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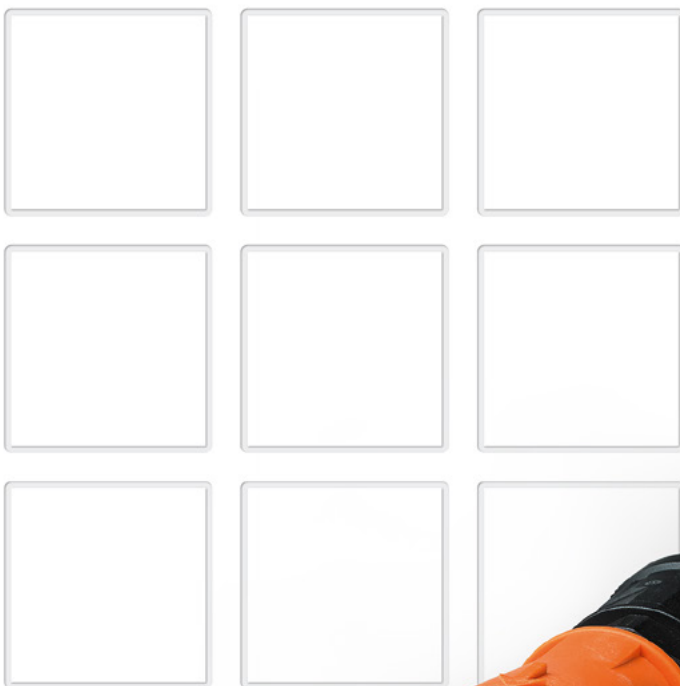
## Connectors

### UIC-IT Series

Connectors for  
data communication  
in rail vehicles

Installation and maintenance  
instructions

Manual F118.en



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# 1. Important Basic Information

## 1.1 Legal Notes

Without prior written consent of Schaltbau GmbH, the instructions is not allowed to be electronically or mechanically reproduced – as a whole or in parts – be distributed, changed, transmitted, translated into another language or used in any other way.


Schaltbau GmbH cannot be held liable for damage caused by not observing (or only partly observing) the Installation and installation instructions.


## 1.2 Conventions for this Installation and Maintenance Instructions


This instructions describe the installation and maintenance of the connectors.

Cross references are presented in **bold italics**.


To highlight particularly important safety instructions and other information, the following symbols are used in this instructions:

 <b>DANGER</b>
<p>Indicates a hazardous situation with a high level of risk which, if not avoided, will result in death or serious injury.</p>

 <b>WARNING</b>
<p>Indicates a hazardous situation with a medium level of risk which, if not avoided, could result in death or serious injury.</p>

 <b>CAUTION</b>
<p>Indicates a hazardous situation with a low level of risk which, if not avoided, may result in minor or moderate injury.</p>

<b>NOTICE</b>
<p>Indicates a hazardous situation which, if not avoided, may result in property damage, such as service interruption or damage to equipment or other materials.</p>

	<p>Refers to technical features and methods aimed at facilitating work or to particularly important information.</p>
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# 2. General and Security Information

The connectors dealt with in this document are intended for use with low-voltage systems for special installations. They are designed and tested in compliance with the generally recognised state of the art. However, improper use, operation, handling, maintenance of or tampering with electric equipment can cause serious or fatal injury to the user or others, and the appliance or other property can be damaged.

The operation, maintenance and installation instructions for the connectors must therefore be strictly followed.

Any uncertainties must be clarified and all queries must include details of the type of device and the serial number.

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 low-voltage systems as well as the proper use of tools approved for this purpose.

Electrical devices are to be protected, as much as possible, from dust and moisture during installation, operation or storage.

## 2.1 Observing the Instructions

- ▶ All staff must read and understand the instructions and adhere to them when working with the device.
- ▶ **Always carefully observe all safety warnings!**

## 2.2 User Obligations

- ▶ Observe the respective national instructions and other applicable safety regulations for the use and cable assembly of connectors and connector systems.
- ▶ Observe all applicable national provisions, all safety, accident prevention and environmental regulations as well as the recognized technical rules for safe and proper working.
- ▶ 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.

- ▶ A qualified electrician is a person who can judge and recognise the possible dangers of the jobs commended to him based on his training, knowledge and experience and by knowledge of the appropriate regulations.
- ▶ Staff must be informed clearly about who is responsible for the maintenance of the connectors.

## 2.3 Intended Use

- ▶ The connectors are intended for plug-in and detachable connections of components, devices and systems only. They are used for the transmission of data and signals.
- ▶ Crimp connections have to be manufactured according to DIN EN IEC 60352-2 – Solderless Connections.
- ▶ Make sure that there are no undue tensile, pressure, flexing and torsion loads on the connection cable.
- ▶ None of the operating conditions defined in our catalogue **F118.en** in section "**Specifications**", such as voltages, currents, ambient conditions, etc. may be changed.
- ▶ Work on the connectors must only be carried out by staff who meets the requirements set out in these instructions.
- ▶ According to DIN EN IEC 61984 connectors used as intended must not be engaged or disengaged when live or under load.
- ▶ The connectors must not be contaminated with aggressive media.
- ▶ 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.
- ▶ 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 when not mated,
  - the plug is always inserted into a dummy receptacle
  - the hinged lid of receptacles is closed, according to its intended use.
- ▶ Double ended connector cables which are not in use have to be stored/ kept properly in the vehicle.

- ▶ When disengaging a connector, pull the plug and never the cable.
- ▶ Open the hinged lid of the receptacle by an angle of at least 110° but not more than 130°. An overstretching of the hinged lid may shorten the operational life span of the torsion spring and may damage the hinge mechanism.
- ▶ Always close the hinged lid by hand, don't let it slam.
- ▶ 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.

## 2.4 Ambient Conditions

### NOTICE

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 F118.en** in section "**Specifications**". Download at: <https://www.schaltbau-gmbh.com/en/Download/Product-information/Connectors/>


### Note:


In case of a very low or very high ambient temperature which approximates the limits of the allowable operating temperature range specified in our **catalogue F118.en** in section "**Specifications**",

- a higher effort may be needed for the plugging and unplugging and
- the operational life span of plug and coupling receptacle may thus be reduced due to increased wear and tear.


### 3. Dangers and Security Measures


#### 3.1 Electrical Dangers


	<b>⚠ DANGER</b>
	<p>The connectors contain components that carry voltage. Risk of electric shock! Always observe the following safety regulations before beginning any work on electrical constructions:</p> <ul style="list-style-type: none"> <li>▶ Disconnect</li> <li>▶ Ensure that it is not possible to reconnect unintentionally</li> <li>▶ Clearly mark your work area</li> <li>▶ Make sure that there is no voltage present</li> <li>▶ Earth and short circuit the installation</li> <li>▶ Insulate or cover adjacent energized parts</li> <li>▶ Only an electrically skilled person may determine if there is no voltage present</li> </ul>

	<b>⚠ WARNING</b>
	<p>Dirt, moisture, snow and ice in the interior of coupling receptacles or dummy receptacles contaminate the plug. The coupling of a contaminated plug to the coupling receptacle may lead to electric shock, short circuit and damage to the connectors!</p> <ul style="list-style-type: none"> <li>▶ Always check if the interior of the receptacles is free from dirt, moisture, snow and ice before inserting a plug into a coupling receptacle or a dummy receptacle.</li> <li>▶ Do not insert a plug into a receptacle when the latter is contaminated, moist or contaminated with snow and ice.</li> <li>▶ Remove dirt, moisture, snow and ice without residues from the interior of receptacles and from the plug.</li> <li>▶ Never couple a contaminated plug to the coupling receptacle.</li> </ul>


#### 3.2 Other Dangers


	<b>⚠ WARNING</b>
	<p>Exclusively use the connectors for purposes as indicated in the specifications and data sheets. A wrong application can cause accidents and severe damages to persons.</p> <ul style="list-style-type: none"> <li>▶ The manufacturer doesn't take the responsibility for accidents which were caused by improper use of the product.</li> <li>▶ We recommend the use of fault current safety systems in constructions with voltages higher than safety extra-low voltage.</li> </ul>

	<b>⚠ WARNING</b>
	<p>The plugging and disconnecting of the connectors on-load can cause electric arcs. When explosive substances or ignition sources of any kind are nearby, there is a risk of fire and explosion!</p> <ul style="list-style-type: none"> <li>▶ Never plug and disconnect the connectors on-load.</li> </ul>

	<p><b>⚠ CAUTION</b></p>
	<p>The connectors may grow warm during operation and they may become hot depending on the ambient temperature and the conditions of use. Risk of burn to the hands!</p> <ul style="list-style-type: none"> <li>▶ Wear safety gloves when plugging and disconnecting the connectors in the case of a high ambient temperature.</li> </ul>

### 3.3 Mechanical Dangers

	<p><b>⚠ CAUTION</b></p>
	<p>The connectors contain components that are subject to mechanical stress. There is a risk of crushing!</p> <ul style="list-style-type: none"> <li>▶ Use only appropriate tools for maintenance work on the connectors.</li> <li>▶ Ensure that components, which are subject to mechanical stress, are secured before installing or dismantling these components.</li> </ul>

	<p><b>⚠ CAUTION</b></p>
	<p>The connectors contain sharp-edged parts. Risk of injury!</p> <ul style="list-style-type: none"> <li>▶ Use only appropriate tools for maintenance work on the connectors.</li> <li>▶ Wear protective gloves when working with sharp-edged components.</li> </ul>

### 3.4 Measures for Avoiding Damages

<b>NOTICE</b>
<p>Aggressive fluids may damage the connectors.</p> <ul style="list-style-type: none"> <li>▶ Make sure that the connectors are not exposed to aggressive fluids.</li> </ul>

<b>NOTICE</b>
<p>Improper handling of the connectors, e.g. when hitting the floor with some impact, can result in breakage, bent pin contacts, cracks and deformation.</p> <ul style="list-style-type: none"> <li>▶ Make sure that the connectors are always used properly.</li> <li>▶ Regularly sight-check the connectors for potential damages.</li> <li>▶ Regularly check the connectors for bent or pushed back contacts.</li> <li>▶ Immediately replace damaged components.</li> </ul>

### 3.5 Measures for Avoiding Malfunctions

<b>NOTICE</b>
<p>In the case of damage, wear and tear and/or soiling of the connector components - in the form of a partial break, sharp edges and discoloured surfaces - the functional safety of the connectors is no longer guaranteed.</p> <ul style="list-style-type: none"> <li>▶ Carry out regular visual checks to detect wear and tear and dirt.</li> <li>▶ Immediately replace damaged parts.</li> <li>▶ Immediately remove dirt without leaving any residues.</li> <li>▶ Immediately replace parts with stubborn dirt.</li> </ul>

## NOTICE

Inappropriate handling when plugging or disconnecting may damage the connectors. The functional safety of the connectors is no longer guaranteed when parts are damaged.

- ▶ Make sure that the guideways and slots of plug and receptacle always interlock when plugging!
- ▶ Take care that plug and receptacle do not tilt and that they are plugged without force.
- ▶ Make sure before the plugging procedure that plug and receptacle as well as the hinged lid of the receptacle are not contaminated. Remove any existing dirt.
- ▶ Make sure that when not mated,
  - the plug is always inserted into a dummy receptacle,
  - the hinged lid of receptacles is closed according to its intended use.

## 4. Description

### 4.1 Features

#### Variants

- ▶ 2x 8-pole Gigabit Ethernet module, shell orange
- ▶ 1x 8-pole Gigabit Ethernet module + 16 signal contacts, shell yellow
- ▶ 1x 8-pole Gigabit Ethernet module, shell green.

#### Shells

- ▶ The shells of cable plug, receptacle and dummy receptacle are IRS 50558 compliant. The rugged proven shells are the same as the ones of other UIC 558 connectors from Schaltbau.

#### Contact inserts

- ▶ **Gigabit Ethernet module:** 360° shielded module with 8 terminals for 4 data pairs for the transmission of 10 GbE in a permanent link with Cat 7 compliant data cables
- ▶ **Signal contacts:** 16 signal contacts for additional control tasks as required, for example, by DB AG for salvage and clearing operations

#### Assembly

- ▶ Suitable for gangway connections
- ▶ Quick and easy to assemble
- ▶ Seals can be replaced without disassembling the contacts

#### Break-away connector

- ▶ Non-destructive disengagement of plug contacts from receptacle contacts when two electrically not decoupled vehicles move apart. In compliance with IRS 50558.

#### Design life

- ▶ up to 10,000 mating cycles

#### Cable Assembly

- ▶ We supply on request receptacles and plugs assembled complete with cables or wires to suit the customer's specific requirements.

#### Sealed to IP69K

- ▶ Receptacle, also empty and dummy receptacle, with closed lid, and connector when mated; cable entry of plug included.

#### Flammability

- ▶ UL94-V0 listed
- ▶ Complies with fire protection standard EN 45545

#### Weatherproof and temperature resistant

- ▶ -40° C up to +90° C for entire connector

#### Technical Information and Material Specifications

- ▶ For technical information and material specifications, see our catalogue *catalogue F118.en*. Download at: <https://www.schaltbau-gmbh.com/en/Download/Product-information/Connectors/>

## 4.2 Design

UIC-IT series connectors are used for looping ethernet data and various control signals between the railway traction vehicle and the passenger vehicles.

The UIC-IT Series connector is fitted with up to two 8 pole Gigabit Ethernet (GbE) modules and 16 optional signal contacts that allows for universal and

The UIC-IT series is equipped with a 8 pole Gigabit Ethernet module and optionally with 16 signal contacts. UIC-IT series connectors consist of the following components:

- Single ended cable of required length, with plug, preassembled on one side or double ended cable with two plugs, preassembled on both sides
- Coupling receptacle (consisting of empty receptacle + contact insert with preassembled single ended cable of required length)
- Dummy receptacle (consisting of empty receptacle + unequipped socket insert without contacts, for the insertion of a non-coupled plug)
- Complete cable sets with cable lengths as required by the customer

The following variants are available:

- 2x 8-pole Gigabit Ethernet module, shell orange
- 1x 8-pole Gigabit Ethernet module + 16 signal contacts, shell yellow
- 1x 8-pole Gigabit Ethernet module, shell green

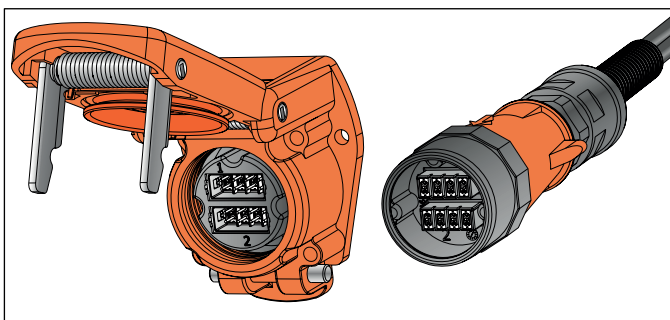


Fig. 1: Receptacle and plug with 2x 8-pole Gigabit Ethernet (GbE) module, shell orange

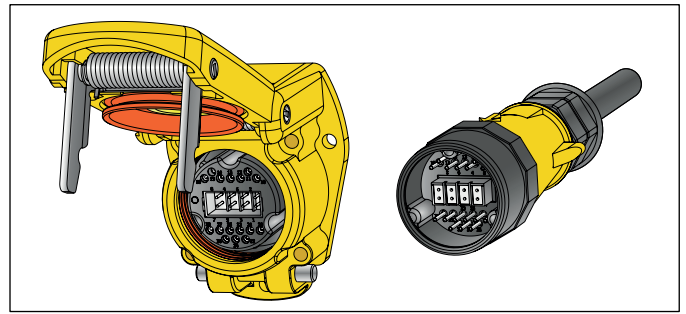


Fig. 2: Receptacle and plug with 1x 8-pole Gigabit Ethernet (GbE) module + 16 signal contacts, shell yellow

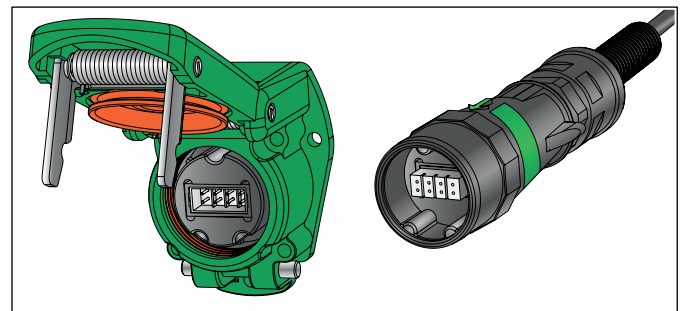
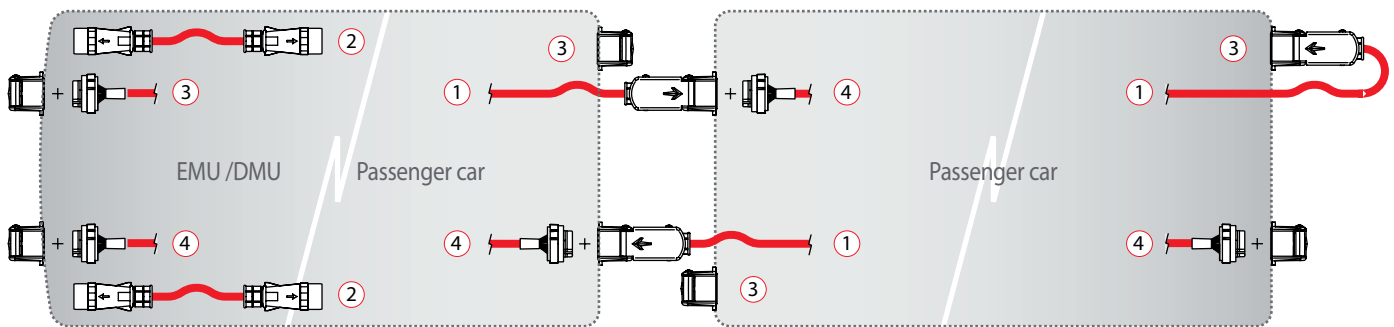


Fig. 3: Receptacle and plug with 1x 8-pole Gigabit Ethernet (GbE) module, shell green



No. and type of contacts	2x 8 pole GbE module	8 pole GbE module + 16 signal contacts	8 pole GbE module
<b>Contact arrangement:</b> Cable plug: GbE module: socket contacts Signal contacts: pin contacts Receptacle: GbE module : pin contacts Signal contacts: socket contacts			
<b>Contact identification</b> Viewing direction: Cable plug: rear view Receptacle: front view			
GbE module contacts, module 1 GbE module contacts, module 2 Signal contacts	1.1 ... 1.8 2.1 ... 2.8 ---	1 ... 8 --- 10 ... 16 and 20 ... 28	1 ... 8 --- ---

### 4.3 Data communication for EMUs, DMUs and passenger cars



**Configurations:**

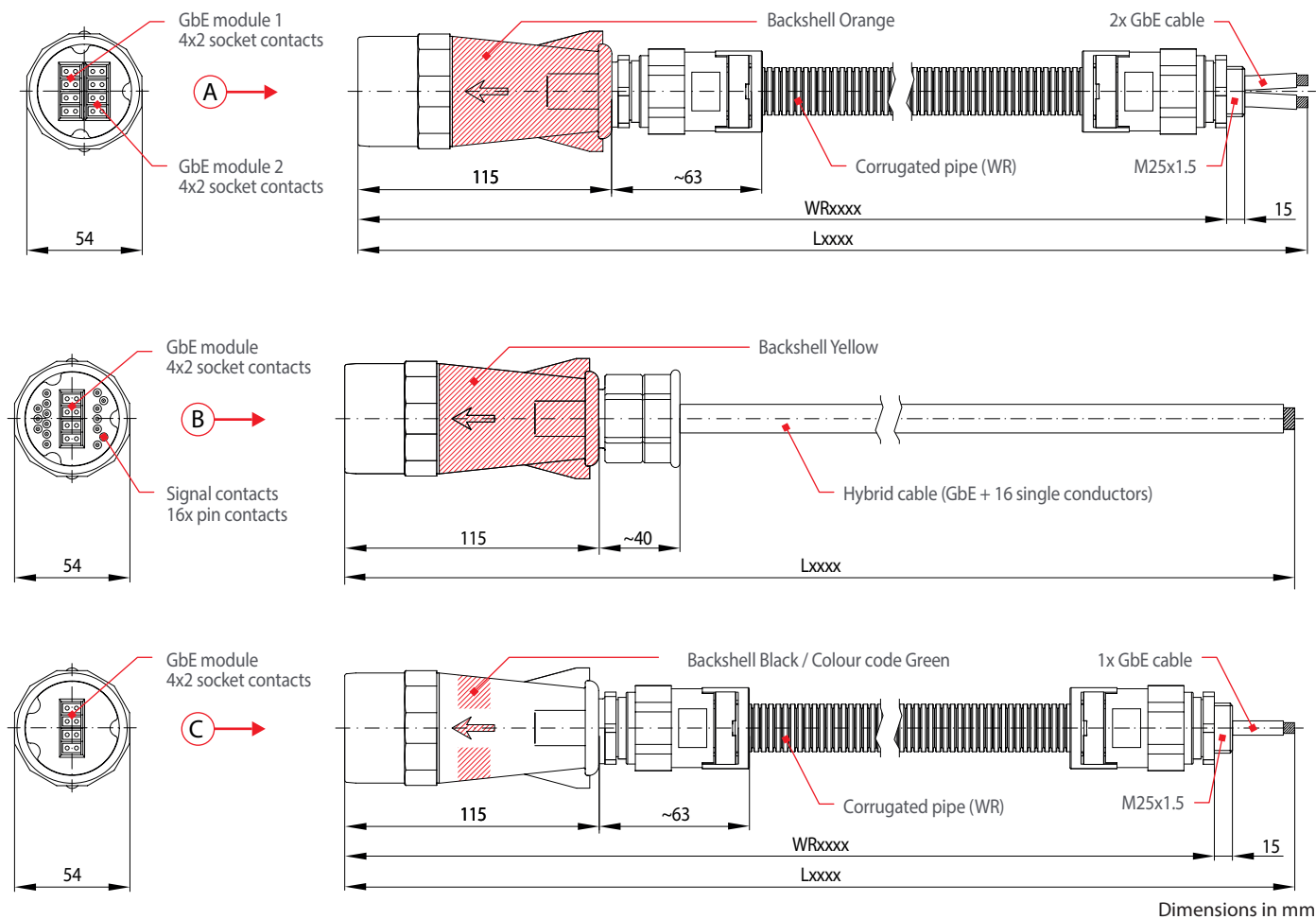
- **Orange:** 2x 8 pole GbE
- **Yellow:** 8 pole GbE + 16 signal contacts
- **Green:** 8 pole GbE

- ① **Single ended cable:** Single ended cable with plug, pre-assembled
- ② **Double ended cable:** Double ended cable with plug, pre-assembled
- ③ **Dummy receptacle:** For storing unplugged connecting cables
- ④ **Empty receptacle + socket insert,** pre-assembled with cable

Fig. 4: Schematic example for data communication for EMUs, DMUs and passenger cars

## 4.4 Survey of the Components (Preferred Types)

### Single ended cable with plug, pre-assembled



Dimensions in mm

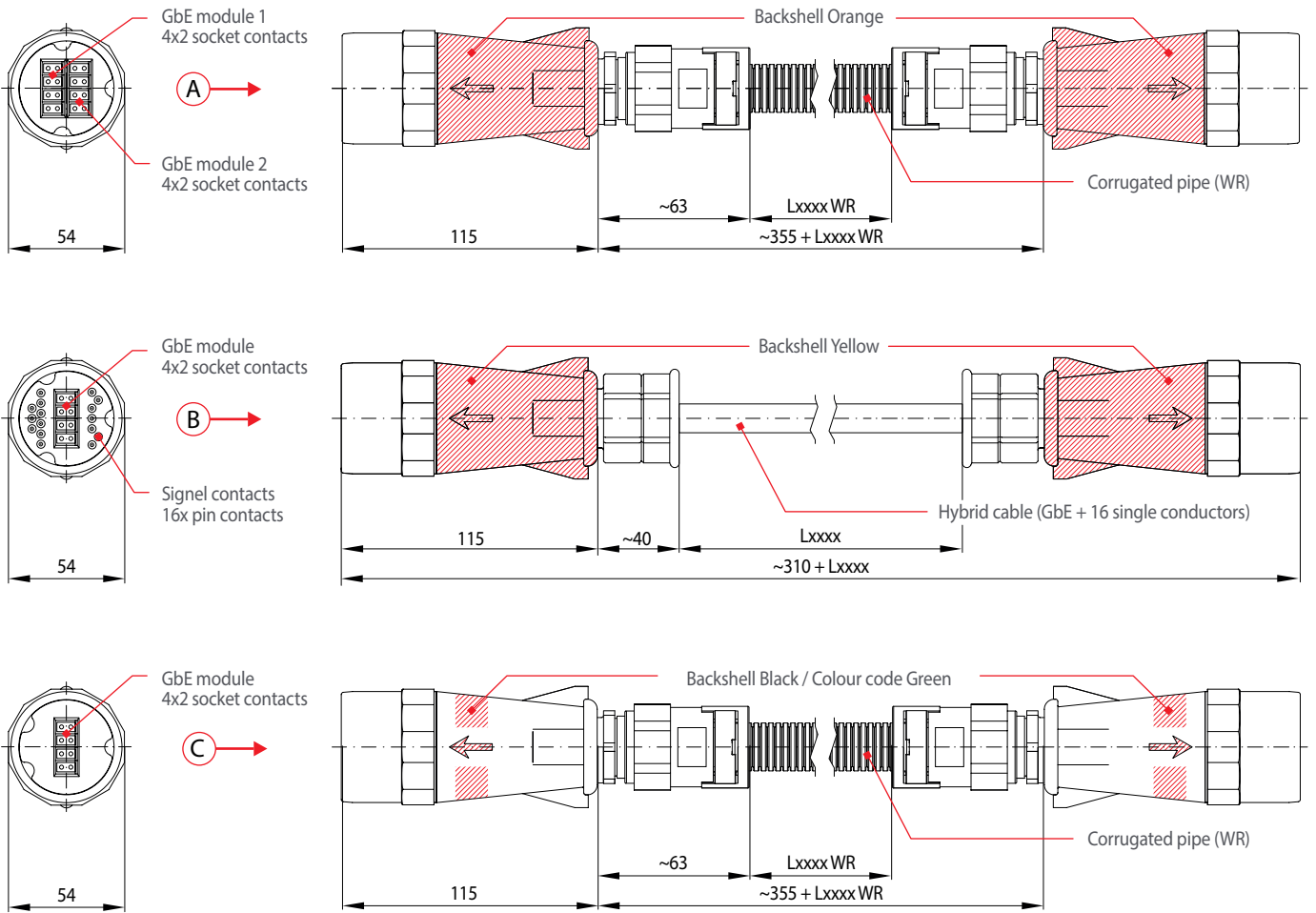
### Single ended cable with preassembled plug

Contact layout	Figure / Ordering code	Colour	No. of contacts	Length
	<b>A</b> → UIC-IT SL 8S/8S C7 M0 Lxxxx WRxxxx	Backshell Orange	8S/8S	Cable length Lxxxx <sup>1)</sup> and corrugated pipe length WRxxxx in mm
	<b>B</b> → UIC-IT SL 8S+16P C5 K0 Lxxxx	Backshell Yellow	8S + 16P	Cable length Lxxxx <sup>1)</sup> in mm
	<b>C</b> → UIC-IT SL 8S C7 EH Lxxxx WRxxxx	Backshell Black Colour code Green	8S	Cable length Lxxxx <sup>1)</sup> and corrugated pipe length WRxxxx in mm

1) Cable length Lxxxx in mm	Tolerance in mm
≤ 2,000	± 20
> 2,000, ≤ 4,000	± 30
> 4,000, ≤ 10,000	± 60
> 10,000	± 80

**Delivery includes:** Single ended cable with preassembled plug and cable length as you require

## Double ended cable with plugs, pre-assembled



Dimensions in mm

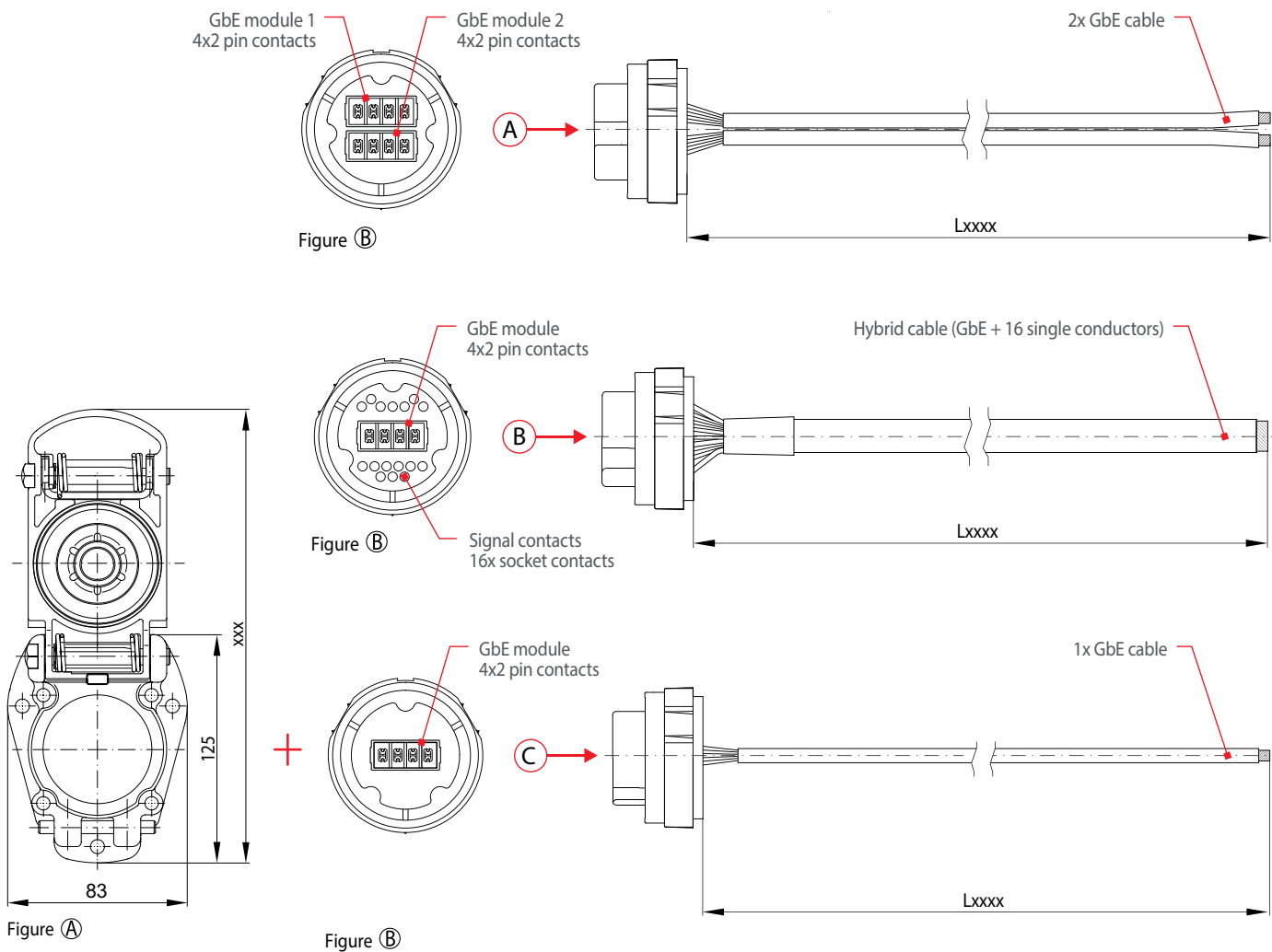
### Double ended cable with preassembled plugs on both ends

Contact layout	Figure / Ordering code	Colour	No. of contacts	Length
	<b>A</b> → UIC-IT VK 8S/8S C7 M0 Lxxxx WRxxxx	Backshell Orange	8S/8S	Cable length Lxxxx <sup>1)</sup> and corrugated pipe length WRxxxx in mm
	<b>B</b> → UIC-IT VK 8S+16P C5 K0 Lxxxx	Backshell Yellow	8S + 16P	Cable length Lxxxx <sup>1)</sup> in mm
	<b>C</b> → UIC-IT VK 8S C7 EH Lxxxx WRxxxx	Backshell Black Colour code Green	8S	Cable length Lxxxx <sup>1)</sup> and corrugated pipe length WRxxxx in mm

1) Cable length Lxxxx in mm	Tolerance in mm
≤ 2,000	± 20
> 2,000, ≤ 4,000	± 30
> 4,000, ≤ 10,000	± 60
> 10,000	± 80

**Delivery includes:** Double ended cable with preassembled plugs and cable length as you require

## Single ended cable with socket insert, pre-assembled + empty receptacle



Dimensions in mm

### Empty receptacle – (Figure A)

Plan view	Ordering code	Colour
	UIC-IT LD 00 M0	Shell Orange
	UIC-IT LD 00 K0	Shell Yellow
	UIC-IT LD 00 H0	Shell Green

### Single ended cable with socket insert, pre-assembled – (Figure B)

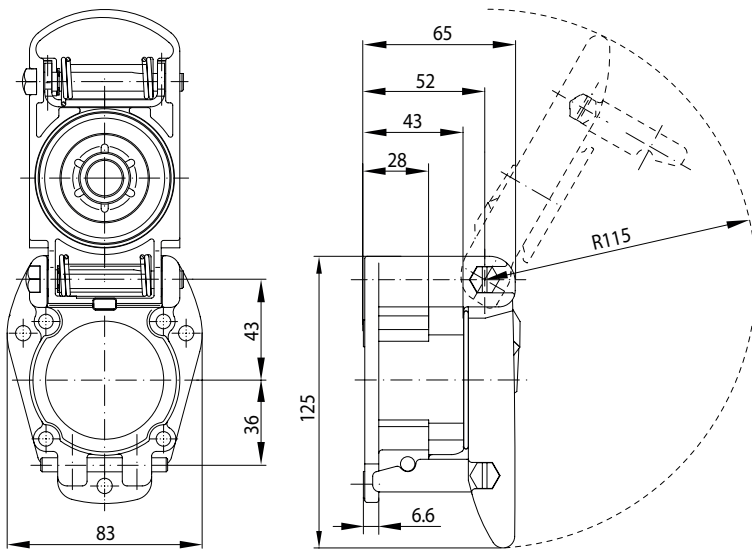
Layout	Ordering code	No. of contacts	Length
+	UIC-IT DL 8P/8P C7 00 Lxxxx	8P/8P	Cable length Lxxxx <sup>1)</sup> in mm
+	UIC-IT DL 8P+16S C5 00 Lxxxx	8P + 16S	Cable length Lxxxx <sup>1)</sup> in mm
+	UIC-IT DL 8P C7 00 Lxxxx	8P	Cable length Lxxxx <sup>1)</sup> in mm

#### Delivery includes:

Kit comprising empty receptacle, seal and contact insert with preassembled single ended cable of required length. All parts are packed separately.

1) Cable length Lxxxx in mm	Tolerance in mm
≤ 2,000	± 20
> 2,000, ≤ 4,000	± 30
> 4,000, ≤ 10,000	± 60
> 10,000	± 80

### Empty receptacle (shell only)



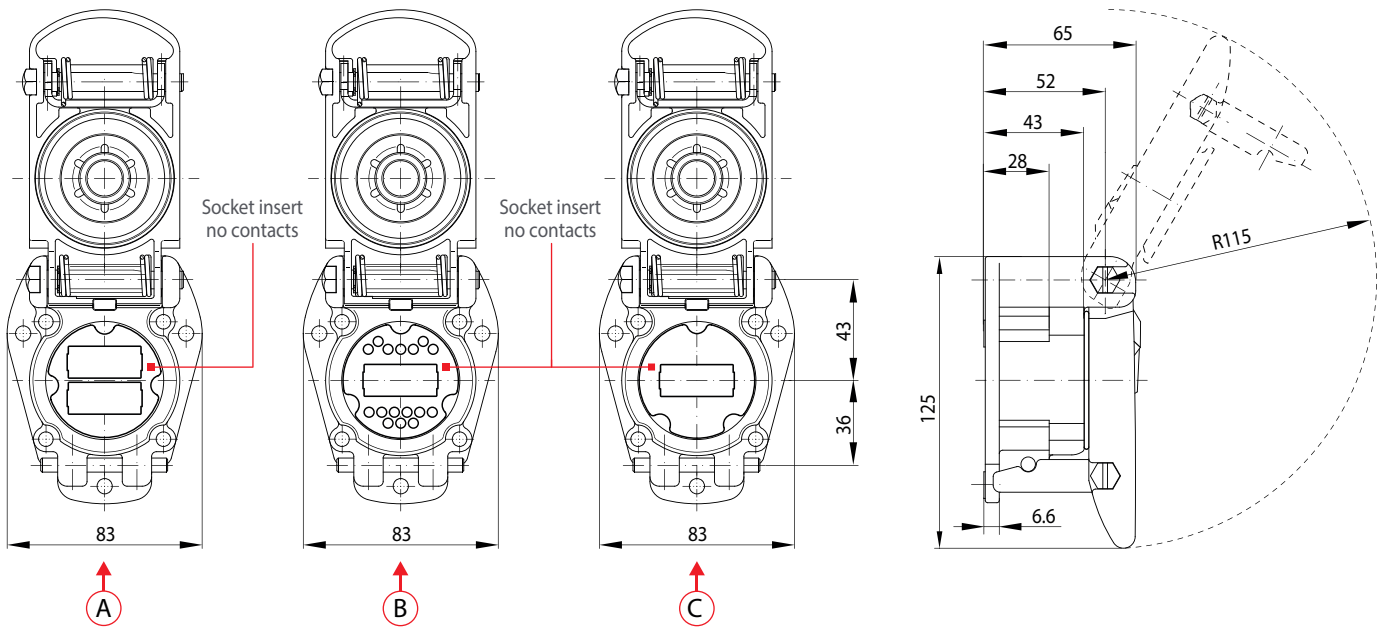
Dimensions in mm

### Empty receptacle

Ordering code	Colour	Contact insert
UIC-IT LD 00 M0	Shell Orange	(w/o)
UIC-IT LD 00 K0	Shell Yellow	(w/o)
UIC-IT LD 00 H0	Shell Green	(w/o)

**Delivery includes:**  
Empty receptacle and seal. All parts packed loose in bags.

### Dummy receptacle (with socket insert, no contacts, for retention of cable plug)



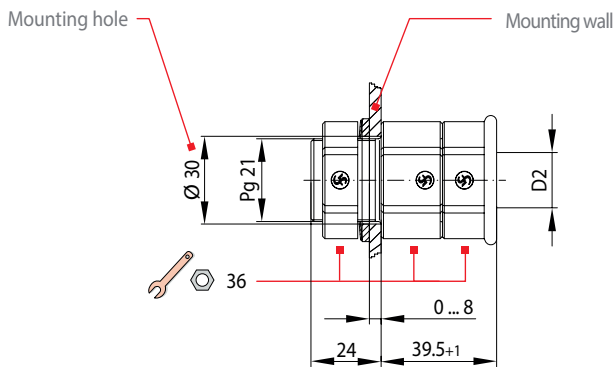
Dimensions in mm

### Dummy receptacle

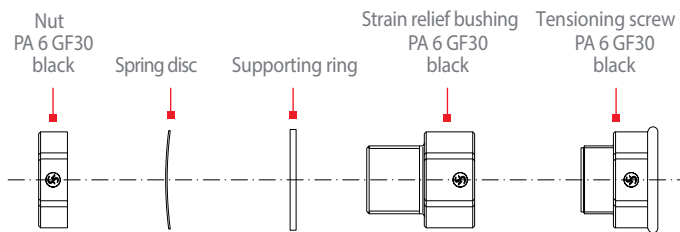
Figure	Ordering code	Colour	Contact insert
<b>A</b> →	UIC-IT BD 00 M0	Shell Orange	8P/8P (empty cavities)
<b>B</b> →	UIC-IT BD 00 K0	Shell Yellow	8P + 16S (empty cavities)
<b>C</b> →	UIC-IT BD 00 H0	Shell Green	8P (empty cavities))

**Delivery includes:**  
Kit comprising dummy receptacle, seal and contact insert without contacts. All parts packed loose in bags.

## Wall-mount (cable gland for single ended cable UIC-IT SL 8S+16P C5 K0 Lxxxx)



Dimensions in mm



Ordering code	Description
UIC KK D2	Cable gland with thread Pg21 and anti-kink sleeve for cable diameter $17.5 \pm 0.5$ mm

### Delivery includes:

Kit comprising of the parts mentioned above. All parts packed loose in bags.


### Note:

Cable gland only for single ended hybrid cable with preassembled plug UIC-IT SL 8S+16P C7 K0 Lxxxx

## Cables

<p><b>Gigabit ethernet cable: 2x 8 pole GbE module:</b></p> <ul style="list-style-type: none"> <li>- Gigabit Ethernet: Data line 4 x 2 x 24/19 AWG</li> <li>- Signal line: ---</li> <li>- Category: up to Cat 7, dependent on cable</li> </ul>	<p><b>Hybrid cable: 8 pole GbE module + 16 signal contacts:</b></p> <ul style="list-style-type: none"> <li>- Gigabit Ethernet: Data line 4 x 2 x 24/19 AWG</li> <li>- Signal line: Single strand 16 x 1.0 mm</li> <li>- Category: Cat 5</li> </ul>	<p><b>Gigabit ethernet cable: 8 pole GbE module:</b></p> <ul style="list-style-type: none"> <li>- Gigabit Ethernet: Data line 4 x 2 x 24/19 AWG</li> <li>- Signal line: ---</li> <li>- Category: up to Cat 7, dependent on cable</li> </ul>
<p>Diagram showing the cross-section of a 2x 8 pole GbE cable. It features two GbE modules, each with 8 signal wires. The outer layer consists of shielding (Cu braid) and a corrugated pipe (WR). Color coding includes white-blue/blue, white-orange/orange, white-brown/brown, and white-green/green.</p>	<p>Diagram showing the cross-section of a hybrid cable. It features an 8 pole GbE module and 16 signal wires. The outer layer consists of shielding (Cu braid) and a corrugated pipe (WR). Color coding includes white-blue/blue, white-orange/orange, white-brown/brown, and white-green/green. Signal wires are numbered 1 through 16.</p>	<p>Diagram showing the cross-section of an 8 pole GbE cable. It features a single 8 pole GbE module with 8 signal wires. The outer layer consists of shielding (Cu braid) and a corrugated pipe (WR). Color coding includes white-blue/blue, white-orange/orange, white-brown/brown, and white-green/green.</p>

## 5. Installation

	<p><b>⚠ DANGER</b></p>
	<p>The connectors contain components that carry voltage. Risk of electric shock! Always observe the following safety regulations before beginning any work on electrical constructions:</p> <ul style="list-style-type: none"> <li>▶ Disconnect</li> <li>▶ Ensure that it is not possible to re-connect unintentionally</li> <li>▶ Clearly mark your work area</li> <li>▶ Make sure that there is no voltage present</li> <li>▶ Earth and short circuit the installation</li> <li>▶ Insulate or cover adjacent energized parts</li> <li>▶ Only an electrically skilled person may determine if there is no voltage present</li> </ul>

<p><b>NOTICE</b></p>
<p>During installation, ensure that dirt caused by surrounding construction activities does not get into the connectors.</p>

### 5.1 Check Parts for Transport Damage

<p><b>NOTICE</b></p>
<p>If parts are damaged, the functional reliability of the connectors is no longer given.</p> <ul style="list-style-type: none"> <li>▶ Before installing, check all parts for any possible transport damage.</li> <li>▶ Do not install any damaged parts.</li> </ul>

### 5.2 Dimensions/Interfaces to the Vehicle

The dimensions to the interfaces of the vehicle are given in the respective data sheets or in our catalogue **F118.en**. (Download: <https://www.schaltbau-gmbh.com/en/Download/Product-information/Connectors/>)

### 5.3 Installing Coupling Receptacles

#### Preliminaries

The assembly has to be carried out by qualified trained personnel.

#### Correct mounting position

The break-away connector function guarantees a non-destructive separation of plug and receptacle when two electrically not uncoupled vehicles move away from each other. For this purpose, the mounting position of the coupling receptacle must be performed in compliance with UIC 558 in order to guarantee the prescribed tensile forces / directions on the flexible cable. **Fig. 5/D** shows an example: Vertical mounting position, lid opening to the top.

Moreover, a mounting position up to an angle of max. 90° clockwise is possible for coupling receptacles. In this instance, the lid must show downward (for examples refer to **Fig. 5/E und F**).

<p><b>NOTICE</b></p>
<p>An installation of the coupling receptacle with lid showing upward (refer to <b>Fig. 5/G</b>) is not permissible! When the lid is open in this mounting position, contamination and moisture might penetrate the contacts and accumulate there during the plugging procedure or in the plugged condition. Moreover, this mounting position causes a not definable limitation of the prescribed tensile forces / directions on the flexible cable and thus on the contact retainer and locking mechanism. In this mounting position, the plug connection is strained in transverse direction and the cable causes a unilateral strain on shell, contacts and locking mechanism!</p>

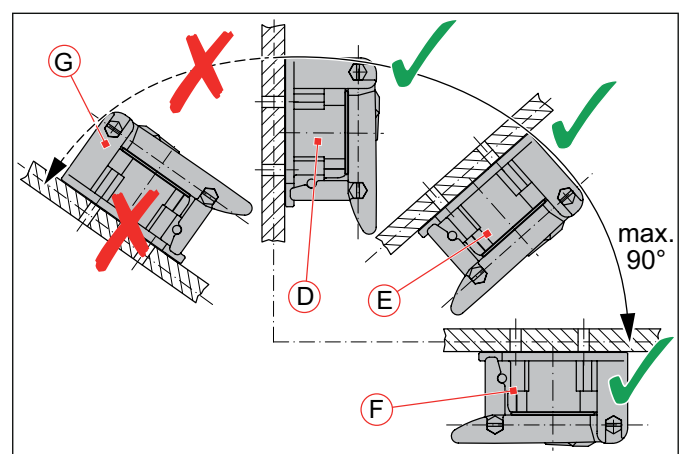


Fig. 5: Permissible and not permissible mounting positions for receptacles

#### Requirements to the vehicle wall / mounting surface

The surface of the vehicle wall / mounting surface must show an average surface roughness Rz of 6.3 ... 12.5 µm. The tightening torque for the fastening screws is 10.5 Nm, for screws of steel with strength class 8.8.

### Mounting points

The coupling receptacle is fastened with 3 cylinder screws M6 or alternatively with 4 cylinder screws M6.

The tightening torque (10.5 Nm for screws of steel with strength class 8.8) and the length of the fastening screws must be determined by the manufacturer of the vehicles depending on the structural conditions.

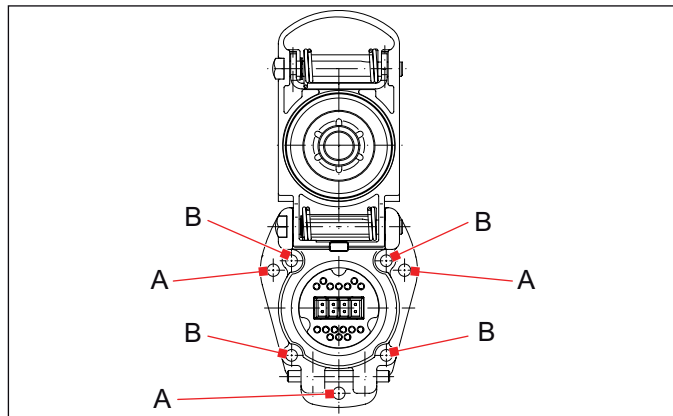


Fig. 6: Mounting points for receptacle

- A Mounting points for installation with 3 holes
- B Mounting points for installation with 4 holes

The dimensions and arrangement of the mounting holes are shown in Fig. 7 und Fig. 8:

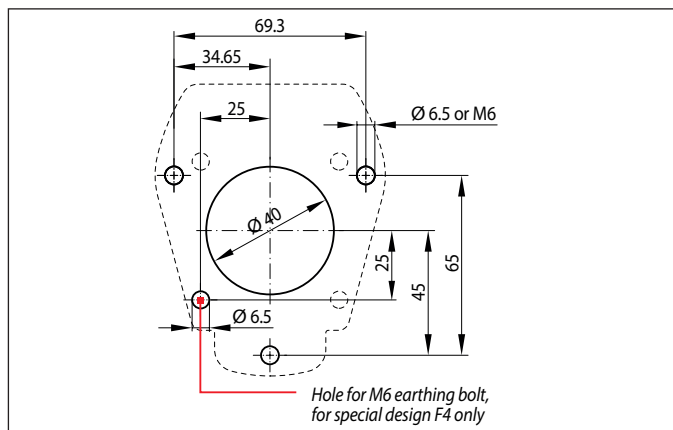


Fig. 7: 3-hole mounting

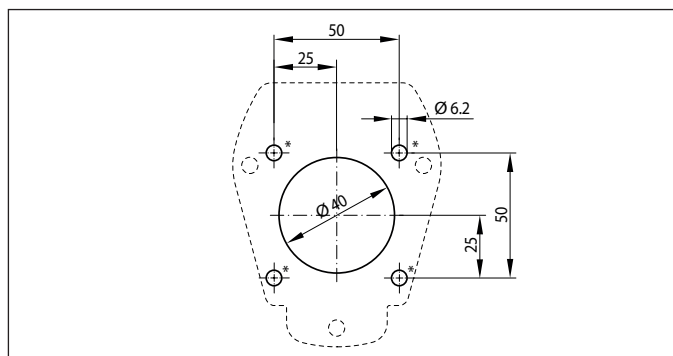


Fig. 8: 4-hole mounting

\* Diameter for all fixing and securing elements, such as screw heads: 12.5 mm max.

### Installation

- ▶ Thread the O-ring (3) onto the open end of the connector cable (1).
- ▶ Pull the open end of the connector cable (1) through the prepared mounting hole (max. 40 mm diameter) in the vehicle wall (2).

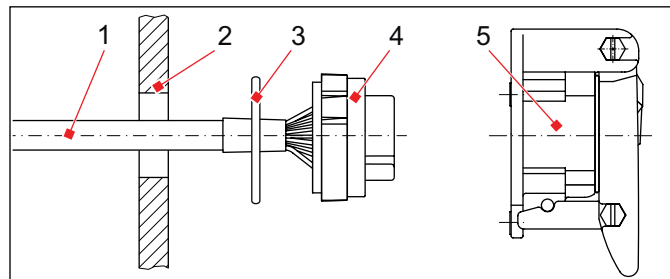


Fig. 9: Coupling receptacle with assembled socket insert and connector cable

- 1 Connector cable, completely assembled
- 2 Vehicle wall with prepared mounting holes
- 3 O-ring for socket insert
- 4 Socket insert, completely assembled
- 5 Empty receptacle with inserted rubber seal (lamella ring)

- ▶ Slide the assembled socket insert (4) in the specified coding position with the slots (B) above onto the guideways (A) of the empty receptacle (5).

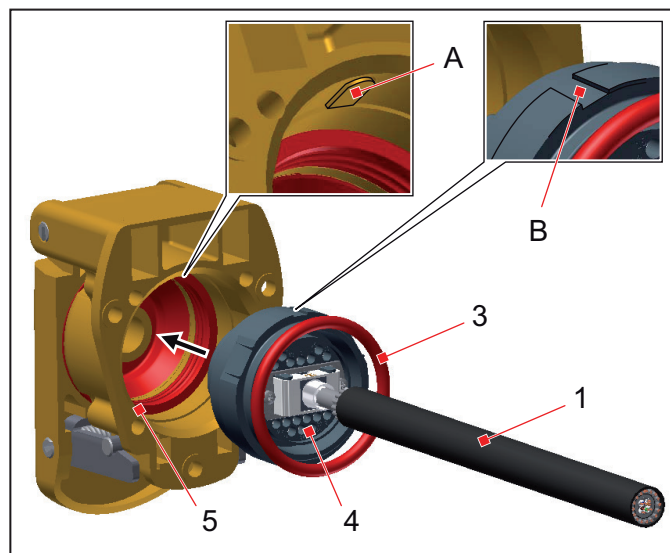


Fig. 10: Coding position with slots (B) on the socket insert and guideways (A) in the empty receptacle

### NOTICE

To ensure the proper operation, the socket insert and the contacts may not be under tension.

- ▶ Make sure that the specified bending radius is observed when laying the cables.



- ▶ Slightly fasten the receptacle (5) with the three M6 cylinder screws (or alternatively with four M6 cylinder screws) to the vehicle wall (2).
- ▶ Check if the O-ring (3) of the socket insert and rubber seal (lamella ring) (6) are properly in place. Align seals where applicable.
- ▶ Adjust all of the parts and fasten the M6 cylinder screws.  
Tightening torque: 10.5 Nm for screws of steel with strength class 8.8.

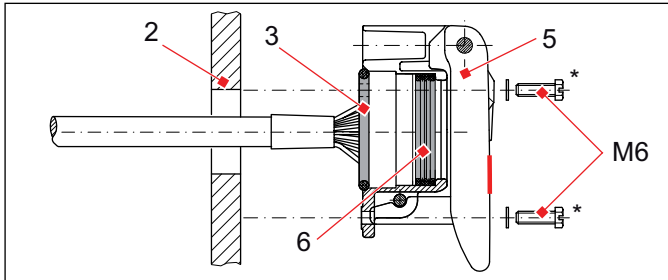


Fig. 11: Screw coupling receptacle with socket insert to the vehicle wall  
\* Diameter for all fixing and securing elements, such as screw heads: 12.5 mm max.

### Test

- ▶ Check that all of the installed parts are in the correct position and function properly.
- ▶ Make sure that there are no undue tensile, pressure, flexing and torsion loads on the connection cables.
- ▶ Check the functionality of the receptacle lid.

### Commissioning

	<p><b>⚠ DANGER</b></p>
	<p>In the case of a contact of the traction current line with the vehicle, the coupling receptacle may be highly energised. Deadly hazard!</p> <ul style="list-style-type: none"> <li>▶ Before commissioning the receptacle, a high voltage test must be carried out.</li> </ul>

- ▶ Before commissioning the receptacle, it must be tested in accordance with EN 50215.

## 5.4 Installing the Dummy Receptacle

### Installation

The dummy receptacle is installed in the same way as the coupling receptacles. Instead of the assembled socket insert with connector cable the dummy receptacle uses an unequipped insert without contacts and cable.

- ▶ Install the dummy receptacle as described under „5.3 Installing Coupling Receptacles“.
- ▶ Instead of the assembled socket insert use an unequipped insert without contacts and cable.

### Test

- ▶ Check that all of the installed parts are in the correct position and function properly.
- ▶ Check the functionality of the receptacle lid.

### Commissioning

	<p><b>⚠ DANGER</b></p>
	<p>In the case of a contact of the traction current line with the vehicle, the dummy receptacle may be highly energised. Deadly hazard!</p> <ul style="list-style-type: none"> <li>▶ Before commissioning the dummy receptacle, a high voltage test must be carried out.</li> </ul>

- ▶ Before commissioning the dummy receptacle, it must be tested in accordance with EN 50215.

## 5.5 Installing Wall-Mount Cable Glands for Plugs with Single Ended Cable

The connector cables have to be installed in such a way that they are free from undue tensile, pressure, flexing and torsion loads.

- For hybrid cables (type 8S+16P, plug shell yellow) we recommend using the UIC KK D2 wall-mount cable gland for the installation on the vehicle body.
- Connector cables with corrugated pipe (types 8S/8S, plug backshell orange and 8S, plug backshell black with green colour code) have a cable gland at the loose end of the cable with a thread M25. The cable gland can either be installed with a mounting hole and nut M25x1.5 (not included in the scope of delivery) or with a thread M25x1.5 directly on the vehicle wall.

### NOTICE

To ensure the proper operation, the plug insert and the contacts may not be under tension.

- ▶ Make sure that the specified bending radius is observed when laying the cables

### Preparing measures

- For the installation of the UIC KK D2 wall-mount cable gland, a mounting hole with 30 mm diameter has to be provided in the vehicle wall.
- For the installation of connector cables with corrugated pipe, a mounting hole with  $25 + 0,2$  mm diameter has to be provided in the vehicle wall or alternatively a thread M25x1,5.

## Installation of the Cable Gland UIC KK D2

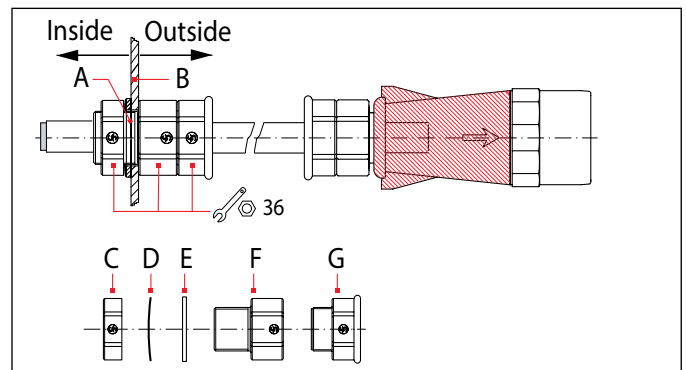


Fig. 12: Wall-mount cable gland UIC KK D2

- A Mounting hole  $\varnothing$  30 mm
- B Vehicle wall
- C Nut
- D Spring disc
- E Supporting ring
- F Strain relief bushing
- G Tension screw

- ▶ Thread the tension screw (G) and strain relief bushing (F) on the open end of the assembled cable.
- ▶ Lead the cable from the outside through the mounting hole (A) ( $\varnothing$  30 mm) in the vehicle wall (B) to the inside.
- ▶ Thread the supporting ring (E), spring disc (D) and nut (C) from the inside on the cable and attach to the thread of the strain relief bushing (F).
- ▶ Screw the nut (C) only slightly on the thread of the strain relief bushing (F).
- ▶ Adjust all of the parts and fasten the nut (C). (Tightening torque: 3 Nm)
- ▶ Establish the strain relief and screw the tension screw (G) into the strain relief (F). (Tightening torque: 3 Nm)

## Installation of the Cable Gland with Corrugated Pipe

(For plugs with single ended cables of the types 8S/8S, backshell orange and 8S, backshell black with green colour code.)

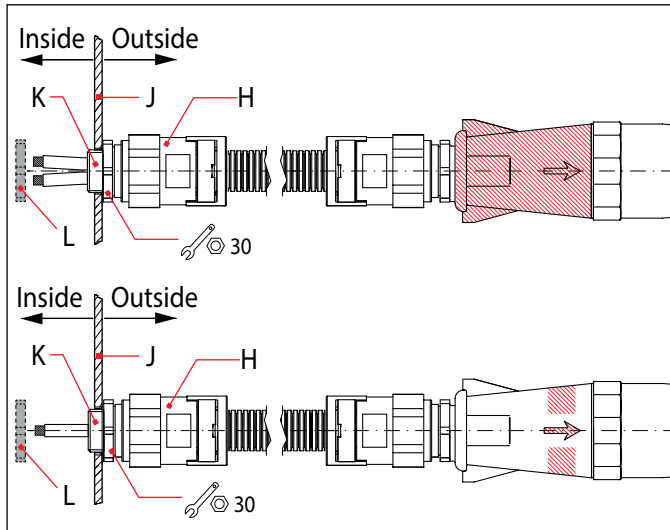


Fig. 13: Wall-mount cable gland for connector cables with corrugated pipe

H Cable gland

J Vehicle wall

K Mounting hole  $\varnothing 25 +0,2$  mm or alternatively a thread M25x1,5

L Nut for installation with mounting hole (nut is not included in the scope of delivery)

### Installation with mounting hole ( $\varnothing 25 +0,2$ mm)

- ▶ Lead the cable with the cable gland (H) from the outside through the mounting hole (K) ( $\varnothing 25 +0,2$  mm) in the vehicle wall (J) to the inside.
- ▶ Screw the nut (L) (not included in the scope of delivery) from the inside on the thread of the cable gland (H).
- ▶ Adjust all of the parts and fasten the nut (L).  
Tightening torque:
  - 8 Nm for metal
  - or 6 Nm für PA (polyamide)


### Installation with thread M25x1,5

- ▶ Screw the cable with the cable gland (H) from the outside into the prepared thread M25x1,5 (K) in the vehicle wall (J).
- ▶ Adjust all of the parts and fasten the nut (L).  
Tightening torque:
  - 8 Nm for metal
  - or 6 Nm für PA (polyamide)

## Test

- ▶ Check that all of the installed parts are in the correct position.
- ▶ Make sure that there are no undue tensile, pressure, flexing and torsion loads on the cable.
- ▶ All contacts must be aligned, i.e. they must not be crooked.
- ▶ Make sure the strain relief fits properly.

## Commissioning

<b>⚠ DANGER</b>	
	<p>In the case of a contact of the traction current line with the vehicle, the cable plug with connector cable may be highly energised. Deadly hazard!</p> <ul style="list-style-type: none"> <li>▶ Before commissioning the cable plug with connector cable, a high voltage test must be carried out.</li> </ul>






- ▶ Before commissioning the plug connection, it must be tested in accordance with EN 50215.

## 5.6 Storage of Double Ended Cables

When storing double ended connector cables in the carriages or driver's cabins, make sure the bending radius (based on the cable type) is observed and that the cable is protected against shocks and dirt.

## 6. Plugging Procedure

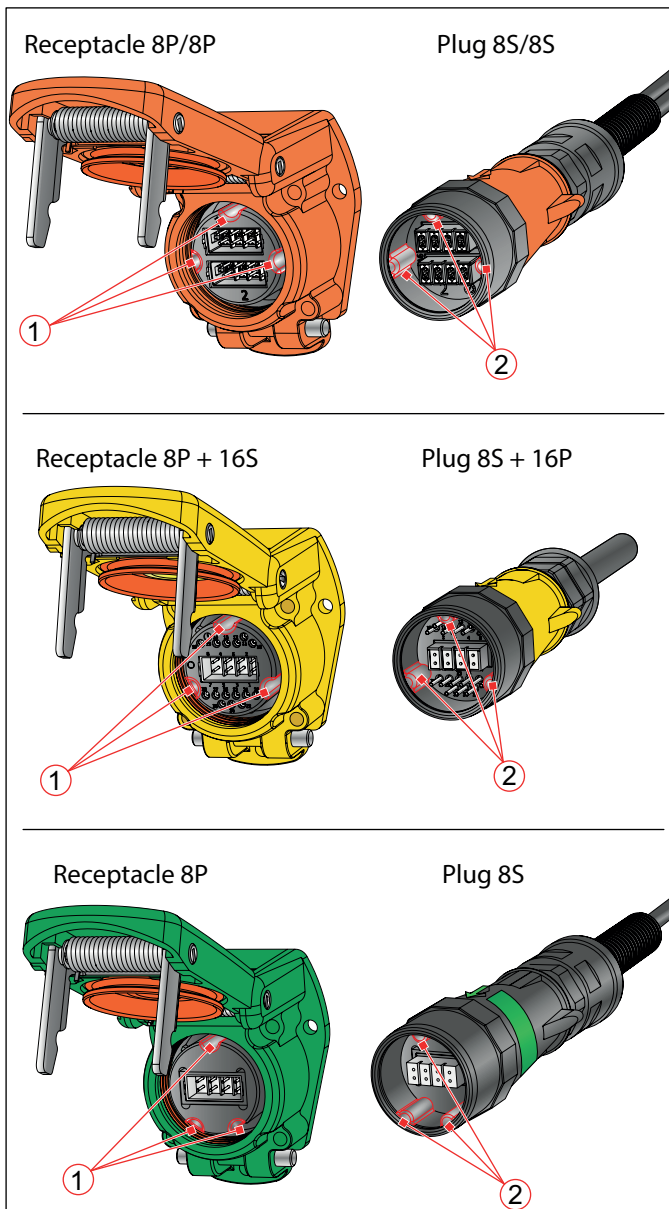
For the plugging procedure observe the requirements in chapter „2.3 Intended Use“.

	<p><b>⚠ WARNING</b></p> <p>Dirt, moisture, snow and ice in the interior of coupling receptacles or dummy receptacles contaminate the plug. The coupling of a contaminated plug to the coupling receptacle may lead to electric shock, short circuit and damage to the connectors!</p> <ul style="list-style-type: none"> <li>▶ Always check if the interior of the receptacles is free from dirt, moisture, snow and ice before inserting a plug into a coupling receptacle or a dummy receptacle.</li> <li>▶ Do not insert a plug into a receptacle when the latter is contaminated, moist or contaminated with snow and ice.</li> <li>▶ Remove dirt, moisture, snow and ice without residues from the interior of receptacles and from the plug.</li> <li>▶ Never couple a contaminated plug to the coupling receptacle.</li> </ul>
 	<p><b>⚠ WARNING</b></p> <p>The plugging and disconnecting of the connectors on-load can cause electric arcs. When explosive substances or ignition sources of any kind are nearby, there is a risk of fire and explosion!</p> <ul style="list-style-type: none"> <li>▶ Never plug and disconnect the connectors on-load.</li> </ul>
	<p><b>⚠ CAUTION</b></p> <p>The connectors contain sharp-edged components as well as components which are subject to mechanical tension. Crushing hazard / risk of injury!</p> <ul style="list-style-type: none"> <li>▶ Wear safety gloves when plugging and disconnecting the connectors.</li> </ul>
	<p><b>⚠ CAUTION</b></p> <p>The connectors may grow warm during operation and they may become hot depending on the ambient temperature and the conditions of use. Risk of burn to the hands!</p> <ul style="list-style-type: none"> <li>▶ Wear safety gloves when plugging and disconnecting the connectors in the case of a high ambient temperature.</li> </ul>

## NOTICE

Inappropriate handling when plugging or disconnecting may damage the connectors. The functional safety of the connectors is no longer guaranteed when parts are damaged.

- ▶ Make sure that the slots (1) and guideways (2) of receptacle and plug always interlock when plugging (*Fig. 14*)!
- ▶ Take care that plug and receptacle do not tilt and that they are plugged without force.
- ▶ Make sure before the plugging procedure that plug and receptacle as well as the hinged lid of the receptacle are not contaminated. Remove any existing dirt.
- ▶ Make sure that when not mated,
  - the plug is always inserted into a dummy receptacle,
  - the hinged lid of receptacles is closed according to its intended use.
- ▶ Open the hinged lid of the receptacle by an angle of at least 110° but not more than 130° (refer to *Fig. 15*). Overstretching of the hinged lid may shorten the operational life span of the torsion spring and may damage the hinge mechanism.
- ▶ Always close the hinged lid by hand, don't let it slam!



### Note:

In case of a very low or very high ambient temperature which approximates the limits of the allowable operating temperature range specified in our catalogue *F118.en* in section "*Specifications*",

- a higher effort may be needed for the plugging and unplugging and
- the operational life span of plug and coupling receptacle may thus be reduced due to increased wear and tear.

Fig. 14: Slots (1) on receptacles and guideways (2) on plugs

## 6.1 Plugging

- ▶ Open the hinged lid (3) of the coupling receptacle (4).
- In doing so, observe the opening angle:
- at least 110 °
  - but not more than 130 °

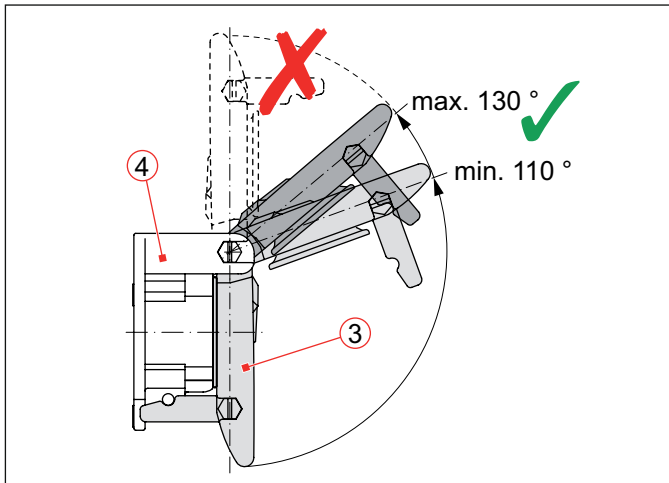


Fig. 15: Open the hinged lid (3) of the coupling receptacle (4):  
Opening angle at least 110 °, at most 130 °

- ▶ Position the plug (5) in such a way that the arrow (6) on the plug is congruent with the arrow (7) on the hinged lid of the coupling receptacle (4).

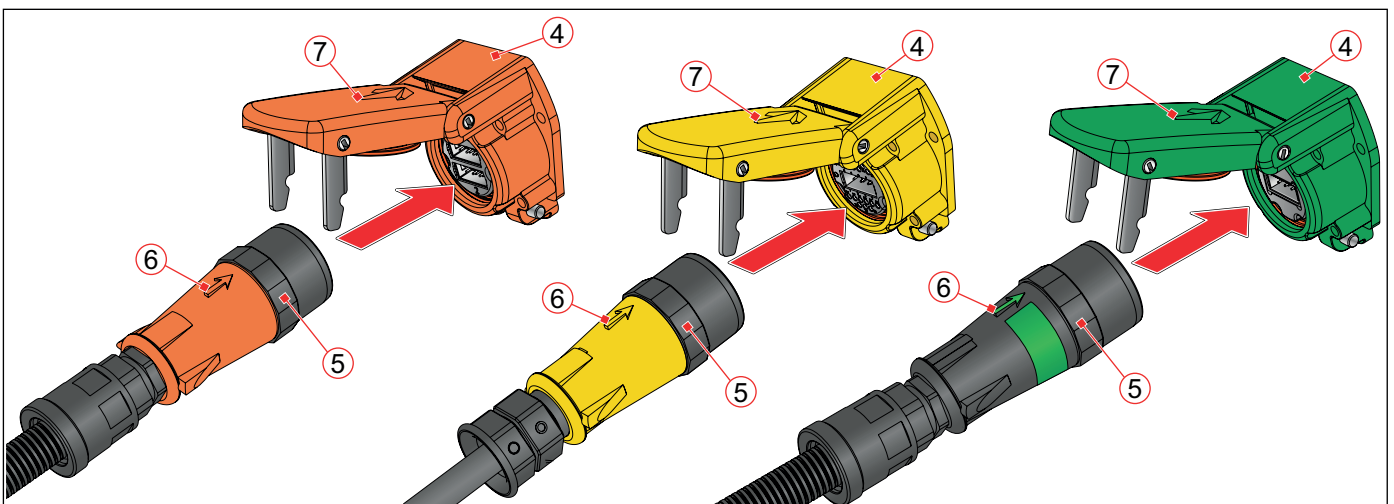


Fig. 16: Align arrow (6) on plug congruent with arrow (7) on the receptacle lid

- ▶ Then insert the plug in such a way that the guide-ways (2) in the plug slide without much effort into the slots (1) of the receptacle (refer to Fig. 14).
- In doing so, take care
- that plug and receptacle are aligned axially (a plug set diagonally by more than 8° cannot be plugged by hand anymore!),
  - that the plug is completely (flush) inserted in the receptacle.

- ▶ After that close the hinged lid (3) by hand until the locking mechanism (8) on lid and plug latches.

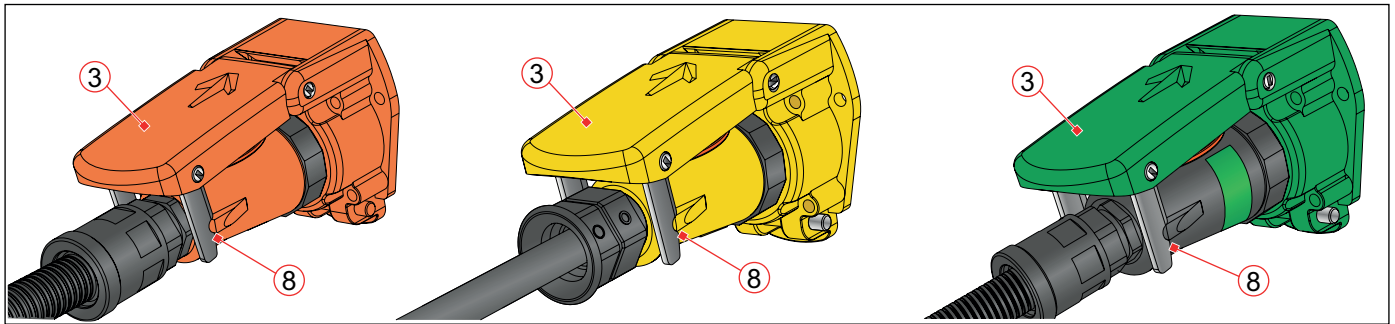


Fig. 17: Close the hinged lid (3) by hand until the locking mechanism (8) on lid and plug latches

## 6.2 Unplugging

- ▶ Open the hinged lid (3) of the coupling receptacle (4). In doing so, observe the opening angle:
  - at least 110°
  - but not more than 130°
- ▶ Hold the hinged lid (3) and take off the plug (5) from receptacle (4). Only pull on the plug, not on the cable.
- ▶ Close the hinged lid (3) by hand until the locking mechanism (9) on lid and receptacle shell latches.

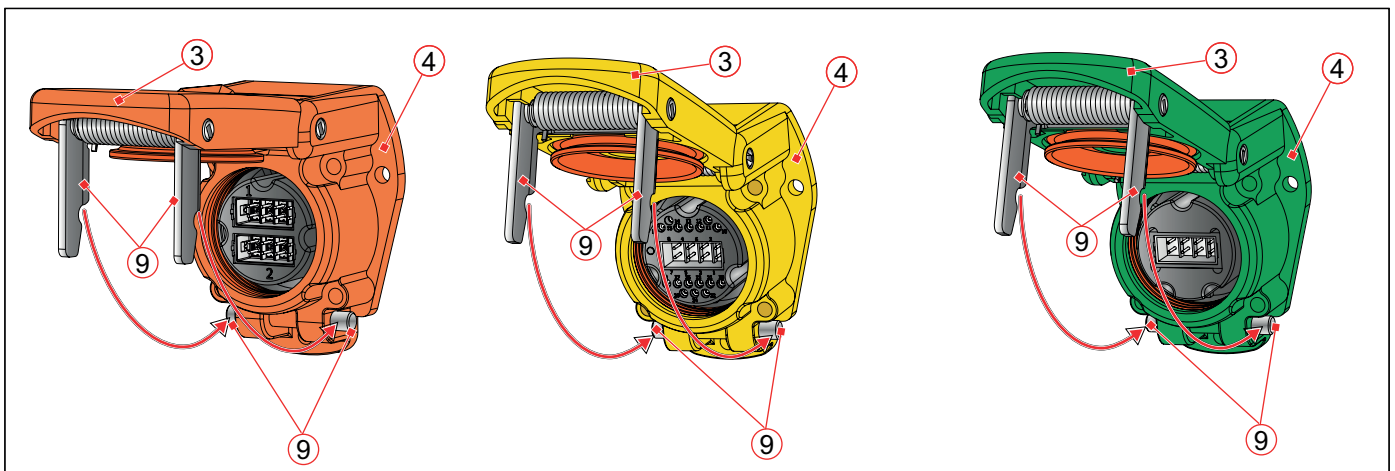




Fig. 18: Close the hinged lid (3) of the coupling receptacle (4) by hand until the locking mechanism (9) latches

## 7. Maintenance

Note the expert knowledge mentioned in chapter „2. General and Security Information“, which is essential for carrying out maintenance work.

 <b>DANGER</b>	
	<p>The connectors contain components that carry voltage. Risk of electric shock! Always observe the following safety regulations before beginning any work on electrical constructions:</p> <ul style="list-style-type: none"> <li>▶ Disconnect</li> <li>▶ Ensure that it is not possible to reconnect unintentionally</li> <li>▶ Clearly mark your work area</li> <li>▶ Make sure that there is no voltage present</li> <li>▶ Earth and short circuit the installation</li> <li>▶ Insulate or cover adjacent energized parts</li> <li>▶ Only an electrically skilled person may determine if there is no voltage present</li> </ul>

All of the maintenance activities that may be carried out on the connectors by skilled personnel are listed below.

### 7.1 Intervals for Checks and Maintenance

Carrying out of the following maintenance activities reduces wear and tear of the connectors. The wear and tear depends on various factors (e. g. operating and environmental conditions, frequency of use). General maintenance intervals can therefore not be made, but must be determined by the operator according to the specific factors.

Checks / Maintenance	Interval
Visual inspection of - plug - coupling receptacle - receptacle lid - cable - Gigabit Ethernet module 1 and if applicable Gigabit Ethernet module 2 (in plug and receptacle) - contacts (in plug and receptacle) - contact inserts (in plug and receptacle) - strain relief - dummy receptacle with socket insert without contacts	▶ At every plugging
Complete maintenance, where all parts of the connectors are checked for damage and correct function	▶ As determined by the operator, according to the specific factors

### NOTICE

Should there be any visible damage to the cable, plug, receptacle, hinged lid, contacts, contact inserts, seals or to any other components of the connectors, the functional reliability of the connector is no longer given s

- ▶ Immediately replace all damaged parts.

In addition to the visual inspection at every plugging a complete maintenance, during which all parts of the connectors are checked for damages and correct function, must be performed at regular intervals as determined by the operator.



## 7.2 Visual and Functional Inspection/Maintenance of Coupling Receptacle and Dummy Receptacle

Connector element	Visual and functional inspection	Measures
Receptacle shell and receptacle lid	Check for: <ul style="list-style-type: none"> <li>▶ low spring tension when opening the receptacle lid</li> <li>▶ ease of movement when plugging</li> <li>▶ dirt</li> <li>▶ damage or wear and tear on shell, contacts, Gigabit Ethernet module, receptacle contact insert</li> <li>▶ damage or abrasion of slots/guideways</li> <li>▶ cracks and ruptured patches</li> <li>▶ loose or missing fastening elements</li> <li>▶ tears and porosity in the lid seal</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ remove existent dirt without leaving any residue</li> <li>▶ immediately replace damaged parts</li> </ul>
Torsion springs at receptacle lid	Check for: <ul style="list-style-type: none"> <li>▶ insufficient lubrication of torsion springs</li> <li>▶ broken or overstretched torsion springs</li> <li>▶ secure and firm fit of torsion springs</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ lubricate torsion springs with Molykote</li> <li>▶ immediately replace damaged parts</li> </ul>
Locking mechanism of the receptacle lid	Close the receptacle lid until the locking mechanism latches and check for: <ul style="list-style-type: none"> <li>▶ damage or abrasion</li> <li>▶ free movement of the locking mechanism</li> <li>▶ proper operation of the locking mechanism</li> <li>▶ secure and firm fit of the locking mechanism</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ immediately replace damaged parts</li> </ul>
Sealing ring (O-ring) on the mounting flange of the receptacle	Check for: <ul style="list-style-type: none"> <li>▶ tears and porosity on the sealing ring (O-Ring)</li> <li>▶ proper fit of the sealing ring (O-Ring)</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ immediately replace damaged O-rings</li> </ul>
Rubber seal (lamella ring) in the receptacle shell	Check for: <ul style="list-style-type: none"> <li>▶ tears and porosity on the rubber seal (lamella ring)</li> <li>▶ proper fit of the rubber seal (lamella ring)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Immediately replace a damaged rubber seal (lamella ring)</li> </ul>
Socket insert (for receptacles)	Check for: <ul style="list-style-type: none"> <li>▶ visible damage</li> <li>▶ dirt</li> <li>▶ signs of moisture</li> <li>▶ cracks and ruptured patches</li> <li>▶ tears and porosity on the sealing ring (O-Ring)</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ remove existent dirt or moisture without leaving any residue</li> <li>▶ immediately replace damaged parts</li> </ul>
Socket contacts (for receptacles) and Gigabit Ethernet module (GbE module 1 and if applicable GbE module 2)	Check for: <ul style="list-style-type: none"> <li>▶ visible damage</li> <li>▶ dirt</li> <li>▶ signs of moisture</li> <li>▶ pushed back contacts</li> <li>▶ a loose fit of the contacts in the socket insert/ Gigabit Ethernet module (in GbE module 1 and if applicable in GbE module 2)</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ remove existent dirt or moisture without leaving any residue</li> <li>▶ immediately replace damaged parts</li> </ul>

### 7.3 Visual and Functional Inspection/Maintenance of the Cable Plug

Connector element	Visual and functional inspection	Measures
Plug shell	Check for: <ul style="list-style-type: none"> <li>▶ ease of movement when plugging</li> <li>▶ for damage or abrasion of plug shell, contacts, Gigabit Ethernet module, plug contact insert</li> <li>▶ damage or abrasion of the guide bead</li> <li>▶ damage on the edge of the locking mechanism</li> <li>▶ proper functioning of the strain relief</li> <li>▶ dirt</li> <li>▶ cracks and ruptured patches</li> <li>▶ loose or missing fastening elements</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ remove existent dirt without leaving any residue</li> <li>▶ immediately replace damaged parts</li> </ul>
Plug ring	Check for: <ul style="list-style-type: none"> <li>▶ damage to the plug ring</li> <li>▶ tears and porosity on the sealing ring (O-Ring)</li> <li>▶ proper fit of the sealing ring (O-Rings)</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ immediately replace damaged parts</li> </ul>
Pin insert (for plugs)	Check for: <ul style="list-style-type: none"> <li>▶ visible damage</li> <li>▶ dirt</li> <li>▶ signs of moisture</li> <li>▶ cracks and ruptured patches</li> <li>▶ tears and porosity on the sealing ring (O-Ring)</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ remove existent dirt or moisture without leaving any residue</li> <li>▶ immediately replace damaged parts</li> </ul>
Pin contacts (for plugs) and Gigabit Ethernet module (GbE module 1 and if applicable GbE module 2)	Check for: <ul style="list-style-type: none"> <li>▶ visible damage</li> <li>▶ dirt</li> <li>▶ signs of moisture</li> <li>▶ bent or pushed back contacts</li> <li>▶ a loose fit of the contacts in the pin insert/Gigabit Ethernet module (in GbE module 1 and if applicable in GbE module 2)</li> </ul>	In case of defects: <ul style="list-style-type: none"> <li>▶ remove existent dirt or moisture without leaving any residue</li> <li>▶ immediately replace damaged parts</li> </ul>

## 8. Spare Parts

Spare parts for UIC-IT coupling receptacles (Fig. 19)		
Item	Denomination	Pcs.
1	UIC-IT LD 00 M0 empty receptacle (shell orange)	1
	UIC-IT LD 00 K0 empty receptacle (shell yellow)	1
	UIC-IT LD 00 H0 empty receptacle (shell green)	1
2	Rubber seal (lamella ring)	1
3	UIC-IT DL 8P/8P C7 00 Lxxxx*, preassembled receptacle insert with single ended cable	1
	UIC-IT DL 8P+16S C5 00 Lxxxx*, preassembled receptacle insert with single ended cable	1
	UIC-IT DL 8P C7 00 Lxxxx*, preassembled receptacle insert with single ended cable,	1
4	O-ring 52x5	1

\* Cable lengths as required, in mm

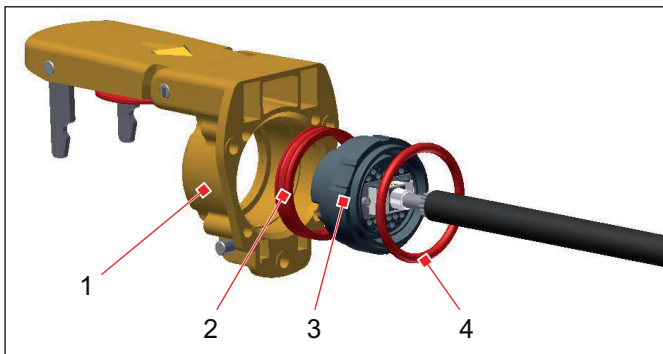


Fig. 19: Spare parts for UIC-IT coupling receptacles (comprising empty receptacle and preassembled contact insert with single ended cable)

Spare parts for UIC-IT cable plugs (Fig. 20)		
Item	Denomination	Pcs.
6	O-Ring 43x2 lubricated with Vaseline (white Vaseline DAB9 Standard)	1
7	Plug ring	1

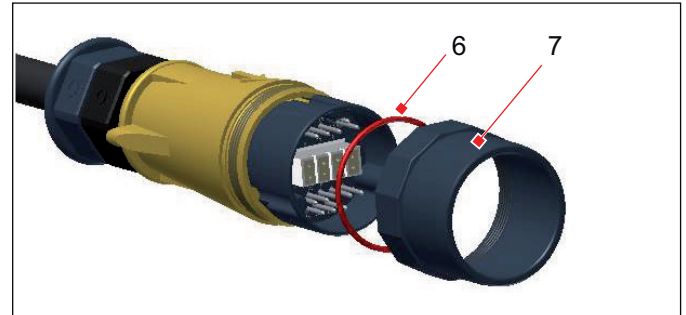


Fig. 20: Spare parts for UIC-IT cable plugs

## 9. Technical Data

Specifications and information on the material characteristics for the connectors in the UIC-IT series are given in our catalogue *F118.en*.

Due to our continuous improvement programme, the design of our products can be modified at any time. So some features may differ from the descriptions, specifications and drawings in the catalogue. You can download the latest update of the catalogue at: <https://www.schaltbau-gmbh.com/en/Download/Product-information/Connectors/>. The updated catalogue renders the previous issue invalid.

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with compliments:



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



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.

## 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
- Snap-action switch made of robust polyetherimide (PEI)
- Snap-action switch with two galvanically isolated contact bridges
- Special switches to suit customer requirements

### Contactors Emergency disconnect switches

- 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