

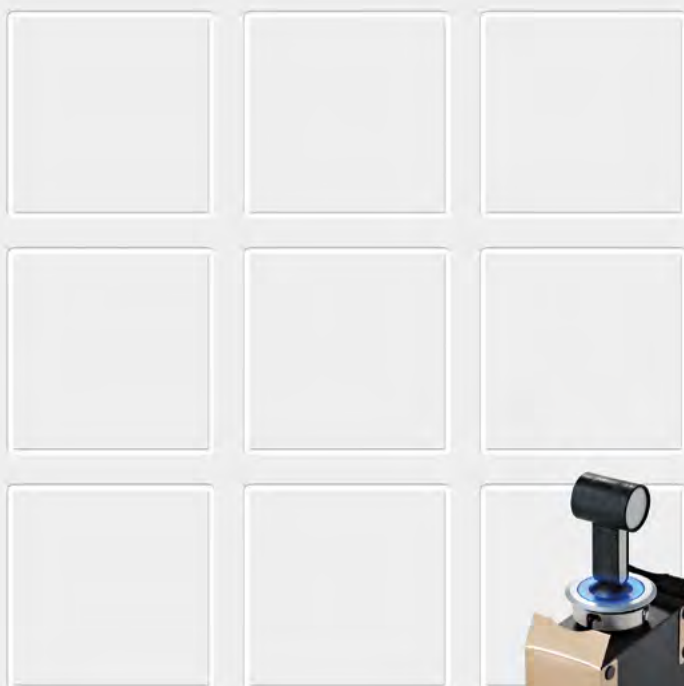
4

Electrics for rolling stock

Series K

Toggle switches
for driver's desks
of rail vehicles

Catalogue F112.en



Series K Toggle switches for driver's desks of rail vehicles

Rail vehicles in good hands – with toggle switches from Schaltbau

Toggle switch K is the newest member of the Schaltbau toggle switch family expanding the existing product range. Typical applications are driver's desks of rail vehicles but also control panels of cranes and cable cars. K Series toggle switches can be equipped with up to 8 S880 Series snap-action switches and have 5 switch settings max. and a variety of different contact positions. Following UIC 612-0 and technologically state-of-the-art

these toggle switches are compatible with the ones of the P Series. The switches are snap-in mounted and available with an illuminated ring in 5 LED colours which can be used as function indicator and makes for effective night design.

Features

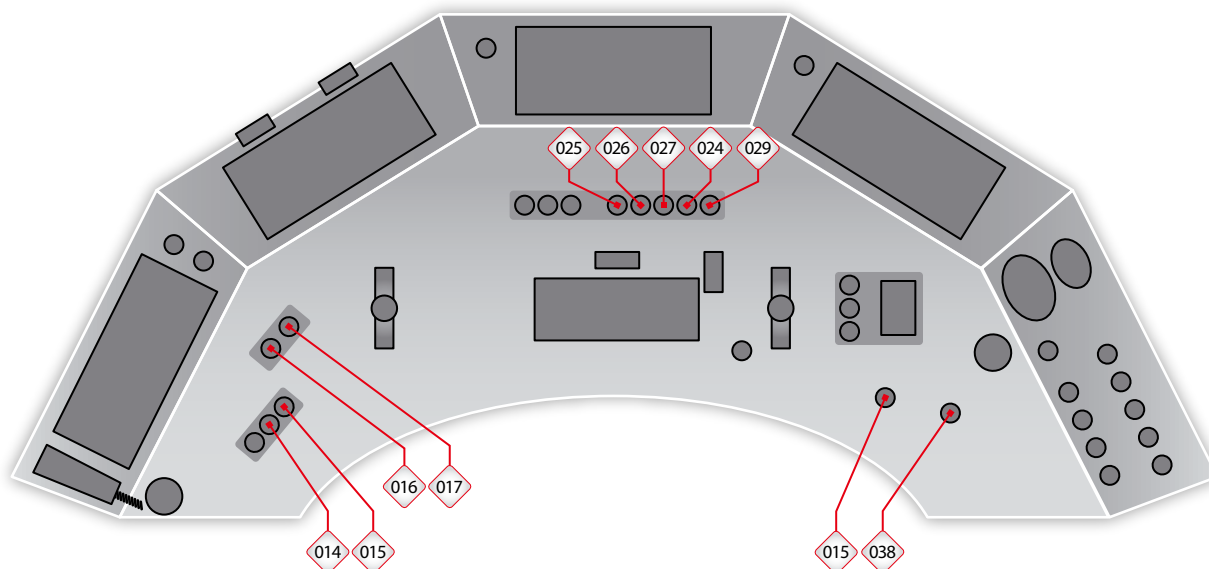
- **Design:** Award winning, elegant, distinctive, high-quality and priced competitively
- **Handle styles:** Standard handle and special handles
- **Action:** 3 and 5 switch settings, momentary and maintained operation compatible with Schaltbau's other series
- **Mounting:** Round cutout and snap-in mount. Wiring with cage clamps
- **LED illumination:** Illuminated ring in 5 LED colours used as function indicator or for night design
- **Shell:** Rugged and durable. Solid and fully sealed plastic shells. Ingress protection rating IP5X max. above mounting plate
- **Switching elements:** 8 snap-action switches S880 max.

iF product design award



Schaltbau toggle switch series K has been granted the iF product design award 20012. The award is a recognized seal for excellent product design the world over. Our toggle switch convinced the international jury with its elegant design and the quality of the materials used. It is already our second award-winning product.

Driver's desk elements to UIC 612-0



K Series toggle switches in European Driver's Desks (EUDDplus project)

The European driver's desk as specified by the EUDDplus project complies with the UIC 612-0 standard, which describes the interface between driver and driver's desk of EMUs, DMUs, locomotives and driving trailers. The project aims at an optimum ergonomic configuration of the desk elements by standardizing and harmonizing their design.

Always prepared with series K: All handle styles, switch functions and contact positions of the K Series toggle switch assemblies meet the requirements of the UIC 612-0 standard and are ideally suited for use in European driver's desks according to the EUDDplus project.

Toggle switches for driver's desk to UIC 612

No.	Function	Handle	Settings	Action
014	ETCS release intervention	Standard	3	TKNKT
015	ETCS acknowledgement	Ball, yellow	3	TKNKT
016	Pantograph / Engine	T-handle	5	TTNTS
017	Main circuit breaker / Power	Standard	3	TKNKT
024	Train lighting	Standard	3	TKNKT
025	Sanding	Ball, black	3	TKNKT
026	Release brake	Standard	3	TKNKT
027	External front lights	Standard	5	SSNSS
028	Instrument lighting	Standard	3	SKNKS
029	Task & driver's cab lighting	Standard	5	STNKT
038	External warning horn	Cylinder	3	TKNKT

Ordering code

Series K

Example:

K-SNKT 3GR CC Lb SK G P

Series

K Toggle switch K

Switch function*1

5 letters

Identification: 1 letter per handle position,
Sequence: +32°, +16°, 0°, -16°, -32°

N

Notched centre position

S

Maintained: Notched position of handle

T

Momentary: Spring return to next position / neutral position

K

No maintained or momentary action, position is left out

<none>

Position blocked*2

Contact positions*3

1 ... 9, A ... Y

1 letter or number per switching element*4 in ascending order
8 letters or numbers for 8 switching elements max.*5

Wiring

CC

Wiring with cage clamps (Push In), no screws

Illumination

<none>

No illumination (standard)

Ly

yellow

Lr

red

Lb

blue

Lg

green

Lw

white

Handle styles

<none>

Handle, straight (standard)

SH

Special handle

SK

Special handle, ball, black

SKy

Special handle, ball, yellow

SW

Special handle, T-handle, black

SM

Special handle, cylinder short, black

Contact material

<none>

Silver contacts (standard)

G

Gold contacts

Special design

<none>

No extras (standard)

P

Lead wire seal*6

*1 **Switch function:** 5 switch settings max.*2 **Blocked position:** Handle is mechanically blocked when pushed up or down.*3 **Contact position:** Letter or number for identification of contact position of each switching element, see table on page 4.*4 **Switching elements:** K Series toggle switches come with S880 Series snap-action switches. For details refer to catalogue D80.en or www.schaltbau-gmbh.com*5 **Number of switching elements:** 8 max. (with illumination 7 max.)
The contact position of each switching element is identified by 1 letter or number*6 **Lead wire seal** Only applicable to 3 and 5 position contact assemblies with blocked positions on one side.**Note:**

Only stock items are presented in this catalogue which can be supplied in short delivery time. For some variants minimum order quantities apply. Please ask for conditions.

Special variant:

If you need a special variant, do not hesitate to contact us. Maybe the type of toggle switch assembly you are looking for is among our many special designs. If not, we can also supply customized designs. In this case, however, minimum order quantities apply.

Handle styles



Standard handle



Special handle (SH)



Ball handle, black (SK)



T-handle (SW)

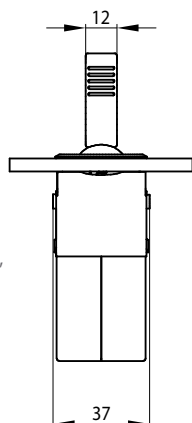
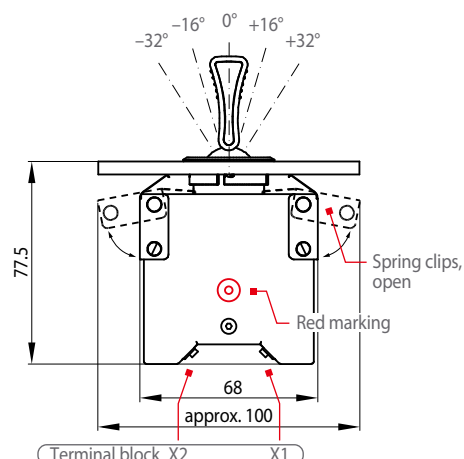


Cylinder handle (SM)

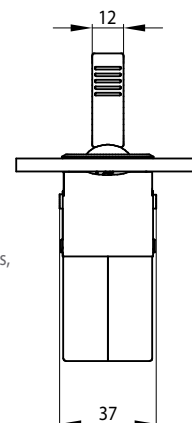
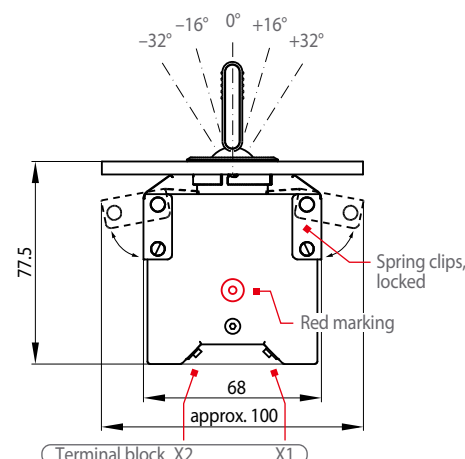
Dimension diagram, Handle styles

Series K

Standard handle



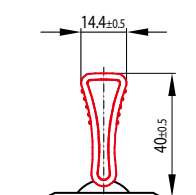
Special handle



Handle styles

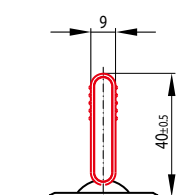
Standard handle

UIC 612-0 style B



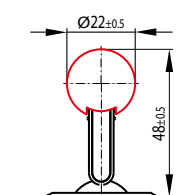
Special handle (SH)

UIC 612-0 style W



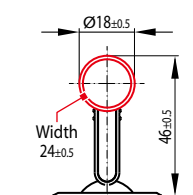
Ball handle (SK)

UIC 612-0 style K



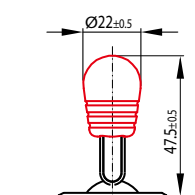
T-handle (SW)

UIC 612-0 style Z



Cylinder handle, short (SM)

UIC 612-0 style M

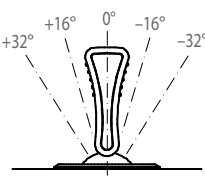


Switch function

Series K

The index defines the switch function of the handle positions and is a significant part of the ordering code.

Note: Neutral means Centre 0°.

Index	Switch function		Up	Down
		Description		
N	Neutral	Notched centre position		
S	Maintained	Notched position		
T	Momentary	Spring return to next position / neutral position (centre 0°)		
K	---	No maintained or momentary action, position is left out		
<none>	Blocked	No action at blocked position		

3 position contact assembly

Index	Handle position				
	Up +32°	Up +16°	Centre 0°	Down -16°	Down -32°
SKNKS	Maintained	---	Neutral	---	Maintained
SKNKT	Maintained	---	Neutral	---	Momentary
TKNKS	Momentary	---	Neutral	---	Maintained
TKNKT	Momentary	---	Neutral	---	Momentary

3 position contact assembly, one side blocked

Index	Handle position				
	Up +32°	Up +16°	Centre 0°	Down -16°	Down -32°
SKN	Maintained	---	Neutral	Blocked	Blocked
TKN	Momentary	---	Neutral	Blocked	Blocked
NKS	Blocked	Blocked	Neutral	---	Maintained
NKT	Blocked	Blocked	Neutral	---	Momentary

5 position contact assembly

Index	Handle position				
	Up +32°	Up +16°	Centre 0°	Down -16°	Down -32°
SSNSS	Maintained	Maintained	Neutral	Maintained	Maintained
SSNST	Maintained	Maintained	Neutral	Maintained	Momentary
SSNTS	Maintained	Maintained	Neutral	Momentary	Maintained
STNTT	Maintained	Momentary	Neutral	Momentary	Momentary
STNSS	Maintained	Momentary	Neutral	Maintained	Maintained
STNST	Maintained	Maintained	Neutral	Maintained	Momentary
STNTS	Maintained	Momentary	Neutral	Momentary	Maintained
STNTT	Maintained	Momentary	Neutral	Momentary	Momentary
TSNSS	Momentary	Maintained	Neutral	Maintained	Maintained
TSNST	Momentary	Maintained	Neutral	Maintained	Momentary
TSNTS	Momentary	Maintained	Neutral	Momentary	Maintained
TSNTT	Momentary	Maintained	Neutral	Momentary	Momentary
TTNSS	Momentary	Momentary	Neutral	Maintained	Maintained
TTNST	Momentary	Momentary	Neutral	Maintained	Momentary
TTNTS	Momentary	Momentary	Neutral	Momentary	Maintained
TTNTT	Momentary	Momentary	Neutral	Momentary	Momentary

5 position contact assembly, one side blocked

Index	Handle position				
	Up +32°	Up +16°	Centre 0°	Down -16°	Down -32°
STN	Maintained	Momentary	Neutral	Blocked	Blocked
SSN	Maintained	Maintained	Neutral	Blocked	Blocked
TTN	Momentary	Momentary	Neutral	Blocked	Blocked
TSN	Momentary	Maintained	Neutral	Blocked	Blocked
NST	Blocked	Blocked	Neutral	Maintained	Momentary
NSS	Blocked	Blocked	Neutral	Maintained	Maintained
NTT	Blocked	Blocked	Neutral	Momentary	Momentary
NTS	Blocked	Blocked	Neutral	Momentary	Maintained

Lead wire seal

Series K

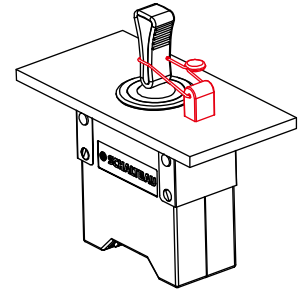
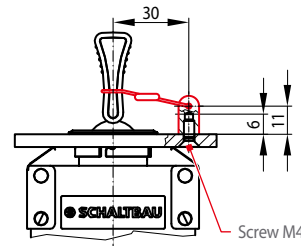
Toggle switches should be provided with a lead wire seal for additional security to prevent unauthorised or accidental operation or to make visible that the switch had been activated in some kind of an override operation.

How to order

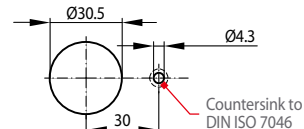
Add option «P» to the ordering code of your order: The lead wire seal is then furnished unassembled with the toggle switch that you have configured.

For assembly push the sealing wire through the hole in the toggle switch handle and fasten the wire holder with the M4 countersunk screw onto the front plate of the toggle switch, see opposite figure.

Lead wire seal:



Mounting holes:



Note:

The lead wire seal can only be used with 3 and 5 position contact assemblies with blocked upside or downside positions.

Illuminated ring (LED)

Series K

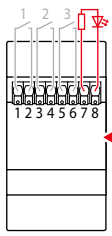





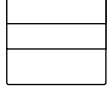


You can order the toggle switch assembly you configure with an optional illuminated ring under the switch handle. The ring is available in 5 LED colours, see ordering code on page 3:

- **Yellow** Option «Ly»
- **Red** Option «Lr»
- **Blue** Option «Lb»
- **Green** Option «Lg»
- **White** Option «Lw»

Benefits:

- The LED illuminated ring makes separate function and indication lights superfluous, thus saving space in the confined driver's cab as well as the costs of additional equipment.
- Illumination is dimmable by way of PWM or voltage controller.
- The dimmable and consistent illumination of the switch makes for an effective night design.
- The terminals are externally accessible for maximum flexibility of control.

Connection assignment for illuminated toggle switch

Number of switching elements	1 ... 3	4 ... 7
Connection LED illumination		
Terminal block X1		
Red marking		
Terminal block X2		
Connection LED illumination		



Connection of LED illumination:

Via terminals 7 and 8. Depending on the number of switching elements fitted to the toggle switch make sure to differentiate between terminal block X1 and X2.

- 1 ... 3 switching elements: Terminal block X1: Terminal 7 (+), Terminal 8 (-)
- 4 ... 7 switching elements: Terminal block X2: Terminal 7 (+), Terminal 8 (-)

Switching elements

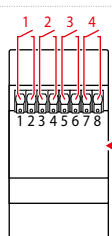
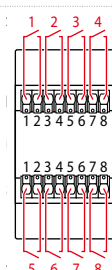
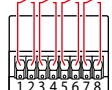
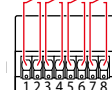


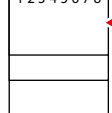
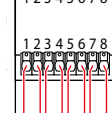

Series K

Number of: K Series toggle switch assemblies can be fitted with 8 snap-action switches max. If you want to order an LED illuminated toggle switch, please note that the maximum number of switching elements is then reduced to 7.

Connection assignment: Depending on their number, switching elements are to be connected to either terminal block X1 or X2. For assemblies with no more than 4 switching elements only terminal block X1 is needed, that is to say that terminal block X2 can be ignored. So make sure not to confuse the terminal blocks:

- Switching elements 1 ... 4: Terminal block X1
- Switching elements 5 ... 8: Terminal block X2

Connection assignment switching elements

Number of switching elements	1 ... 4	5 ... 8
Snap-action switch		
Terminal block X1		
Red marking		
Terminal block X2		
Snap-action switch		



Switching elements:

K Series toggle switch assemblies come fitted with Schaltbau S880 Series SPDT snap-action switches. Responsible for any switching operation is only the positively driven NC contact of the changeover switch. For further information please refer to our catalogue D80.en or visit our website at www.schaltbau-gmbh.com

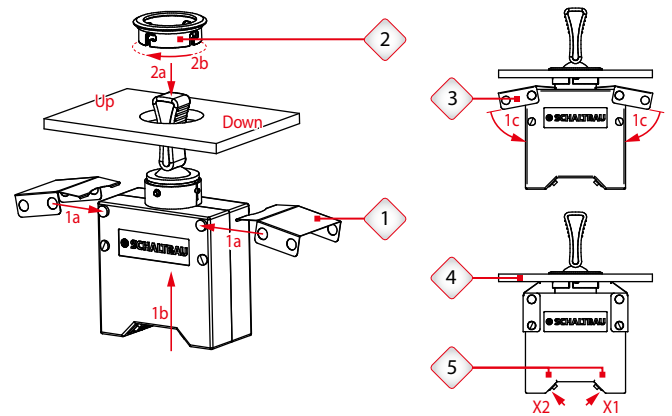
Installation instructions

Series K

Mount switch:

Round cutout and snap-in panel mount – no special mounting tool required.

- Snap mounting clips (1) onto mounting points (1a). Keep clips open in this position and push toggle and bushing of the switch through hole in front plate (1b).
- Mounting position: The toggle switch is properly mounted when the red marking is, seen from the top, on the right hand side.
- Place bayonet locking ring (2) with seal (2a) over them and lock tight.
- Push both mounting clips (1) firmly home by approx. 90° (1c) until they are clipped in position.
- Toggle switch (3) finally mounted.
- Wire switch: Connect wires to push-in terminals of terminal blocks (4) X1 and X2, see also paragraph Wiring at bottom of page.



Mounting:

No special tool is needed for mounting the switch. Pushing home the mounting clips is all you need for a successful installation.

Dismount switch:

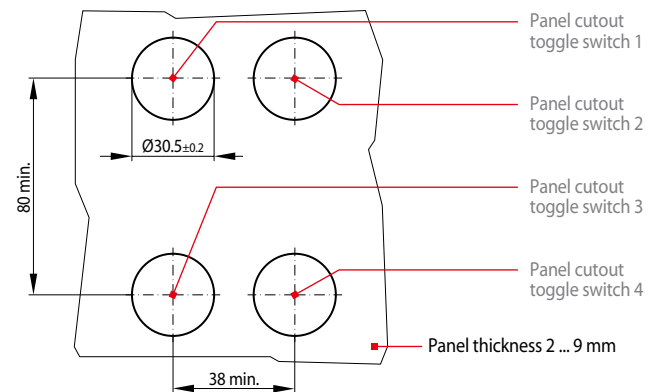
For dismounting the switch Schaltbau offers a special tool for prying open the mounting clips that has to be ordered separately.

Panel cutout:

The size of the mounting hole is $\varnothing 30.5$ mm, the same as for most push-button switches installed in driver's cabs.

The figure on the right depicts a UIC compliant mounting template giving the minimum distances for Schaltbau K Series toggle switches.

Make sure that these minimum distances are respected!



Wiring:

Series K toggle switches feature PCB terminals with a push-in conductor connection system. Unlike cage clamps the wire need not be screwed to the terminal but can directly be pushed in to it. This option saves a lot of time on wiring.

For wire gauges to be observed when wiring refer to the table on the right.

Conductor	Wire gauges in AWG	
	Min.	Max.
Wire	25	14
Lead	25	14
Ferrule to DIN 46228/1	24	14
Ferrule to DIN 46228/4	24	18



Note:

K Series toggle switches have a fully insulated plastic casing. A separate ground connection is, therefore, not necessary.

Standards

Series K

Selection of applicable standards

- **NF F 16-101:** Railway Rolling Stock, Fire Behaviour, Choice of Materials
- **NF F 16-102:** Railway Rolling Stock, Fire Behaviour, Choice of Materials, Application to Electrical Equipment
- **DIN 5510-2:** Preventive fire protection in railway vehicles - Part 2: Fire behaviour and fire side effects of materials and parts - Classification, requirements and test methods
- **CEN/TS 45545-2:** Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behaviour of materials and components
- **UIC 612:** Driver machine interfaces for EMU/DMU, locomotives and driving coaches - Functional and system requirements associated with harmonised driver machine interfaces
- **EN 50155:** Railway applications - Electronic equipment used on rolling stock
- **EN 50124-1:** Railway applications - Insulation coordination - Part 1: Basic requirements - Clearances and creepage distances for all electrical and electronic equipment
- **IEC 60068-2-1:** Environmental testing - Part 2-1: Tests - Test A: Cold
- **IEC 60068-2-2:** Environmental testing - Part 2-2: Tests - Test B: Dry heat
- **IEC 60068-2-38:** Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test
- **IEC 60529:** Degree of protection provided by enclosures (IP-Code)
- **IEC 61373:** Railway applications - Rolling stock equipment - Shock and vibration tests

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