

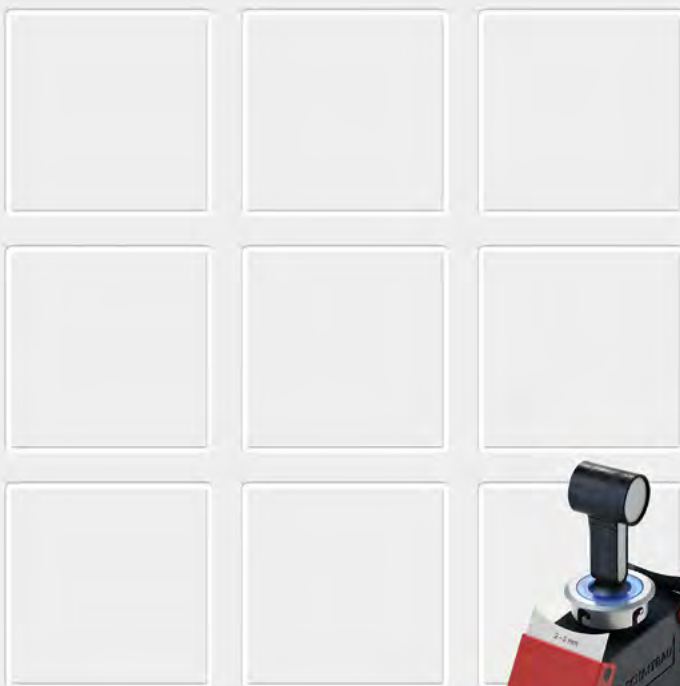
# 4

## Electrics for rolling stock

Series K

Toggle switches  
for drivers' desks  
of rail vehicles

Catalogue F112.en



## Series K Toggle switches for drivers' 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 drivers' 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

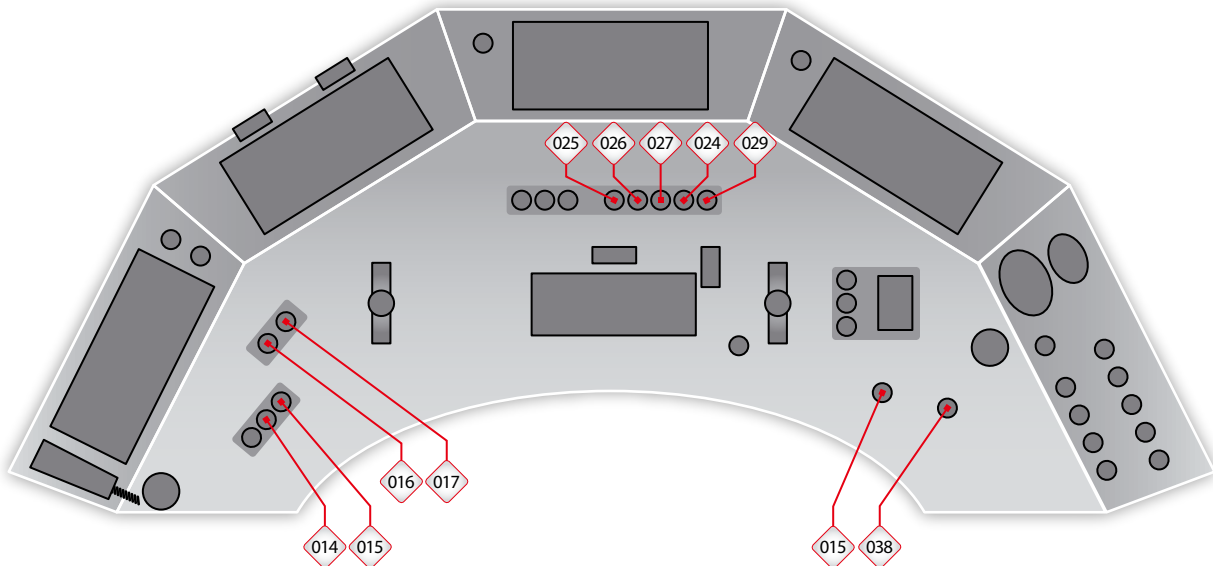
- **Design:** Award winning, elegant, distinctive, high-quality and priced competitively
- **Handle styles:** Standard handle and special handles
- **Action:** 3 and 5 switch settings, momentary and maintained operation compatible with Schaltbau's other series
- **Mounting:** Bushing mount, round panel hole. 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 IP50 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 2012. 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



### K Series toggle switches in European drivers' 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.

Toggle switches for driver's desk				
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-SKNKT 3GR CC Lb SK G P S**

### Series

K	Toggle switch K
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### Switch function\*1

5 letters	Identification: 1 letter per handle position, Sequence: +32°, +16°, 0°, -16°, -32°
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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
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### Wiring

CC	Wiring with cage clamps (Push In), no screws
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### 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

### Sealing

<none>	No extras (standard)
P	Lead wire seal*6

### Mounting method

<none>	Bushing mount - plus toggle latches (standard)
S	Bushing mount - plus screwing device*7

\*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](http://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.

\*7 **Mounting method** There is the option of a screwing device you can use instead of the toggle latches.



### 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)



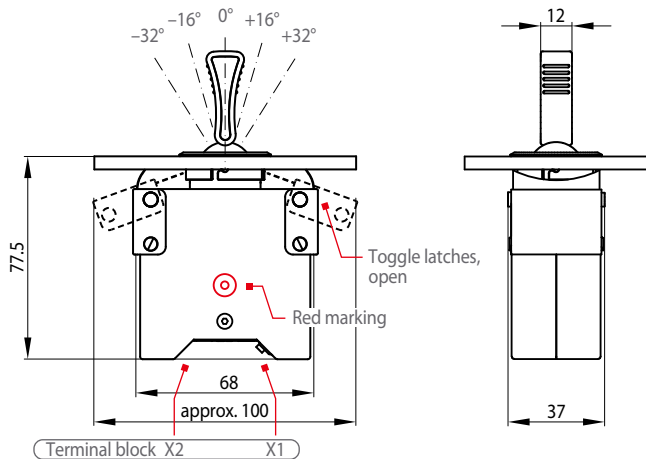
Cylinder handle (SM)



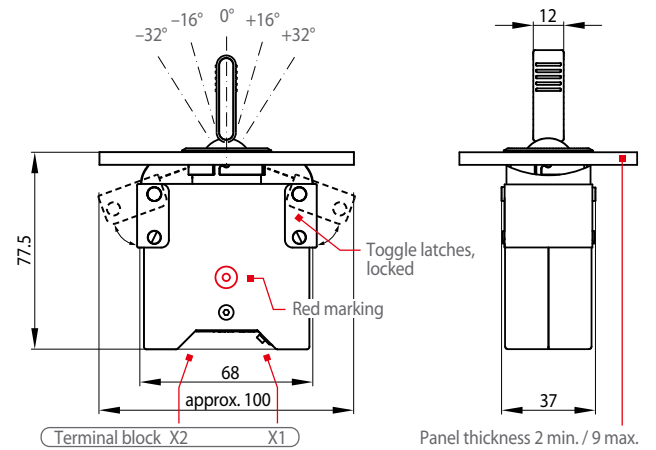
**Dimension diagram, Handle styles**

Series K

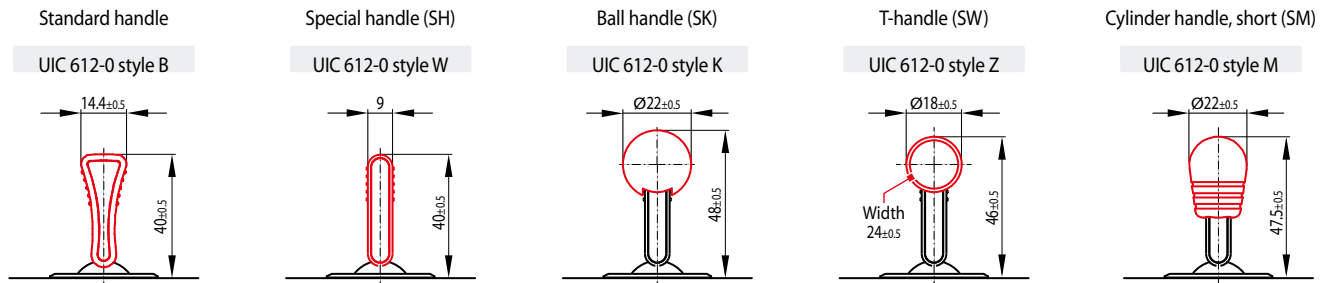
**Standard handle**



**Special handle**



**Handle styles**



**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	Description	Up	Down
<b>N</b>	Neutral	Notched centre position		
<b>S</b>	Maintained	Notched position		
<b>T</b>	Momentary	Spring return to next position / neutral position (centre 0°)		
<b>K</b>	---	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°
<b>SKNKS</b>	Maintained	---	Neutral	---	Maintained
<b>SKNKT</b>	Maintained	---	Neutral	---	Momentary
<b>TKNKS</b>	Momentary	---	Neutral	---	Maintained
<b>TKNKT</b>	Momentary	---	Neutral	---	Momentary

**3 position contact assembly, one side blocked**

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

**5 position contact assembly**

Index	Handle position				
	Up +32°	Up +16°	Centre 0°	Down -16°	Down -32°
<b>SSNSS</b>	Maintained	Maintained	Neutral	Maintained	Maintained
<b>SSNST</b>	Maintained	Maintained	Neutral	Maintained	Momentary
<b>SSNTS</b>	Maintained	Maintained	Neutral	Momentary	Maintained
<b>STTTT</b>	Maintained	Momentary	Neutral	Momentary	Momentary
<b>STNSS</b>	Maintained	Momentary	Neutral	Maintained	Maintained
<b>STNST</b>	Maintained	Maintained	Neutral	Maintained	Momentary
<b>STNTS</b>	Maintained	Momentary	Neutral	Momentary	Maintained
<b>STNTT</b>	Maintained	Momentary	Neutral	Momentary	Momentary
<b>TSNSS</b>	Momentary	Maintained	Neutral	Maintained	Maintained
<b>TSNST</b>	Momentary	Maintained	Neutral	Maintained	Momentary
<b>TSNTS</b>	Momentary	Maintained	Neutral	Momentary	Maintained
<b>TSNTT</b>	Momentary	Maintained	Neutral	Momentary	Momentary
<b>TTNSS</b>	Momentary	Momentary	Neutral	Maintained	Maintained
<b>TTNST</b>	Momentary	Momentary	Neutral	Maintained	Momentary
<b>TTNTS</b>	Momentary	Momentary	Neutral	Momentary	Maintained
<b>TTNTT</b>	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°
<b>STN</b>	Maintained	Momentary	Neutral	Blocked	Blocked
<b>SSN</b>	Maintained	Maintained	Neutral	Blocked	Blocked
<b>TTN</b>	Momentary	Momentary	Neutral	Blocked	Blocked
<b>TSN</b>	Momentary	Maintained	Neutral	Blocked	Blocked
<b>NST</b>	Blocked	Blocked	Neutral	Maintained	Momentary
<b>NSS</b>	Blocked	Blocked	Neutral	Maintained	Maintained
<b>NTT</b>	Blocked	Blocked	Neutral	Momentary	Momentary
<b>NTS</b>	Blocked	Blocked	Neutral	Momentary	Maintained

## Switching elements

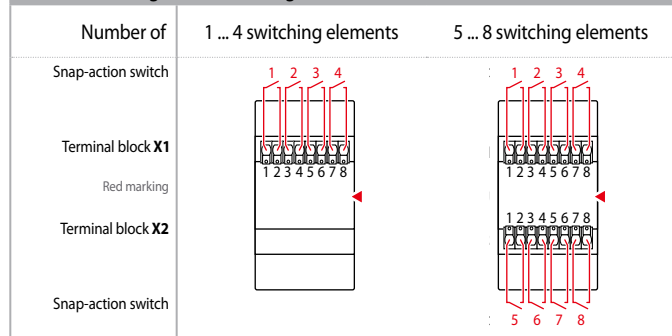
Series K

**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



#### Connection assignment of terminal blocks X1 and X2:

We will deliver the toggle switch assembly you have configured with the specific terminal assignment marked on its bottom. Please ask for the exact connection assignment.



#### 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](http://www.schaltbau-gmbh.com)

## Illuminated ring (LED)

Series K

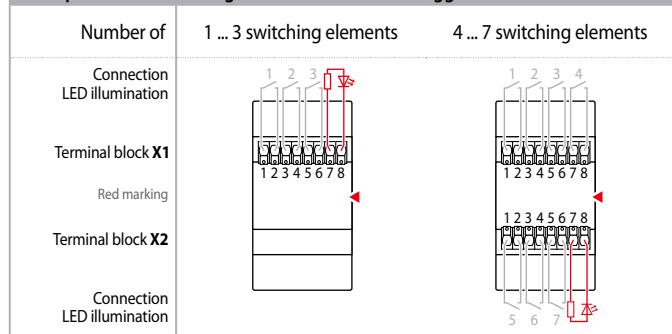
You can order the toggle switch assembly you configure with an optional illuminated ring under the switch handle. The ring is available in 5 LED colours, see ordering code on page 3:

- **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.

### Example: connection assignment for illuminated toggle switch



#### 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. Please ask for the exact connection assignment.

## Standards

Series K

K toggle switches following applicable standards, such as:

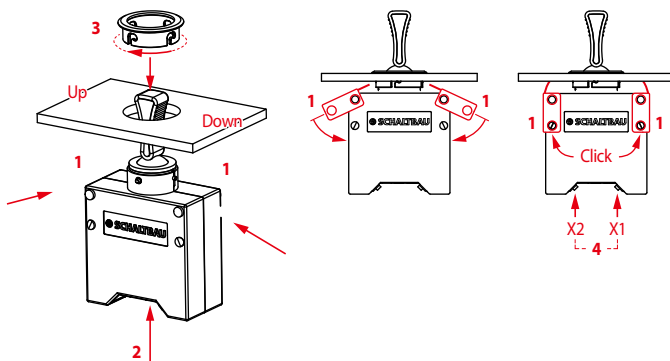
- **NF F 16-101:** Railway Rolling Stock, Fire Behaviour, Choice of Materials
- **NF F 16-102:** Railway Rolling Stock, Fire Behaviour, Choice of Materials, Application to Electrical Equipment
- **DIN 5510-2:** Preventive fire protection in railway vehicles – Part 2: Fire behaviour and fire side effects 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

## Mounting instructions

Series K

**Bushing mount - plus toggle latches (no special tools required), Standard**  
 Item number for ordering spares: 1-2733-337377

- Bring toggle latches (1) into mounting position and keep them open (1a)
- Push toggle and bushing of the switch through hole in front plate (2).
- Place bayonet lock ring (3) on top of the switch and lock tight.
- Push both toggle latches (1) firmly home by approx. 90° until they are latched in position.  
Toggle switch finally mounted.
- Wiring: Connect wires to push-in terminals of terminal blocks (4), see also paragraph Wiring.



- Mounting:** No special tools are required here. Push both toggle latches firmly home until they are clipped in position.  
**Dismounting:** For prying open the toggle latches a simple screwdriver will do the job.

### Wiring:

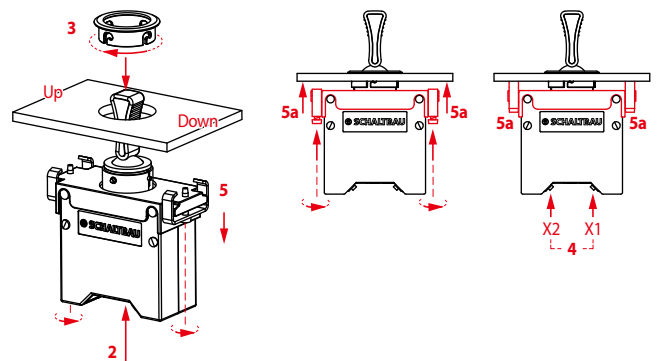
Depending on the number of switching elements, K Series toggle switches come with either 1 or 2 terminal blocks X1 and X2. Unlike cage clamps the wire need not be screwed to the terminal but can directly be pushed in to it.

- Be sure to use the right size wire connector. For correct wire gauges refer to the table »Terminal block X1, X2« below.
- Two leads with ferrules can be connected to one cage clamp terminal. In this case, however, the use of twin wire end ferrules is required according to IEC 60999-1.
- K Series toggle switches have a fully insulated plastic casing. A separate ground connection is, therefore, not necessary.

Terminal block X1, X2 Terminal style	Wire gauges (AWG)	
	Min.	Max.
Wire or lead, stripped 1 cm	24	15
Ferrule to DIN 46228/1	23	15
Ferrule to DIN 46228/4	23	18

**Bushing mount - plus screwing device, optional**  
 Item number: 1-1733-337107

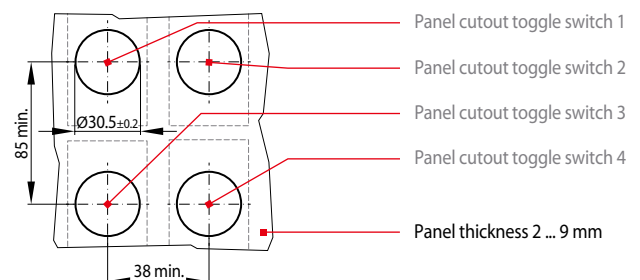
- Remove toggle latches (1), see figures on the left, and place screwing device (5) on top of toggle switch.
- Push toggle and bushing of the switch through hole in front plate (2).
- Place bayonet lock ring (3) on top of the switch and lock tight.
- Press brackets (5a) of screwing device (5) into underside of front plate by tightening both screws.  
Toggle switch finally mounted.
- Wiring: Connect wires to push-in terminals of terminal blocks (4), see also paragraph Wiring.



- Final check:**  
 The toggle switch is mounted properly when, viewed from the top, the red marking is on the right hand side.

### Panel cutout:

- The size of the mounting hole is  $\varnothing 30.5$  mm, the same as for most push-button switches installed in drivers' 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 observed!



## Lead wire seal

Series K

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

**Option «P»** (see Ordering code on page 3):

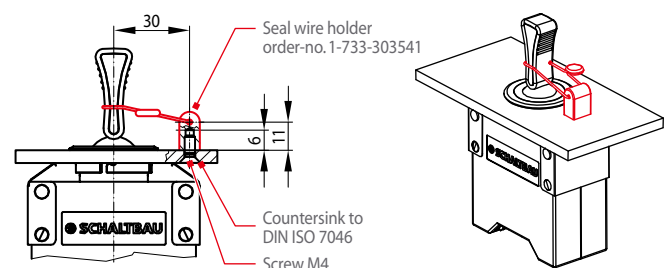
An additional hole in the lever allows the inclusion of the seal wire.

**The seal wire holder must be ordered separately.**

**Order no. 1-733-303541**

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.

Specifications are subject to alteration without prior notice / Dimensions in mm



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

# 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