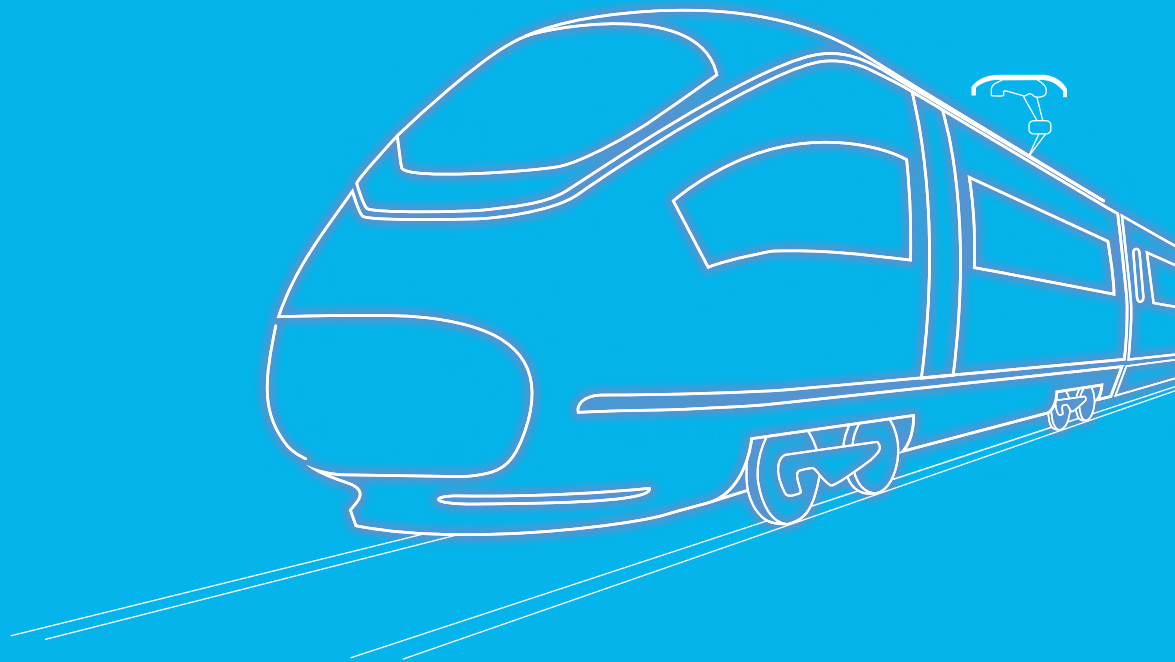


www.schaltbau.com

SCHALTBAU
DC Power Under Control



RAILWAY



Safely on track

Connect and control

As a specialist for high-quality DC applications, Schaltbau GmbH has been developing and producing electro-mechanical components for rail technology since 1929 – fulfilling all quality, reliability and durability demands every step of the way. This has helped Schaltbau establish its reputation as a renowned rail equipment manufacturer.



Railway Technology

Customisation comes as standard

The safety and reliability of rail transport systems are directly dependent on the quality of the electro-mechanical components they use. Schaltbau's solutions set global benchmarks when it comes to fulfilling complex connection and control functions.

Driver's cab equipment

Efficiency through standardisation and flexibility through customisation for all types of vehicles are the maxims driving the development of innovative Schaltbau operating elements. These range from the full driver's desk, modular and configurable master controllers and toggle switches to interactive screens and consoles.



UIC connectors

Connectors have to stand up to particularly tough conditions. As a result, we are constantly working on refining these components. The Schaltbau series encompass systems for remote control, data communication, energy transmission and braking functions. They offer efficiency-boosting innovations like pre-assembled plugs and jumper receptacles with replacement inserts.



Snap-action switches

Safety knows no limits – particularly given its dependency on the smallest details. Available in various series, Schaltbau snap-action switches are built for extreme demands with improved temperature and chemical resistance, as well as for standard demands with dust-proof and water-proof versions.



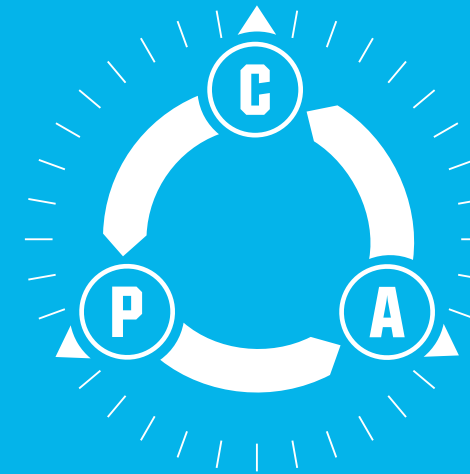
Circuit breaker units

Connecting DC circuits has been a core competency of Schaltbau for many years. The numerous complex power supply systems used for rail vehicles are covered by a whole host of different contactor series, including battery and universal contactors, HV disconnectors and contactors, as well as traction contactors.





The Schaltbau 360° Competence!



C Consulting

Experts are the best consultants.

Schaltbau is a specialist in electromechanical components and customer specific solutions with decades of experience in development and manufacture.



Expertise

Benefit from the Schaltbau know-how



Consulting

Experienced sales engineers work on-site with you



Solution

Cooperation spells success

A Application

No need to reinvent the wheel.

Schaltbau sales engineers have access to a treasure trove of knowledge and experience including a host of realized applications. Thus you will benefit from analogies and empirical data that may be of some value for your application.



Customer specific

Added value and maximum benefit for your application



Safe

Safety components of approved quality



Cost-effective

Easy to mount, no maintenance, long life

P Product

The right solution may eventually be an item from our product line, a special variant with little need for adaptation, or a completely new design – because customizing is standard with us!



Finished item from our product line



Well-proven and tested special variant with little need of adaptation



Completely new development to customer requirements

3 Possibilities – 1 Solution

In the development and project planning of electrical components and devices for rail applications, there is a good rule of thumb:

The earlier our expertise is integrated into the process, the more efficient your solution will ultimately be. The knowledge we have built up over decades in developing and producing electro-mechanical components makes us an invaluable development partner for customers when it comes to identifying the right solution.

Our sales engineers are experienced professionals who work closely with our developers and design engineers, and who are well versed in all branches of industry relevant for rail applications. They bridge the gap between customer wishes and development engineers. In this way, our customers enjoy the support of an expert who can offer knowledgeable advice, always helping to find the right solution for the application in question.

Electrics for rolling stock

Connectors – UIC 558, UIC-IT

Receptacle with replacement insert for easy on-site maintenance - without cable replacement! Plug with Gigabit-Ethernet module for fast and safe data communications in modern railway vehicles.

Emergency brake handles – PAD10, PAD30, PAD40

Up-to-date versions for lintel and wall mounting in passenger spaces and service spaces of rail vehicles. Meets the design requirements of the applicable standards and regulations.

High-voltage contactors – CH1130/02

Single-pole high-voltage contactor with new design. Due to replace existing CH contactor series. Suitable for use as precharging and switch-on contactor in power supplies and as a control contactor for resistor banks in heating and air conditioning equipment.

Snap switches – S826, S847, S880, S926, S970

Suitable for safety-related applications. 8xx Series for use in standard applications. 9xx Series for use under extreme conditions with better resistance to temperature and chemicals.

Connectors to UIC 552 – ZH551, ZH550

All railway vehicles used in cross-border rail traffic, such as locomotives as well as EMUs and DMUs that are equipped with a train line, require these ZH series jumpers.

Emergency brake handle
PAD10
PAD30
PAD40

Snap-action switches
S826, S847
S880
S926, S970

Air conditioning
Heater banks

Train line

Connectors
UIC-IT
UIC 558

AC main switch
CVB

Change-over-switch
SCO

Disconnector

Earthling switch

Precharging contactor
CH, CL, CPP, C360

Power contactor
CP, CT, C320, C360

Earthling switch
SE

Connector
EP brake
EP

Connectors
ZH

Traction contactors – CA, CF

1 and 3-pole AC contactor for the disconnection of traction motors of multiple electric units, e.g. in the event of a short-circuit in the output circuit of the traction inverter.

Pre-charging contactors up to 3 kV – CH, CL, CPP, C360

Pre-charging contactors for effective limitation of the inrush current of the DC link. CPP precharging contactors are available as integrated variants with CP power contactors.

Precharging contactor
CH, CL, CPP, C360

Power contactor
CP, CT, C320, C360

Precharging contactor
CH, CL, CPP, C360

Power contactor
CP, CT, C320, C360

Contactor
CA, CF

Power contactors up to 3 kV and 2,000 A – CP, CT, C320, C360

1 and 2 pole traction contactors with high breaking capacity and innovative arc extinguishing for use in AC and DC traction current networks.

Compact contactors – C195X, C320, C360

Proven DC NO contactors for operating voltages up to 1,500 V are now also available in a bidirectional version with increased current carrying capacity of up to 1,000 A.

ATX-SPII HMI displays

Interactive touchscreen PC operating as the central Human Machine Interface for display and diagnosis of operating and vehicle status, control commands, train radio, electronic timetable and video surveillance.

Driver's desks and master controller

Proven worldwide: Modular design or up to 100% customised. Design and manufacture strictly to the customer's requirements.

Other operating elements for driver desks to UIC 612

Toggle switches, height-adjustable footrests, DSD switches, push buttons and keylock switches, electronic and multi-tone buzzers complement the portfolio of available driver's cab equipment.

Battery contactors – C320, C360, CS115

1-pole or 4-pole DC contactors for universal use in battery networks up to 1,500 V, e.g. as disconnecting or switching contactors for battery-powered functions.

Driver's cab equipment
Driver's desks
Master controller
Toggle switches
DSD switches
Control panels
Footrests

Auxiliary converter

Switchgear cabinet

Traction converter

Contactor
CA, CF

Driver desks for rail vehicles

Virtual Reality
V-DESK
Validation-
and design tool



IntelliDesk – The smart driver desk concept

IntelliDesk is an innovative communications and wiring concept for system integration inside a driver desk. Here, every subsystem can be simply connected to a field bus box and immediately establish communication via a central master interface with the on-board train control and monitoring system (TCMS). A feature that is unique to this desk is the display of condition-based maintenance.

IntelliDesk has thus turned out to be a landmark on the road towards standardisation and modularisation as intended by UIC 612 and, at the same time, it offers the utmost flexibility and adaptability to a wide variety of rail vehicles.



- Easy configuration of driver desks, also including complete and finished, with fully integrated electromechanical operating elements as well as all electronic subsystems necessary. Fast and easy to plan and realise.
- Custom required, modular, robust, durable. Various possible variations in the design and arrangement of additional display and control elements. Condition display based on maintenance (unique).
- Ergonomics, ease of use, pleasant feel and modern design for more safety.
- Subsystems with integrated field bus and/or gateway for communication with the TCMS. Data communications via a central master interface.
- Hardware and software-prepared safety design for next-generation SIL 2 driver desks. Internal, redundant and EN 50159-compliant CAN network. TCMS connection via Ethernet.

IntelliArm

Welcome to the future – Welcome IntelliArm!

Technology must serve people, must be functional, but also attractive. Technology must help people to solve tasks better, easier and safer. Therefore, the goal from the beginning was to transform a «User-centred design» into a «Human-centred design».

With regard to the driver's cab, the human being, in this case the train driver, was placed at the centre. Then, step by step, all the functions that the driver needs for his daily work were placed ergonomically and naturally around him. In combination with the best available technology for today's most modern trains, we have developed the driver's desk of the future from scratch. The result: a new, innovative and minimalist «Human Machine Interface» – the IntelliArm.

- **Easy to get** The driver in focus: the right combination, the perfect ergonomics, the best technology, that means integration and implementation of different HMI interfaces into a unique, custom-fit shape.
- **Easy to plug** Compact and modular, IntelliArm can be easily installed even after the driver's cab has been completed and offers full accessibility for maintenance and servicing.
- **Easy to play** From the beginning, the main user is at the centre of the design of IntelliArm. This is ergonomic, increases his attention and improves safety.
- **Easy to have** Thanks to the small space requirement and the vertical structure, all internal components can be reached easily and without difficulty. This increases availability.



Interactive displays

IntelliCockpit – Human Machine Interfaces ATX Displays

Modern ATX displays appear modestly as displays, but in reality they are interactive touchscreen PCs and universal all-rounders: display and diagnosis of the vehicle and operating status, control of subsystems, include ERTMS/SCMT, train radio, timetable and video monitoring. In a user-friendly way, all important parameters can be controlled and monitored very simply and centrally. The units meet the requirements of EN 50155 and comply with the UIC standard, but can also be customised. ATX displays are robust and suitable for years of rough railway operation. They offer a high level of reliability thanks to „Predictive Maintenance & Remote Diagnostics“.



▲ ATX-K062-MMI-00
12.1" LCD screen, easy removable

- Screen size: 8"/10.4"/12.1", up to 21", Resistive/capacitive touch panel
- Processor: Freescale™ iMX6®–Quad ARM®–Quad ARM® Cortex up to 1.8 GHz / Intel E3940 up to 1.8 GHz / Freescale™ i.MX6®–Quad ARM® Cortex™-A9 up to 1.0 GHz with TrustZone® for SIL application
- External interfaces:
 - Keyboard to UIC 612 standard
 - USB / Serial / CanBus / MVB
 - Ethernet 10–100–1000 Base-T Mbps
 - Buzzer and external speaker output
- Up to SIL 3 certificate available



▲ ATX-K065-MMI-03
10.4" UIC 612 LCD screen

DMI-K065-MMI-42
8" Single or redundant
▼ LCD screen



Master controllers

Configurable and expandable functions

Schaltbau master controllers can be found in railway vehicles all around the world. The modular construction of our robust, shock-proof and vibration-proof master controllers enables a wide range of possible design variants and varying arrangements for individual operations, such as direction control, keylock and pushbutton switches and lots more. Modern project management ensures adherence to the required deadlines and quality – even when requirements change.

- Standard master controller complemented by additional existing standard modules
- Compact, rugged, durable
- Can be configured individually, allowing last minute changes
- Mechanically interacting function modules
- Components comply with railway standards (UIC 612 and others)



S334 H34 ▶

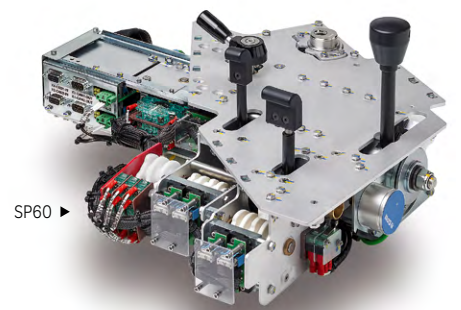


CTA7000 ▶

Customized design to order

Here, a master controller is newly designed in close cooperation with the customer according to the respective requirements and exact specifications. Our inhouse electronics development division enables us to respond quickly and flexibly to changing needs. Comprehensive type testing is performed in our laboratory according to customer specifications. It is then manufactured by Schaltbau in its own factories.

- In-house design and manufacture
- Field bus: Profinet, CAN, and others
- Sensitive touch functions, RFID card reader, automatic reset of the handle, and others
- Mechanically interacting function modules
- Components comply with railway standards (UIC 612 and others)



SP60 ▶

Toggle switches, portable consoles

K Series toggle switches for driver desks according to UIC 612

Our award winning K series toggle switches now have four new options. As a result, our K series toggle switch assemblies meet all requirements of the UIC 612-0 railway standard as well as the EUDDplus project which aims at an optimal ergonomic configuration of the desk elements by standardising and harmonising their design. Creating a driver's desk in a modern design is therefore no problem. The dimmable and consistent illumination of the toggle switches makes separate indicator lights superfluous.

- Bushing mount
- Indicator light function: illuminated ring in 5 LED colours for use as function indicator or for night design, optional
- Can be lead sealed with lead seal holder
- Yellow ball for ETCS acknowledgement
- Cylinder handle for external warning horn for locomotives
- 8 switching elements max. (S880 series snap-action switches)



Console with 4x K



Portable driver console PDD-100 for driverless metro trains

Today, more and more of the world's metros are being operated on a driverless basis. They therefore no longer require a driver's desk. But if a train is unresponsive on track and defies remote control, or in the case of maintenance on track, a real driver desk would come in handy. And that is what the SPII offers you. The portable driver console PDD-100 can be connected via plug and play and is immediately ready for use. Like the IntelliDesk, the console is modular and scalable and comes with all operating elements and subsystems fully integrated, so there is no need for wiring.

- Removable and portable, all subsystems already integrated
- Interactive touchscreen HMI for data communication with the TCMS
- Separate console fitted with operating elements, display panels and audible feedback
- Master controller/brake controller with integrated dead-man function
- Train radio display
- Emergency stop switch (mushroom)



◀ PDD-100

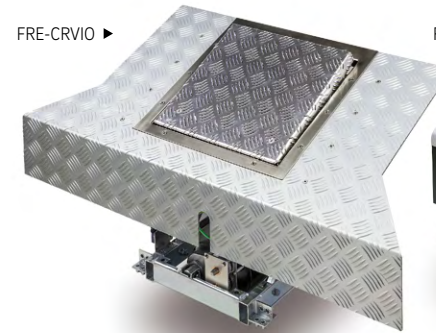
Footrests, emergency brake handles

FRE-CRVIO, FRE-AVTRA, FRM-ASR, FRF-M7 Footrests for rail vehicles

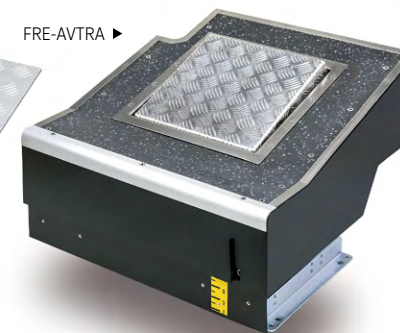
Footrests and DSD switches can be found in railway vehicles all around the world. Footrests with DSD switches allow the driver to operate the driver safety device from an ergonomic seating position while keeping hands free. Additional functions, e.g. for track sanding or horn activation can be integrated. An heatable base plate provides additional comfort in winter. Development, production and assembly are carried out in accordance with DIN EN ISO 9001 and IRIS.

- Modular, rugged, maintenance-free
- Customized design with or without height adjustment
- Integrated DSD foot switch
- Optional additional foot switches
- Optional heatable base plate
- High vibration and shock resistance

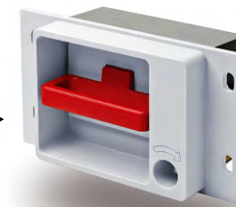
FRE-CRVIO ▶



FRE-AVTRA ▶



PAD30 ▶



PAD40 ▶



Emergency brake handles PAD10, PAD30, PAD40 for lintel and wall mounting

Schaltbau has developed two types of emergency brake handles for use in passenger spaces and service spaces of trains: PAD10 for lintel mounting, e.g. under the lintel of a carriage door, and PAD30 and PAD40 for wall mounting, e.g. in vestibules, passenger spaces or the train manager's compartment. The emergency brake handles meet the design requirements of DIN EN 15327-1 and comply with the provisions for the installation of braking equipment and emergency brake operations in vehicles used for the carriage of persons.

- Elegant design
- Aluminium die-cast housing, rugged, long-lasting
- Finish: semi-gloss varnish, resistant to acids and chemicals
- Handle can be lead sealed
- Optional automatic reset (spring return)
- 2 switching elements max. with gold or silver contacts

UIC 558 VE Series

Updated connector for remote control, doors and lights or for public address systems in passenger coaches and multiple unit trains.

UIC-IT Series

Robust and state-of-the-art Ethernet solution for data communications in modern railway vehicles.

UIC558

UIC-IT

EP

ZH

EP Series

Connector for electro-pneumatic brakes (EP brakes) as well as for emergency brake override control.

ZH Series

UIC 552-compliant rugged jumpers providing electrical connections between rail vehicles as well as carriages.

Connectors to UIC

Robust jumpers to UIC 552 UIC 552 series

The ZH550 jumper receptacle for train lines has a new symmetrical design and a common terminal for connecting cables entering from the left, right or the Schaltbau ZH series connectors fully meet the requirements of UIC 552. With their long time proven design these jumpers have been the stock items of Schaltbau for the railway industry since decades. The plug ZH551 are now also available pre-assembled with a connection cable on one side or on both sides.

- Rugged mechanical and electrical design, receptacle shell with metal handle
- Metal latch locking of mated plug in receptacle and key lock for locking receptacle and dummy receptacle
- Pilot contact for feedback: optional switching element integrated in the receptacle is used for feedback signalling a plug being mated
- Cable assembly optional: Halogen-free power cable for rail vehicles with shielding and improved flammability rating and higher heat resistance in accordance with DIN VDE 0250-606 and EN 50624



Connectors to UIC

Receptacle with new replacement insert UIC558 series

Schaltbau has added a new type of receptacle to its UIC558 connector series which is likely to reduce maintenance and downtime considerably. While undertaking maintenance work, there is no longer any need for rewiring. All you need to do is exchange the replacement insert of the receptacle. You can do that outside the engine shed, and the electrical testing of the connector's contacts and wires is therefore also no longer necessary.

- Break-away connector
- Replacement insert with socket contacts implemented on both sides
- Crimp adapter with pre-assembled cable for on-site replacement
- No need of rewiring the rail vehicle
- No need of testing the connector's contacts and wires



Plug with Gigabit Ethernet up to Cat 7 UIC-IT series

Rugged and state-of-the-art Ethernet solutions for data communications is what is required by today's rail vehicles. The new UIC-IT series from Schaltbau meets those requirements providing a highly flexible, universal and reliable Ethernet connection option for the harsh railway environment with a design life that will last for decades. It is designed for use with various types of rail vehicles, making it possible to combine rolling stock of different manufacturers and railway operators.

- Break-away connector
- Ingress protection rating IP69K: Receptacle with lid closed and connector when mated
- 1 or 2 Gigabit Ethernet module for 4 data pairs for transmission of 10 Gb in a permanent link with Cat 7 compliant data cables
- 16 optional signal contacts
- 10,000 mating cycles



Snap-action switches

The world's smallest snap-action switch with positive opening operation – S880 series

Schaltbau subminiature S880 snap-action switches feature both wiping, self-cleaning contacts as well as a positive opening function. Minimum size in combination with maximum reliability make this V4 snap-action switch ideally suited for a host of applications such as a safety limit switch in medical engineering or limit switch for machine, door and system control projects or in the driver's consoles of locomotives.

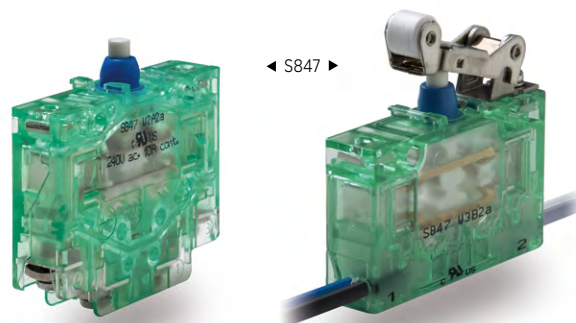
- Positive opening operation, IEC 60947-5-1 Annex K,
- Dimensions to DIN 41636-3, type B (V4 subminiature switch)
- Degree of protection: contacts IP40, IP60, IP67, terminals IP00, IP67 according to IEC 60529
- Wiping, self-cleaning contacts
- Contact material: hard silver or gold alloy
- Snap mechanism highly resistant to shock and vibration
- Dimensions 20 x 9,3 x 6,6 mm (L x W x H)*



Snap-action switches with IP rating up to IP67 S847 series

S847 series snap-action switches in modular design are available with three degrees of protection according to IEC 60529: IP40 (protected against solid particles), IP60 (dust-proof), and IP67 (water-proof). Due to their self-cleaning double-break contacts as well as protection against dust, moisture and pollutants, S847 series switches are highly reliable even at low contact ratings. The switches are therefore also often used for handling low currents and voltages.

- Positive opening operation, IEC 60947-5-1 Annex K
- Degree of protection: contacts IP40, IP60, IP67, terminals IP00 according to IEC 60529
- Form Z circuitry SPDT-DB, galvanically isolated, self-cleaning, double-break contacts
- Contact material: Hard silver or gold alloy, magnetic blowout, optional
- Long overtravel after positive opening operation
- Dimensions 50 x 36 x 12 mm (L x W x H)*

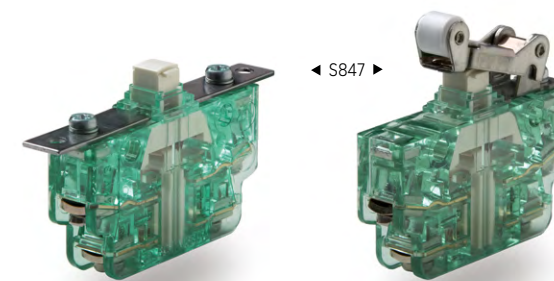


Snap-action switches

Snap-action switches for standard applications S826 series

S826 series switches feature galvanically isolated contact bridges that make it possible to control two separate load circuits with independent voltage levels at the same time. This makes them ideally suited for automation tasks with separate electric loads. The wiping, double-break contacts ensure high reliability even at low electrical loads. Switches with gold contacts are particularly suitable for low currents and voltages.

- Positive opening operation, IEC 60947-5-1 Annex K
- Degree of protection IP40, IEC 60529
- Wiping, double-break contacts
- Form Z SPDT-DB, galvanically isolated
- Contact material: hard silver or gold alloy
- Magnetic blowout, optional
- Dimensions 50 x 28,5 x 12 mm (L x W x H)*

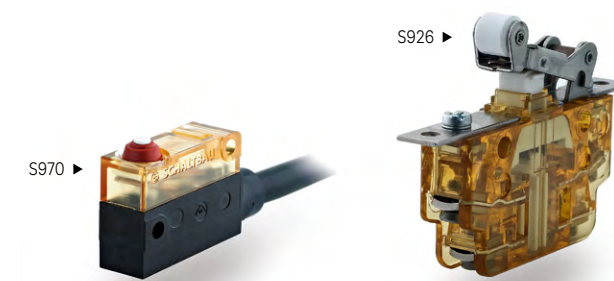


* Housing without terminals, leads, actuators

Snap-action switches for extreme conditions S926 and S970 series

Thanks to the high-performance thermoplastic used as housing material, S926 and S970 series snap-action switches feature both a better resistance to temperature and chemicals as well as a 50% higher impact resistance compared to polycarbonate (PC). Thus they are ideally suited for applications characterised by harsh environmental conditions. Sharing the same design, dimensional and electrical characteristics as the S826 and S870 series switches, they can easily replace a standard switch without great effort.

- Better resistance to temperature and chemicals
- Form Z SPDT-DB, galvanically isolated (S926)
- Double-break contacts (S926)
- IP rating IP40, IEC 60529 (S926)
- IP rating IP40, IP60, IP67 IEC 60529 (S970)
- Terminal styles: e.g. leads, cable (S970)
- Dimensions
S926: 50 x 28,5 x 12 mm (L x W x H)*
S970: 30 x 16 x 10,5 mm (L x W x H)*

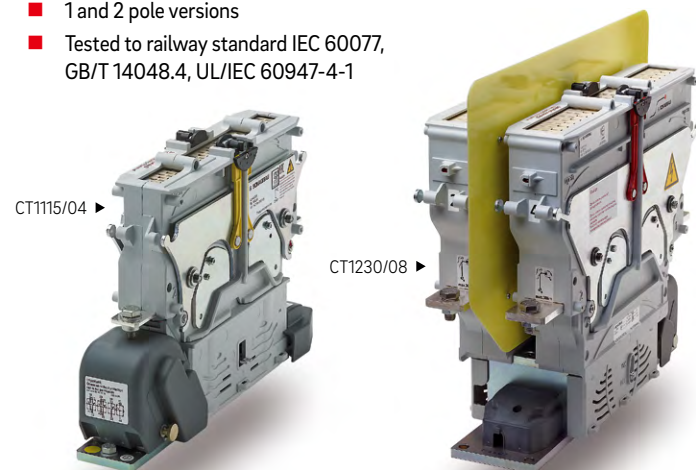


Power contactors for DC and AC

1- and 2-pole CT traction contactor for up to 1,100 A AC and DC – CT series

CT series power contactors are 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 AC and DC traction power networks. Schaltbau CT traction contactors have been operating successfully for decades, all across the world in locomotives and EMUs.

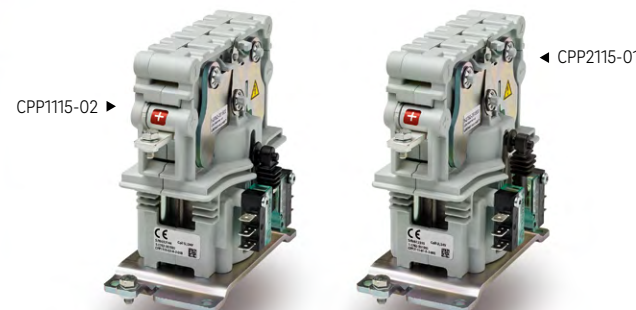
- Power range
 - Nominal voltage 1,500–3,000 volts
 - Thermal current 400–800–1,100 amps
- DC bi-directional or AC up to 60 Hz max.
- Combination of permanent-magnetic and electromagnetic blowout – no critical currents
- 1 and 2 pole versions
- Tested to railway standard IEC 60077, GB/T 14048.4, UL/IEC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



1-pole contactors for DC or AC CPP series

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 3,000 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-charging contactors for the large Schaltbau models CP and CT.

- Power range
 - Nominal voltage 1,500 volts, DC uni-direktional / AC f < 60 Hz
 - Thermal current NO 200 amps or NC 120 amps
- 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



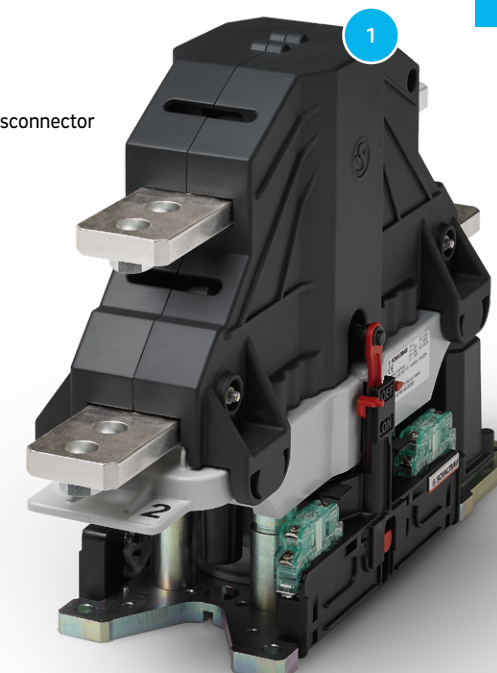
Power contactors for DC and AC

1-pole bi-directional high-voltage contactors, disconnectors, changeover switches for DC and AC for up to 2,000 A – CP series

With the CP series, Schaltbau is introducing an innovative concept to the switchgear market. The arc-handling is done exclusively by permanent-magnetic blowout. This patented technology ensures fully bi-directional breaking capability and a more compact design. And for the first time the universal devices can be configured as a NO/NC contactor, disconnector or changeover switch. Furthermore, a high-voltage discharging contact, a pre-charging contactor or several auxiliary contacts can be integrated. Multipole versions are also available. This enables us to react flexibly to changing customer requirements.

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

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



Optionally integrable pre-charging contactor – CPP series

A pre-charging 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.

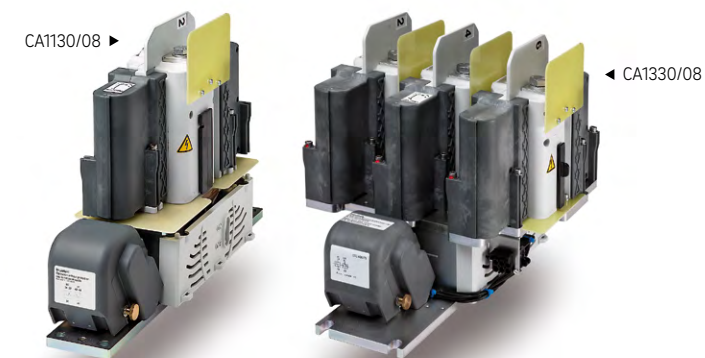


AC Traction contactors

1- and 3-pole traction contactor for electric multiple units – CA series

The CA series are available as 1 or 3-pole AC contactors. It is typically used for switching off permanent magnet traction motors (PMSM) 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 especially designed for use with traction motors with supply voltage frequencies of up to 400 Hz!

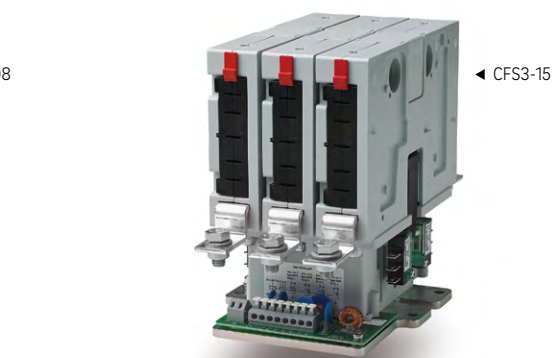
- Power range:
 - Nominal voltage 1,500–3,000 volts
 - Thermal current 350–540–800 amps
- High short-circuit breaking capacity for frequencies up to 400 Hz
- Reinforced insulation between main circuit and control / auxiliary circuit
- Functional insulation for main circuit
- Tested to railway standard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



3-pole AC contactors CF series

Schaltbau's highly modular CF series begins with a compact 3-pole AC power contactor for loads up to 600 amps and 3,000 volts for inverter-fed alternating current drives with higher frequencies. One special feature is the newly developed switching chambers. This can be universally configured as NO, NC or in combination as a change-over. An efficient electronic autotransformer circuit reduces input power as well as thermal losses and cuts costs.

- Power range
 - Nominal voltage 1,500–3,000 volts, frequencies up to 400 hertz
 - Thermal current 200–300–600 amps by parallel connection
- Configurable as NO, NC or changeover switch
- High short-circuit breaking capacity
- 4 auxiliary switches, optionally 1 NC contact b_0 and 1 NO contact a_1
- Low energy consumption and low heating thanks to sophisticated coil saving circuit
- Tested to railway standard EN/IEC 60077



Contactors for DC and AC

1-pole bi-directional NO contactors C360 series

The C360 is a single-pole bi-directional DC NO contactor. It was designed to ensure safe switching of high loads and to protect reliably in case of a system malfunction. The new bi-directional contactors are suitable for typical applications such as the DC end of inverters, combiner boxes of photovoltaic installations, battery storage systems and electric vehicles. The key features and benefits of the C360 series are the compact design, double-break contacts, very efficient newly developed arc chamber as well as the high breaking capacity.

- Power range
 - Nominal voltage 60–1,500 volts, DC bi-direkt. / AC f < 60 Hz
 - Thermal current up to 150–300–500 amps
- Efficient extinguishing chamber with permanent magnetic blowout
- High making and breaking capacity
- High rated short-time withstand current
- Max. 2 auxiliary switches with mirror contact function
- Low energy consumption, thanks to PWM controller
- Tested to railway standard EN/IEC 60077



1-pole bi-directional NO contactors C320 series

The C320 is a 1-pole bi-directional DC contactor in the range up to 1,000 amps. It was designed to ensure safe switching of high loads and to protect reliably in case of a system malfunction. The new bi-directional contactors are suitable for typical applications such as the DC end of inverters, combiner boxes of photovoltaic installations, battery storage systems and electric vehicles. The key features and benefits of the C310 series are the compact design, double-break contacts, very efficient newly developed arc chamber as well as the high breaking capacity.

- Power range
 - Nominal voltage 60–1,500 volts, DC bi-direkt. / AC f < 60 Hz
 - Thermal current up to 1,000 amps
- Efficient extinguishing chamber with permanent magnetic blowout
- Very high making and breaking capacity
- High rated short-time withstand current
- Max. 4 auxiliary switches, of them max. 2 with mirror contact function
- Low energy consumption, thanks to PWM controller
- Tested to railway standard IEC 60077, GB/T 14048.4, UL/IEC 60947-4-1



HV contactors, HV changeover units

1-pole high-voltage contactors CH series

With the CH1130/02, Schaltbau has a compact HV contactor in its line of proven high-voltage railway contactors. The design has been completely modernised, matched more closely to those of the CT contactor series. Accordingly, permanent magnets and ceramic elements are also used for arc extinguishing in the CH1130. It is suitable for use as a precharging and switch-on contactor in power supplies and as a control contactor for resistor banks in heating and air conditioning equipment.

- Power range:
 - Nominal voltage up to 3,000 volts
 - Thermal current 200 amps
- Compact, rugged design
- Double-break contacts
- Magnetic blowout and ceramic materials for cooling the arc
- CH1130/02 will replace existing CH series
- Tested to railway standard EN/IEC 60077



◀ CH1130/02 ▶

High-voltage changeover unit for rail vehicles CO4 series

High-voltage changeover units of the CO4 series are switching devices for load-free configuration of electrical loads. The 6-position devices are now more powerful – the cam switchgear configures faster and the switching chambers can carry higher currents. Switching devices are required for the voltage configuration of power supply systems and heating registers in railway vehicles in transnational traffic with changing supply voltages.

- Power range:
 - UIC voltages up to 3,6 kV DC, with reinforced insulation 5 kV DC
 - Thermal current 100 A
- 6 control inputs for 6 pre-configured positions, controlled via a motor-driven cam switch unit with max. 10 switching units.
- Load-free adaptation of electrical configurations to different train busbar systems according to UIC 550
- Customer-specific configuration of switching programmes respectively many switching programmes of European railway operators available
- Tested to railway standard EN/IEC 60077

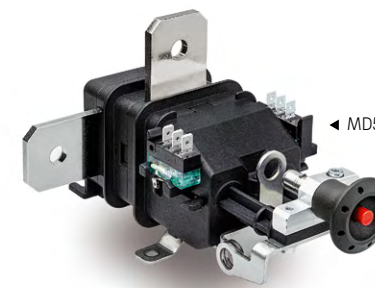


Disconnecter switches, universal contactors

1- and 2-pole manual disconnectors for battery voltages up to 1,500 V – MD500 series

The new MD500 modular, manually operated disconnectors conduct currents up to 500 amps – without noticeable power loss thanks to the new, patented contact system. The devices are suitable for use with powerful high-voltage battery packs for traction applications in battery and hydrogen-powered vehicles, but also in rail vehicles with storage hybrid drive systems. The robust contact system is dimensioned for carrying short-circuit currents of up to 30,000 amps for short time.

- Power range:
 - Nominal voltage up to 1,500 volts
 - Thermal current 500 amps
- Manual actuator with integrated safety catch for secure locking
- Contact system with extremely low contact resistance (< 100 µΩ) and very high rated short-time withstand current (30,000 A @ 100 ms) for years of continuous operation.
- 1 and 2 pole versions
- 2 auxiliary switches
- Tested to railway standard EN/IEC 60077



◀ MD521-500

4-pole universal contactor for battery volt- ages up to 800 V – CS115 series

The CS115 extends the product range with a series of universal contactors for battery voltages up to 800 volts. The 4-pole 20 amps control contactor is available with 4 NO, 3 NO/1 NC, or 2 NO/2 NC contacts. Optionally up to 4 snap-on auxiliary switches can be mounted on it. These units are especially designed for controlling low and medium loads in battery networks, such as switching on and off, locking, signalling and controlling power contactors.

- Power range:
 - Nominal voltage up to 800 volts
 - Thermal current 20 amps
- Compact, rugged design, DIN rail mounting
- Magnetic blowout
- Contact arrangements: 4 NO, 3 NO/1 NC, or 2 NO/2 NC
- NC or NO auxiliary switches available
- Tested to railway standard EN/IEC 60077



◀ CS115 + 4x aux. switch AS115

◀ CS115



HIGH
AVAILABILITY

COST-EFFICIENT
MAINTENANCE

END-TO-END
PLANNING CERTAINTY

HIGHLY
CONVENIENT

SERVICE @ SCHALTBAU

Schaltbau provides comprehensive services via a well-developed service network to make your operations safer, more reliable and more economical.

The scope of services offered depends entirely on your requirements, ranging from individual replacement parts to full servicing or an on-site presence at the depot.

Our customer advisors, technicians and engineers are at your disposal – a valuable basis for a good partnership to keep operations running smoothly.

Service

Technical maintenance for disruption-free operations

Specialised in components and driver’s cab systems, Schaltbau is able to draw on wide-ranging know-how in advising, planning and executing comprehensive technical maintenance measures, repairs and regular inspections. We work with you to produce solutions which are tailor-made to integrate into existing vehicles and operating concepts. We aim to deliver on your demands for technical availability and therefore ensure disruption-free operations.

Repairs

We repair your Schaltbau product based on extensive initial diagnostics, including a cost estimate and detailed repair report

Maintenance

We offer expert technical maintenance for your Schaltbau product based on the intervals and approach defined in your maintenance strategy.

Overhaul

We can design all measures for your Schaltbau product with a view to extending its service life or adding additional technical functions.

Replacement parts

We have replacement and wear parts in Schaltbau quality available over the standard market service period.

Drop-In

We ensure long-term availability in general and develop tailored alternative solutions, including in cases of obsolescence.

Logistics

We offer rapid global delivery and ensure on-time part and materials availability.

Assembly

We take care of the installation and removal or commissioning of your Schaltbau product on site.

Analysis

We analyse the product performance and advise you regarding deployment optimisation.

Training

We offer you a tailored training program on commissioning, use and service.



Certified safety

Safety and reliability are our greatest assets. We've been producing snap-action switches with positive opening operation for four decades and also offer the greatest variety. Every series is built, tested and certified according to VDE, UL and when necessary even CCC.



Certified to
DIN EN ISO 14001
since 2002. For the most
recent certificate visit
our website.



Certified to
DIN EN ISO 9001
since 1994. For the most
recent certificate visit
our website.



The production facilities
of Schaltbau GmbH have
been IRIS certified
since 2008.

Markets and Applications

We develop our connectors, snap-action switches and contactors in line with the safety standards of railway engineering. Electromechanical components from Schaltbau are used in all branches of industry in which electrical systems have to be connected, contacted and controlled reliably under the harshest conditions.

RAILWAY	INDUSTRY	NEW ENERGY	NEW MOBILITY
Safely on track. Switching and controlling features which meet the highest requirements. For goods and passengers.	Reliable in production. Certified variations on safety-relevant solutions. For man and machine.	More power for electricity. Top-notch safety for stationary energy supply systems. For renewable energies.	Safe either way. Safely disconnecting high voltages in electric vehicles. For tomorrow's mobility solutions.
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SCHALTBAU
DC Power Under Control

Schaltbau – the creative and smart railway specialist

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