Connectors

ZH Series
Inter-car jumpers
 to UIC 552
Catalogue F122.en
**ZH Series**  Inter-car jumpers to UIC 552

Schaltbau inter-car jumpers to UIC standard – cost-effective, durable and highly reliable

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.

All railway vehicles used in cross-border rail traffic, such as locomotives as well as electric and diesel multiple units that are equipped with a train line require these ZH Series jumpers.

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**Circuit diagram of energy transmission between cars equipped with a train line**

**Features**

**ZH Series plug with single or double ended connector cable:**
- UIC 552 compliant
- Rugged, durable aluminium die cast housing
- Termination:
  - High-quality screw machined contact, continuous low contact resistance
  - Crimp connection, wire gauge 185 mm²
  - Earthing: sheathed cable, wire gauge 25 mm², connected to plug housing
- Assembly of plug: Single or double ended connector cable in different designs and lengths

**ZH series receptacle:**
- UIC 552 compliant: rugged, durable aluminium die cast housing, metal handled lid
- Termination:
  - High-quality screw machined contact, continuous low contact resistance
  - Screw-type connection with M16 screw
  - Earthing: M10 screw connection at side of shell and mounting surface
  - Optional pilot contact for feedback signalling a plug being mated
- Housing:
  - Massive, two-piece receptacle shell with universal terminals for connecting cables
  - Easy mounting and maintenance
  - Lock and key for mounting on the right or left
  - Metal latch locking of mated plug in receptacle

**ZH Series dummy receptacle:**
- Rugged, durable aluminium die cast housing
- Designed to accommodate not mated ZH series plugs (parking position)
- Lock and key
- Earthing: mounting surface

**ZH Series junction boxes:**
- Rugged, durable aluminium die cast housing
- Termination:
  - Screw terminal or terminal block
  - Earthing: mounting surface or M12 screw terminal

**Common features**
- Life:
  - Designed for frequent use up to 5,000 mating cycles
- IP54 rated
  - Receptacle with closed lid and for mated connector, including cable entry
- Temperature resistance:
  - -50° C min. up to +85° C max., valid for all materials used
- Corrosion resistance:
  - Increased resistance against chemicals, in particular detergents alkaline or acidic
- Flammability rating:
  - UL94-V0 rated
  - Meets requirements for fire protection according to EN 45545

Subject to change
## Specifications

<table>
<thead>
<tr>
<th>Jumpers</th>
<th>ZH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard</strong></td>
<td>UIC 552</td>
</tr>
<tr>
<td>Number of contacts</td>
<td>1</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>3 kV AC / DC</td>
</tr>
<tr>
<td>Rated current (UIC 552)</td>
<td>800 A at –10 °C</td>
</tr>
<tr>
<td>Terminal type</td>
<td>Crimp connection M16 screw connection</td>
</tr>
<tr>
<td>Contact diameter</td>
<td>25 mm</td>
</tr>
<tr>
<td>Wire gauge</td>
<td>185 mm²</td>
</tr>
<tr>
<td>Contact resistance, typ. (IEC 60512-2-2)</td>
<td>&lt; 1 mΩ</td>
</tr>
<tr>
<td>Test voltage (DIN EN 50124-1)</td>
<td>11.5 kV (50 Hz) 10 sec</td>
</tr>
<tr>
<td>Contact forces</td>
<td></td>
</tr>
<tr>
<td>Mating force</td>
<td>&gt; 200 N</td>
</tr>
<tr>
<td>Sliding force</td>
<td>&gt; 100 N</td>
</tr>
<tr>
<td>Unmating force</td>
<td>&gt; 100 N</td>
</tr>
<tr>
<td>Pilot contact</td>
<td>optional in receptacle shell: 1 SPDT, 250 V AC: 15 A / 24 V DC: 6 A</td>
</tr>
<tr>
<td>IP rating (IEC 60529, IP code)</td>
<td>When mated: IP54 Receptacle with lid closed: IP54</td>
</tr>
<tr>
<td>Shock, Vibration (IEC 61373)</td>
<td>Category 1, Class B</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-50 °C ... +85 °C</td>
</tr>
<tr>
<td>Mechanical endurance (IEC 60512-9-1)</td>
<td>5,000 mating cycles</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Plug shell, receptacle shell</td>
<td>Aluminium die cast</td>
</tr>
<tr>
<td>Inserts</td>
<td>Thermoplastic / Thermoset</td>
</tr>
<tr>
<td>Seals</td>
<td>Thermoplastic elastomer (TME) / Neoprene</td>
</tr>
<tr>
<td>Contacts</td>
<td>Copper wrought alloy, crimpable</td>
</tr>
</tbody>
</table>

## Quality and reliability

**Rail vehicles in good hands – with Schaltbau jumpers**

The development, manufacture and assembly of our products are subject to the quality management provisions of DIN EN ISO 9001 and IRIS (International Railway Industry Standard). Continuous testing guarantees consistently high quality. Your benefit: Great performance at low operating costs. Maximum operating reliability and long lifetime of your rolling stock.

Subject to change
Ordering code

- **ZH plug with cable**
  Example: **ZH551 SK-L3000**

  **Series**
  - ZH551 SK
  - ZH622 VK

  **Cable length**
  - Lxxxx: Cable length in mm, standard and lengths on request

  **Plug with single ended cable**
  - DL
  - DM
  - DK

  **Handled lid**
  - DL: Handled lid, long
  - DM: Handled lid, medium
  - DK: Handled lid, short

  **Lock and key**
  - V0
  - V1
  - S0
  - S1

  **Pilot contact**
  - S0
  - S1

  **Colour**
  - B: Black, RAL 9005
  - C: Concrete grey, RAL 7023

  **Threads for cable glands**
  - P: Thread 2x Pg36 / 1x Pg13.5
  - M40: Metric thread 2x M40x1.5 / 1x M20x1.5
  - M50: Metric thread 2x M50x1.5 / 1x M20x1.5

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- **ZH Receptacle**
  Example: **ZH550-KD-DK-V1-S0-B-P**

  **Series**
  - ZH550 KD

  **Cable junction box**
  Example: **ZH552 KA-B-P**

  **Series**
  - ZH552 KA
  - ZH952 AK

  **Lock and key**
  - V0
  - V1
  - S0
  - S1

  **Pilot contact**
  - S0
  - S1

  **Colour**
  - B: Black, RAL 9005
  - C: Concrete grey, RAL 7023

  **Threads of cable glands**
  - P: Pg36 + Pg13.5
  - M40: M40x1.5
  - M50: M50x1.5
  - M1: Pg36 + Pg29 + Pg13.5
  - M50x1.5 + M25x1.5 + M20x1.5

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- **ZH dummy receptacle**
  Example: **ZH092 BD-V1-B**

  **Series**
  - ZH092 BD

  **Lock and key**
  - V0
  - V1

  **Colour**
  - B: Black, RAL 9005
  - C: Concrete grey, RAL 7023

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- **ZH junction box**
  Example: **ZH552 KA-B-P**

  **Series**
  - ZH552 KA only
  - ZH952 AK only

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**Note:**
This catalogue shows only stock items. For some variants minimum quantities apply. Please ask for the conditions.

**Special variant:**
If you need a special variant of the connector, please do not hesitate to contact us. Maybe the type of connector you are looking for is among our many special designs. If not, we can also supply customized designs. In this case, however, minimum order quantities apply.
Single ended connector cables Pre-assembled cable sets

- **ZH551 SK Lxxxx** Single ended cable with plug

  ![Diagram of ZH551 SK Lxxxx](image)

  *Length at ordering code

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Length L*</th>
<th>Total length L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZH551 SK L1420</td>
<td>1,420 mm</td>
<td>1,814 mm</td>
</tr>
<tr>
<td>ZH551 SK L1800</td>
<td>1,800 mm</td>
<td>2,094 mm</td>
</tr>
<tr>
<td>ZH551 SK L3300</td>
<td>3,300 mm</td>
<td>3,954 mm</td>
</tr>
</tbody>
</table>

  **Note:** Other lengths on request.

Double ended connector cables Pre-assembled cable sets

- **ZH622 VK Lxxxx** Double ended cable with two plugs

  ![Diagram of ZH622 VK Lxxxx](image)

  *Length at ordering code

<table>
<thead>
<tr>
<th>Ordering code</th>
<th>Length L*</th>
<th>Total length L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZH622 VK L1200</td>
<td>1,200 mm</td>
<td>1,476 mm</td>
</tr>
<tr>
<td>ZH622 VK L1460</td>
<td>1,460 mm</td>
<td>1,736 mm</td>
</tr>
<tr>
<td>ZH622 VK L3400</td>
<td>3,400 mm</td>
<td>3,672 mm</td>
</tr>
</tbody>
</table>

  **Note:** Other lengths on request.

Subject to change / Dimensions in mm
## ZH550-KD-DL-Vx-Sx-B-P Receptacle, handled lid long

### Type of connector: Receptacle ZH550-KD

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handled lid</td>
<td>DL Long</td>
</tr>
<tr>
<td>Key lock</td>
<td>V0 None</td>
</tr>
<tr>
<td>Key lock</td>
<td>V1 Existent</td>
</tr>
<tr>
<td>Pilot contact</td>
<td>S0 None</td>
</tr>
<tr>
<td>Pilot contact</td>
<td>S1 Existent</td>
</tr>
<tr>
<td>Colour</td>
<td>B Black, RAL 9005</td>
</tr>
<tr>
<td>Colour</td>
<td>C Concrete grey, ground coated, RAL 7023</td>
</tr>
<tr>
<td>Threaded joint</td>
<td>P 2x Pg36 / 1x Pg13.5</td>
</tr>
<tr>
<td>Threaded joint</td>
<td>M40 2x M40x1.5 / 1x M20x1.5</td>
</tr>
<tr>
<td>Threaded joint</td>
<td>M50 2x M50x1.5 / 1x M20x1.5</td>
</tr>
</tbody>
</table>

### Circuit diagram with optional pilot contact

![Circuit diagram](image)

- **Dimensions in mm / Subject to change**

**Note:**
- Included in delivery are:
  - 2x screw-type blank caps: 1x Pg36, M40x1.5 or M50x1.5 and 1x Pg13.5 or M20x1.5
- Finish: zinc moulded
- **Type of connector:** Receptacle ZH550-KD

  | Handled lid: | DM | Medium |
  | Key lock:    | V0 | None   |
  |             | V1 | Existent |
  | Pilot contact: | S0 | None |
  |             | S1 | Existent |
  | Colour:      | B  | Black, RAL 9005 |
  |             | C  | Concrete grey, ground coated, RAL 7023 |
  | Threaded joint: | P | 2x Pg36 / 1x Pg13.5 |
  |             |   | M40 2x M40x1.5 / 1x M20x1.5 |
  |             |   | M50 2x M50x1.5 / 1x M20x1.5 |

- **Circuit diagram with optional pilot contact**

  Note:
  - Included in delivery are:
    - 2x screw-type blank caps: 1x Pg36/M40x1.5 or M50x1.5 and 1x Pg13.5 or M20x1.5

Subject to change / Dimensions in mm
**Type of connector: Receptacle ZH550-KD**

- **Handled lid:** DK Short
- **Key lock:** V0 None, V1 Existent
- **Pilot contact:** S0 None, S1 Existent
- **Colour:** B Black, RAL 9005, C Concrete grey, ground coated, RAL 7023
- **Threaded joint:** P 2x Pg36 / 1x Pg13.5
  - M40 2x M40x1.5 / 1x M20x1.5
  - M50 2x M50x1.5 / 1x M20x1.5

**Circuit diagram with optional pilot contact**

**Note:** Included in delivery are:
- 2x screw-type blank caps 1x Pg36, M40x1.5 or M50x1.5 and 1x Pg13.5 or M20x1.5

Dimensions in mm / Subject to change
**Dummy receptacle**

- ZH092 BD-V1-x Dummy with lock and key
  - Mounting surface zinc plated
  - Key lock

- ZH092 BD-V0-x Dummy without lock and key
  - Mounting surface zinc plated

**Note:**
Dummy receptacles are available in black (RAL9005) or concrete grey (RAL 7023), see also ordering code on page 3.

**ZH552 KA Cable junction box**

- ZH552 KA Cable junction box for single ended connector cable ZH551 SK
  - M40: 40x1.5 / M50: M50x1.5 or P: Pg36
  - Mounting surface zinc plated
  - 2x Mounting bolts M16

**Note:**
Cable glands and blank caps as depicted are included in delivery. Cable junction boxes are available in black (RAL9005) or concrete grey (RAL 7023), see also ordering code on page 4.
ZH952 AK Junction box

- ZH952 AK Junction box

Key for locking receptacles and dummy receptacles V1.

ZH550 VS1 with movable bit Key

Features:
Key can be inserted and removed in any position.

ZH550 VS2 with fixed bit Key

Features:
Key can only be inserted and removed when locked.

Note:
Cable glands and blank caps as depicted are included in delivery.
Junction boxes are available in black (RAL9005) or concrete grey (RAL 7023), see also ordering code on page 4.

Note:
Lock and key are optional and not included in the delivery of receptacles and dummy receptacles. Please make sure to order them separately.

Cable Single pole sheathed connector cable, single or double ended

Outer sheath
Conductor
Screen + Seperator
Inner sheath
Separator
Insulation

You can order the connector cable according to DIN EN 45545 by the metre.

Ordering code: NSHXAFCMOE 185QMM

- Non-halogen sheathed power supply line for rail vehicles
- Following DIN VDE 0250-606 and DIN EN 50624
- Min. bending radius: 10 x diameter (cable freely movable)
- Wire gauge: 185 mm²
- Nominal voltage: $U_0 = 3.6$ kV, $U = 6$ kV
- Temperature range: $-40^\circ$ C ... $+90^\circ$ C

Dimensions in mm / Subject to change
In order to meet the requirements of the protection class and to protect the connectors against the entry of dirt or moisture, make sure that:

- The plug is always inserted into a dummy receptacle.
- The hinged lid of receptacles is closed, according to its intended use.

Dirt, moisture, snow and ice in the interior of ZH092 series dummy receptacles contaminate the plug. The coupling of a contaminated plug to the receptacle may lead to a life-threatening electric shock. Always check if the interior of the receptacles is free from dirt, moisture, snow and ice before inserting a plug into a receptacle or a dummy receptacle.

Use the connector only according to its intended use. Replace or repair damaged parts exclusively with original parts. Any other usage of or tampering with the connector is considered contrary to its intended use. No liability is assumed for damages and accidents caused due to non-compliance with the instructions or improper use of the connector.

The connectors are constructed for specific ambient conditions. Operate the connectors only under the ambient conditions, like temperature ranges and IP protection classes as defined in our catalogue on page 3 “Specifications”.

Installation and safety instructions

- Only authorized and trained personnel are allowed to plan and carry out all mechanical and electrical installations, transport, commissioning, as well as maintenance and repair work.
- This applies to the observation of the general installation and safety regulations for high-voltage systems as well as the proper use of tools approved for this purpose. Electric equipment requires protection from moisture and dust during installation, operation and storage.
- Carry out regular inspections of all protection and safety devices to see if they work properly.
- Work on electric equipment may only be performed by a qualified electrician or trained personnel working under the direction and supervision of a qualified electrician according to the applicable rules of electrical engineering.
- The connectors supply power. They are intended for plug-in and detachable connections of components, devices and systems only.
- In order to comply with IEC 61984 make sure that always the live side of the connector – no matter whether plug or receptacle – is fitted with socket contacts.
- Make sure that there is no undue strain, pressure, flexing and torsion on the cable connection.
- According to IEC 61984 connectors used as intended must not be engaged or disengaged when live or under load.
- When disengaging a connector, pull the plug and never the cable.
- A connector that does not engage easily requires special attention: Check for the correct orientation, pollution or if contacts got bent. Remedy the cause without delay. Never use force! The connector should always engage easily.

Installation and maintenance manual

For a detailed list of all safety, installation and maintenance instructions, download our manual F122-M.en!

Visual inspections

Be sure to make visual inspections regularly. Improper handling of the connector, e.g. when hitting the floor with some impact, can result in breakage, visible cracks and deformation.

Defective and/or leaky parts must be replaced instantaneously!
Electrical Components and Systems for
Railway Engineering and Industrial Applications

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

Contactors
- 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

Electrics for rolling stock
- 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

Subject to change!
For updated product information visit www.schaltbau-gmbh.com.
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