

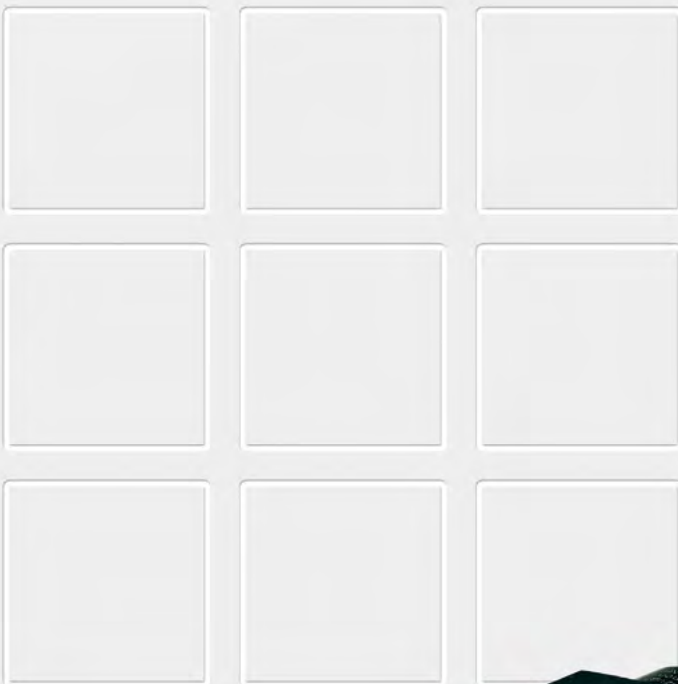
# 1

## Connectors

### SB Series

Circular connectors for  
special applications

Catalogue A30.en



more information here:  
[schaltbau-gmbh.com](http://schaltbau-gmbh.com)

## 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 or IP67 when not mated 0.35 bar 30 min.
    - 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	
SB Series Receptacles	 <b>Flange mount receptacle</b> <b>SB DF 5P+PE-AG</b> Page 5 5+PE pin, solder terminal, silver plated	 <b>Plug</b> <b>SB ST 5S+PE-AG</b> <b>SB ST 5S+PE-C AG</b> Page 5 5+PE socket, solder terminal, silver plated 5+PE socket, crimp terminal, silver plated	SB Series Plugs
	 <b>Flange mount receptacle</b> <b>SB DF 6S-AG</b> <b>SB DF 6S-AU</b> Page 5 6x socket, solder terminal, silver plated 6x socket, solder terminal, gold plated	 <b>Plug</b> <b>SB ST 6P-AG</b> <b>SB ST 6P-AU</b> <b>SB ST 6P-C AU SP</b> Page 5 6x pin, solder terminal, silver plated 6x pin, solder terminal, gold plated 6x pin, crimp terminal, gold plated	
	 <b>Flange mount receptacle</b> <b>SB DF 14P-C</b> Page 6 14x pin, crimp terminal, silver plated	 <b>Plug</b> <b>SB ST 14S-C</b> Page 6 14x socket, crimp terminal, silver plated	

### Competence

As a competent manufacturer of electrical components Schaltbau offers for use in harsh environments a range of the following connectors:

- for railway engineering (to UIC standards)
- for industrial trucks (charging connectors)
- to industry standard (circular modular connectors)
- for communications engineering (audio connectors)
- for customer-specific applications

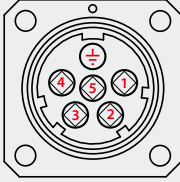
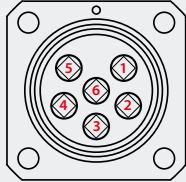
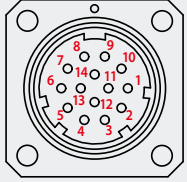

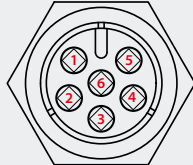
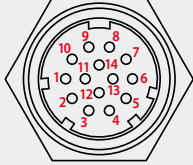















### Standards

- 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
<b>Flange mount receptacles</b> Contact arrangement ►			
View on mating face			
Insert for	pin contacts	socket contacts	pin contacts
<b>Plugs</b> Contact arrangement ►			
View on mating face			
Insert for	socket contacts	pin contacts	socket contacts
<b>Rated voltage</b> (IEC 60038) at pollution degree 3 (IEC 60512)	 115 V  Earth contact	 42 V	 20 V
<b>Orientations / keys and keyways</b>	1 / 5	1 / 1	1 / 5
<b>Contacts</b> Max. rated current of individual contact, at wire gauge 1.5 mm <sup>2</sup> Contact diameter Termination	 5x 16 A Ø 4.2 mm Solder* <sup>2</sup> , crimp* <sup>1</sup>	 6x 16 A Ø 4.2 mm Solder* <sup>2</sup> , crimp* <sup>1</sup>	 14x 16 A Ø 1.58 mm Crimp
<b>PE contact</b> Contact diameter Termination	 Ø 4.2 mm Solder* <sup>2</sup> , crimp* <sup>1</sup>	---	---
<b>Max. rated current of individual contact depending on wire gauge</b> <b>Solder contacts</b> <sup>*2</sup> 1.50 mm <sup>2</sup> <b>Crimp contacts</b> 0.50 mm <sup>2</sup> 0.75 mm <sup>2</sup> ... 1.00 mm <sup>2</sup> 1.50 mm <sup>2</sup> 2.50 mm <sup>2</sup>	 16 A --- ---  16 A ---	 16 A --- --- ---	---  7.5 A  10 A  16 A  16 A
<b>Insulation resistance</b> (IEC 60512-2)	> 50 MΩ at 500 V		
<b>Temperature range</b>	-40° C ... +85° C		
<b>Degree of protection</b> (EN 60529) When mated When not mated	IP69K Open flanged receptacle IP67		
<b>Test standard</b> (EN 60068-1) (t <sub>min</sub> [°C]/t <sub>max</sub> [°C]/t <sub>testing time</sub> [days])	-25/60/21		
<b>Mechanical endurance</b> (IEC 60512-5, test 9a)	2,000 mating cycles		
<b>Materials</b> 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 UL94-V0		Aluminium, black anodized finish Shell: PA 6 - GV 30 / Coupling nut: Aluminium, black anodized finish Synthetic rubber / PA 6 - GV 30 UL94-V0
<b>Material of contacts</b> 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

\*<sup>1</sup> Crimp termination only with plug 5-pole + PE (SB ST 5S+PE-C AG) and 6-pole (SB ST 6P-C AU SP)

\*<sup>2</sup> 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.

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

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

<b>Series</b>	SB	Designation of series
<b>Connector style</b>	ST DF	Plug Flange mount receptacle
<b>Contact arrangement</b>	5P+PE 5S+PE 6P 6S 14P 14S	6x pin contact (PE contact, first make / last break) 6x socket contact (PE contact, first make / last break) 6x pin contact 6x socket contact 14x pin contact 14x socket contact
<b>Contact type/ termination</b>	AU AG C C AG C AU SP	Solder, gold plated, moulded in insert, not removable Solder, silver plated, moulded in insert, not removable Crimp, silver plated, (not included, order from page 6) Crimp, silver plated, (added as loose part) Crimp, gold plated, (added as loose part)



#### Note:

This catalogue shows only stock items.

**For some variants minimum quantities apply.**  
**Please ask for the conditions.**

### • Ordering code for »tools«

Example: **EWZ-4,2**

<b>Insertion tool</b>	EWZ-4,2 EWZ-A	for crimp contacts B 4,2C 1,5 AG for crimp contacts SAC-xxx-Ag and BAC-xxx-Ag
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Example: **AWZ-4,2**

<b>Extraction tool</b>	AWZ-4,2 AWZ-A	for crimp contacts B 4,2C 1,5 AG for crimp contacts SAC-xxx-Ag and BAC-xxx-Ag
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Example: **DWZ-5S+PE**

<b>Disassembly tool</b>	DWZ-5S+PE	for socket insert of plug SB ST 5S+PE-C AG
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Example: **CWZ-600-1**

<b>Crimp tool</b>	CWZ-600-1	Crimp tool for wire gauges 0.14 ... 6 mm <sup>2</sup>
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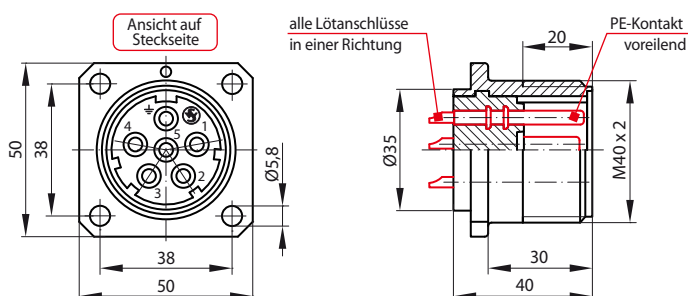
#### Special variant:

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 minimum quantities apply.

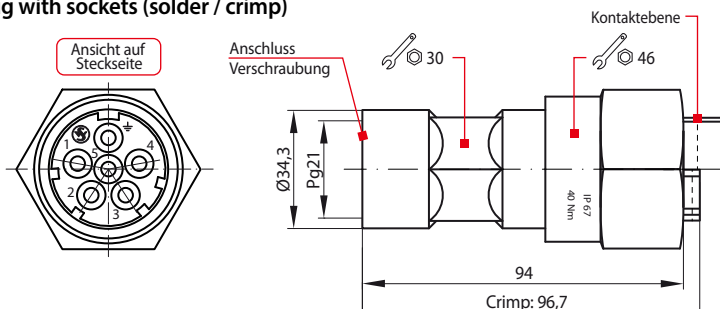
## 5 pole + PE Flange mount receptacle, plug

Series SB

### • Flange mount receptacle with pins (solder)



### • Plug with sockets (solder / crimp)



### Ordering code flange mount receptacle 5 + PE

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

### Ordering code plug 5 + PE

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



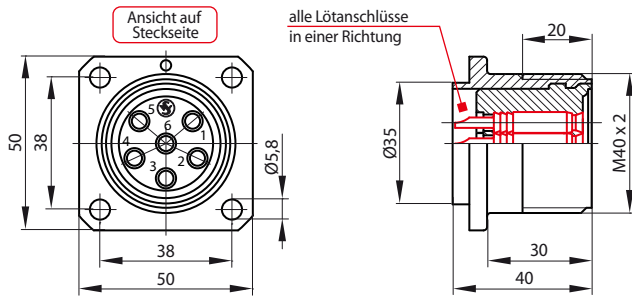
#### Note:

- 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.

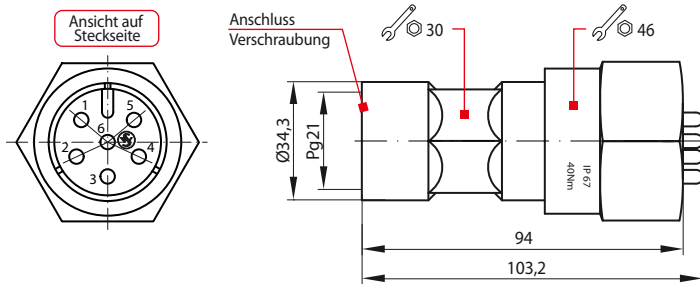
**6-pole** Flange mount receptacle, plug

Series SB

## • Flange mount receptacle with sockets (solder)



## • Plug with pins (solder / crimp)



## Ordering code flange mount receptacle 6 pole

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

## Ordering code plug 6 pole

Ordering code	Description
<b>SB ST 6P-AG</b>	Plug, 6x pin, solder, silver plated
<b>SB ST 6P-AU</b>	Plug, 6x pin, solder, gold plated
<b>SB ST 6P-C AU SP</b>	Plug, 6x pin, crimp, gold plated

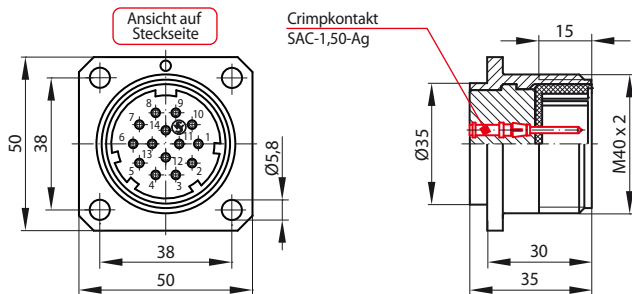
**i** Note:

- Solder contacts are moulded in the insert and cannot be removed.
- 6x crimp contacts SZC-1,50-AU added as loose parts.
- Cable gland not included, order separately as OEM part.

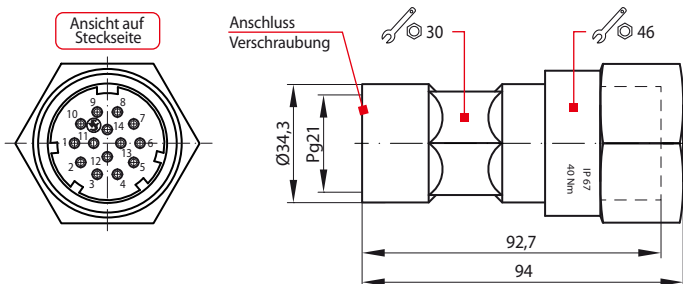
**14 pole** Flange mount receptacle, plug

Series SB

## • Flange mount receptacle for pins (crimp)



## • Plug for sockets (crimp)



## Ordering code flange mount receptacle 14 pole

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

## Ordering code plug 14 pole

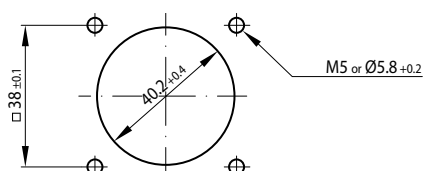
Ordering code	Description
<b>SB ST 14S-C</b>	Plug, 14x socket, crimp, silver plated

**i** Note:

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

**Mounting holes** Flange mount receptacle / Flange plug

Series SB

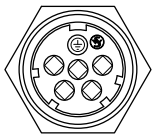
**i** Note:



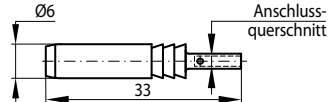
- Flange mount receptacles:
- SB DF 5P+PE-AG
  - SB DF 6S-AG/-AU
  - SB DF 14P-C
- are to be front mounted.

## Crimp contacts for plugs and flange mount receptacle

Series SB

### • Plug SB ST 5S+PE-C AG Crimp-type socket

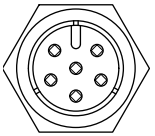



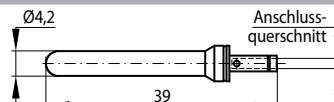
# of	Drawing	Identi- fication	Ordering- code
5x  1x 		---	B 4,2C 1,5 AG

### Specifications

Wire- gauge	Rated current of individual contact
1.5 mm <sup>2</sup>	16 A

### • Plug SB ST 6P+PE-C AU SP Crimp-type pin

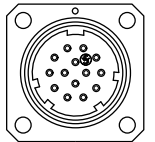



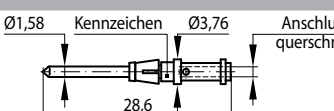
# of	Drawing	Identi- fication	Ordering- code
6x 		---	SZC-1,50-Au

### Specifications

Wire- gauge	Rated current of individual contact
1.5 mm <sup>2</sup>	16 A

### • Flange mount receptacle SB DF 14P-C Crimp-type pin

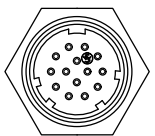



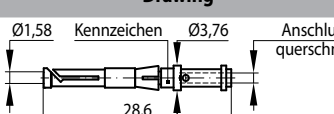
# of	Drawing	Identi- fication	Ordering- code
14x 		---	SAC-0,50-Ag SAC-1,00-Ag SAC-1,50-Ag SAC-2,50-Ag

### Specifications

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

### • Plug SB ST 14S-C Crimp-type socket



# of	Drawing	Identi- fication	Ordering- code
14x 		---	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 <sup>2</sup>	7.5 A
0.75 mm <sup>2</sup> ... 1 mm <sup>2</sup>	10 A
1.5 mm <sup>2</sup>	16 A
2.5 mm <sup>2</sup>	16 A

## Tools Insertion, extraction, disassembly and crimp tool

Series SB

### • Insertion tool for crimp contacts

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



### • Extraction tool for crimp contacts

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



### • Assembly tool

Ordering code	Assembly tool
EDZ-ST	Adapter for fixing the contact insert in the connector shell included: SB ST 5S+PE-xx, SB ST 6S-xx, SB ST 14S-xx



### • Disassembly tool

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



### • Crimp tool

Ordering code	Crimp tool
CWZ-600-1	for wire gauges 0.14 mm <sup>2</sup> ... 6 mm <sup>2</sup> Crimping of pin and socket contacts: B 4,2C 1,5 AG, SZC-1,50-AU, SAC-xxx-Ag and BAC-xxx-Ag



Reduced scale diagrams / dimensions in mm

## Installation and safety instructions

Series SB

The connectors dealt with in this catalogue are intended for use with low-voltage systems and 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.

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. Electric equipment requires protection from moisture and dust during installation, operation and storage.



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 [schaltbau.info/download1en](https://schaltbau.info/download1en). The updated catalogue renders the previous issue invalid.



**Electrical hazards: Any exposure to the connector's live parts. Risk of electrical shock!**

Observe all applicable national provisions, all safety, accident prevention and environmental regulations as well as the recognized technical rules for safe and proper working.

### Installation instructions

- 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 and signals. 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 current-carrying part of the connector – no matter whether plug or receptacle – is fitted with socket contacts.
- For optimum protection of the cable connection make sure the connector is supplied with a strain relief.
- According to IEC 60352-2 – “Solderless connections” – crimp contacts are required.
- Make sure that there is no undue strain, pressure, flexing and torsion on the cable connection.

### Safety instructions

- Carry out regular inspections of all protection and safety devices to see if they work properly.
- According to IEC 61984 connectors used as intended must not be engaged or disengaged when live or under load.
- A connector that does not engage easily requires special attention: Check for the correct orientation or if its contacts got bent or polluted. Never use force! The connector should always engage easily.
- To prevent dust and moisture from entering, make sure that the connector, when not mated, is covered by the protective cap.
- When disengaging a connector, pull the plug and never the cable.
- 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 designed for special environmental conditions as defined by “Specifications” on page 3 of this catalogue. Any use which goes beyond the limits of these specifications is not regarded as the intended use of the connector.

### Installation and maintenance instructions SB Series



For a detailed list of all safety, installation and maintenance instructions, download our manual [A30-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!



# Schaltbau GmbH

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

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with compliments:



Schaltbau GmbH manufactures in compliance with RoHS.



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
- 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