SCHALTBAU
Connect Contact Control

# 2

## Snap-action switches

S834 Series

Enabling switches with positive opening operation and wiping contacts

**Catalogue D34.en**


More information
schaltbau.com

# S834 Enabling switch with positive opening operation and wiping contacts

**Enabling switches for manual control units of industrial robots**

The S834 enabling switch is typically used in manual control actuators for automatic handling machines and robotics. When installed in such devices, the S834 greatly increases safety for the operator in the working area.

**Operation:**

- **Mid position (ON) – circuit closed:** The manual control actuator is continuously held by the operator in the detented mid position.
- **Emergency cutout – the machine stops:** The manual control actuator is either released or further depressed - past the midpoint detent of the switch - by a panicking operator.

## Features

Series S834

**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.

**3-position switch:** Three distinct OFF-ON-OFF actuator positions and mid position detent. Single and double pole versions available.

**Precision switch:** High switching accuracy and resistance to shock and vibration.

**IP rating:** Protection against dust, hazardous substances and direct contact with live parts in compliance with IEC 60529: contacts IP50 / terminals IP00.

IP50 max

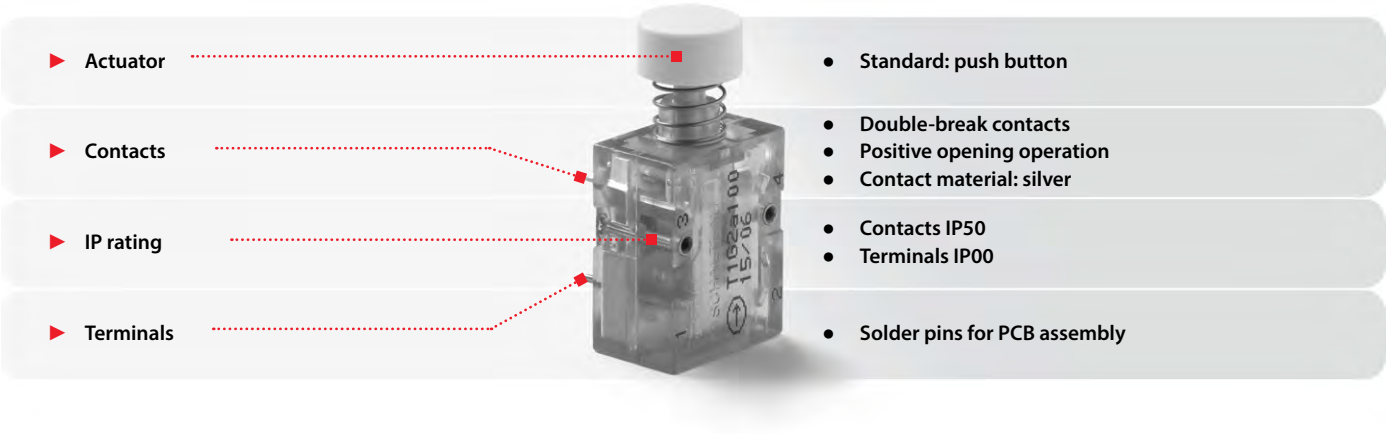
**Wiping contacts:** Continuous low contact resistance ensures high contact reliability over the entire design life of the switch.

**Contact material:** silver

Ag

## Switch design and function

Series S834




## 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.

With their well known transparent-green housing, the safety function in Schaltbau switches is visible.

## Application

Series S834

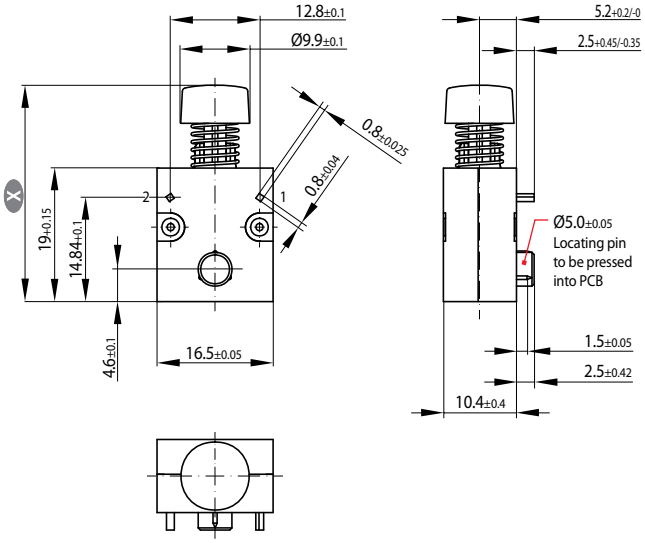
Typical applications are systems and components that require a high degree of safety and reliability.

Schaltbau enabling switches are designed especially for manual control units of industrial robots.

## S834 T1G2a 090, S834 T1G2a 100 Dimension diagrams



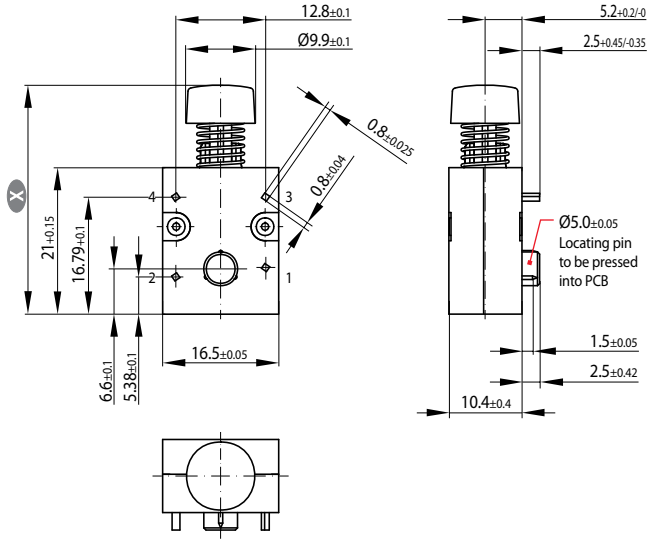
- **S834 T1G2a 090:** Single pole enabling switch




| Actuator position | Pushbutton Dim. (X) in mm | Contact 1–2 |
|---|---|---|
| Free position | 30.90 ±0.20 | |
| Operating position | 28.28 +0.30/–0.12 | |
| Total travel position | 24.90 +0.30/–0.12 | |

***Note:*** *To ensure proper operation of the positive opening function it is necessary to depress the plunger to the total travel position. However, it must not be pushed beyond total travel position. Data is valid for new switches.*

- **S834 T1G2a 100:** Double pole enabling switch




| Actuator position | Pushbutton Dim. (X) in mm | Contact 1–2 | Contact 3–4 |
|---|---|---|---|
| Free position | 32.90 ±0.20 | | |
| Operating position | 30.28 +0.30/–0,.2 | | |
| Total travel position | 26.90 +0.30/–0.12 | | |

***Note:*** *To ensure proper operation of the positive opening function it is necessary to depress the plunger to the total travel position. However, it must not be pushed beyond total travel position. Data is valid for new switches.*

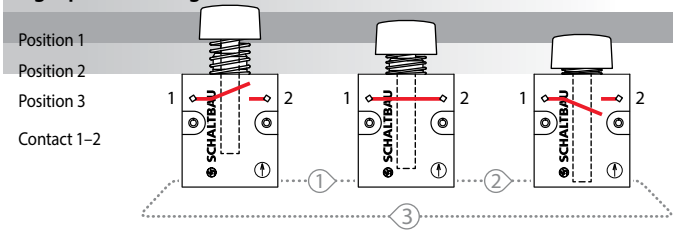
## Operation of enabling switches



Contact is made only in position 2, the detented mid position. In position 1 (actuator not operated) and position 3 (actuator pressed past the detented mid position) the contact is open.

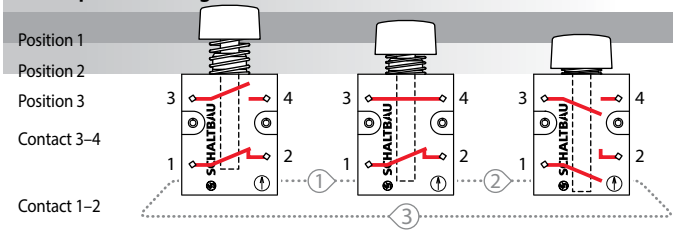
When released to position 1 the contact remains open (OFF) by the force of the return spring. Return to position 1 is guaranteed even in case of a broken spring.

**Single pole enabling switch**




1. **Position 1 ▶ Position 2 (mid position):**
   Contact 1–2 closed, when actuator is continuously held in the detented mid position.
2. **Position 2 ▶ Position 3:**
   Contact 1–2 ⊖ opened, when actuator is pressed past the midpoint detent of the switch.
3. **Position 3 ▶ Position 1:**
   Contact 1–2 remains open, when released to position 1 the contact remains open (OFF) by the force of the return spring.

**Double pole enabling switch**




1. **Position 1 ▶ Position 2 (mid position):**
   Contact 1–2 and 3–4 closed, when actuator is continuously held in the detented mid position.
2. **Position 2 ▶ Position 3:**
   Contact 1–2 ⊖ and 3–4 opened, when actuator is pressed past the midpoint detent of the switch.
3. **Position 3 ▶ Position 1:**
   When released to position 1, contact 1–2 is closed, whereas contact 3–4 remains open (OFF) by the force of the return spring.

⊖ ***Positive opening operation:***
*Reliable interruption of the circuit even after contact welding, in compliance with IEC 60947-5-1, Annex K.*

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## Assembly PCB assembly instructions

Series S834

Our S834 is designed for PCB assembly only. After assembly a test is required in accordance with the test principles of GS-ET-22, section 6.
Download at: **www.schaltbau.info/s834-en**

**Hand soldering:**

- Soldering apparatus: hand-held soldering iron
- Solder: flux-filled solder wire, lead-free
- Temperature/duration: 350 °C; 6 sec max. (PCB, 1.6 mm, through-hole plating)

**Selective soldering:**

- Soldering apparatus: selective soldering station
- Solder: lead-free solder for selective and wave soldering
- Temperature/duration: 300 °C, 2 sec, 3 mm wave distance, flux time 1 sec

**Wave soldering:**

- Soldering apparatus: wave soldering station, 1 wave (Wörthmann wave)
- Solder: lead-free solder for selective and wave soldering
- Temperature/duration: 260 °C, 4.4 sec, wave width 66 mm; conveyor speed 1.3 m/min, pre-heating approx. 100 sec at 110 ° ... 145 °C typ.

## Mounting and safety instructions, environmental conditions

Series S834

**Mounting instructions:**

- Enabling switches should be mounted by qualified professional staff only.
- Observe the required clearance and creepage distances.
- When installing the switch make sure to provide suitable shock protection!
- It is necessary to use insulating plates when mounting the enabling switch on an uninsulated surface.
- The switches can be mounted in any desired position.
- The actuator may not be pre-tensioned when in the free position. When actuated, the actuator should travel well beyond the operating 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 also have a negative effect on its mechanical life.

**Non-permissible environmental conditions:**

- Cleaning agents, adhesives, solvents, or screw-retaining varnish must be compatible with polycarbonate. Never use chemicals which are not compatible with polycarbonate.
- Using chemicals which are not compatible can result in cracks, deformation, breakage and dissolution of the housing or complete destruction of the switch.

**Safety instructions:**

- Be sure to make visual inspections regularly.
- Make sure to electrically link the enabling switch to the control circuit in such a way that all safety requirements according to DIN EN 775, DIN EN 60204-1, DIN EN 954-1, DIN EN 1088 and VDI 2854 are met.
- All cables and conductors (except PE) of equipment used in an installation that are either accessible without opening or removing a machine guard or are laid on exposed conductive parts that may become live in the event of a failure must have double insulation or reinforced insulation. Insulation must insulate the wire from the surface on which the conductor is laid. Alternatively conductors can be enclosed in a metal sheathing that should have sufficient current carrying capacity in the event of a short circuit between wire and sheath.
- Our S834 is not a ready-to-use enabling switch, but the necessary switching element for it.
- Make sure that in the case of an actuator malfunction, for instance due to a broken return spring, the safety device as such will continue to function properly.
- No liability is accepted for failure to observe our safety instructions.
- Full observation of the safety instructions is essential for the proper functioning of the switch.
- 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 a detailed list of all safety instructions see here: schaltbau.info/download2en!**

## Standards

Series S834

- **DIN EN 60947-5-1, Annex K:** Special requirements for control switches with direct opening action
- **DIN EN 60529:** Degrees of protection provided by enclosures (IP code)
- **UL 94V-0:** Flammability Standard
- **DIN 40050-9:** Road vehicles; degrees of protection (IP code); protection against foreign objects; water and contact; electrical equipment

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## Specifications

Series S834

| | Standard | S834 T1G2a 090 | S834 T1G2a 100 |
|---|---|---|---|
| Contact system | IEC 60947 | | |
| Single pole momentary switch | | ● | --- |
| Double pole momentary switch | | --- | ● |
| Distinct operating point | | ● | ● |
| Positive opening operation ⊖ | | ● | ● |
| Wiping contacts | | ● | ● |
| Conventional thermal current $I_{th}$ | IEC 60947 | 2.5 A | |
| Rated insulation voltage $U_i$ | IEC 60947 | 250 V | |
| Pollution degree | IEC 60947 | PD2 | |
| Overvoltage category | IEC 60947 | no data | |
| Rated impulse withstand voltage $U_{imp}$ | IEC 60947 | 2.5 kV | |
| Utilization category | IEC 60947 | DC-12: 48 V / 1.0 A surge overvoltage 600 V max.<br>DC-13: 48 V / 0.3 A surge overvoltage 1.4 kV max. | |
| Contact gap, typ. | IEC 60947 | 1.2 mm | |
| Contact force, typ. | IEC 60947 | no data | |
| Contact resistance, typ. | IEC 60947 | 100 mΩ (no leads) | |
| Positive opening force *1 | IEC 60947 | ≤ 21 N | |
| Positive opening travel | IEC 60947 | 4.5 mm | 5.5 mm |
| Maximum actuator travel *1 | IEC 60947 | 6.0 mm | |
| Actuating speed | IEC 60947 | 0.5 m/s max.<br>1.0 mm/s min. | |
| Vibration resistance at 0.1 ms opening time max.<br>10 … 150 Hz all directions | IEC 60068-2-6 | no data | |
| Shock resistance<br>(no aux. actuator)<br>at 0.1 ms opening time max. | IEC 60068-2-27 | no data | |
| Short-circuit protection | IEC 60269-2 | 1 A gL | 1 A gL |
| Actuation force *1<br>up to distinct operating position<br>in operating position<br>up to total travel position<br>(beyond distinct contact point) | IEC 60947 | 1.75 N ±0.25 N<br>> 3 N<br>> 5 N | |
| Release force *1 | IEC 60947 | no data | |
| IP rating:<br>Contacts<br>Terminals | IEC 60529 | IP50<br>IP00 | |
| Endurance, operating cycles<br>mechanical (operating / total travel position)<br>electrical (at U = 48 V DC I = 1 A; τ = 0 ms) | IEC 60947 | > 300,000 / > 70,000<br>> 200,000 | > 200,000 / > 100,000<br>> 200,000 |
| Temperature range | IEC 60947 | -0 °C … +55 °C | |
| Material<br>Contacts<br>Terminals<br>Plastic parts<br>Housing | --- | Hard silver (AgCu3)<br>Solder pins for PCBs<br>Flammability rated to UL 94-V0<br>PC, green, transparent | |
| Mounting orientation | --- | any | |
| Weight | --- | 4.1 g ±0.5 g | |
| Approval | --- | EAC | |

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*1 Measured directly at push-button

**Note:**
*Data valid for new switches under laboratory conditions and at room temperature, unless otherwise mentioned.*

# Schaltbau GmbH

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

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with compliments:

RoHS 2011/65/EC

Schaltbau GmbH manufactures in compliance with RoHS.

IRIS Certification

The production facilities of Schaltbau GmbH have been IRIS certified since 2008.

Schaltbau GmbH ISO 14001 certified since 2002

Certified to DIN EN ISO 14001 since 2002. For the most recent certificate visit our website.

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## *Electrical Components and Systems for Railway Engineering and Industrial Applications*

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### Snap-action switches

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