration on the configuration.

X1-8	Coil terminal U_s+
X1-7	Coil terminal U_s+
X1-6	Coil terminal Us–
X1-5	Coil terminal Us–
X1-4	Version «N»: Control input enable U_{St2}+ Version «B»: Control input close U_{St2}+
X1-3	Version «N»: Control input enable U_{St2}– Version «B»: Control input close U_{St2}–
X1-2	Version «B»: Control input open U_{St1}+
X1-1	Version «B»: Control input open U_{St1}–

* Wiring of switching inputs X1:5 and X1:6 only for bistable coil versions «B».
An auxiliary contact S870 is additionally required for monitoring the switching state (position «1»). This auxiliary contact is not available on the customer side.

** Mixed configurations with NO and NC contacts are possible, see also order code on page 6 or 7.

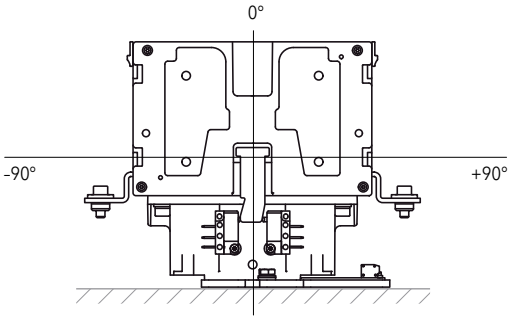


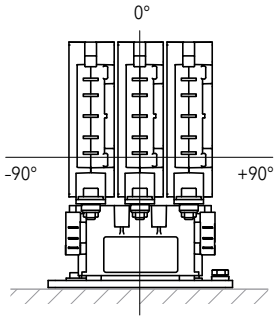
Assignment of the maximum of 4 S870 auxiliary switches: The illustration is an example and applies equally to all CF contactors with 1 or 2 magnetic drives.

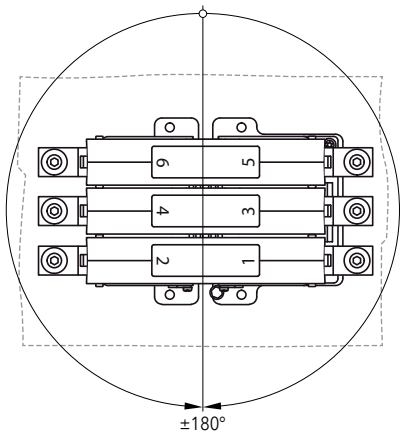
Coil control and auxiliary contacts can optionally be led out via a separate connector. We will also be pleased to supply customer-specific versions if the corresponding number of units is available. Please contact us!

Permissible mounting orientations

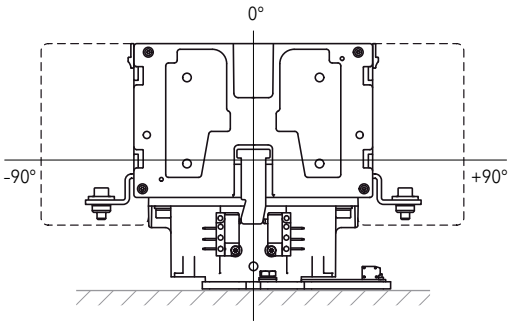
CFS/CFW NO contactors with one magnetic drive

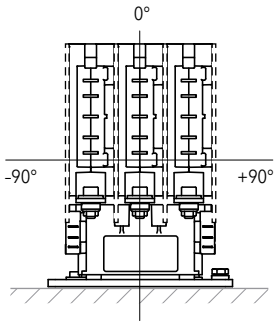


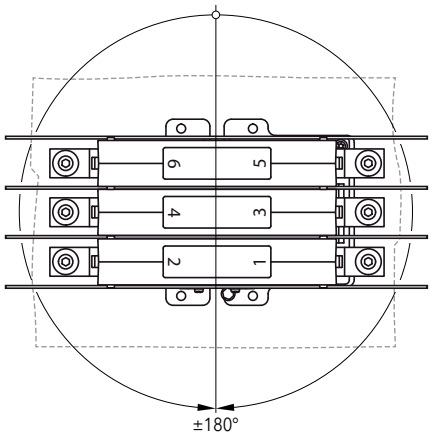




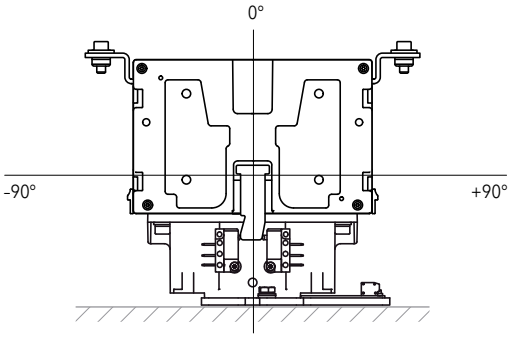
CFS/CFW NO contactors with one magnetic drive and deflection shields

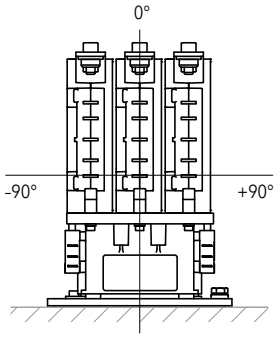


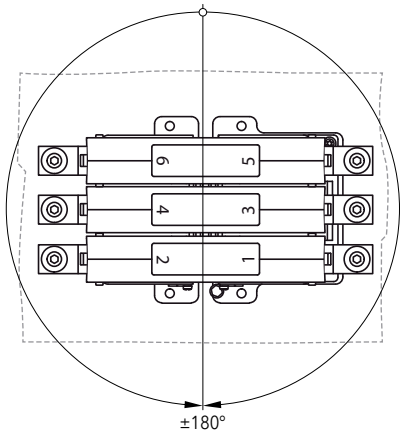




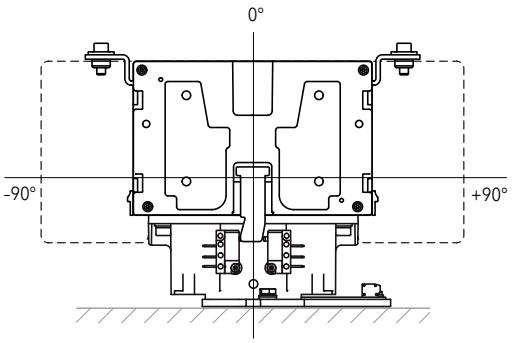
CFS/CFW NC contactors with one magnetic drive

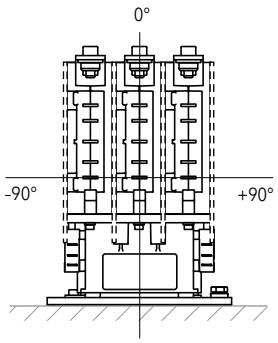


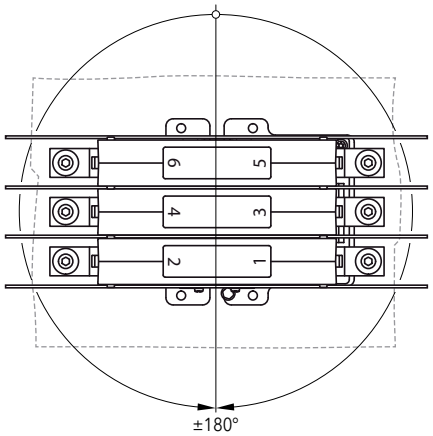




CFS/CFW NC contactors with one magnetic drive and deflection shields







The contactors can be mounted horizontally or vertically on a prepared mounting plate. Further mounting positions upon request.

Examples of 3-pole contactors with 200 A or 300 A main contacts are shown. The mounting positions also apply to main contacts with 400 A and generally to all 1-/2-/3-/4-/5- and 6-pole contactors.

Minimum distances to magnetically active, live, earthed or insulating parts

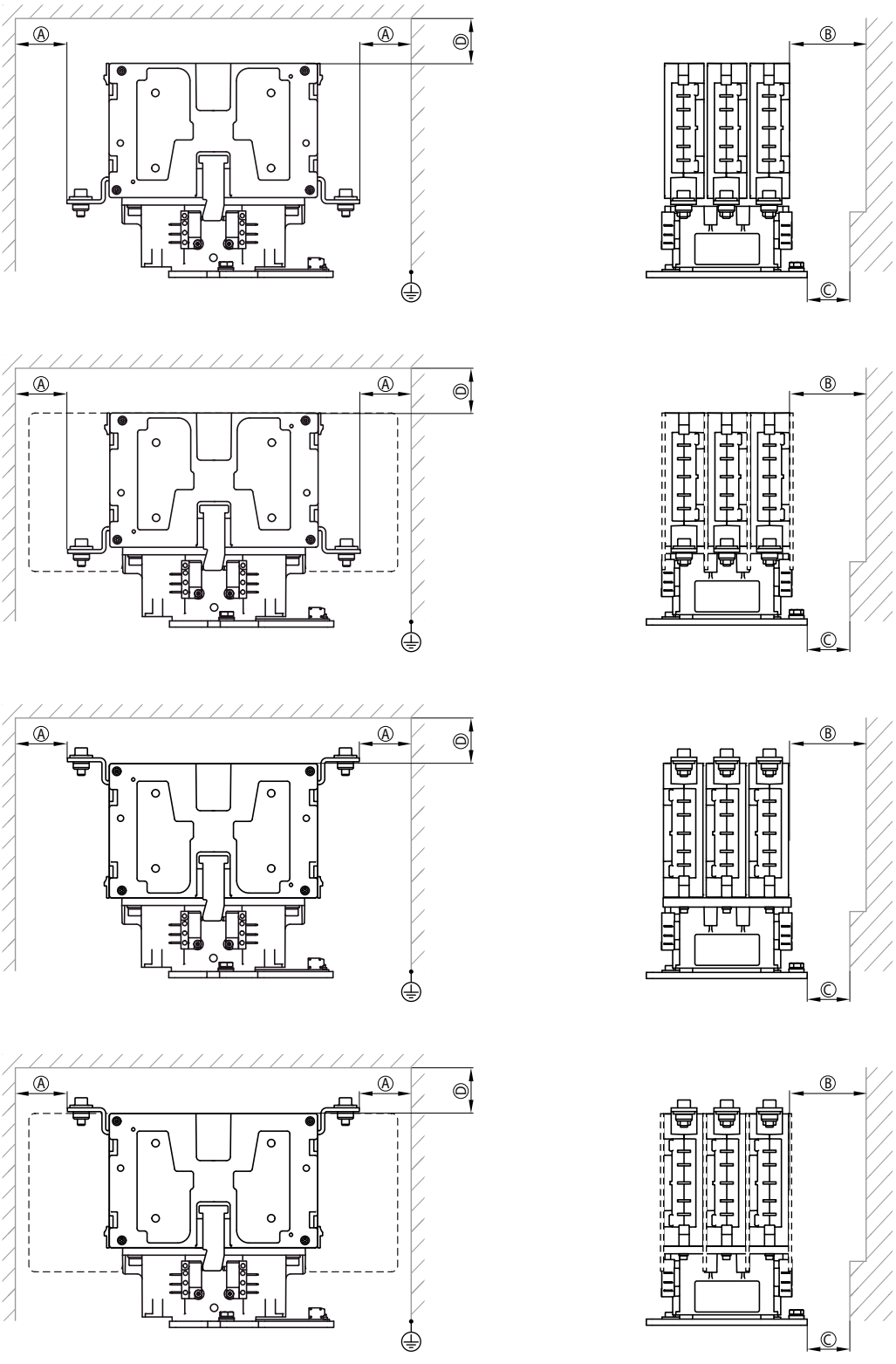
For the CF series, minimum distances to magnetically active
active, live, earthed or insulating parts.

Minimum distances to magnetically active, live or earthed parts in [mm]
Defined for maximum breaking performance

Ⓐ	Ⓑ	Ⓒ	Ⓓ
48	39	24	0

Minimum distances to insulating parts in [mm]
Defined for maximum breaking performance

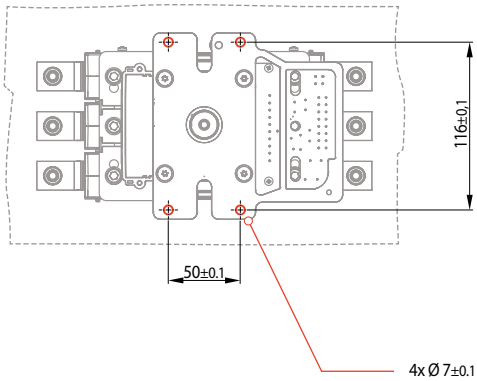
Ⓐ	Ⓑ	Ⓒ	Ⓓ
31	0	0	0



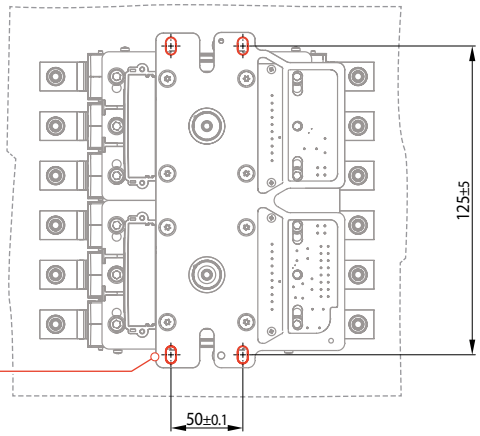
Mounting holes

The mounting holes for mounting frames or mounting plates can be either tapped holes for threaded screws or through holes for threaded screws and nuts.

Mounting CFS series with 1 magnetic drive



Mounting CFW series with 2 magnetic drives



Minimum clearances: The minimum distances to earth potential or to insulating parts specified in the dimension diagrams must be observed!

Maintenance and safety instructions

Maintenance:

- CF series contactors are basically maintenance free.
- Make regular in-depth visual inspections once or twice a year.

For detailed maintenance, safety and mounting instructions please refer to our operating manuals > C60-M.en!

Safety instructions:

- The device must be used according to the intended purpose as specified in the technical documentation. You are obliged to observe all specifications depending on operating temperature, degree of pollution etc. that are relevant to your application.
- Without further safety measures the contactors are not suited for use in potentially explosive atmospheres.
- In case of malfunction of the device or uncertainties stop using it any longer and contact the manufacturer instantly.
- Tampering with the device can seriously affect the safety of people and equipment. This is not permitted and leads to an exclusion of liability and warranty.
- Coil suppression for reducing surges when the coil is switched off is optimally attuned to the contactors switching behaviour. The existing opening characteristic must not be negatively influenced by parallel connection with an external diode.
- Contactors running permanently may heat up. So make sure that the contactor has sufficiently cooled down before you start any inspection or maintenance work.
- When installing contactors with magnetic blowout make sure to do it in such a way that no magnetizable parts can be attracted by the permanent magnets that are also capable of destroying all data of swipe cards.
- In general, strong electromagnetic fields can be generated in the area around the contactors. These can influence other components in the area of the contactors.
- Improper handling of the contactor, e.g. when hitting the floor with some impact, can result in breakage, visible cracks and deformation.

Defective contactors or parts (e.g. arc chambers, auxiliary switches) must be replaced immediately!

For a detailed list of all safety instructions see here: > schaltbau.info/safety3en!

Safety and efficiency in rail, energy, and e-mobility

Schaltbau is a global industry leader specializing in DC power and providing products and solutions that that enable electrification. With a broad portfolio of contactors, connectors, switches, and safety components, Schaltbau helps partners and customers solve today's challenges in rail.

Building on this experience, with our brand Eddicy we also create future-oriented products and solutions with the highest standards of safety and reliability to switch and protect DC applications in energy and e-mobility.

Schaltbau is headquartered in Munich, Germany and represented globally, with over 1,000 employees worldwide.

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Catalogue CF – C2261/2501/0