

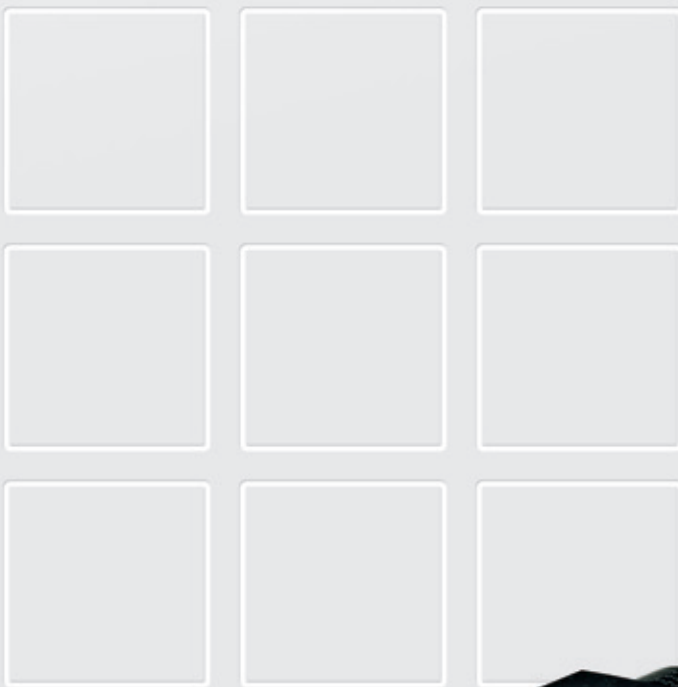
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Connectors

SB Series

Circular connectors for
special applications

Catalogue [A30.en](#)



Circular connectors for special applications, Series SB

Special connectors with machined precision contacts and rubber sealed inserts for the ultimate in weather protection

Schaltbau SB Series connectors are designed for use in rail vehicles, where they are expected to function reliably under the harsh conditions of daily operation. The connectors have proven themselves over many years in this environment!

Fitted with silver or gold plated contacts in rubber sealed insulators, the SB Series connectors are weather and water proof. The sturdy connectors feature impact resistant shells with threaded coupling for rapid, convenient connections.

Features

The connectors are typically used for systems and components that require high reliability and safety in performance, accuracy, etc.

- **Rubber sealed contacts:** Highly resistant to shock and vibration
- **Material properties:**
 - Contacts:**
 - Screw machine contacts
 - Silver/gold plated
 - Shells:**
 - Sturdy metal/plastic shells – impact resistant, UL compliant, long life
 - Sealed to IP69K when mated and IP67 when not mated, respectively
 - Threaded coupling
- Electrical and mechanical characteristics of connectors to IEC 61984




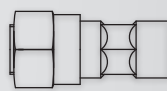



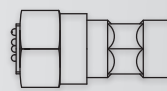



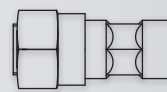
Applications

- Connection of supply line and control cable for automatic train protection systems installed in bogies of railway vehicles
- Special connector for harsh industrial applications

Series SB

Overview

Series SB

Flange mount receptacles		Plugs	
 Flange mount receptacle SB DF 5P+PE-AG	 Page 5 5+PE pin, solder terminal, silver plated	 Plug SB ST 5S+PE-AG SB ST 5S+PE-C AG	 Page 5 5+PE socket, solder terminal, silver plated 5+PE socket, crimp terminal, silver plated
 Flange mount receptacle SB DF 6S-AG SB DF 6S-AU	 Page 5 6x socket, solder terminal, silver plated 6x socket, solder terminal, gold plated	 Plug SB ST 6P-AG SB ST 6P-AU	 Page 5 6x pin, solder terminal, silver plated 6x pin, solder terminal, gold plated
 Flange mount receptacle SB DF 14P-C	 Page 6 14x pin, crimp terminal, silver plated	 Plug SB ST 14S-C	 Page 6 14x socket, crimp terminal, silver plated

Competence

For decades Schaltbau has been a well-known and competent manufacturer of products designed for use in harsh environments. Typical applications:

- Industry
- Military communications
- Traffic engineering

Based on the success of the proven industrial connectors, the high quality and reliability typical of Schaltbau is being continued by the SB Series.

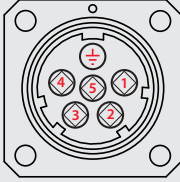
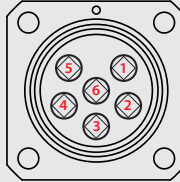
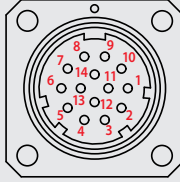
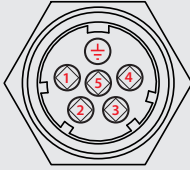
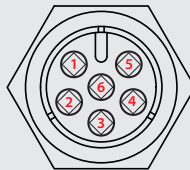
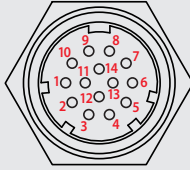















Standards

- Electrical and mechanical characteristics of connectors- in accordance with IEC 61984
- Degree of protection according to IEC 60529 (IP code)
- UL 94-V0 flammability rating of plastics used

Series SB

Specifications

Series SB

Series SB	5 pole + PE	6 pole	14 pole
Flange mount receptacles Contact arrangement ►			
View on mating face			
Insert for	pin contacts	socket contacts	pin contacts
Plugs Contact arrangement ►			
View on mating face			
Insert for	socket contacts	pin contacts	socket contacts
Rated voltage (IEC 60038) at pollution degree 3 (IEC 60512)	 115 V  Earth contact	 42 V	 20 V
Orientations / keys and keyways	1 / 5	1 / 1	1 / 5
Contacts Max. rated current of individual contact, at wire gauge 1.5 mm ² (see page 7) Contact diameter Termination	 5x 16 A Ø 4.2 mm Solder* ² , crimp* ¹	 6x 16 A Ø 4.2 mm Solder* ²	 14x 16 A Ø 1.58 mm Crimp
PE contact Contact diameter Termination	 Ø 4.2 mm Solder* ² , crimp* ¹	---	---
Max. rated current of individual contact depending on wire gauge			
Solder contacts ² 1.50 mm ²	 16 A	 16 A	---
Crimp contacts 0.50 mm ² 0.75 mm ² ... 1.00 mm ² 1.50 mm ² 2.50 mm ²	--- ---  16 A ---	--- --- --- ---	 7.5 A  10 A  16 A  16 A
Insulation resistance (IEC 60512-2)	< 5,000 mΩ at 500 V		
Temperature range	-25° C ... +60° C		
Degree of protection (EN 60529) When mated When not mated	IP69K IP67		IP69K IP69K
Test standard (EN 60068-1) (t _{min} [°C]/t _{max} [°C]/t _{testing time} [days])	-25/60/21		
Mechanical endurance (IEC 60512-5, test 9a)	2,000 mating cycles		
Materials Flange mount receptacle Plug Insert Flammability rating (PA6-GV30)	Aluminium, black anodized finish Shell: PA 6 - GV 30 / Coupling nut: Aluminium, black anodized finish Synthetic rubber / PA 6 - GV 30 UL94-V0		
Material of contacts Pin Socket Contact plating	Copper wrought alloy Copper wrought alloy with hyperboloid socket technology Silver	Copper wrought alloy Copper wrought alloy with hyperboloid socket technology Silver / Gold	Copper wrought alloy Copper wrought alloy with hyperboloid socket technology Silver



*1 Crimp termination only with plug SB ST 5S+PE-CAG

*2 Solder contacts are moulded in the insulator and cannot be removed

Ordering code

Series SB

Our SB Series connectors have a modular structure. All components of the connector are shown in the Overview on page 2.

You will find the ordering code for a connector variant as presented in this catalogue in the table opposite its dimension diagram.

• **Ordering code for »plugs and flange mount receptacles«**

Example: **SB ST 5P+PE-AG**

Series SB Designation of series

Connector style ST Plug
DF Flange mount receptacle

Contact arrangement

5P+PE	6x pin contact (PE contact, first make / last break)
5S+PE	6x socket contact (PE contact, first make / last break)
6P	6x pin contact
6S	6x socket contact
14P	14x pin contact
14S	14x socket contact

Contact type/ termination

AU	Solder, gold plated, moulded in insert, not removable
AG	Solder, silver plated, moulded in insert, not removable
C	Crimp, silver plated, (not included, order from page 6)
C AG	Crimp, silver plated, (added as loose part)

• **Ordering code for »tools«**

Example: **EWZ-4,2**

Insertion tool

EWZ-4,2	for crimp contacts B 4,2C 1,5 AG
EWZ-A	for crimp contacts SAC-xxx-Ag and BAC-xxx-Ag

Example: **AWZ-4,2**

Extraction tool

AWZ-4,2	for crimp contacts B 4,2C 1,5 AG
AWZ-A	for crimp contacts SAC-xxx-Ag and BAC-xxx-Ag

Example: **DWZ-5S+PE**

Disassembly tool

DWZ-5S+PE	for socket insert of plug SB ST 5S+PE-C AG
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Example: **CWZ-600**

Crimp tool

CWZ-600	Crimp tool for wire gauges 0.14 ... 6 mm ²
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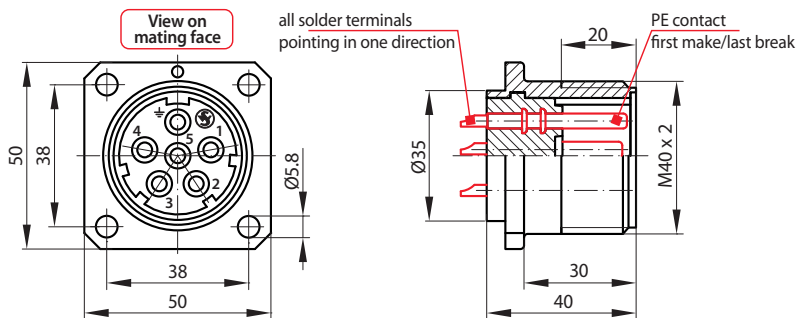
Note:
This catalogue shows only stock items.
For some variants minimum quantities apply.
Please ask for the conditions.

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 custom-sized designs. In this case minimum quantities apply.

5 pole + PE Flange mount receptacle, plug

Series SB

Flange mount receptacle with pins (solder)



Ordering code

Example: **SB DF 5P+PE-AG**

Designation of series SB

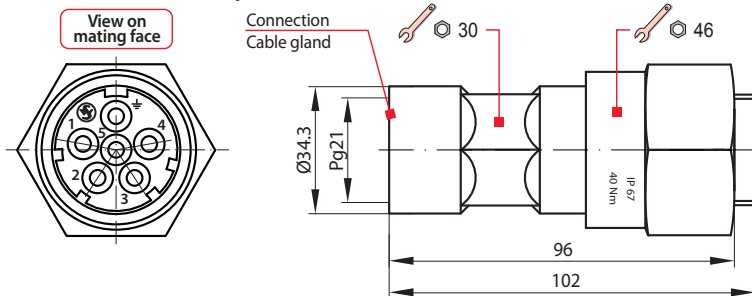
Shell style DF Flange mount receptacle

Contact type 5P+PE

Plating / termination AG

Ordering code	Description
SB DF 5P+PE-AG	Flange mount receptacle 5+PE, Pin, solder, silver plated

Plug with sockets (solder / crimp)



Ordering code

Example: **SB ST 5S+PE-AG**

Designation of series SB

Shell style ST Plug

Contact type 5S+PE

Plating / termination AG CAG

Ordering code	Description
SB ST 5S+PE-AG	Plug 5+PE, Socket, solder, silver plated
SB ST 5S+PE-C AG	Plug 5+PE, Socket, crimp, silver plated

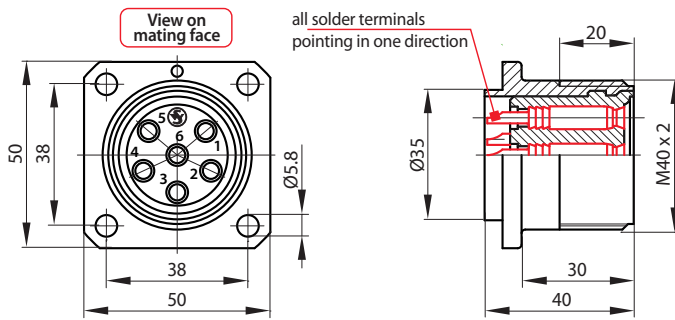
Note:

- Solder contacts are moulded in the insert and cannot be removed.
- 6x crimp contacts B 4,2C 1,5 AG added as loose parts.
- Cable gland not included, order separately as OEM part.

6-pole Flange mount receptacle, plug

Series SB

Flange mount receptacle with sockets (solder)



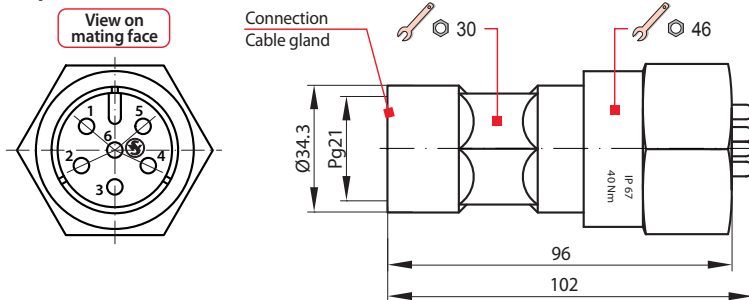
Ordering code

Example:

SB DF 6S-AGDesignation of series **SB**Shell style **DF** Flange mount receptacleContact type **6S**Plating / termination **AG AU**

Ordering code	Description
SB DF 6S-AG	Flange mount receptacle, 6x socket, solder, silver plated
SB DF 6S-AU	Flange mount receptacle, 6x socket, solder, gold plated

Plug with pins (solder)



Ordering code

Example:

SB ST 6P-AGDesignation of series **SB**Shell style **ST** PlugContact type **6P**Plating / termination **AG AU**

Ordering code	Description
SB ST 6P-AG	Plug, 6x pin, solder, silver plated
SB ST 6P-AU	Plug, 6x pin, solder, gold plated



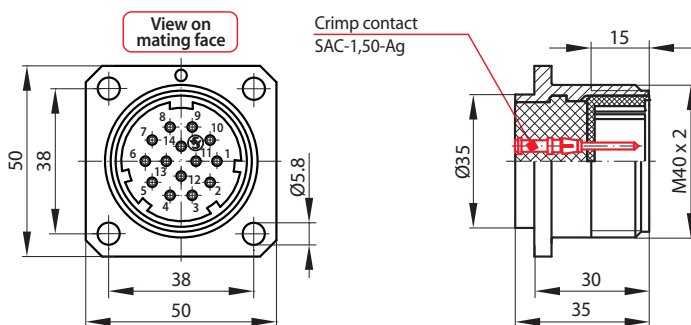
Note:

- Solder contacts are moulded in the insert and cannot be removed.
- Cable gland not included, order separately as OEM part..

14 pole Flange mount receptacle, plug

Series SB

Flange mount receptacle for pins (crimp)



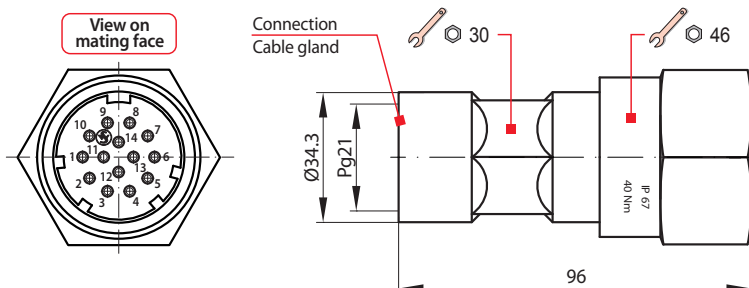
Ordering code

Example:

SB DF 14P-CDesignation of series **SB**Shell style **DF** Flange mount receptacleContact type **14P**Plating / termination **C**

Ordering code	Description
SB DF 14P-C	Flange mount receptacle, 14x pin, crimp, silver plated

Plug for sockets (crimp)



Ordering code

Example:

SB ST 14S-CDesignation of series **SB**Shell style **ST** PlugContact type **14S**Plating / termination **C**

Ordering code	Description
SB ST 14S-C	Plug, 14x socket, crimp, silver plated



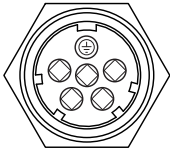
Note:

- Crimp contacts not included, order from page 6.
- Cable gland not included, order separately as OEM part..

Crimp contacts for plugs and flange mount receptacle

Series SB

● **Plug SB ST 5S+PE-C AG** Crimp-type socket

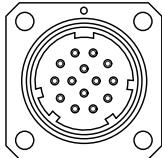


# of	Drawing	Identification	Ordering-code
5x 1x	Drawing of the crimp-type socket pin. Dimensions: diameter Ø6, length 33, and wire gauge attachment point.	---	B 4,2C 1,5 AG

Specifications

Wire-gauge	Rated current of individual contact
1.5 mm ²	16 A

● **Flange mount receptacle SB DF 14P-C** Crimp-type pin

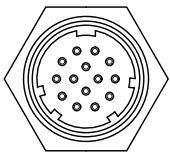


# of	Drawing	Identification	Ordering-code
14x	Drawing of the crimp-type pin. Dimensions: diameter Ø1.58, identification groove, diameter Ø3.76, length 28.6, and wire gauge attachment point.	---	SAC-0,50-Ag SAC-1,00-Ag SAC-1,50-Ag SAC-2,50-Ag

Specifications

Wire-gauge	Rated current of individual contact
0.5 mm ²	7.5 A
0.75 mm ² ... 1 mm ²	10 A
1.5 mm ²	16 A
2.5 mm ²	16 A

● **Plug SB ST 14S-C** Crimp-type socket



# of	Drawing	Identification	Ordering-code
14x	Drawing of the crimp-type socket pin. Dimensions: diameter Ø1.58, identification groove, diameter Ø3.76, length 28.6, and wire gauge attachment point.	---	BAC-0,50-Ag BAC-1,00-Ag BAC-1,50-Ag BAC-2,50-Ag

Specifications

Wire-gauge	Rated current of individual contact
0.5 mm ²	7.5 A
0.75 mm ² ... 1 mm ²	10 A
1.5 mm ²	16 A
2.5 mm ²	16 A

Tools Insertion, extraction and disassembly tools, crimp tool CWZ-600

Series SB

● **Insertion tool for crimp contacts**

Ordering code	Description
EWZ-4,2	Insertion tool for socket contacts, B 4,2C 1,5 AG
EWZ-A	Insertion tool for pin and socket contacts, SAC-xxx-Ag and BAC-xxx-Ag



● **Extraction tool for crimp contacts**

Ordering code	Description
AWZ-4,2	Extraction tool for socket contacts, B 4,2C 1,5 AG
AWZ-A	Extraction tool for pin and socket contacts, SAC-xxx-Ag and BAC-xxx-Ag



● **Disassembly tool**

Ordering code	Description
DWZ-5S+PE	Disassembly tool for socket insert, plug SB ST 5S+PE-C AG



● **Crimp tool**

Ordering code	Description
CWZ-600	Crimp tool for wire gauges 0.14 mm ² ... 6 mm ²

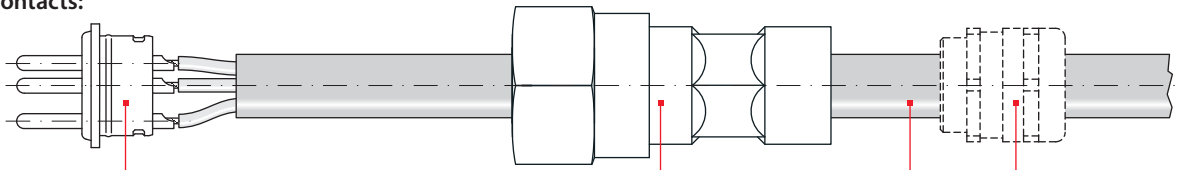


Note:
Tool for crimping of pin and socket contacts
B 4,2C 1,5 AG, SAC-xxx-Ag and BAC-xxx-Ag

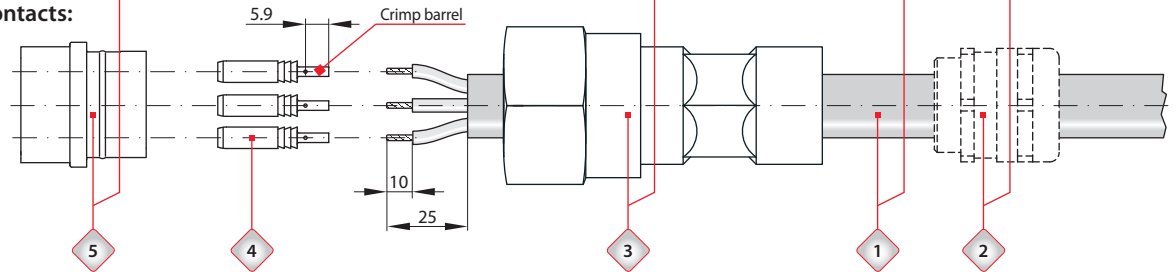
Assembly instructions

Baureihe SB

• Assembly solder contacts:



• Assembly crimp contacts:



Assembly of solder contacts

- Strip jacket of cable ① to a length of approx. 25 mm and the insulation of the stranded wires to a length of approx. 10 mm.
- Thread cable gland (OEM part) ② and connector shell ③ on cable ①.
- Solder stripped wire ends to socket insert ⑤.
- Insert socket insert ⑤ into connector shell ③ as far as it will go. Make sure that the three keys of the shell fit into the keyways of the insert. Use only alcohol as a lubricant.
- Screw cable gland (OEM part) ② into connector shell ③. When tightening the strain relief use spanner, size 30, for holding the connector shell in order to prevent torque to the socket insert.
- For the disassembly of the insert, loosen nut and cable gland and turn the connector shell to detach it from the insert. Use the recommended disassembly tool in order to extract the socket insert from the shell. The tool is designed to extract it from the mating face.

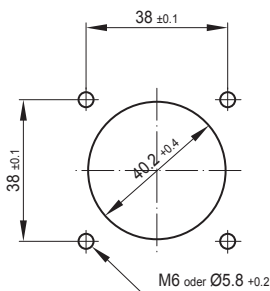
Assembly of crimp contacts

- Strip jacket of cable ① to a length of approx. 25 mm and the insulation of the stranded wires to a length of approx. 10 mm.
- Thread cable gland (OEM part) ② and connector shell ③ on cable ①.
- Crimp stripped wire ends to crimp barrels of socket contacts ④ (use crimp tool CWZ-600). Make sure the barrel is crimped in the middle between inspection hole and barrel end, see above drawing.
- Insert socket contacts ④ into socket insert ⑤ (use insertion tool EWZ-4,2). Make sure that the socket contacts are flush with the rear of the insert - except for the PE contact, which sits 2 mm deeper in the socket insert. For proper assembly it is recommended to place the socket insert with its mating face on a hard surface and to insert the contacts from the rear of the insulator as far as they will go. The contacts should always be assembled from the inside outwards.
- Insert socket insert ⑤ into connector shell ③ as far as it will go. Make sure that the three keys of the shell fit into the keyways of the insert. Use only alcohol as a lubricant.
- Screw cable gland (OEM part) ② into connector shell ③. When tightening the strain relief use spanner, size 30, for holding the connector shell in order to prevent torque to the socket insert.
- For the disassembly of the insert, loosen nut and cable gland and turn the connector shell to detach it from the insert. Use the recommended disassembly tool in order to extract the socket insert from the shell. The tool is designed to extract it from the mating face. To extract the contacts from the insert use extraction tool AWZ-4,2. Exercise some force on the contact from the front side of the insert so that the contact comes out the rear.

Mounting holes

Series SB

Flange mount receptacle / Flange plug



Note:

- Flange mount receptacles:
- SB DF 5P+PE-AG
 - SB DF 6S-AG/-AU
 - SB DF 14P-C
- are to be front mounted.

Safety instructions

Series SB

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 parts must be replaced immediately!

Reduced scale diagrams / dimensions in mm

Normal use of the connector:

According to IEC 61984 connectors are electrical components which must not be engaged or disengaged in normal use when live or under load.

Improper handling of the connector when engaging and disengaging can result in a shorter design life.

Schaltbau GmbH

For detailed information on our products and services visit
- or give us a call!

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with compliments:



Schaltbau GmbH manufactures in compliance with RoHS.



Schaltbau GmbH has an environment management system that has been certified since 2002.



Schaltbau GmbH has a quality management system that has been certified since 1994.

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