Snap-Action Switches

S880 Series

Snap-action switches with positive opening operation and self-cleaning contacts

Catalogue D80.en
Snap-action switches, S880 Series

The world’s smallest snap-action switch with self-cleaning contacts and positive opening operation

Schaltbau subminiture S880 snap-action switches feature self-cleaning contacts and a positive opening function. Minimum size in combination with maximum reliability make the V4 snap-action switch ideally suited for a host of applications: as a safety limit switch in medical engineering, as a limit switch for machine, door and system control or in driver’s desks of locomotives. Risks resulting from contact welding or spring failure are reduced by the positive opening operation of the switch. Thanks to its snap mechanism it is highly resistant to shock and vibration. Self-cleaning contacts (silver) and IP60/IP67 protection against dust, humidity and pollutants all contribute to the high reliability of the switch, even at low currents. The switch is operated by a standard push button, but plain levers, roller levers and simulated roller levers are also available as auxiliary actuators.

Features

- Precision switch: High switching accuracy and high resistance to shock and vibration.
- 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.
- Wiping contacts: Continuous low contact resistance ensures high contact reliability over the entire design life of the switch.
- Contact finish: Silver or gold

Switch design and function

- Actuator
- Contact area
- Degree of protection
- Terminals

Competence

The success of a product is owed to its quality

The Schaltbau product line is clearly defined and keeps up with the technological requirements of today’s markets. Behind every individual snap-action switch you will find decades of experience in engineering and manufacturing. Snap-action switches are designed with a snap mechanism that allows extremely fast switching, practically regardless of the duration of actuation. This reproduces the operating position precisely, and controls the arc more efficiently.

In Schaltbau’s snap-action switches the safety function can be seen – with their transparent green housing, they are known all over the world.

Ordering code

Example: S880 W1G6a Z

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Protection contacts/Terminals</td>
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<td>Contact configuration</td>
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</tbody>
</table>

Specifications are subject to alteration without prior notice

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 customised designs. In this case minimum quantities apply.

Examples:
- S880 W1G6a Z
- S880 W1J6v Z
- S880 W5G6r
- S880 W3B6t
Specifications

**Series S880**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>W3G6a</th>
<th>W2G6a</th>
<th>W3B6a</th>
<th>W3B6a</th>
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</thead>
<tbody>
<tr>
<td>Contact configuration</td>
<td>IEC 60947</td>
<td>IEC 60947</td>
<td>IEC 60947</td>
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<td>Conventional thermal current Iₚ</td>
<td>6 A at 85°C</td>
<td>6 A at 85°C</td>
<td>6 A at 85°C</td>
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<td>Rated insulation voltage Uₗ</td>
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<td>UL 508</td>
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<td>Pollution degree</td>
<td>UL 508</td>
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<tr>
<td>Rated impulse withstand voltage Uₗₜₚ</td>
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<td>Overvoltage category</td>
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<td>Utilization category for silver contacts</td>
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<td>IEC 60947</td>
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<td>Contact resistance, typ.</td>
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<td>21 N</td>
<td>21 N</td>
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<td>Actuator travel for positive opening operation</td>
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<td>Maximum actuator travel *)</td>
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<td>Actuation speed</td>
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<td>Vibration resistance, 10 ... 500 Hz all directions (without aux. actuator at 0.1 ms max. opening time)</td>
<td>IEC 60064-2-4</td>
<td>IEC 60064-2-4</td>
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<td>Shock resistance (without aux. actuator at 0.1 ms max. opening time)</td>
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<td>IEC 60064-2-7</td>
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<td>Short-circuit protection for silver contacts</td>
<td>IEC 60947</td>
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<td>Maximum operating frequency</td>
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<td>Release force *)</td>
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<td>IEC 60947</td>
<td>IEC 60947</td>
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<td>Degree of protection Contacts</td>
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<td>Terminals Soldier Terminals PCB Leads</td>
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<td>IP40 / IP60</td>
<td>IP40 / IP60</td>
<td>IP40 / IP60</td>
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<td>Mechanical endurance</td>
<td>IEC 60947</td>
<td>IEC 60947</td>
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<tr>
<td>Temperature range</td>
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<td>1.5 million cycles min.</td>
<td>1.5 million cycles min.</td>
<td>1.5 million cycles min.</td>
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<td>-40°C ... +85°C</td>
<td>-40°C ... +85°C</td>
<td>-40°C ... +85°C</td>
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<td>Material Contacts Terminals Seal</td>
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<td>Silver (Ag/AgSn) or Gold (Au/AgSn)</td>
<td>Silver (Ag/AgSn) or Gold (Au/AgSn)</td>
<td>Silver (Ag/AgSn) or Gold (Au/AgSn)</td>
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<tr>
<td>Housing upper part</td>
<td>Brass, silver or gold-plated</td>
<td>Brass, silver or gold-plated</td>
<td>Brass, silver or gold-plated</td>
<td>Brass, silver or gold-plated</td>
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<tr>
<td>Housing lower part</td>
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<td>Silicon, blue</td>
<td>Silicon, blue</td>
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<td>UL/C SA</td>
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<td>Mounting position</td>
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<tr>
<td>Weight, without leads connected</td>
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<td>approx. 1.3 g</td>
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</table>
| Specifications are subject to alteration without prior notice | Specifications are subject to alteration without prior notice / Dimensions in mm

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**Notes:**

1) * Specifications are subject to alteration without prior notice
2) * Dimensions/gold contacts upon request
3) General information
4) * Measured next to push button

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**Series S880**

<table>
<thead>
<tr>
<th>Circuit diagram</th>
<th>W3G6a</th>
<th>W2G6a</th>
<th>W3B6a</th>
<th>W3B6a</th>
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</thead>
<tbody>
<tr>
<td>Dimensions</td>
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<td>S880 W2G6a</td>
<td>S880 W3B6a</td>
<td>S880 W3B6a</td>
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<tr>
<td>Colour of leads</td>
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</tbody>
</table>

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**Specifications**

Specifications are subject to alteration without prior notice / Dimensions in mm
### Actuator options, actuator positions

#### Dimensions S880

- **Pushbutton (standard)**
  - Actuator position: Pushbutton (standard)
  - Actuator travel:
    - Free position: 10.70 in mm
    - Operating position: 6.60 in mm
    - Release position: 10.15 ± 0.70 in mm
    - Total positive opening travel: 7.30 in mm
    - Movement differential (between operating and release position): 0.40 (typical)
  - Note: To ensure the proper working of the positive opening operation 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.

- **Plain lever, short**
  - Actuator position: Plain lever, short
  - Actuator travel:
    - Length of lever: 10.70 in mm
    - Free position: 13.70 ± 0.80 in mm
    - Operating position: 11.60 ± 0.80 in mm
    - Release position: 12.00 ± 0.80 in mm
    - Total positive opening travel: 7.50 in mm
    - Total travel position: 7.30 in mm
    - Movement differential (between operating and release position): 0.40 (typical)
  - Note: To ensure the proper working of the positive opening operation 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.

- **Roller lever, short / long**
  - Actuator position: Roller lever (rear-mounted (Z)) / Roller lever (short / long)
  - Actuator travel:
    - Length of lever: 10.70 in mm
    - Free position: 16.00 ± 0.70 in mm
    - Operating position: 15.00 ± 0.70 in mm
    - Release position: 15.25 ± 0.70 in mm
    - Total positive opening travel: 13.30 ± 1.40 in mm
    - Total travel position: 12.65 ± 1.50 in mm
    - Movement differential (between operating and release position): 0.25 (typical)
  - Note: To ensure the proper working of the positive opening operation 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.

- **Simulated roller lever**
  - Actuator position: Simulated roller lever (Z)
  - Actuator travel:
    - Length of lever: 10.70 in mm
    - Free position: 14.00 ± 0.70 in mm
    - Operating position: 12.60 ± 0.70 in mm
    - Release position: 12.90 ± 0.70 in mm
    - Total positive opening travel: 10.50 ± 0.70 in mm
    - Total travel position: 10.30 ± 0.70 in mm
  - Note: To ensure the proper working of the positive opening operation 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.

### Rear-mounted actuators, actuator positions

#### Dimensions S880

- **Plain lever, short**
  - Actuator position: Plain lever, short
  - Actuator travel:
    - Length of lever: 10.70 in mm
    - Free position: 13.70 ± 0.80 in mm
    - Operating position: 11.60 ± 0.80 in mm
    - Release position: 12.00 ± 0.80 in mm
    - Total positive opening travel: 7.50 in mm
    - Total travel position: 7.30 in mm
    - Movement differential (between operating and release position): 0.40 (typical)
  - Note: To ensure the proper working of the positive opening operation 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.

- **Roller lever, short / long**
  - Actuator position: Roller lever (rear-mounted (Z)) / Roller lever (short / long)
  - Actuator travel:
    - Length of lever: 10.70 in mm
    - Free position: 16.00 ± 0.70 in mm
    - Operating position: 15.00 ± 0.70 in mm
    - Release position: 15.25 ± 0.70 in mm
    - Total positive opening travel: 13.30 ± 1.40 in mm
    - Total travel position: 12.65 ± 1.50 in mm
    - Movement differential (between operating and release position): 0.25 (typical)
  - Note: To ensure the proper working of the positive opening operation 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.

- **Simulated roller lever**
  - Actuator position: Simulated roller lever (Z)
  - Actuator travel:
    - Length of lever: 10.70 in mm
    - Free position: 14.00 ± 0.70 in mm
    - Operating position: 12.60 ± 0.70 in mm
    - Release position: 12.90 ± 0.70 in mm
    - Total positive opening travel: 10.50 ± 0.70 in mm
    - Total travel position: 10.30 ± 0.70 in mm
  - Note: To ensure the proper working of the positive opening operation 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.

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

**Specifications are subject to alteration without prior notice / Dimensions in mm**
**Temperature/duration:**
- IEC 60068-2-27
- UL508: grey
- DIN EN ISO 13849-1
- DIN 41636-6: black
- Soldering apparatus:
  - Temperature/duration: black
- Series S880
- Dimensions S880
- Temperature/duration: black
- Solder:
  - Dimensions S880
- UL 94V-0: grey
- Dimensions S880
- Temperature/duration: black
- Solder:
  - Dimensions S880
- IEC 60529: black
- Solder:
  - Dimensions S880
- Actuator

**Terminals**

**Dimensions S880 WxLxx**
- Leads opposite actuator

**Dimensions S880 WxPxx**
- PCB terminals, straight

**Dimensions S880 WxGxx**
- Solder terminals, straight

**Note:**
- Terminals: Leads AWG 24
- Length: 500 mm
- Connection:

**Terminal**
- **Colour**
  - 2: Grey
  - 3: Blue
  - 4: Black

**Hand soldering:**
- Soldering apparatus: Manual hand soldering iron
- Solder: Flux-filled solder wire, leadfree
- Temperature/Duration: 205 °C, 3 s; 3 mm wave distance; Flux time 0.2 s
- Wave soldering:
  - Soldering apparatus: Wave soldering station, 1 wave (Wörthmann wave)
  - Solder: Leadfree solder for selective and wave soldering
  - Temperature/Duration: 203 °C, 4 s; wave width 66 mm; conveyor speed 1 m/min; pre-heating approx. 70 °C at 110 °C (typical)
- Selective soldering:
  - Soldering apparatus: Selective soldering station
  - Solder: Leadfree solder for selective and wave soldering
  - Temperature/Duration: 200 °C, 1 s; 3 mm wave distance; Flux time 0.2 s
- Wave soldering:
  - Soldering apparatus: Wave soldering station, 1 wave (Wörthmann wave)
  - Solder: Leadfree solder for selective and wave soldering
  - Temperature/Duration: 201 °C, 2 s; wave width 66 mm; conveyor speed 1 m/min; pre-heating approx. 70 °C at 110 °C (typical)
- Selective soldering:
  - Soldering apparatus: Selective soldering station
  - Solder: Leadfree solder for selective and wave soldering
  - Temperature/Duration: 200 °C, 1 s; 3 mm wave distance; Flux time 0.2 s

**Standards**
- Switch series based on the following 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 operating action
  - UL 508: Industrial control equipment
  - IEC 60529: Degrees of protection provided by enclosures (IP Code)
  - UL 94V-0: Flammability Standard
  - DIN 41636-6: Sensitive switches for communication technology, dimensions, type B

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

When to use a roller lever?
- Snap-action switches should be mounted by qualified professional staff only.
- Observe the required clearance and creepage distances. This is also applicable for assembled leads.
- When actuating 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.
- Avoid lifting the screw when mounting to prevent mechanical tension on the housing.
- The actuator may not be pre-tensioned when in the free position. When actuated, the actuator should travel well 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.

In case of moisture of any kind or impact of aggressive substances, chemicals, solvents or acids appropriate protective measures must be taken by the user in accordance with IEC 60364-4-41:2005, modified (Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock). One such measure is the use of roller levers Series S880.

For applications with both a high ambient temperature of >40°C and a high Ith current, a correction factor i.a.w. DIN EN 60204-1 Tab. 6 and Table D.1 must be applied for the wire and current.

Defective parts must be replaced immediately!

For a detailed list of all safety instructions see here: [schaltbau.info/download2en](http://schaltbau.info/download2en)

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

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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

We reserve the right to make technical alterations without prior notice.
For updated product information visit www.schaltbau-gmbh.com.