



# High Power Contactors

Advanced Technology for Rail



At Schaltbau, we offer high-performance contactors that set new standards in railway technology. The innovative switching devices are suitable for switching large currents and high voltages with an unmatched performance. Designed to meet the demands of modern trains, they combine exceptional reliability with versatility in a compact design, ensuring smooth operation in the harsh railway environment. Schaltbau contactors offer superior technical performance, are efficient and increase the safety of railway systems.

# Advanced Technology for Rail

## Innovation and Expertise

With decades of experience in the railway industry, Schaltbau offers advanced products and solutions that are precisely tailored to the high demands of rail transport.

## Reliability and Durability

Schaltbau contactors are designed to withstand the toughest conditions and guarantee consistently high performance and safety over their entire service life.

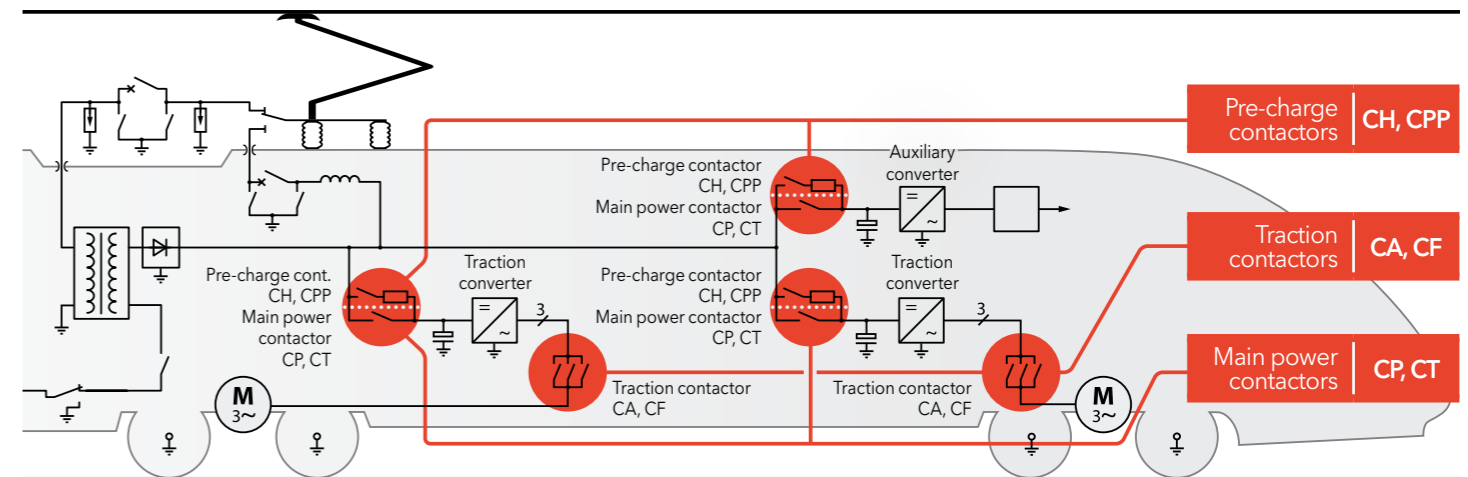
## Comprehensive Support

Schaltbau provides expert advice and support to help customers choose the right contactors, ensuring optimal system performance.

## DC and AC high-power contactors for railway applications

High-power contactors are specialized electromechanical devices designed to manage and control large currents and high voltages within railway systems. These contactors ensure reliable switching of high-power circuits, providing essential functions such as power distribution, traction motor control,

and system protection. Engineered to withstand harsh operating conditions, high-power contactors play a critical role in maintaining the safety, efficiency, and performance of railway electrical systems.



### Main high-power contactors

Line or main power contactors are crucial for a reliable high-voltage supply in railway vehicles. Contactors from the CP and CT series ensure the stable operation of converters and protect systems in critical situations.

### High-power traction contactors

Traction contactors from Schaltbau ensure the safe operation of traction motors. They are required for reliably switching off inverter-fed permanently excited drive motors and are suitable for drive motors with higher supply voltage frequencies.

### Pre-charge contactors

Protect your systems during start-up. Schaltbau pre-charge contactors limit making currents and ensure a smooth and safe start of the electrical system. They protect sensitive components and increase the service life of your devices.

### Applications

- Converter/inverter systems: Ensuring a stable power supply and distribution
- Power distribution: Efficient management of high-voltage circuits
- Transformer integration: Reliable connections for power transformers

### Applications

- Motor start and stop: Reliable load switching of the drive motors
- Direction control: Seamless reversal and change of direction
- Precise control: Smooth acceleration and braking thanks to high frequency range of the contactors up to 400 Hz
- Overload and short-circuit protection: Reliable protection of the drive system

### Applications

- Capacitor pre-charge: Gentle and controlled charging of capacitors in power converters
- System start protection: Prevents damage during system start
- Energy storage systems: Management and charging of storage units
- Auxiliary circuits: Safe power supply for additional systems

## High-power traction contactors

AC power contactors for traction motors in traction units and EMUs

CF series **Additional variants available**

3-pole AC power contactor up to 3,000 volts and 400 amps per switching chamber. Multi-pole DC and AC variants with up to six switching chambers can be utilized.

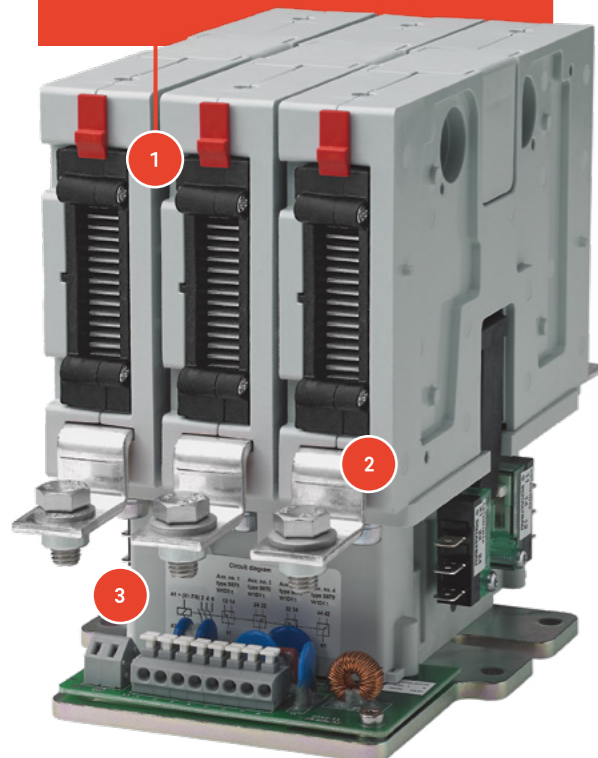
Thanks to its modular design, the modern multi-pole CF contactor is suitable for wide range of applications. As a compact 3-pole AC power contactor, it is used in the power class up to 3,000 volts and 3x 400 amps in inverter-fed AC drives for permanently magnet synchronous motors (PMM) with higher frequencies.

The switching chambers can be configured as normally open contacts, normally closed contacts or in combination as changeover contacts. Multi-pole variants with a maximum of six DC and AC switching chambers can be realised.

- Power range
  - Nominal voltage 1,500-3,000 volts
  - Conventional thermal current 200-300-400 amps
- DC bi-directional / AC,  $f \leq 60$  Hz
- Configurable as NO, NC or changeover switch with 1 to 6 main contacts
- Innovative application-dependent arc chamber design
- High short-circuit breaking capacity
- 4 optional auxiliary switches
- Low energy consumption and low heating thanks to sophisticated coil saving circuit
- Tested to railway standard IEC 60077

Arc chambers with optional ceramic, plastic or metal extinguishing elements

Configuration with a maximum of 6 main contacts á 200 A or 300 A or 4 main contacts á 400 A. Higher currents can be carried by connecting main contacts in parallel.



- 1 3 pole AC NO contactor for inverter-fed PMM drive motors with higher frequencies
- 2 Arc chamber with plastic extinguishing inserts. Ceramic and metal inserts are available as an alternative.
- 3 Sophisticated coil-saving circuit for low energy consumption and low heating

## Main high-power contactors

For permanently stable power distribution in traction units and EMUs

CP series **Additional variants available**

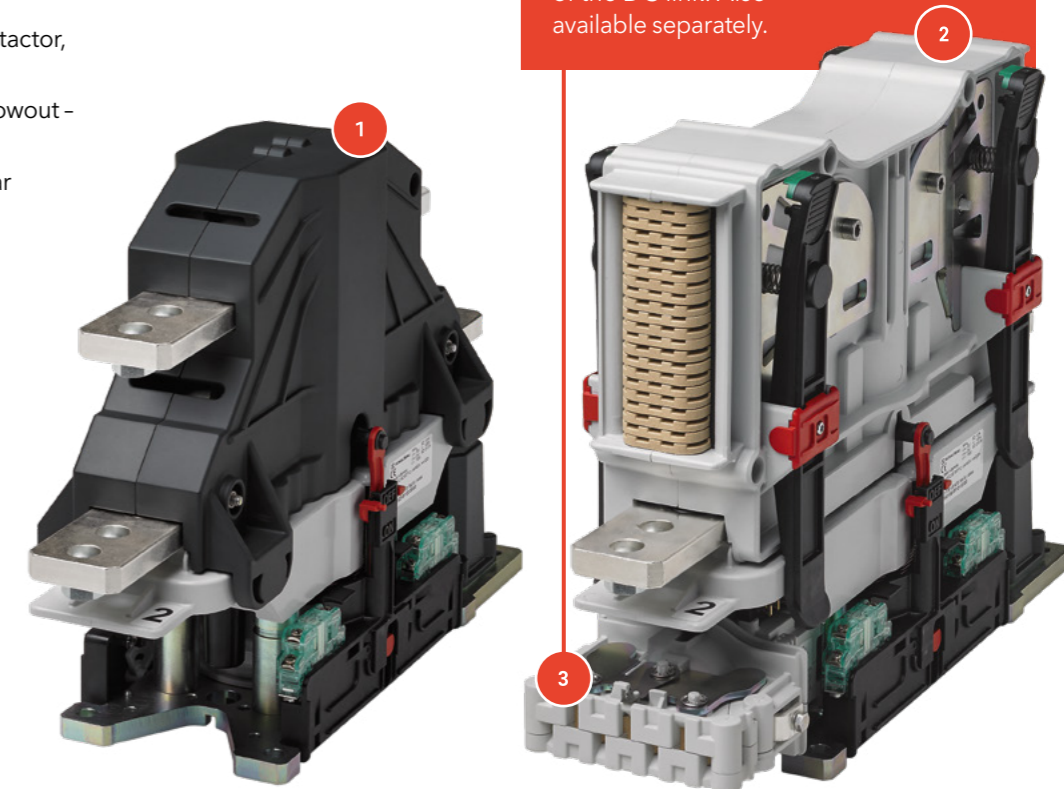
1 pole bi-directional high-voltage contactors, disconnectors, changeover switches up to 3,000 volts and 2,000 amps for DC and AC

With the CP series, Schaltbau is offering an innovative concept to the switch-gear market. The arc-handling is done exclusively by permanent-magnetic blowout. This patented technology ensures fully bi-directional breaking capability and enables an extremely compact design for this performance class. In addition, the universal devices can be configured as a NO/NC contactor, disconnector or changeover switch. Furthermore, a high-voltage discharging contact, a pre-charge contactor or several auxiliary contacts can be integrated. This enables us to react flexibly to changing customer requirements.

- Power range:
  - Nominal voltage 1,500-3,000 volts
  - Conv. thermal current 600-800-1,000-1,200-1,500-2,000 amps
- DC bi-directional / AC,  $f \leq 60$  Hz
- Easily configurable as a NO/NC contactor, disconnector or changeover switch
- Exclusively permanent-magnetic blowout - no critical currents
- Low total cost of ownership, modular and compact
- Tested to railway standard IEC 60077

Optionally integrable pre-charge contactor - CPP series

A pre-charge contactor from the CPP series can be directly integrated. This saves space and ensures the effective limitation of the inrush current of the DC link. Also available separately.



- 1 CO CP3130/12  
 $U_N = 3,000$  V,  $I_{th} = 1,200$  A
- 2 NO CP1115/12  
 $U_N = 1,500$  V,  $I_{th} = 1,200$  A
- 3 Pre-charge NO CPP1115/02  
 $U_N = 1,500$  V,  $I_{th} = 200$  A

## High-power traction contactors

AC power contactors for traction motors in traction units and EMUs

### CA series

**1 and 3 pole NO power contactors up to 3,000 volts and 800 amps for AC**

The CA series is available as 1 or 3-pole AC contactors. It is typically used for switching off permanent magnet traction motors of EMUs in the event of a short-circuit in the output circuit of the traction inverter in order to prevent the drive from being blocked. The CA contactor series is specifically designed for use with traction motors with supply voltage frequencies of up to 400 Hz.

- Power range:
  - Nominal voltage 1,500-3,000 volts
  - Conventional thermal current 350-540-800 amps
- High short-circuit breaking capacity for frequencies up to 400 Hz
- 1 and 3 pole versions
- Reinforced insulation between main circuit and control/auxiliary circuit
- Functional insulation for main circuit
- Tested to railway standard EN/IEC 60077



CA1115/04



CA1330/08

## Main high-power contactors

For permanently stable power distribution in traction units and EMUs

### CT series

**1 and 2 pole NO power contactors up to 3,000 volts and 1,100 amps for DC and AC**

CT series power contactors is outstanding for extinguishing the arc with a combination of electromagnetic and permanent magnetic blowout and ensuring high breaking capacity. The innovative technology enables the almost unrestricted use in DC and AC traction power networks. Schaltbau CT traction contactors have been operating successfully for decades, all across the world in locomotives and EMUs.

- Power range
  - Nominal voltage 1,500-3,000 volts
  - Conventional thermal current 400-800-1,100 amps
- DC bi-directional / AC,  $f \leq 60$  Hz
- 1 and 2 pole versions
- Combination of permanent-magnetic and electromagnetic blowout - no critical currents
- Tested to railway standard IEC 60077, GB/T 14048.4, UL/IEC 60947-4-1



CT1115/04



CT1230/08

## Pre-charge contactors

Handling high inrush currents for a safe and efficient system startup

### CH1130/02 series

**1 pole NO high-voltage contactors up to 3,000 volts and 250 amps for DC and AC**

The CH1130/02 series replaces the CH high-voltage contactors that have been tried and tested for decades. The design has been completely revised. The CH1130/02 now also features efficient permanent magnets and ceramic elements for arc quenching. The contactor is used as a pre-charge contactor in power supply systems or as a main contactor in heating and air conditioning systems.

- Power range:
  - Nominal voltage 3,000 volts
  - Conventional thermal current 250 amps
- DC, semi-bi-directional / AC,  $f \leq 60$  Hz
- Compact, robust design
- Double break contacts
- Permanent magnets and ceramic elements for arc extinguishing
- Replaces the existing CH series
- Tested to railway standard IEC 60077



CH1130/02

### CPP series

**1 pole NO and NC contactors for DC or AC up to 1,500 volts and 200 amps**

The new super-compact DC contactors from the CPP series are the smallest contactors for handling loads up to 200 A and are suitable for nominal operating voltages of up to 1,500 V. The single-pole contactor is available as an NO or NC contactor. They are used in main and auxiliary converters of railway vehicles. These devices are ideally suited as integrated or separate pre-charge contactors for the large Schaltbau models CP and CT.

- Power range
  - Nominal voltage 1,500 volts
  - Conventional thermal current NO 200 amps or NC 120 amps
- DC bi-directional / AC,  $f \leq 60$  Hz
- Permanent magnetic blowout - no critical current range
- High making and breaking capacity
- 2 auxiliary switches with mirror contact function
- Super-compact, robust, reliable
- Tested to railway standard IEC 60077, GB/T 14048.4, UL/IEC 60947-4-1



CPP2115-02



CPP2115-01

## 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 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.