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# Material Handling

Improved performance for rapid charging



# Intralogistics

Efficient and sustainable in the warehouse

As a DC specialist, Schaltbau develops and produces reliable and durable electromechanical components for rail and industrial applications.

In the intralogistics sector, we focus on the field of battery-powered industrial trucks and offer numerous innovations which deliver on the technological requirements of the industry.



## Material Handling

Improved performance for rapid charging

Lower energy consumption for greater performance: "Alternative energy sources" and "energy-efficient use of industrial trucks" are key issues for manufacturers of sustainable products in intralogistics. With new charging connectors and combi contactors, Schaltbau is proud to present its solutions for the industrial trucks of tomorrow.



### Schaltbau Power Bridge – High Power Connectors

**Charging connectors for electric forklift trucks:** Thanks to their modular design, Schaltbau charging connectors offer scalable solutions spanning the vehicle, battery and charger. The LV series ensures safe and reliable power transmission of up to 500 A. As a result, industrial truck batteries are charged in short space of time and therefore quickly ready to return to service. Energy, air, water and data can all be delivered using a single charging interface.



### Snap-action switches for top-notch safety

The **S870 and S880** series are ideally suited to systems with high safety requirements – such as tiller heads in pedestrian-operated industrial trucks – as these ensure that the anti-trap protection in electric lift trucks works reliably.



### Battery contactors

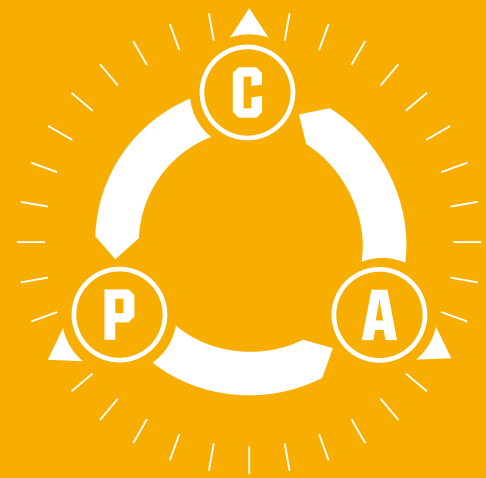
**Schaltbau contactors** are ideal for switching direct currents ranging from 60 to 320 A and battery voltages of up to 80 V. The C100, C110B and C137 to C165 series are used in electric forklift trucks, and the AFS series is deployed as the main or auxiliary contactor. These products' features deliver on the requirements of traction batteries for modern industrial trucks and other battery-powered material handling vehicles.



### Combi contactors

The **C130 combi contactor** pools multiple functions into one single device: emergency switch, main contactor, auxiliary contacts and fuses. As a result, there is no need for installing, wiring and checking individual parts. The specifications can be adjusted to suit each individual customer's needs.





**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.

**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 realised applications. As a result, you benefit from analogies and empirical data that may be of some value for your application.

**P** Product

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



Schaltbau:  
360° of expertise!

## Consulting

The expert at your side

Planning an intralogistics system offers the potential for substantial efficiency gains. Contemporary solutions are designed in step with the latest trends, such as electric or hybrid engines in industrial trucks, and as a result offer substantially superior performance with lower energy consumption. The earlier our expertise is integrated into your planning process, the more sustainable and efficient your individual solution will ultimately be.

Our sales engineers can draw on cross-sector expertise to deliver on specific requirements from the customer's side. As a development partner, we can offer you our extensive knowledge built up over decades and guarantee cost-effective results. The latter takes the form of minimised workloads and costs in development over the short-term and then corresponding gains in daily operations in the long term.



**▶** Expertise

Benefit from the Schaltbau know-how

**▶** Consulting

Experienced sales engineers work on-site with you

**▶** Solution

Cooperation spells success





# Applications

Schaltbau products for material handling

Electric forklift trucks are used in environments which prioritise an emissions-free atmosphere and noise reduction. These vehicles work reliably, offering a durable and energy-efficient solution. High-performance batteries, which yield enough energy for two shifts without changing batteries, are an essential prerequisite for this.

**More power for fast charging** with Schaltbau's proven charging connectors. Industrial trucks fitted with these high power connectors can recharge their batteries in double-quick time, ensuring smooth workflows.

**One device, a range of functions:** Schaltbau's multifunctional combi contactors reduce wiring work, fitting times and ensure safety. The functions and specifications can be individually adjusted to customer requirements.



### High-power charging connectors

LV-HPC charging connectors in various designs charge industrial truck batteries extremely rapidly, ensuring a quick return to service. The high power transmission required for this is realised without overheating.

### Combi contactor C130

A device with multiple functions, designed for safe switching and simple handling. Combi contactors offer ideal support for industrial truck manufacturers.



**▶ Customer specific**  
Added value and maximum benefit for your application

**▶ Safe**  
Safety components of approved quality

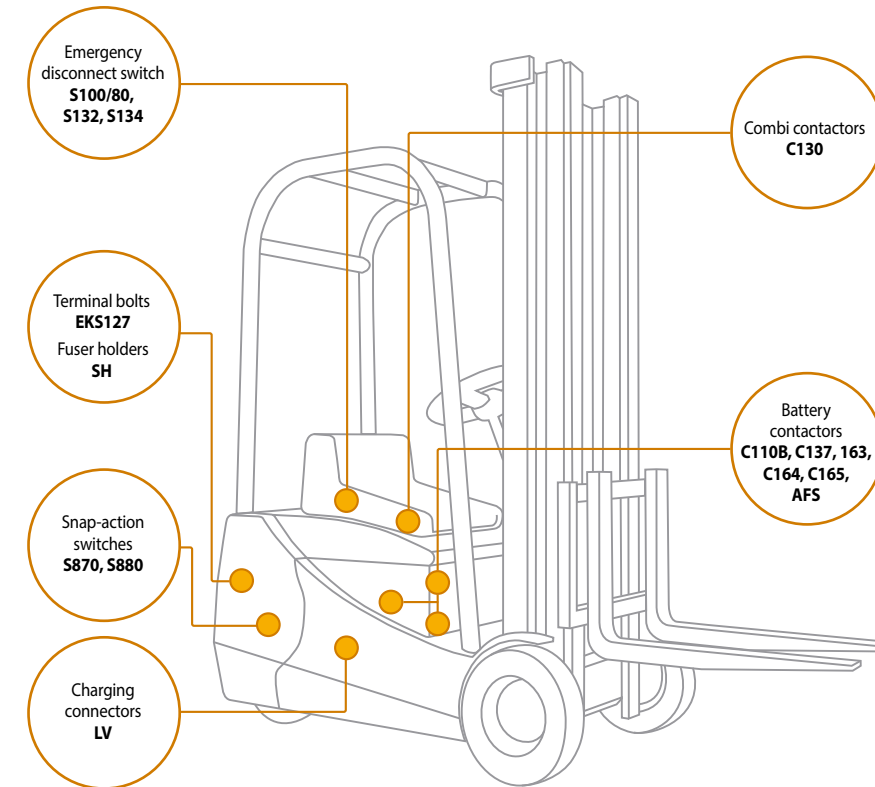
**▶ Cost-effective**  
Easy to mount, no maintenance, long life

A

# Product

Reconciling safety and efficiency

From our decades of experience in the market for connectors, contactors and safety switches, we are well aware that no compromises should ever be made when it comes to safety. As a result, our quest for improvements often leads us to the details. The efficiency of our products is protected by numerous patents, which we can offer you in three different ways: as a finished item from our product line, a special solution with small modifications or a completely new development.

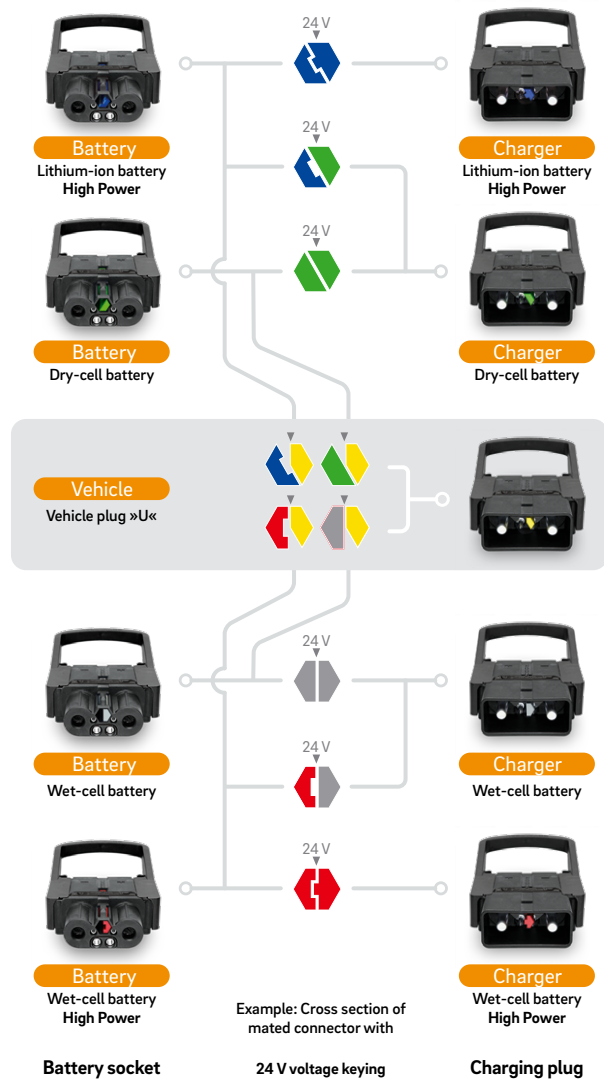


3 Possibilities  
1 Solution

- ▶** Finished item from our product line
- ▶** Tried and tested special solution with little need of adaptation
- ▶** Completely new development delivering on customer requirements




# Schaltbau Power Bridge



## High Power Connectors LV80, LV160, LV320 Series

Schaltbau LV-HPC Series connectors meet the requirements of the DIN VDE 0623-589 standard for charging connectors featuring a higher current-carrying capacity. The connectors are, therefore, ideally suited for modern fast chargers as used for industrial trucks, thus catering to interests of the material handling industry that aims at shortening the times for charging the vehicle battery. Charging faster means reducing downtime and saving costs.

- Keying to DIN VDE 0623-589 for 120 A, 250 A and 400 A
- High-quality, solid power contacts
- High resistance to acids and extremes of temperature
- Optional air supply adapter for electrolyte circulation systems
- Modular design, integrated interlocking
- Intermateable with other connectors to DIN VDE 0623-589
- UL-listed 


LV80, LV160, LV320 series Charging connector



# Charging connectors

## High ampacity charging connector LV500 Series

Delivering maximum performance and working in harsh environmental conditions requires reliable, durable and safe products. It is exactly these requirements that are met by the new Schaltbau LV500 Series charging connectors. The low-maintenance and high-performance connectors fulfil the expectations of the contemporary user: Modern fast chargers recharge vehicle batteries in short time or traditionally over night.

- Fast charging: High-quality, solid power contacts capable of handling continuous currents up to 500 A reliably
- High resistance to acids and extremes of temperature
- Air supply adapter for electrolyte circulation systems
- Modular design, integrated interlocking
- UL-listed 

LV500 series Charging connector



## Multifunctional adapters for LV Series

- Pilot contact adapter:**  
2 pilot contacts provide a data link between battery and charger.
- Air supply adapter:**  
Air blow-in system for batteries with electrolyte circulation.
- Multifunctional adapter:**  
Multi purpose adapter for water top up and electrolyte circulation systems. The new feature that the flow of air and/or water is shut off when the connector is unmated ensures that no acid particles enter the interior of the vehicle.
- Water top up of battery
- Electrolyte circulation systems: Air supply of battery can now be shut off when connector is not mated
- Monitoring of battery by means of auxiliary and pilot contacts

Multifunctional adapters for LV series



# Snap-action switches, emergency disconnect switches

## Snap-action switches S870, S880 Series

Whilst S870 is a favourite among the Schaltbau snap-action switches, the S880 is a subminiature switch which combines minimum size with maximum reliability. Both series feature positive opening operation, wiping contacts and are sealed against dust, humidity and pollutants. This ensures high reliability even at low contact loads. Schaltbau snap-action switches are ideally suited for systems with high safety requirements, such as tiller heads in pedestrian-operated industrial trucks.

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1, Annex K
- Dimensions according to DIN 41636-2, type A (S870) or according to DIN 41636-3, type B (S880)
- Ingress protection rating: contacts IP40, IP60, IP67, terminals IP00, IP20, IP67 according to IEC 60529 (IP code)
- Wiping contacts
- Contact material: hard silver or gold alloy
- High resistance to shock and vibration



## Emergency disconnect switches for up to 48 V S100/80 Series

Schaltbau S100 Series emergency disconnect switches guarantee instantaneous cut-out by manual operation. Load circuits are closed by pulling the red knob and, in an emergency, forcibly ruptured by pushing it down. The positive opening operation guarantees that the contacts open in the event of an emergency. Special feature: The knob can be used as key. When engaged to the OFF position it can be removed so as to prevent unauthorised use of the truck.

- Single pole emergency disconnect switch with snap mechanism
- Thermal current  $I_{th} = 60 \text{ A}$
- Key function: Knob removable in OFF position
- Maintained position for ON and OFF
- High resistance to shock and vibration
- Optional auxiliary switch



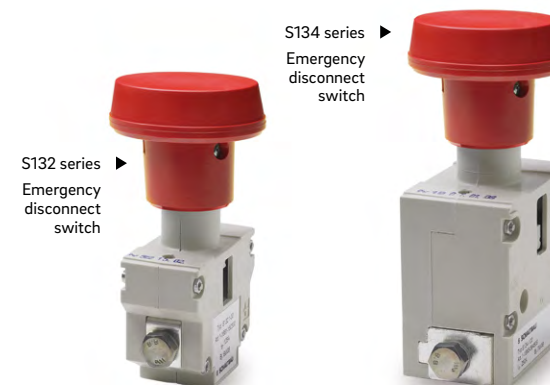
# Emergency disconnect switches, combi contactors

## Emergency disconnect switches for up to 100 V S132, S134 Series

Manually operated emergency disconnect switches are capable of interrupting a power circuit (meeting requirements of accident prevention). Single pole S132 Series switches are especially designed for DC applications.

Load circuits are closed by pulling the red mushroom knob and ruptured by pushing it down. The positive opening operation guarantees that the contacts open in the event of an emergency.

- Single pole emergency disconnect switch with snap mechanism
- 2 sizes:  $I_{th} = 125 \text{ A} - 250 \text{ A}$
- Permanent magnetic blowout
- Two definite maintained positions (ON/OFF)
- Optional lockable version

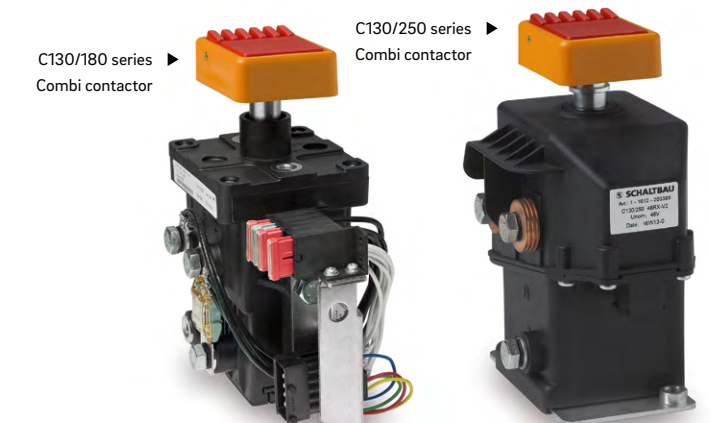


## Combi contactors for battery voltages C130 Series

Schaltbau's competitively-priced all-in-one device is a combination of line contactor, main fuse and manual cut-off switch in which additional devices as well as an optional horn can be integrated. The exact design of your combination contactor depends on the requirements of your industrial truck.

Main fields of application are battery powered warehouse machines, such as forklift and reach trucks as well as walk behind trucks and stackers.

- Emergency disconnect switch with rugged, spring-loaded snap mechanism
- 2 sizes:  $I_{th} = 180 \text{ A} - 250 \text{ A}$
- Battery contactor with main fuse
- Permanent magnetic blowout
- Double-break contacts, cadmium-free
- Optional horn and fuses





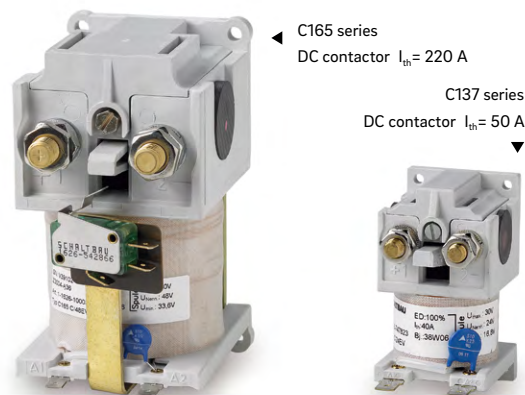
# Battery contactors, accessories

## Battery contactors C137, C163, C164, C165 Series

C137 to C165 Series contactors are suitable for handling DC loads in the range of 50 A to 220 A for the most common coil voltages up to 110 V.

Version »C« series are single pole NO contactors with magnetic blowout, whereas version »H« series are single pole changeover contactors.

- Compact design
- 4 different sizes:  $I_{th} = 50\text{ A} - 100\text{ A} - 140\text{ A} - 220\text{ A}$
- Double-break contacts
- Easy to replace main contacts
- Versions with magnetic blowout
- Optional auxiliary switch



## Terminal bolts, EKS Series, Fuse holders, SH Series

Single terminal bolts of Schaltbau are easily incorporated in devices for the purpose of electrical termination. They are designed for currents and voltages applicable to material handling and rail vehicle equipment.

Fuse holders for strip fuses to DIN 43560 are designed for use in battery powered vehicles covering voltages up to 80 V. Fuse ratings may range from 50 A to 425 A. We offer fuse holders admitting 1, 2 or 3 strip fuses. Tie bars for 2 or 3 poles are available.

### Single terminal bolts

- 4 different sizes available
- Base material flame retardant to UL 94 V-0

### Fuse holders

- Fuse holders suitable for fuse links to DIN 43560
- Base made of heat-proof thermoplastic material
- Base material flame retardant to UL 94-V0



# Contactors for industrial trucks

## Changeover and reversing contactors AFS Series

AFS Series contactors are designed for use with all kinds of electric vehicles in material handling. Coming with double-break contacts, the DC changeover and reversing contactors are designed for switching resistive, capacitive and inductive loads.

Especially in the after-sales market the contactors are in great demand as replacement contactors for most leading brands of trucks.

- Changeover contactors: single pole
- Reversing contactors: assembly of two SPDT or two DPST-NO
- 3 different sizes:  $I_{th} = 80\text{ A} - 150\text{ A} - 250\text{ A}$
- Double-break contacts
- Magnetic blowouts and auxiliary switch, optional
- Standards: IEC 60947, EN 1175-1



## DC NO contactors C100, C110B Series

C100 and C110 B Series contactors are the environmentally friendly and cost-effective solution to switching DC currents of 60 A up to 250 A as well as battery voltages up to 80 V.

The contactors are equipped with DC coils featuring a coil tolerance as required for traction batteries of industrial trucks and other material handling vehicles.

- Compact, rugged design
- 4 different sizes:  $I_{th} = 60\text{ A} - 100\text{ A} - 150\text{ A} - 250\text{ A}$
- Closed contact housing, standard
- Double-break cadmium-free contacts
- Standards: IEC 60947, EN 1175-1



## 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

Safely on track. Switching and controlling features which meet the highest requirements. For goods and passengers.

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### INDUSTRY

Reliable in production. Certified variations on safety-relevant solutions. For man and machine.

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### NEW ENERGY

More power for electricity. Top-notch safety for stationary energy supply systems. For renewable energies.

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### NEW MOBILITY

Safe either way. Safely disconnecting high voltages in electric vehicles. For tomorrow's mobility solutions.

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## Schaltbau – the creative and smart specialist for the material handling industry

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