SCHALTBAU



CA

1- and 3-pole AC NO power contactors up to 3,000 volts and 800 amps for traction motors in electric multiple units (EMUs)

CA power contactors – AC NO contactors up to 3,000 volts, 800 amps and 400 Hz

1- and 3-pole AC normally open contactors for higher supply voltage frequencies. Suitable for converter-fed drive motors in modern traction vehicles and electric multiple units (EMUs) – for greater efficiency, safety, and performance.

The modern CA series power contactors from Schaltbau offer a reliable switching device concept for the safe disconnection of inverters. Thanks to their compact design, the switching devices can be integrated in a space-saving manner and are available in single-pole and three-pole versions. They are suitable for use in AC output circuits and can switch significantly higher frequencies than the usual 50 to 60 Hz – for example, up to 400 Hz in modern drive systems for electrically powered rail vehicles. The product family includes various versions tailored to a wide range of applications.

Features

Innovative design for the highest requirements

- 3-pole AC power contactor for rated voltages up to 3,000 V and continuous currents up to 400 A or 800 A
- High short-circuit switching capacity – even at high supply voltages up to 400 Hz
- Double contact interruption of the main contacts for maximum safety
- Compact and robust design for reliable use under demanding conditions

Excellent insulation properties

- Reinforced insulation between main circuit and control circuit/auxiliary circuit

Easy maintenance – fast and efficient

- Easy visual inspection of the contact parts in the main circuit
- Quick replacement of the contact parts for minimal downtime
- Easy replacement of the extinguishing chambers for maximum serviceability

4 auxiliary contacts with snap-action switches for diagnostics and switching status monitoring

The contactors offer up to four auxiliary contacts with robust snap-action switches. These enable precise diagnosis and reliable monitoring of the switching status – for maximum safety and transparency during operation. You can choose from switches in the S826, S870, or S970 series, each with changeover contacts, positive opening, and silver or gold contacts. In addition, the mirror contact function complies 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.

Standards

IEC 60077-1
Railway applications – Electric equipment for rolling stock – Part 1: General service conditions and general rules

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

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

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

EN 50125-1
Railway applications – Environmental conditions for equipment – Part 1: Equipment on board rolling stock

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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

Traction contactors in electrically operated multiple units

CA contactors are required for reliable disconnection of inverter-fed permanent magnet drive motors (PEM) in the event of a fault, for example in the event of a short circuit in the output circuit of the traction converter. The contactors are particularly suitable for permanently excited drive motors with higher supply voltage frequencies.

Power contactors in photovoltaic or wind power systems

The switching devices are used on the AC side in the output circuit of inverters and are capable of disconnecting large loads. The switchgear is thus a cost-effective alternative to circuit breakers for safely disconnecting central inverters from the mains and reconnecting them to the mains.

Ordering code

CA1330/08 110ECM-00

Series, contact configuration
- **CA11** 1-pole AC NO contactor
- **CA13** 3-pole AC NO contactor

Nominal voltage / Conventional thermal current
- **15/04** U_n = 1,500 V, 400 Hz / I_{th} = 400 A
- **30/08** U_n = 3,000 V, 400 Hz / I_{th} = 800 A

Coil voltage
- **24 / 36 / 48 / 72 / 110 V DC** *1

Coil tolerance
- **E** –30 % ... +25 %

Auxiliary switches, (snap-action switches: number, type)

Silver contacts, M3 screw-type terminals	1x S870 (a1) + 1x S870 (b0) + 2x S826	**00**
	4x S826	**02**

Coil suppression
- Double coil controller (DCC) with integreated suppressor diode for magnetic drives with double winding coil **CM**

*1 others on request

Do you need support for a special application? Please contact us! We would be glad to assist you in the selection of the contactor that suits your application best.

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.

Specifications – 1-pole CA power contactors

Series			CA1115/04	CA1130/08
Type of voltage			AC (10 ≤ f ≤ 400 Hz)	AC (10 ≤ f ≤ 400 Hz)
Main contacts, configuration			1x SPST-NO	1x SPST-NO
Electrical data according to IEC 60077-2				
Nominal voltage		U_n	1,500 V	3,000 V
Rated operating voltage		U_e/U_r	1,800 V	3,600 V
Rated insulation voltage		U_{Nm}	2,000 V	4,800 V
Rated impulse withstand voltage		U_{Ni}	15 kV	25 kV
Pollution degree / Overvoltage category			PD3 / OV3	PD2 / OV3
Conventional thermal current		I_{th}	400 A @ 70° C	800 A @ 40° C; 650 A @ 70°
Component category		IEC 60077-2	A2	A2
Rated operating current I_e/I_r	Operational frequency C1	U_e/U_r = 1,800 V	---	
		U_e/U_r = 3,600 V		---
Short-circuit making capacity		I_{cm}	2,500 A *1	3,500 A *1
Rated short-circuit breaking capacity	@ f = 50 Hz; cos = 0.8	U_e/U_r = 1,200 V	1,500 A	---
		U_e/U_r = 1,800 V	1,300 A	1,500 A
		U_e/U_r = 3,600 V*2	---	800 A
	@ f = 50 Hz; cos = 1	U_e/U_r = 1,200 V	2.000 A	---
		U_e/U_r = 1,800 V	1,750 A	1,750 A
		U_e/U_r = 3,600 V*2	---	1,000 A
Rated short-time withstand current I_{cw}		T < 100 ms	5,000 A	5,000 A
Main contacts				
Contact material			$AgSnO_2$	
Terminals			M10	
Torque			20 Nm max.	
Auxiliary switches				
Number and type		Snap-action switches	1x S870 (a_1)*3 + 1x S870 (b_0)*3 + 2x S826 or 4x S826	
Contact material			Silver	
Switching capacity		Snap-action switches S826	AC-15: 230 V / 1.0 A DC-13: 110 V / 0.5 A	
		Snap-action switches S870	AC-15: 230 V / 1.5 A DC-13: 60 V / 0.5 A DC-13: 24 V / 2.0 A	
Terminals			M3 screws (6.3 x 0.8 mm flat tabs or connector on request)	
Magnetic drive				
Pollution degree / Overvoltage category			PD3 / OV2	
Coil voltage		U_s	24 / 36 / 48 / 72 / 110 V DC	
Coil tolerance			–30 % ... +25 % U_s	
Coil suppression			Double coil controller (DCC) with integreated suppressor diode for magnetic drives with double winding coil	
Power dissipation		@ U_s and T_a = 20 °C	Pull-in: 280 W max. @ 500 ms max. / hold: < 27 W	
Pull-in voltage		typical @ T_a = 20 °C	0.6 x U_s	
Pull-in time		typical @ T_a = 20 °C	150 ms	
Drop-off voltage		typical @ T_a = 20 °C	0.1 x U_s	
Drop-off time		typical @ T_a = 20 °C	50 ms	
Coil terminal			WAGO 264: Cage clamp for solid and stranded copper conductors, AWG14 (2.5 mm² max.)	
Degree of protection			IP00	
Mechanical endurance			> 500,000 operating cycles	
Vibration / shock		IEC 61373	Category 1, class B	
Mounting position			vertical, horizontal	
Environmental conditions	Operating/Storage temperature		–40 °C … +70 °C / –40 °C … +85 °C	
	Altitude/Humidity (IEC 50125-1)		< 2,000 m above sea level / < 75 % yearly average	
Weight			10 kg	13 kg

*1 Values for used contacts; the value for new contacts is lower
*2 Refers to a 3-phase AC system, therefore phase voltage for a 1-pole AC system is 2,200 V
*3 a1 and b0 according to IEC 60077

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Specifications – 3 pole CA power contactors

Series			CA1315/04	CA1330/08
Type of voltage			AC (10 ≤ f ≤ 400 Hz)	AC (10 ≤ f ≤ 400 Hz)
Main contacts, configuration			3x SPST-NO	3x SPST-NO
Electrical data according to IEC 60077-2				
Nominal voltage		U_n	1,500 V	3,000 V
Rated operating voltage		U_e/U_r	1,800 V	3,600 V
Rated insulation voltage		U_{Nm}	2,200 V	4,800 V
Rated impulse withstand voltage		U_{Ni}	15 kV	25 kV
Pollution degree / Overvoltage category			PD3 / OV3	PD2 / OV3
Conventional thermal current		I_{th}	400 A @ 70° C	800 A @ 40° C; 650 A @ 70°
Component category		IEC 60077-2	A2	A2
Rated operating current I_e/I_r	Operational frequency C1	U_e/U_r = 1,800 V	360 A	
		U_e/U_r = 3,600 V		850 A
Short-circuit making capacity			2,500 A *1	3,500 A *1
Rated short-circuit breaking capacity	@ f = 50 Hz; cos = 0.8	U_e/U_r = 1,200 V	1,500 A	---
		U_e/U_r = 1,800 V	1,300 A	1,400 A
		U_e/U_r = 3,600 V*2	---	1,000 A
	@ f = 50 Hz; cos = 1	U_e/U_r = 1,200 V	2,100 A	---
		U_e/U_r = 1,800 V	1,750 A	tbd
		U_e/U_r = 3,600 V*2	---	tbd
Rated short-time withstand current I_{cw}		T < 100 ms	5,000 A	5,000 A
Main contacts				
Contact material			$AgSnO_2$	
Terminals			M10	
Torque			20 Nm max.	
Auxiliary switches				
Number and type		Snap-action switches	1x S870 (a_1)*3 + 1x S870 (b_0)*3 + 2x S826 or 4x S826	
Contact material			Silver	
Switching capacity	Snap-action switches S826		AC-15: 230 V / 1.0 A DC-13: 110 V / 0.5 A	
	Snap-action switches S870		AC-15: 230 V / 1.5 A DC-13: 60 V / 0.5 A DC-13: 24 V / 2.0 A	
Terminals			M3 screws (6.3 x 0.8 mm flat tabs or connector on request)	
Magnetic drive				
Pollution degree / Overvoltage category			PD3 / OV2	
Coil voltage		U_s	24 / 36 / 48 / 72 / 110 V DC	
Coil tolerance			–30 % ... +25 % U_s	
Coil suppression			Double coil controller (DCC) with integreated suppressor diode for magnetic drives with double winding coil	
Power dissipation		@ U_s and T_a = 20 °C	Pull-in: 280 W max. @ 500 ms max. / hold: < 27 W	
Pull-in voltage		typical @ T_a = 20 °C	0.6 x U_s	
Pull-in time		typical @ T_a = 20 °C	150 ms	
Drop-off voltage		typical @ T_a = 20 °C	0.1 x U_s	
Drop-off time		typical @ T_a = 20 °C	50 ms	
Coil terminal			WAGO 264: Cage clamp for solid and stranded copper conductors, AWG14 (2.5 mm² max.)	
Degree of protection			IP00	
Mechanical endurance			> 500,000 operating cycles	
Vibration / shock		IEC 61373	Category 1, class B	
Mounting position			vertical, horizontal	
Environmental conditions	Operating/Storage temperature		–40 °C … +70 °C / –40 °C … +85 °C	
	Altitude/Humidity (IEC 50125-1)		< 2,000 m above sea level / < 75 % yearly average	
Weight			20 kg	25 kg

*1 Values for used contacts; the value for new contacts is lower
*2 Refers to a 3-phase AC system
*3 a1 and b0 according to IEC 60077

Dimension diagram – CA1130/04: 1 pole SPST-NO, U_n 1,500 V AC, I_{th} 400 A, f ≤ 400 Hz

Main contact system
SPST-NO: NO contact, 1 pole

Switching state indicator
ON: Main contact system switched on
OFF: Main contact system switched off

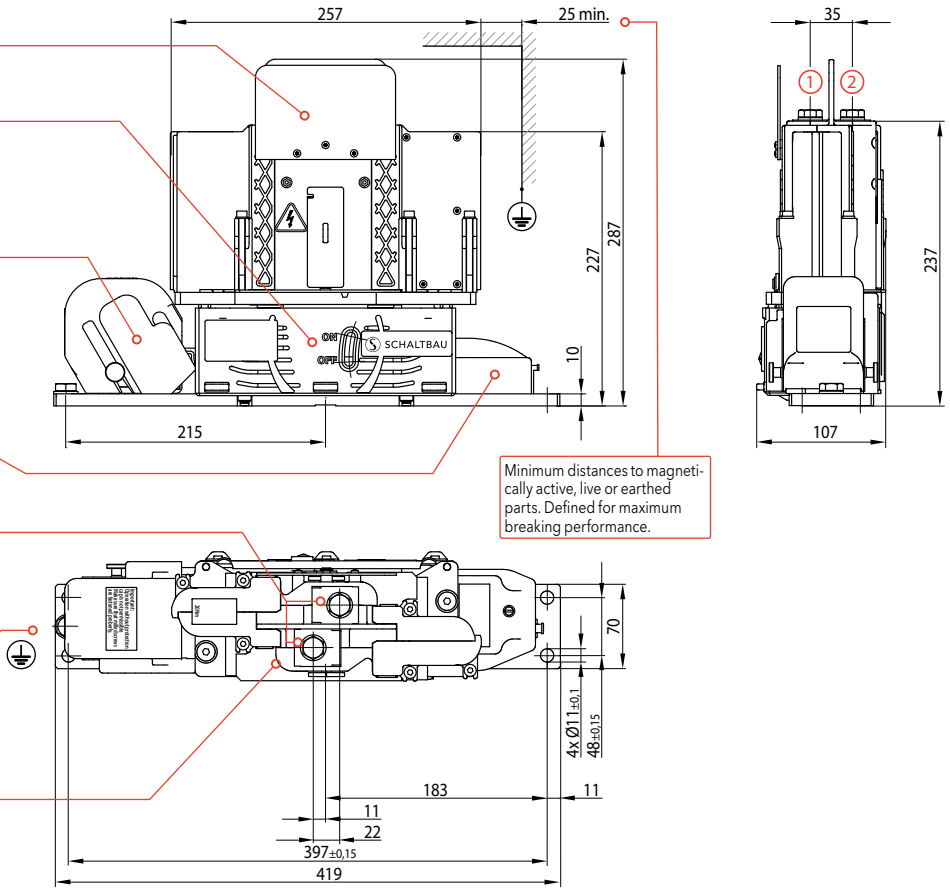
Auxiliary switches
under the cover:
1x S970 + 1x S970;
2x S970 + 2x S970;
1x S870 + 1x S870 + 2x S826
or 4x S826;
Terminals screws M3

Coil terminal
under the cover:
WAGO 264

Main contact terminals
M10 screw each, tightening torque 16 ... 20 Nm

Earting terminal
M10, torque 15 Nm max.

Arc chamber
1 removable chamber



Dimension diagram – CA1130/08: 1 pole SPST-NO, U_n 3,000 V AC, I_{th} 800 A, f ≤ 400 Hz

Main contact system
SPST-NO: NO contact, 1 pole

Switching state indicator
ON: Main contact system switched on
OFF: Main contact system switched off

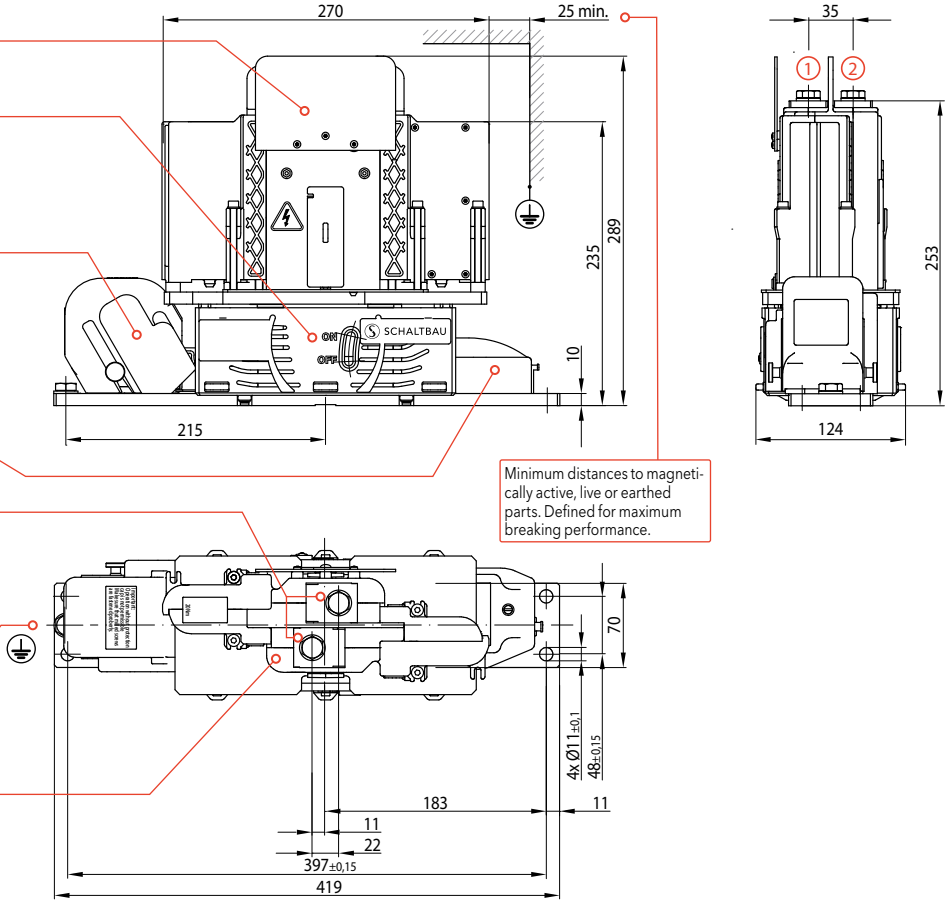
Auxiliary switches
under the cover:
1x S970 + 1x S970;
2x S970 + 2x S970;
1x S870 + 1x S870 + 2x S826
or 4x S826;
Terminals screws M3

Coil terminal
under the cover:
WAGO 264

Main contact terminals
M10 screw each, tightening torque 16 ... 20 Nm

Earting terminal
M10, torque 15 Nm max.

Arc chamber
1 removable chamber



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Dimension diagram – CA1330/04: 3 pole SPST-NO, U_n 1,500 V AC, I_{th} 400 A, f ≤ 400 Hz

Main contact system
SPST-NO: NO contact, 1 pole

Switching state indicator
ON: Main contact system switched on
OFF: Main contact system switched off

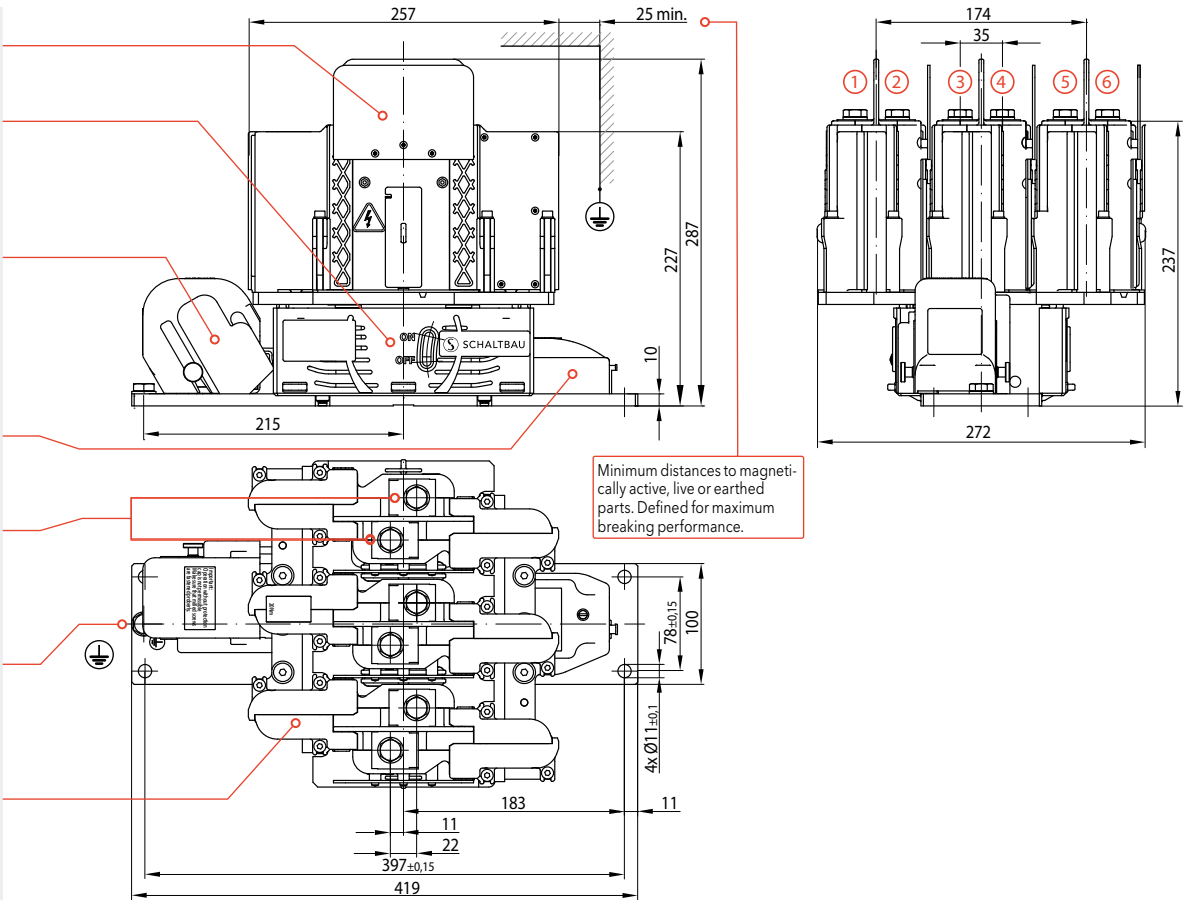
Auxiliary switches
under the cover:
1x S970 + 1x S970;
2x S970 + 2x S970;
1x S870 + 1x S870 + 2x S826
or 4x S826;
Terminals screws M3

Coil terminal
under the cover:
WAGO 264

Main contact terminals
M10 screw each, tightening torque 16 ... 20 Nm

Earting terminal
M10, torque 15 Nm max.

Arc chamber
1 removable chamber



Dimension diagram – CA1330/08: 3 pole SPST-NO, U_n 3,000 V AC, I_{th} 800 A, f ≤ 400 Hz

Main contact system
SPST-NO: NO contact, 1 pole

Switching state indicator
ON: Main contact system switched on
OFF: Main contact system switched off

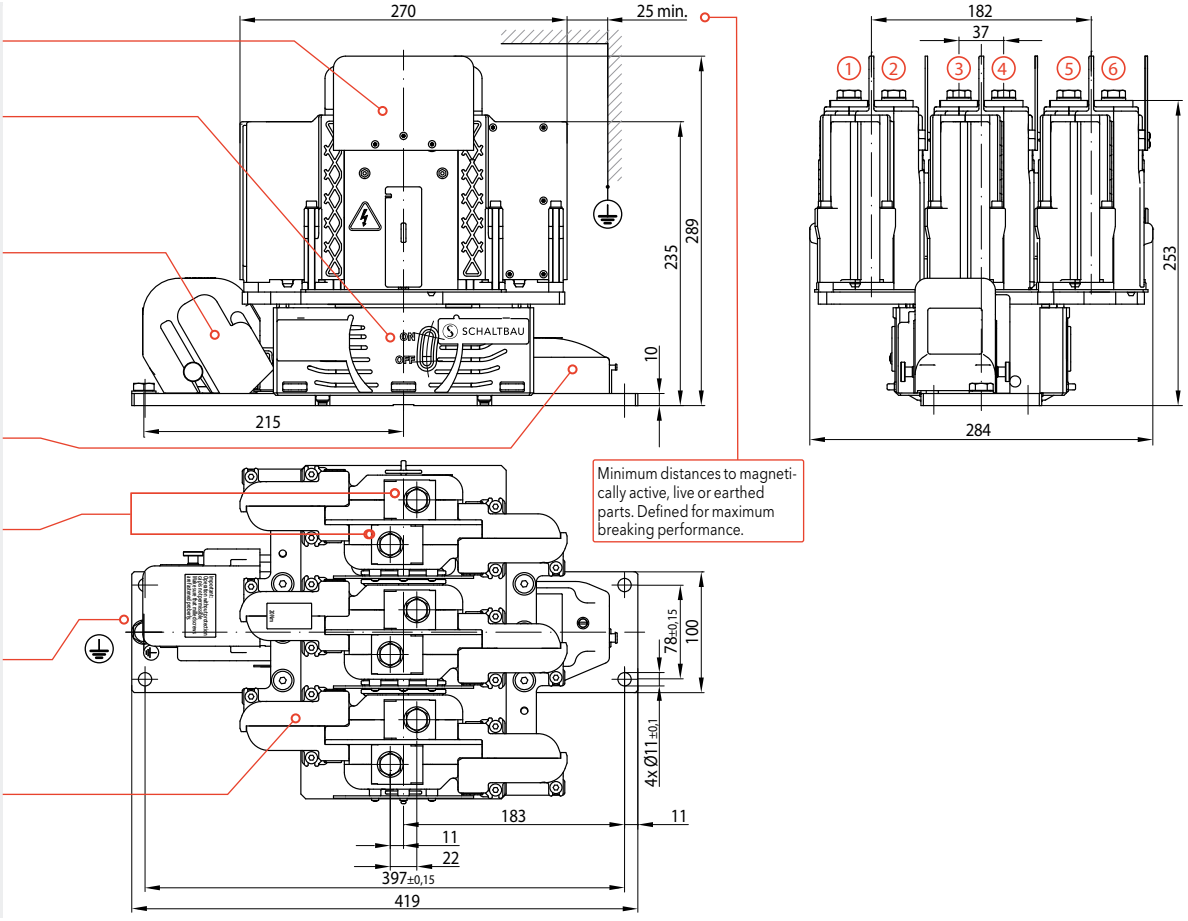
Auxiliary switches
under the cover:
1x S970 + 1x S970;
2x S970 + 2x S970;
1x S870 + 1x S870 + 2x S826
or 4x S826;
Terminals screws M3

Coil terminal
under the cover:
WAGO 264

Main contact terminals
M10 screw each, tightening torque 16 ... 20 Nm

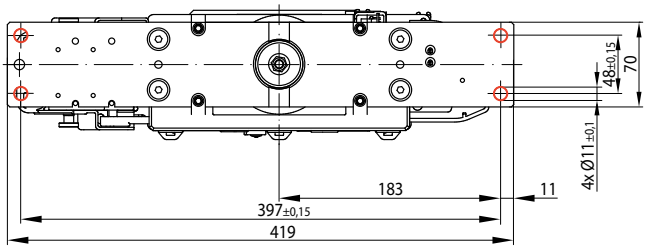
Earting terminal
M10, torque 15 Nm max.

Arc chamber
1 removable chamber

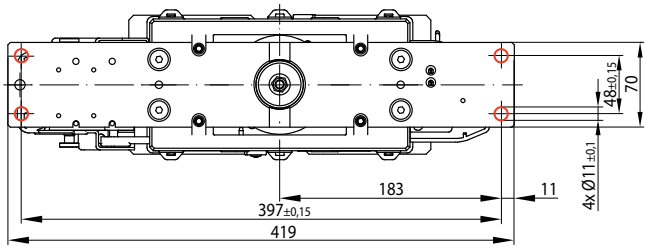


Mounting holes

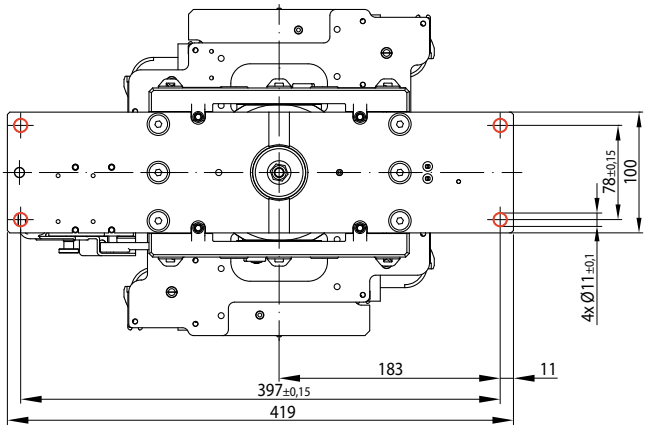
CA1115/04 – 1 pole SPST-NO, U_n 1,500 V AC, I_{th} 400 A, f ≤ 400 Hz



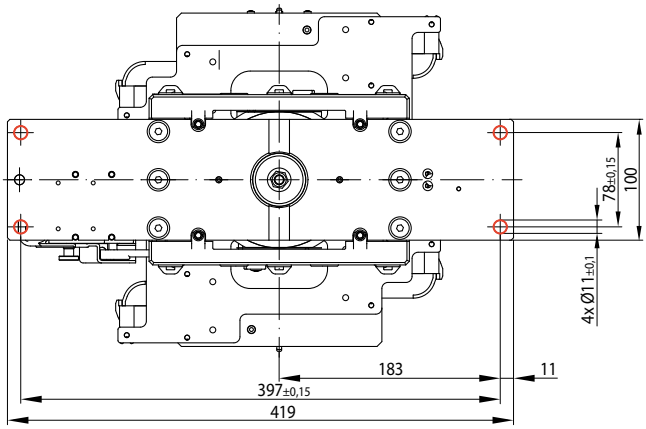
CA1130/08 – 1 pole SPST-NO, U_n 3,000 V AC, I_{th} 800 A, f ≤ 400 Hz



CA1315/04 – 3 pole SPST-NO, U_n 1,500 V AC, I_{th} 400 A, f ≤ 400 Hz



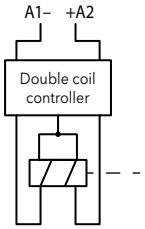
CA1330/08 – 3 pole SPST-NO, U_n 3,000 V AC, I_{th} 800 A, f ≤ 400 Hz



Circuit diagram

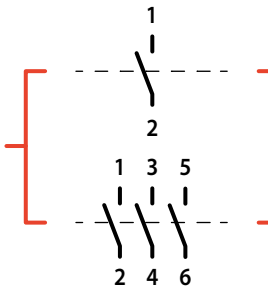
Magnetic drive

Coil suppression «CM»
Double coil controller (DCC) with integreated suppressor diode for magnetic drives with double winding coil



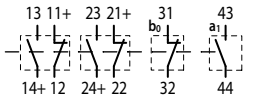
Main contacts

«CA1115/04»
U_n = 1,500 V / I_{th} = 400 A
«CA1130/08»
U_n = 3,000 V / I_{th} = 800 A

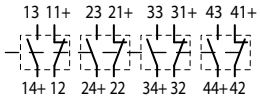


«CA1315/04»
U_n = 1,500 V / I_{th} = 400 A
«CA1330/08»
U_n = 3,000 V / I_{th} = 800 A

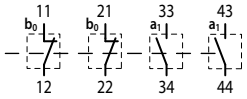
Auxiliary contacts, number and type



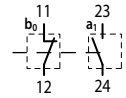
Aux. contact block «00»
2x S826*1 + 1x S870*2 (b_0) + 1x S870*2 (a_1)



Aux. contact block «02»
4x S826*1



Aux. contact block «09»
2x S970*2(b0) + 2x S970*2(a_1)



Aux. contact block «11»
1x S970*2(b_0) + 1x S970*2(a_1)

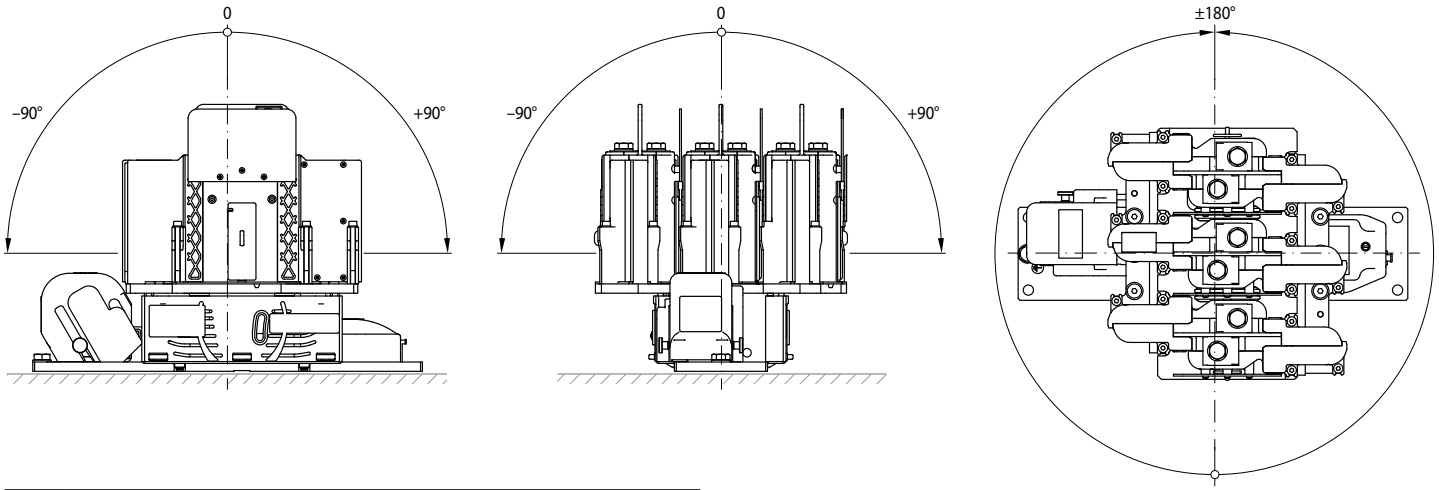
Note:
Optionally, we offer separate plug connections for coil and auxiliary contacts. We also supply customized designs. In this case, however, minimum order quantities apply. So do not hesitate to contact us!

Note:
*1 Aux contact, version with blowout magnetics, see also catalogue D26
*2 Aux contact, see also catalogue D70

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Permissible mounting orientations

CA1115/04, CA1130/08 – 1 pole SPST-NO,
CA1315/04, CA1330/08 – 3 pole SPST-NO



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

Maintenance and safety instructions

Maintenance:

- CA 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 > C28-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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