



C830

1 pole bi-directional DC NO contactors
up to 1,500 volts and 3,000 amps for
automotive applications

C830 - 1-pole bi-directional DC and AC NO contactors for automotive applications

Eddicy C830 series contactors have been specifically designed to meet the growing demands of modern high-voltage platforms in the heavy-duty commercial vehicle sector. With switching voltages up to 1,500 volts and continuous currents up to 3,000 amps, the series combines maximum performance with a compact design. Designed for mobile applications and extreme operating conditions, the series delivers maximum performance, reliability, and scalability. It enables powerful and efficient high-voltage drive systems and lays the technological foundation for ultra-fast charging of the next generation of heavyweight electric vehicles.

Fast charging at up to 3.75 megawatts sets new standards for heavy-duty trucks, construction machinery, and mining trucks. This exceptional performance is made possible by an innovatively designed, two-stage main contact system developed specifically to meet extreme electrical and mechanical demands. On the vehicle side, the C830 can withstand a short-term current of 15,000 A for five milliseconds without the contacts welding together, thereby ensuring maximum operational reliability

even under the harshest conditions. After the switching process, a separate, highly optimized secondary contact system reliably conducts continuous currents of up to 3,000 amps. Thanks to a consistently extremely low contact resistance of just 40 microohms, electrical losses are reduced to a minimum. This increases energy efficiency, reduces power loss, and lays the foundation for economical, high-performance, and scalable next-generation vehicle platforms.

Features

High efficiency and minimal heat loss thanks to extremely low contact resistance

The newly developed main contacts, with a contact resistance of just 40 microohms, significantly reduce heat build-up, thereby contributing to consistently stable and reliable operation. At the same time, energy losses within the contactor are effectively reduced, resulting in a noticeable increase in the efficiency of the entire system. The lower heat generation also leads to reduced cooling requirements, which simplifies thermal management.

Safe arc extinguishing - no risk of explosion

The compact air contactor with permanent-magnet arc extinguishing and without gas encapsulation equalizes excess pressure. This ensures long, trouble-free operation in demanding environments without explosion hazards.

V2G-ready for bi-directional charging stations

Bi-directional contactors are required for the perfect interaction between electric vehicles and charging stations. These enable electric vehicles not only to charge, but also to feed electricity into the grid or use it for the domestic power supply.

Full bi-directionality - reliable disconnection of high power

All versions of the C830 can reliably switch high currents and voltages when required, regardless of the direction of current flow. These properties are achieved through the special arrangement of blow magnets and arcing chambers.

Applications

Mobile use in commercial vehicles, buses, off-road and construction vehicles, as well as agricultural machinery and heavy-duty passenger cars

The C830 automotive contactor is used in electric vehicles, buses, commercial vehicles, and construction vehicles and is part of the safety circuit in the high-voltage vehicle electrical system. In battery and hybrid vehicles, it can be used as the main contactor in the battery disconnect unit (BDU) and reliably ensures the galvanic isolation of the battery from the drive train. In the event

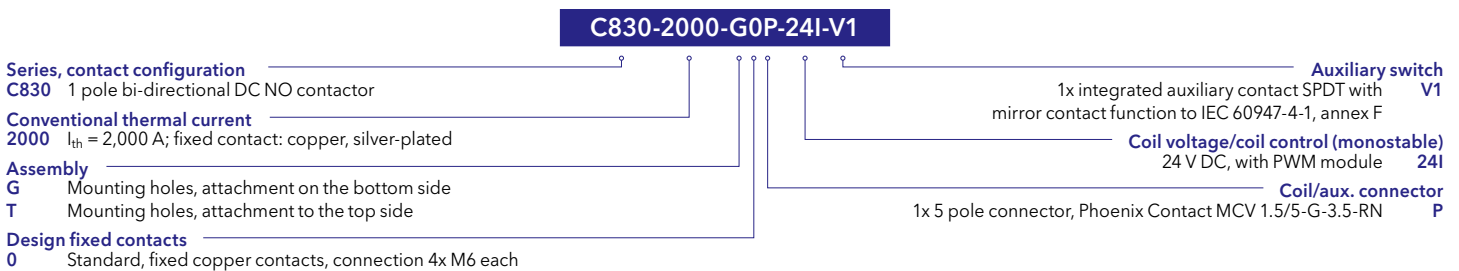
of a fault, the contactor ensures galvanic isolation of the high-voltage battery from the vehicle electrical system, for example in the event of system failures, overload, or an accident. The C830 thus contributes significantly to the safety of vehicle occupants, rescue workers, and the vehicle itself, and supports the reliable operation of high-voltage drive systems.

Reliable, robust and economical

C830 series contactors are designed for continuous currents of up to 3,000 amps. These switching devices feature both high switching capacity and a high short-time rated current. This ensures a high level of operational reliability. An integrated electronic coil control ensures a consistently reliable contact force regardless of the ambient temperature. This also significantly reduces energy consumption and the associa-

ted heat generation when the device is energized. Depending on the application, electromechanical components are subject to high demands. The new DC contactors are highly robust against shock and vibration loads and are designed to meet the requirements of ISO 16750 for automotive applications. They reliably meet the specifications regarding mechanical, climatic, and electrical loads.

Ordering key



Accessories

4-pin connector for connecting the coil and auxiliary switch: Anytek KD0510520000G or Phoenix Contact FMC 1.5/ 5-ST-3.5-RF; please order separately.

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.

Standards

IEC 60947-4-1

Low-voltage switchgear and controlgear - Part 4-1: Contactors and motor starters - Electromechanical contactors and motor starters

UL 60947-4-1

Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-Starters - Electromechanical Contactors and Motor-Starters.





GB/T 14048.4

Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-Starters - Electromechanical Contactors and Motor-Starters.

ISO 16750-3

Road vehicles - Environmental conditions and testing for electrical and electronic equipment - Part 3: Mechanical loads

Specifications

Series	C830			
Type of voltage	DC bi-directional			
Main contacts, configuration	1x, NO			
Switching voltage max. U	1,500 V			
Continuous current, recommended cross section	2,000 A @ 3x 500 mm ² 3,000 A @ 3x 1,000 mm ² *1			
Insulation resistance, new contacts	Main contact - ground	> 200 MΩ		
	Main contact - coil / aux. contact	> 200 MΩ		
	Main contact - main contact	> 100 MΩ		
Breaking capacity, L < 25 μH, bi-directional	1 contactor in the circuit: 1 main contact	U _e = 1,500 V / I _e = 2,200 A	Switching cycles	1
		U _e = 1,500 V / I _e = 500 A		3
		U _e = 1,500 V / I _e = 350 A		10
		U _e = 850 V / I _e = 2,500 A		1
		U _e = 850 V / I _e = 1,200 A		5
Dielectric strength	Contact to contact; contact to coil; contact to aux (Leakage < 1 mA)		6,000 VAC, 60 sec	
	Electrical data according to IEC/UL 60947-4-1			
Rated operational voltage U _e	max.	1,000 V (1,500 V for occasional switching)		
Rated insulation voltage U _i		1,000 V @ PD3 / 1,500 V @ PD2		
Rated impulse withstand voltage U _{imp}		10 kV		
Pollution degree / Overvoltage category		PD2 or PD3, see U _i / OV3		
Conventional free air thermal current I _{th} *1	@ cross section	2,000 A @ 3x 500 mm ²		
Power dissipation	@ I _{th} = 2,000 A, typical	160 W		
Pole impedance		40 μΩ		
Utilization category DC-1*2, U _e = 1,000 V		10 A		
Rated operational current I _e		10 A		
Frequency of operation (operations per hour) I _e	DC-1 (10 A)	360 h ⁻¹		
Rated short-time withstand current I _{cw} (L < 50 μH)	@ t ≤ 5 ms, typical	15,000 A	Contactor fully functional, no contact welding	
		30,000 A	Contact welding, no detachment of conductive parts	
Rated short-circuit making capacity I _{cm}	L < 50 μH	2,000 A		
Main contacts				
Contact material		AgSnO ₂		
Terminals		Thread M6		
Torque		8±0.2 Nm for screws with strength class 8.8		
Auxiliary contacts				
Number, configuration / contact material		1 CO (SPDT) / silver		
Mirror contact function	IEC 60947-4-1, annex F	●		
Utilisation category		AC-15: 50 V / 1.0 A	DC-13: 50 V / 0.5 A	
Maximum voltage / current		50 V / 1 A		
Minimum voltage / current		5 V / 10 mA		
Terminals		5 pole connector		
Magnetic drive with PWM module, monostable				
Coil voltage U _s (operating range) *3		24 V DC (19 ... 32 V DC)		
Pollution degree / Overvoltage category		PD3 / OV2		
Coil power, max.	Pull-in @ T _a = 20°C Holding @ T _a = 20°C	95 W		
		11 W		
Pull-in time / drop-off time	@ T _a = 20 °C / U _s , typical	< 200 ms / < 100 ms		
Coil suppression		PWM module with suppressor diode integrated		
Coil terminal		5 pole connector		
Mounting position		vertical / horizontal (see permissible mounting orientations on page 6)		
Mechanical endurance		200,000 operations		
Shock / Vibration	ISO 16750-3	Test VII		
Environmental conditions	Operating temperature / Storage temperature	-40° C ... +85° C / -40° C ... +95° C		
	Altitude / Humidity (EN 50125-1)	< 4,000 m above sea level / < 75 % on an annual average		
Approvals *4		   		
Weight		approx. 2.3 kg		

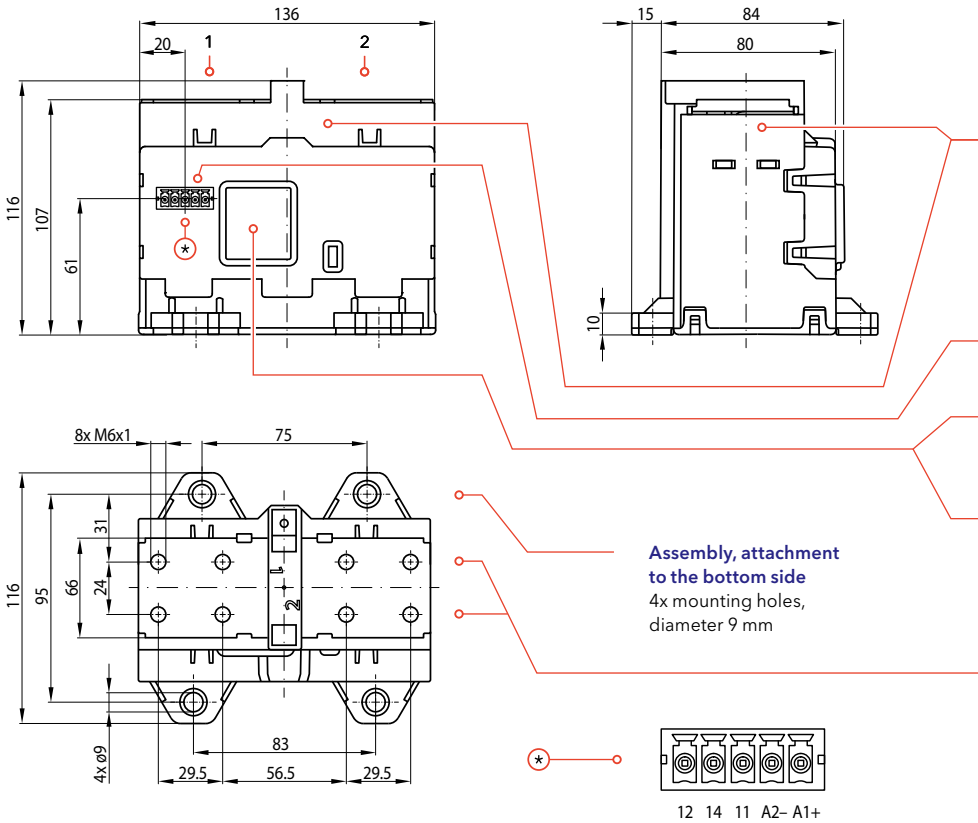
*1 In the application, the terminal temperature 95° C max. must not be exceeded continuously. This value must be ensured during system integration.

*2 Corresponds to 50 switching operations 1.5 x I_e and 6,000 switching operations 1.0 x I_e

*3 For a safe pull-in, the voltage must reach the lower value of the coil voltage U_s function range within a maximum of 1 ms.

*4 In preparation

C830 - Dimension diagram for mounting on the bottom side of the device



C830 - 1 pole bi-directional DC NO contactor up to 1,500 volts and up to 3,000 amps; mounting holes on the bottom side

Main contact system with arc chamber
1-pole NO contact with two-stage contact system for making/breaking and an additional, extremely low-resistance NO contact for carrying high continuous currents with maximum contact protection and long operating life.

5-pin connector auxiliary switch/coil*
For pin layout, see circuit diagram on page 6.

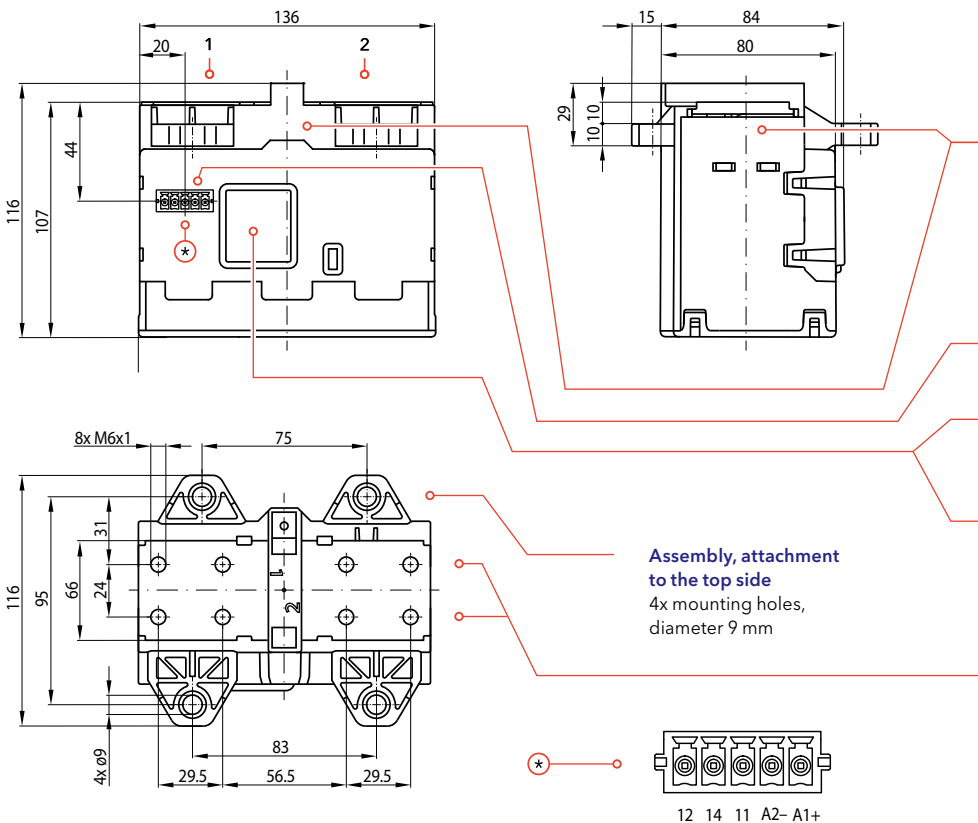
Auxiliary switch
CO (SPDT) with mirror contact function according to IEC 60947-4-1, annex F

Electronic coil controller
PWM module for permanently reliable switching behaviour regardless of ambient temperature, reduced energy consumption and less heat generation.

Fixed contacts main contact system

- Material: Copper, silver-plated
- Connection: 8x threaded holes for 2x 4 M6 connecting screws, length 15 mm + screw lock and thickness of the busbar; Tightening torque: 8±0.2 Nm for screws of strength class 8.8

C830 - Dimension diagram for mounting on the top side of the device



C830 - 1 pole bi-directional DC NO contactor up to 1,500 volts and up to 3,000 amps; mounting holes on the top side

Main contact system with arc chamber
1-pole NO contact with two-stage contact system for making/breaking and an additional, extremely low-resistance NO contact for carrying high continuous currents with maximum contact protection and long operating life.

5-pin connector auxiliary switch/coil*
For pin layout, see circuit diagram on page 6.

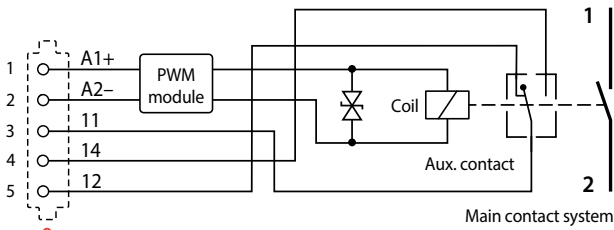
Auxiliary switch
CO (SPDT) with mirror contact function according to IEC 60947-4-1, annex F

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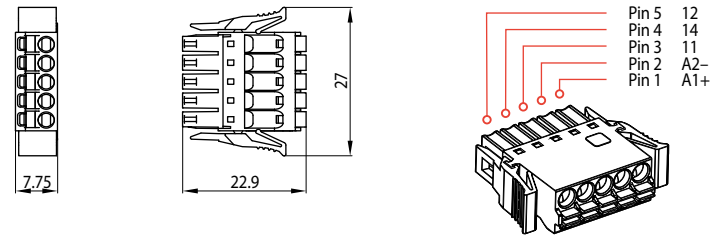
Circuit diagram



5-pin connector for connecting magnetic drive with PWM module and auxiliary contact with mirror contact function

i The magnetic drive with PWM module and auxiliary contact with mirror contact function is connected via a 5-pin connectors.

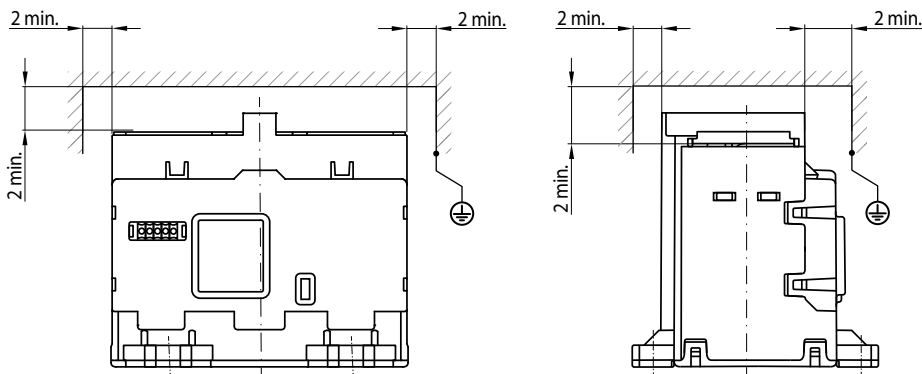
Mating connector



5 pole connector Anytek KD0510520000G or Phoenix Contact FMC 1.5/ 5-ST-3.5-RF

- Cross-section: 1.5 mm² max.
- Connection: Push-in spring connection
- Fastening type: Snap-in tabs

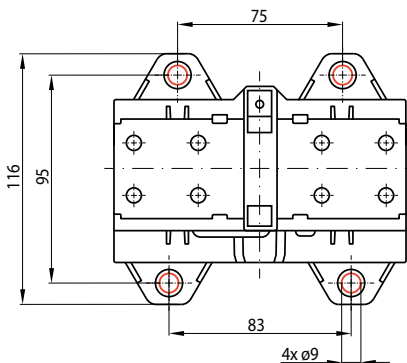
Minimum distances to magnetically active, live, or grounded parts



i For the C830 series, a minimum distance of 2 mm applies for short-circuit currents up to 30 kA to magnetically active, live, or earthed parts. Minimum distances for short-circuit currents greater than 30 kA are available on request. The minimum distances also apply to the "attachment to the top side" not shown here.

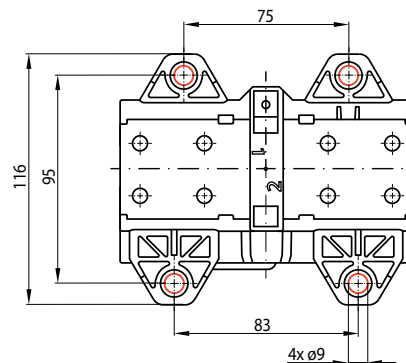
Mounting holes

Mounting option: "Attachment to the bottom side"



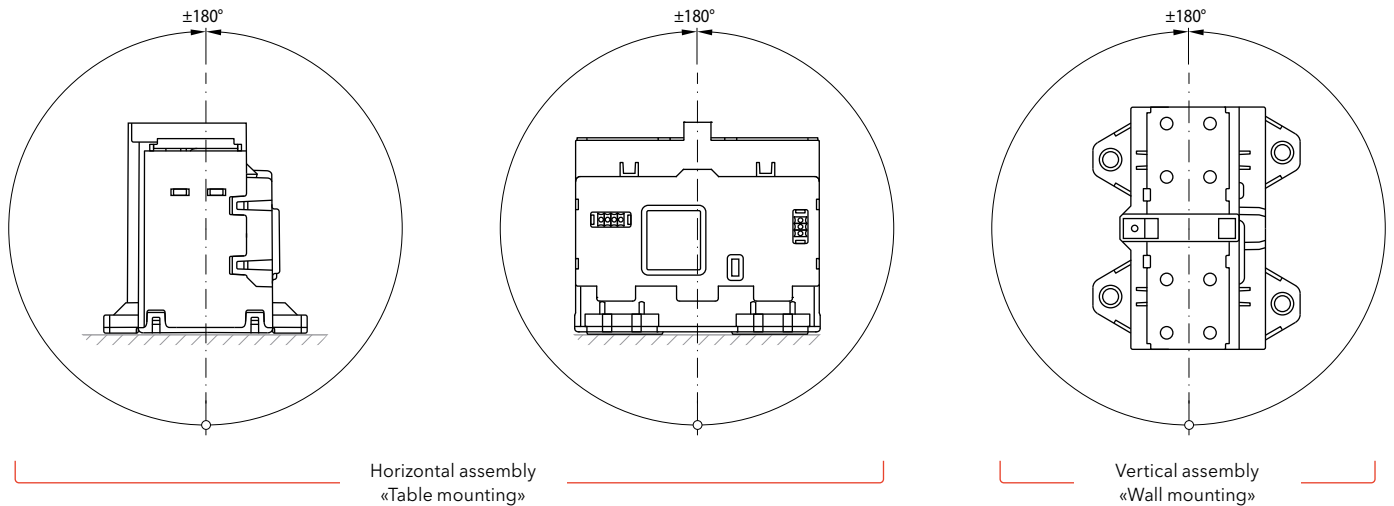
i The contactors are mounted on a suitable mounting plate using four M8 screws. Tightening torque: 15 ± 2 Nm for screws with strength class 8.8

Mounting option: "Attachment to the top side"



i The contactors are mounted at the top using four M8 screws. Tightening torque: 15 ± 2 Nm for screws with strength class 8.8

Permissible mounting orientations



i The mounting positions also apply to the “attachment to the top side” not shown here.

Maintenance and safety instructions

Maintenance:

- C830 series contactors are basically maintenance free.
- Make regular in-depth visual inspections once or twice a year.

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 be-

fore 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!**

We enable electrification for a sustainable future

Schaltbau is a global technology leader specializing in contactors, connectors, switches, and electrical devices.

As pioneers of electrification, Schaltbau has been championing safety on rail for generations. Building on nearly a century of rail experience, with our brand Eddicy we also create future-oriented products and solutions with the highest standards of safety and reliability to switch, connect, control and protect DC applications in energy and e-mobility.

Headquartered in Germany, Schaltbau has a worldwide presence with 12 production and sales sites on all major continents.

Find out more on www.schaltbau.com.