Snap-Action Switches
S826, S926 series
Dual changeover switches with positive opening operation and wiping contacts
Catalogue D26.en
Snap-action switches, S826 and S926 series

Dual changeover switches with positive opening operation and wiping, double-break contacts

Schaltbau S826 and S926 series dual changeover switches feature positive opening operation which guarantees the forced disconnection of contacts even when they have become welded together due to a short-circuit.

The contact bridges of the snap-action switches are galvanically isolated allowing two separate load circuits with independent voltage levels to be controlled simultaneously. Wiping, double-break contacts ensure high reliability even at low electrical loads. Versions with optional gold contacts are particularly suitable for handling low currents and voltages. A defined and repeatable switching action is possible thanks to the snap mechanism whose switching speed is virtually independent of the speed of the button or actuator. That is why snap-action switches are preferred in applications with slow actuation speeds in which they are used, for instance, as motor switches, position switches, or gear limit switches.

Features

Variants for extreme conditions: Ruggedized housing made from polyetherimide (PEI). Designed for use in harsh environments. Improved resistance to chemicals, impact and extremes of temperature.

Positive opening operation: Reliable breaking of the normally closed (NC) circuit even if the contacts have become welded together, in compliance with IEC 60947-5-1, Annex K.

Dual changeover switch: Changeover switch with galvanically isolated contact bridges for double-break NC and NO contacts. Thus two separate load circuits can be controlled simultaneously.

Ingress protection rating (IP code): Degrees of protection against dust, humidity, contaminants, or access to hazardous parts to IEC 60529:
Contacts: IP40 / Terminals: IP00

Wiping, double-break contacts: Continuous low contact resistance ensures high contact reliability over the life of the switch.

Contact material: Silver or gold

Design and function

Actuator
- Standard: push button
- Auxiliary actuator: roller lever

Mounting
- Front mount
- Side mount (ganging)

Contact area
- Dual changeover switch, galvanically isolated
- Positive opening operation and self-cleaning contacts
- Contact material: silver or gold

Terminals
- M3 screws with saddle clamp
- Flat tabs 6.3 x 0.8
- M3 screws with spring washer

Series 9

Applications

Schaltbau snap-action switches are typically used with systems and components that require a high degree of safety and reliability, such as
- Limit switches for machine, door and plant control systems
- Control switches for the driver's desk of rail vehicles or crane consoles
- Switching elements for automation
- Safety limit switches for control systems and plant controls

Variants for extreme conditions

Schaltbau has developed special variants for use in harsh environments. The S926 series has a ruggedized housing made from polyetherimide (PEI) that stands for improved resistance to:
- temperatures from -55 °C to +85 °C
- chemicals (e.g. acids and alkalis)
- impact (PEI more resistant than PC)

The amber, transparent switches are ideally suited for applications where impact forces are high and/or frequent as well as for use in products that are exposed to strong chemicals or extremes of temperature.

The S9xx series switches have the same design, dimensions and technical features as the switches of the standard S8xx series, allowing for easy replacement and upgrade from a standard switch without additional implementation effort.

S926
Better

Resistance to
- temperature
- chemicals
- impact

Specifications subject to alterations!
### Ordering code

**Example:** S826 b10/20/40 L

#### Series, contact configuration

**S826**
- Dual changeover switch, wiping double-break contacts, positive opening operation, galvanically isolated contact bridges

**S926**
- Same as S826 with improved resistance to chemicals, impact and extremes of temperature

#### Actuator styles

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>Push button, no mounting plates</td>
</tr>
<tr>
<td>c</td>
<td>Push button, mounting plates</td>
</tr>
<tr>
<td>cs</td>
<td>Push button, mounting plates, slotted</td>
</tr>
<tr>
<td>e</td>
<td>Roller lever, no mounting plates</td>
</tr>
<tr>
<td>a</td>
<td>Roller lever, mounting plates</td>
</tr>
<tr>
<td>as</td>
<td>Roller lever, mounting plates, slotted</td>
</tr>
<tr>
<td>d</td>
<td>Roller lever, mounting plates, one angled</td>
</tr>
</tbody>
</table>

#### Contact material

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Silver</td>
</tr>
<tr>
<td>10</td>
<td>Gold</td>
</tr>
</tbody>
</table>

#### Special design, optional

- Magnetic blowout
- Actuating and release force
  - standard
  - reinforced
- Terminals
  - *
  - 20
  - 24
  - 30

#### Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Identification</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP rating: contacts / terminals</td>
<td>IP40/20</td>
<td></td>
</tr>
<tr>
<td>Actuator styles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Push button (standard), no mounting plates</td>
<td>b</td>
<td></td>
</tr>
<tr>
<td>Push button, mounting plates</td>
<td>c</td>
<td></td>
</tr>
<tr>
<td>Push button, mounting plates, slotted</td>
<td>cs</td>
<td></td>
</tr>
<tr>
<td>Roller lever, no mounting plates</td>
<td>e</td>
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<tr>
<td>Roller lever, mounting plates</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Roller lever, mounting plates, slotted</td>
<td>as</td>
<td></td>
</tr>
<tr>
<td>Roller lever, mounting plates, one angled</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>Series</td>
<td>S826 / S926</td>
<td></td>
</tr>
<tr>
<td>Contact material</td>
<td>* 10</td>
<td></td>
</tr>
<tr>
<td>Actuating and release force</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnetic blowout (special design)</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Terminal styles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M3 screws with saddle clamp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat tabs 6.3x0.8</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Flat tabs 6.3x0.8, angled 90°</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>M3 screws with spring washer</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

#### Note:

This product catalogue comprises only stock items. For some variants minimum quantities apply. Please ask for conditions.

**Special variants:**
- If you need a special variant of the switch, please do not hesitate to contact us. Maybe the type of switch you are looking for is among our many special designs. If not, we can also supply customized designs. In this case minimum quantities apply.
- * No index
## Specifications

<table>
<thead>
<tr>
<th>Series</th>
<th>Standard</th>
<th>S826 / S926</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact configuration</td>
<td>IEC 60947</td>
<td>Form Zb SPDT-DB, 2 galvanically isolated contact bridges, 4 terminals</td>
</tr>
<tr>
<td>Conventional thermal current $I_{th}$</td>
<td>IEC 60947 / UL 508</td>
<td>$10 \text{ A at } T = 85^\circ \text{C}$ / $5 \text{ A at } T = 85^\circ \text{C}$</td>
</tr>
<tr>
<td>Rated insulation voltage $U_i$</td>
<td>IEC 60947 / UL 508</td>
<td>400 V / 300 V</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>IEC 60947 / UL 508</td>
<td>PD3 / S826: PD3 / S926: PD2</td>
</tr>
<tr>
<td>Rated impulse withstand voltage $U_{imp}$</td>
<td>IEC 60947</td>
<td>4 kV</td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>IEC 60947 / UL 508</td>
<td>OV3 / OV3</td>
</tr>
<tr>
<td>Utilization category for silver contacts</td>
<td>IEC 60947 / UL 508</td>
<td>AC-15: 230 V AC / 1.0 A / DC-13: 110V DC / 0.5 A</td>
</tr>
</tbody>
</table>

### Notes:
- Data valid for new switches under laboratory conditions and at room temperature, unless otherwise mentioned.
- *1 Valid for flat tab terminal styles. Values for M3 screws terminal styles are: 250 V: PD3 / 400 V: PD2
- *2 Data for gold contacts upon request
- *3 General Purpose
- *4 Measured next to push button

### Additional Specifications:
- Contact gap, typ.: 2x 0.85 mm
- Contact force, typ.: 0.4 N min.
- Contact resistance, typ. without leads connected: 100 mΩ
- Positive opening force: 20 N
- Actuator travel for positive opening operation: see page 5
- Maximum actuator travel: 3.2 mm
- Actuating speed: 1 m/s max. 0.5 mm/s min.
- Vibration resistance, 10 … 500 Hz all directions (without aux. actuator at 0.1 ms max. opening time): 10 g
- Shock resistance (without aux. actuator at 0.1 ms max. opening time): 30 g, half sinus
- Short-circuit protection for silver contacts: 6 A gR
- Max. operating frequency: 465 cycles/minute
- Actuating force: 3.6 N / 5.5 N
- Release force: 0.2 N / 2.0 N
- Ingress protection rating (IP code):
  - Contacts: IP40
  - Terminals: IP00
- Mechanical endurance: 10 million cycles, min.
- Ambient temperature range: S826: −40 °C … +85 °C / S926: −55 °C … +85 °C
- Material:
  - Contacts: Hard silver (AgCu3) or gold (AuAg26Ni3)
  - Terminals: Brass, silver-plated or gold plated
  - Housing: S826: PC, green, transparent / S926: PEI, amber, transparent
- Mounting position: any
- Weight: approx. 20 g
- Approvals:...
### Dimension diagram, circuit diagram

- **Dimension diagram S826 b / S926 b**: SPDT-DB, Form Zb

### Actuator styles, actuator positions

- **S826 / S926, Push button (standard) [b] / [c] / [cs]**

- **S826 / S926, Roller lever [e] / [a] / [as] / [d]**

### Note:
To ensure proper operation of the positive opening function it is necessary to depress the plunger to the point of total positive opening travel. However, it must not be pushed beyond total travel position.

Data is valid for new switches.
Mounting | Front mount, Ganging
--- | ---

Front mount
- No mounting brackets (standard): Fastening by way of the retainer nuts (M3) which are fixed in the housing of the switch. Tightening torque 0.9 Nm max.
- With mounting brackets: Mounting brackets are available for all actuator options. Tightening torque 0.9 Nm max.
- Push button (standard) no mounting brackets | style [b]

Ganging (side mount)
- Through the two transversal holes in the body of the switch by means of a collar screw or threaded bolt. Tightening torque 1.0 Nm max.
- Alternatively, DUO-Clips or retaining rings can be used.
- Roller lever without mounting brackets | style [c]
- Roller lever and mounting brackets | style [a]
- Roller lever and mounting brackets, slotted | style [as]
- Roller lever and mounting bracket, angled | style [d]
- Push button and mounting brackets | style [c]
- Push button and mounting brackets, slotted | style [as]

Terminals | M3 screws, flat tabs 6,3x0,8
--- | ---
- M3 Screws with saddle clamp (standard) | style [a]
- M3 Screws with spring washer | style [30]
- Flat tab 6.3x0.8 | style [b0]
- Flat tab 6.3x0.8, angled 90° | style [24]

Note:
- Screw terminals for single and multiple-wire conductors:
  - No ferrules: AWG 18, 16 (0.75 mm², 2.5 mm²), with ferrules: AWG 14 (1.5 mm² max).
  - Max. 2 conductors with the same wire gauge can be clamped per terminal.
  - Tightening torque of terminal screws should be 0.9 Nm max.
- Ingress protection rating (IP code): contacts IP40 / terminals IP00

Dimensions in mm / Subject to change
Mounting

Use of roller levers

Snap-action switches are designed for actuation with and without a roller lever. A roller lever is required if the direction of actuation deviates more than ±15° from the plunger axis.

- **Switch with roller lever actuated by cam disc**
- **Switch with roller lever actuated by linear cam**

<table>
<thead>
<tr>
<th>Disc (mm)</th>
<th>Distance (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>3.6</td>
</tr>
<tr>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td>100 (max.)</td>
<td>0</td>
</tr>
</tbody>
</table>

Mounting instructions:
- Snap-action switches should be mounted by qualified professional staff only.
- Observe the required clearance and creepage distances. This is also applicable for connected wires.
- It is necessary to use insulating plates when ganging or mounting switches on uninsulated surfaces.
- The switches can be mounted in any orientation.
- When mounting the switches make sure to use 2 fastening elements (e.g. screws).
- Only use adequate fastening elements such as cylinder head or collar screws or DUO-clips, including washers. When fastening make sure not to exceed the maximum tightening torque.
- When affixing switches with mounting brackets make sure that the mounting surface is level.
- Avoid tilting the screw when mounting to prevent mechanical tension on the housing.
- The actuator should not be pre-tensioned when in the free position. When actuated, the actuator should travel beyond the operating position, for at least 50% of the predefined overtravel, all the way to total travel position.
- To ensure the proper function of the positive opening operation it is necessary to depress the plunger to the total travel position.
- To prevent mechanical destruction of the switch, make sure that actuation of the switch does not exceed the specified total travel position. Avoid using the switch as a mechanical end stop.
- High-impact actuation of the switch can have a negative effect on its mechanical life.
- When securing stripped wire ends in the terminal clamp, make sure the wire insulation is flush with the clamp.
- Prevent a transfer of forces to the switch terminals, and ensure that connected leads have a functioning strain relief.
- When using versions with blowout magnets observe the right polarity, see circuit diagram on the bottom of the switch.

Non-permissible environmental conditions:
- Cleaning agents, adhesives, solvents, or screw-retaining varnish must be compatible with polycarbonate (S826) or polyetherimide (S926) respectively. Never use chemicals not compatible with polycarbonate for S826 series switches or not compatible with polyetherimide for S926 series snap-action switches.
- Using such chemicals can result in cracks, deformation, breakage and dissolution of the housing or complete destruction of the respective switch.

Safety instructions:
- Be sure to make regular visual inspections.
- Improper handling of the switch, e.g. when hitting the floor with some impact, can result in breakage, visible cracks and deformation.
- The switch suitability has to be confirmed by the customer for the specific application, and under application conditions.

Defective parts must be replaced immediately!

For detailed maintenance, safety and mounting instructions please refer to our operating manuals: schaltbau.info/safety2en

Standards:
- IEC 60947-1: Low-voltage switchgear and controlgear, Part 1: General rules
- IEC 60947-5-1, Annex K: Special requirements for control switches with direct opening action
- UL508: Industrial control equipment
- IEC 60529: Degrees of protection provided by enclosures (IP Code)
- UL 94V-0: Flammability Standard
- Dimensions according to DIN 41636-6, type F
- ISO 13849-1: Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
- IEC 60068-2-6: Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)

For other applicable standards please refer to the specifications table on page 4.
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