Brochure Connectors

High-quality connectors for industry, transportation and telecommunications

More information: schaltbau.com
Reliable connections

WE PROVIDE RELIABLE CONNECTIONS

Connectors must ensure reliable transmission of energy and signals – coping with high voltages, harsh environments and the rough conditions of rail traffic. Connectors from Schaltbau are especially designed to meet these requirements: Where safety and health of human beings are dependent on technology – as in transportation, mechanical engineering, lighting, food processing, battery charging, mining or offshore operations – the rugged heavy-duty connectors from Schaltbau are first choice.

For further information visit www.schaltbau.info/connectors

Schaltbau connectors are characterized by: Long life and rugged design, up to 10,000 mating cycles, tightness up to IP69K, high material and temperature resistance as well as resistance to shock and vibration.

This makes them ideally suited to be used for years of continuous operation and under harsh environmental conditions.
## Electrochemical 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 of conditions.

<table>
<thead>
<tr>
<th>Connectors manufactured to industry standards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connectors for signal transmission</strong></td>
</tr>
<tr>
<td><strong>Charging connectors for industrial trucks</strong></td>
</tr>
<tr>
<td><strong>Connectors for railway and traffic engineering</strong></td>
</tr>
</tbody>
</table>

### SPECIFICATIONS

**Connectors**

<table>
<thead>
<tr>
<th>Series</th>
<th>M1, M3</th>
<th>G18, G28, G42, G57</th>
<th>GA</th>
<th>KF77, KF10</th>
<th>LV</th>
<th>LV50B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. no. of contacts</td>
<td>14 + PE</td>
<td>48 + PE</td>
<td>14 + PE</td>
<td>7 x 10</td>
<td>2 x 22</td>
<td>2 x 22</td>
</tr>
<tr>
<td>Orientation</td>
<td>2 orientations</td>
<td>5 max.</td>
<td>2 orientations</td>
<td>5 max.</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Rated voltage</td>
<td>400 V max.</td>
<td>400 V max.</td>
<td>400 V max.</td>
<td>315 V</td>
<td>150 V DC</td>
<td>150 V DC</td>
</tr>
<tr>
<td>Rated current</td>
<td>32 A max.</td>
<td>125 A max.</td>
<td>50 A max.</td>
<td>2.5 A max.</td>
<td>380 A max.</td>
<td>50 A max.</td>
</tr>
<tr>
<td>Insulation resistance (at 20°C)</td>
<td>1000 MΩ</td>
<td>1000 MΩ</td>
<td>1000 MΩ</td>
<td>1000 MΩ</td>
<td>1000 MΩ</td>
<td>1000 MΩ</td>
</tr>
<tr>
<td>Contact resistance</td>
<td>50 mΩ</td>
<td>50 mΩ</td>
<td>50 mΩ</td>
<td>50 mΩ</td>
<td>50 mΩ</td>
<td>50 mΩ</td>
</tr>
<tr>
<td>Water resistant &amp; Corrosion resistance</td>
<td>Corrosion resistant</td>
<td>Corrosion resistant</td>
<td>Corrosion resistant</td>
<td>Corrosion resistant</td>
<td>Corrosion resistant</td>
<td>Corrosion resistant</td>
</tr>
<tr>
<td>Temperature</td>
<td>-25°C to +85°C</td>
<td>-25°C to +85°C</td>
<td>-25°C to +85°C</td>
<td>-25°C to +85°C</td>
<td>-25°C to +85°C</td>
<td>-25°C to +85°C</td>
</tr>
<tr>
<td>Humidity, Salt resistance</td>
<td>95% RH</td>
<td>95% RH</td>
<td>95% RH</td>
<td>95% RH</td>
<td>95% RH</td>
<td>95% RH</td>
</tr>
<tr>
<td>Temperature and humidity</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
</tr>
<tr>
<td>Temperature and humidity</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
</tr>
<tr>
<td>Temperature and humidity</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
<td>-40°C to +80°C</td>
</tr>
</tbody>
</table>

### Connectors for railway and traffic engineering

Electrochemical 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 of conditions.

- **G18, G28, G42, G57, GA, M1, M3 Series**
  - Main fields of application for Schaltbau industrial circular connectors are machinery and equipment, measuring, controlling and regulating, as well as drive, power and traffic engineering. The rugged connectors offer a wide variety of contact arrangements to suit a multitude of applications, and always provide for reliable connectors.

- **NF07, NF10 Series**
  - Schaltbau special connectors for communications engineering meet the requirements of VG 55313 and VG NF798. These circular audio microphone connectors are extremely robust and have a long design life. A technological equivalent of this connector series sets new standards for signal transmission in industrial applications.

- **LV90/120, LV160/250, LV500/400, LV500 Series**
  - Schaltbau charging connectors are designed to meet the demands of contemporary battery-powered vehicles and systems. They meet the requirement of DIN VDE 0263-589 also with regard to a higher current-carrying capacity. The state-of-the-art contact technology of our charging connectors results in a permanently low contact resistance and reduced contact heating.

- **E, EP, G18, G42, G57, M1, M3, SB, UCS 558 VE, UC-IT, ZH Series**
  - Schaltbau connectors for railway and traffic engineering can be found in many rail vehicles and special purpose vehicles where they provide for safe and comfortable operation. These include not only the connectors manufactured to UK standards but also many connector series used for industrial applications.

The heavy-duty connectors reliably transmit power and also control signals.

---

Glossary

**Connector**
- A component which terminates conductors for the purpose of providing conductors and discontinuity to a suitable female connector.
- **Connector with breaking capacity (CB)**
  - Connectors specially designed to be energized or de-energized in normal use when live or underload. The term is frequently used in situations where high energy is available, such as in flammable environments.

**plug and socket device (PSD)**
- A connector designed to be engaged or disengaged in normal use when live.

**Spring-loaded contacts**
- Contacts that can be compression- or tension-loaded to facilitate insertion or removal.

**Contact holder**
- The individual contact elements are accommodated by the contact holder, which acts as an insulator.

**Contact capacity**
- The maximum amount of current that a contact can carry simultaneously under a specified ambient temperature.

**Degree of protection (IP code)**
- A marking system to specify the degree of protection of housing against access to dangerous parts and ingress by solid substances or water.

**Protective conductor (PE) terminal**
- Terminals where the protective conductor of the current-carrying capacity of a component is connected.

**Cyclic of mechanical operation**
- The number of times a component is subjected to the cyclic of mechanical operation.
The GA Series comprises high-quality special purpose connectors. Made of metal, the series has a contact arrangement of 4 main contacts and 11 control contacts. With inserts and contacts glued in place, the receptacles are water tight even when not mated. The functional threaded coupling prevents the contacts from touching the insulator, thus making possible a “blind” mating of the connector halves.

**Features**

- High quality metal shells
- Receptacles sealed to IP67 even when not mated
- Resistant to many aggressive liquids
- Functional threaded coupling
- Electrical and mechanical characteristics to IEC 61984
- Approvals: [IEC]

---

### Series NF

Circular audio miniature connectors

The proven 7 and 10 pole circular audio miniature connectors NF07 and NF10 are especially designed for communications engineering. The modular design provides many combinations to suit your particular application. The connectors feature a high degree of protection and are water tight even when not mated.

**Features**

- Circular audio miniature connectors to VG 95351 and VG 96934
- Optional customized filters
- Plugs and receptacles sealed to IP68 even when not mated
- Spring-loaded contacts: Resistant to shock and vibration
- Bayonet coupling
- Shielding ≥ 70 dB (10 kHz ... 10 MHz)
- Approvals: [EN, UL]

---

### Specifications

<table>
<thead>
<tr>
<th>Series M</th>
<th>Series G</th>
<th>GA</th>
<th>Series NF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of contacts</strong></td>
<td>4+PE, 6+PE, 6+PE, 5+3+PE, 12+PE, 7+7+PE</td>
<td>12 max.</td>
<td>4+PE, 6+PE, 6+PE, 5+3+PE, 12+PE, 7+7+PE</td>
</tr>
<tr>
<td><strong>Orientations</strong></td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
<td>400 V max.</td>
<td>25 V</td>
<td>400 V max.</td>
</tr>
<tr>
<td><strong>Rated current</strong></td>
<td>4x 16 A</td>
<td>16 A max.</td>
<td>3x 16 A</td>
</tr>
<tr>
<td><strong>Contacts</strong></td>
<td>Copper wrought alloy, silver/gold</td>
<td>Copper wrought alloy, brass, silver</td>
<td>Copper wrought alloy, silver/gold</td>
</tr>
<tr>
<td><strong>Finish</strong></td>
<td>Clamping, solder, screw-type*</td>
<td>Clamping, solder, screw-type*</td>
<td>Clamping, solder</td>
</tr>
<tr>
<td><strong>Mechanical endurance</strong></td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td><strong>Coupling</strong></td>
<td>Threaded coupling, bayonet coupling</td>
<td>Threaded coupling, bayonet coupling</td>
<td>Threaded coupling, bayonet coupling</td>
</tr>
</tbody>
</table>

---

* Screw-type: Only selected variants of G28 Series

---

### Catalogue

- **A10**: Connectors
- **A20**: Connectors
- **A25**: Connectors
- **A58**: Connectors
Keying to DIN VDE 0623-589:

Shortening charging times in order to reduce downtime and save costs. The LV Series high power connectors are, therefore, ideally suited for modern fast chargers as used for industrial trucks. 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.

**High-Power Charging Connectors**

- **for industrial trucks**
  - Schaltbau high power connectors of the LV series meet the requirements of the EN 1175-1 and DIN VDE 0623-589 standard for charging connectors featuring a higher current-carrying capacity. A red keying plug signifies operation at 120, 250 and 380 amperes for charging wet cell batteries. The LV Series high power connectors are, therefore, ideally suited for modern fast chargers as used for industrial trucks. Thus they cater to the needs of the material handling industry which aims at shortening charging times in order to reduce downtime and save costs. Providing high 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 LV900 Series charging connectors.

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 LV900 Series charging connectors.

**High ampacity charging connectors**

- **for modern fast chargers**

**Multifunctional adapters**

- **for LV**
  - LV160/250, LV320/400 Series
    - LV250-HPC, LV400-HPC
    - **Pilot contact adapter**: 2 pilot contacts provide a data link between battery and charger.
    - **Air tube adapter**: Air blow-in system for batteries with electrolyte circulation.
    - **Multifunctional adapter**: Multipurpose 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.

**Series LV**

- High-Power Charging Connectors
  - for industrial trucks
  - Schaltbau high power connectors of the LV series meet the requirements of the EN 1175-1 and DIN VDE 0623-589 standard for charging connectors featuring a higher current-carrying capacity. A red keying plug signifies operation at 120, 250 and 380 amperes for charging wet cell batteries.
  - The LV Series high power connectors are, therefore, ideally suited for modern fast chargers as used for industrial trucks. Thus they cater to the needs of the material handling industry which aims at shortening charging times in order to reduce downtime and save costs.

**Series LV500**

- High ampacity charging connectors
  - for modern fast chargers
  - 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 LV900 Series charging connectors.
  - The low-maintenance and high-performance connectors fulfils the expectations of the contemporary user: Modern fast chargers recharge vehicle batteries in short time or traditionally over night.

**Series SB**

- Circular connectors for special applications
  - Connection of supply line and control cable for automatic train protection systems installed in bogies of railway vehicles. Fitted with silver or gold plated contacts in rubber sealed insulators, the SB series connectors are for weather and water proof. The sturdy connectors feature impact resistant shells with threaded coupling for rapid, convenient connections.

**Multifunctional adapters for LV**

- **Multiport adapter**
  - Multipurpose 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.

### Specifications

<table>
<thead>
<tr>
<th><strong>LV160/250 / LV320/400</strong></th>
<th><strong>LV500</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of contacts</strong></td>
<td>2 main contacts / 2 aux. contacts, optional 2 pilot contacts</td>
</tr>
<tr>
<td><strong>Keying</strong></td>
<td>Wet-cell red/grey, dry-cell green, vehicle yellow</td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
<td>150 V DC</td>
</tr>
<tr>
<td><strong>Rated current</strong></td>
<td>500 A</td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td>Copper wrought alloy</td>
</tr>
<tr>
<td><strong>Finish</strong></td>
<td>Silver-plated</td>
</tr>
<tr>
<td><strong>Mechanical endurance</strong></td>
<td>5,000</td>
</tr>
<tr>
<td><strong>Coupling</strong></td>
<td>Safety interlock</td>
</tr>
</tbody>
</table>

**Multifunctional adapters for LV**

- **4 pilot contacts**
  - 5+PE / 6 pole / 14 pole

**SB**

- **3 pole**
  - 5+PE / 6 pole / 14 pole

### Features

- **Keying to DIN VDE 0623-589**
  - LV: 120 A, 250 A, 380 A (higher current-carrying capacity: keying plug red)
  - LV: 80 A, 160 A and 320 A (keying plug: grey, green, yellow)
  - High-quality cold-formed contacts
  - Improved resistance to acids and extremes of temperature
  - Air supply for electrolyte circulation systems
  - Modular design, safety interlock
  - Interconnectable with LV Series connectors and those to DIN VDE 0623-589 of other manufacturers
  - Approvals: ENEC

- **Fast charging**
  - High-quality cold-formed contacts capable of carrying currents up to 500 A.
  - Improved resistance to acids and extremes of temperature
  - Air supply for electrolyte circulation systems

- **Water top up of battery**
  - Electrolyte circulation: Air blow-in system for batteries can now be shut off when connector is unmated
  - Monitoring of battery by means of auxiliary and pilot contacts
  - Approvals: ENEC

- **Screw machine contacts, silver or gold plated**
  - Sturdy metal/plastic shells: Impact resistant, UL compliant, long life
  - Sealed to IP67 when mated or unmated
  - Functional threaded coupling
  - Electrical and mechanical characteristics to IEC 61984
  - Approvals: ENEC
Connectors for rail vehicles

Series B

B Series connectors have been designed especially for the demanding railway environment. They are superbly suited for power and control circuits on road and rail vehicles alike. An integrated interlocking circuit ensures that voltage is applied to the power circuit only when all covers are closed and all plugs have been mated or inserted into their respective dummy receptacles.

FEATURES

- Rugged mechanical and electrical design
- Universally usable connectors for power and control circuits
- Easy replacement of components
- Easy assembly resulting in short assembly times
- Mechanically locking connector
- Approvals: EEC

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Contacts</th>
<th>EP (UIC 541-5 VE)</th>
<th>ZH (UIC 552)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of contacts</td>
<td>2x PE / 2x PE + 3 / 2x PE + 2 / 2x PE + 2 + 2 / 3x PE / 3x PE + 2</td>
<td>4 + 2 x 1 (each)</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>400 V max.</td>
<td>250 V max.</td>
</tr>
<tr>
<td>Rated current</td>
<td>35 A max.</td>
<td>800 A (at -10°C)</td>
</tr>
<tr>
<td>Contacts Material, Finish, Terminal type</td>
<td>Copper wrought alloy, silver / nickel</td>
<td>Copper wrought alloy, brass, silver / gold</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>5,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Coupling</td>
<td>Interlock circuit (handle)</td>
<td>Interlock circuit (handle)</td>
</tr>
</tbody>
</table>

Connectors to UIC S41-5 VE

Series EP

The connector is designed in accordance with the specifications of the international railway standard UIC S41-5. This heavy-duty connector is designed to ensure the electrical connection within a train for the electropneumatic brakes (EP brakes) as well as an electropneumatic emergency brake override.

FEATURES

- Feedback: Plug being mated via an optional switching element integrated in the receptacle shell
- Coupling: End of train via a pin contact in the dummy receptacle
- Rugged mechanical and electrical design
- Receptacle shell with metal handle
- Connector for power and signal transmission
- Approvals: EEC

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Contacts</th>
<th>UIC 541-5VE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of contacts</td>
<td>2x PE / 2x PE + 2 / 2x PE + 2 / 2x PE + 2 + 2 / 3x PE / 3x PE + 2 / 3x PE + 2 + 3 / 4x PE / 4x PE + 3</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V max.</td>
</tr>
<tr>
<td>Rated current</td>
<td>800 A (at -10°C)</td>
</tr>
<tr>
<td>Contacts Material, Finish, Terminal type</td>
<td>Copper wrought alloy, silver / nickel</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>5,000</td>
</tr>
<tr>
<td>Coupling</td>
<td>Interlock circuit (handle)</td>
</tr>
</tbody>
</table>

Connectors to UIC S552

Series ZH

Designed in compliance with UIC 552, the proven ZH and ZS Series connectors have been the stock items of the Schaltbau product range for the railway industry since decades. Rail vehicles equipped with a train line, such as passenger trains and multiple units, do need jumpers like these to rely on for smooth operation in the harsh railway environment.

FEATURES

- Break-away connector for a nondestructive separation of plug and receptacle when two electrically not coupled vehicles move apart
- Increased corrosion resistance to chemicals, in particular to detergents containing acids or alkalis
- Keying prevents connectors from mismating with connectors carrying different inserts
- 13 pole plug intermateable with 18 pole receptacle in accordance with UIC 558 VE
- Approvals: EEC

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Contacts</th>
<th>UIC 558 VE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of contacts</td>
<td>8 + 2x PE / 8 + 2x PE + 2x PE / 2x PE / 2x PE + 2x PE / 3x PE / 3x PE + 3x PE / 2x PE / 2x PE + 2x PE + 2x PE</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>250 V (+ PE)</td>
</tr>
<tr>
<td>Rated current</td>
<td>60 A</td>
</tr>
<tr>
<td>Contacts Material, Finish, Terminal type</td>
<td>Copper wrought alloy, silver / gold</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>5,000</td>
</tr>
<tr>
<td>Coupling</td>
<td>Interlock circuit (handle)</td>
</tr>
</tbody>
</table>

Connectors to UIC S558 VE

Series UIC-IT

The connector complies with railway standard UIC 558 VE. It connects lines used for remote control of lights, doors and public address systems in passenger coaches or multiple unit trains. It is also suitable for transmission of binary data, e.g., CAN bus. A new replacement insert will reduce maintenance and downtime considerably. Usually, if it is necessary to replace worn contacts, you have to cut the old cable in order to replace the insert. Now, there is no need of rewiring any longer. All you need do is exchange the replacement insert of the receptacle.

FEATURES

- Interface connector that offers reliable Ethernet data transmission (Ethernet)
- Break-away connector in compliance with IRS 50558
- 2x 8 pole Gigabit Ethernet module, shell orange
- 1x 8 pole Gigabit Ethernet module + 16 signal contacts, shell yellow
- Gigabit Ethernet module 360° shielded module for 4 data pairs for transmission of 10 GBE in a permanent link with CAT 7 compliant data cables
- Meets the requirements for closed circuit TV, traveler and passenger information systems, automatic passenger counters, voice control systems and diagnosis
- Break-away connector in compliance with IRS 50558

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Contacts</th>
<th>UIC-IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of contacts</td>
<td>8 pole Ethernet insert up to CAT 7 / 2x orange, 1x yellow, 1x green</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>25 V (+ PE), 115 V (+ PE)</td>
</tr>
<tr>
<td>Rated current</td>
<td>60 A</td>
</tr>
<tr>
<td>Contacts Material, Finish, Terminal type</td>
<td>Copper wrought alloy, silver / gold</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>5,000</td>
</tr>
<tr>
<td>Coupling</td>
<td>Interlock circuit (handle)</td>
</tr>
</tbody>
</table>

Connectors for rail vehicles

Series EP

Series ZH

Series UIC-IT

Series UIC-IT
Electrical Components and Systems for Railway Engineering and Industrial Applications

- Connectors manufactured to industry standards
- Connectors to suit the special requirements of communications engineering (MIL connectors)
- Charging connectors for battery-powered machines and systems
- Connectors for railway engineering, including UIC connectors
- Special connectors to suit customer requirements

- Snap-action switches with positive opening operation
- Snap-action switches with self-cleaning contacts
- Enabling switches
- Special switches to suit customer requirements

- Single and multi-pole DC contactors
- High-voltage AC/DC contactors
- Contactors for battery powered vehicles and power supplies
- Contactors for railway applications
- Terminal bolts and fuse holders
- DC emergency disconnect switches
- Special contactors to suit customer requirements

- Equipment for driver’s cab
- Equipment for passenger use
- High-voltage switchgear
- High-voltage heaters
- High-voltage roof equipment
- Equipment for electric brakes
- Design and engineering of train electrics to customer requirements

Schaltbau GmbH
Hollerithstrasse 5
81829 Munich
Germany
Phone +49 89 30 05-0
Fax +49 89 30 05-350
Internet www.schaltbau.com
e-Mail contact@schaltbau.de

We reserve the right to make technical alterations without prior notice.
For updated product information visit www.schaltbau.com
Issued 05-2020