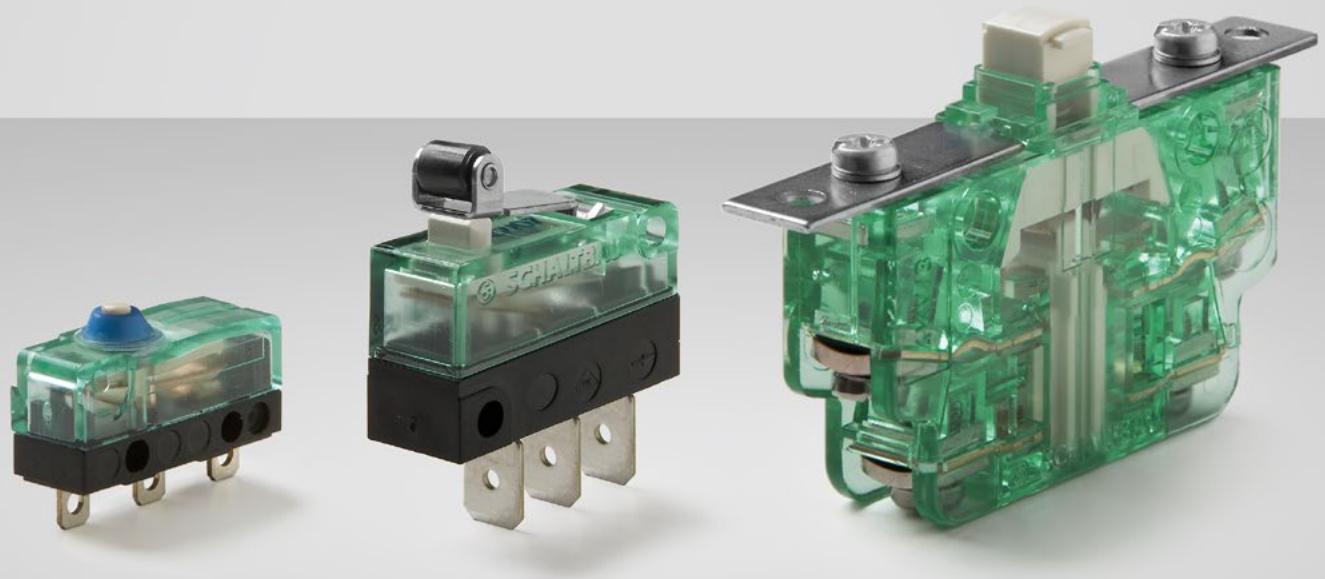
SCHALTBAU

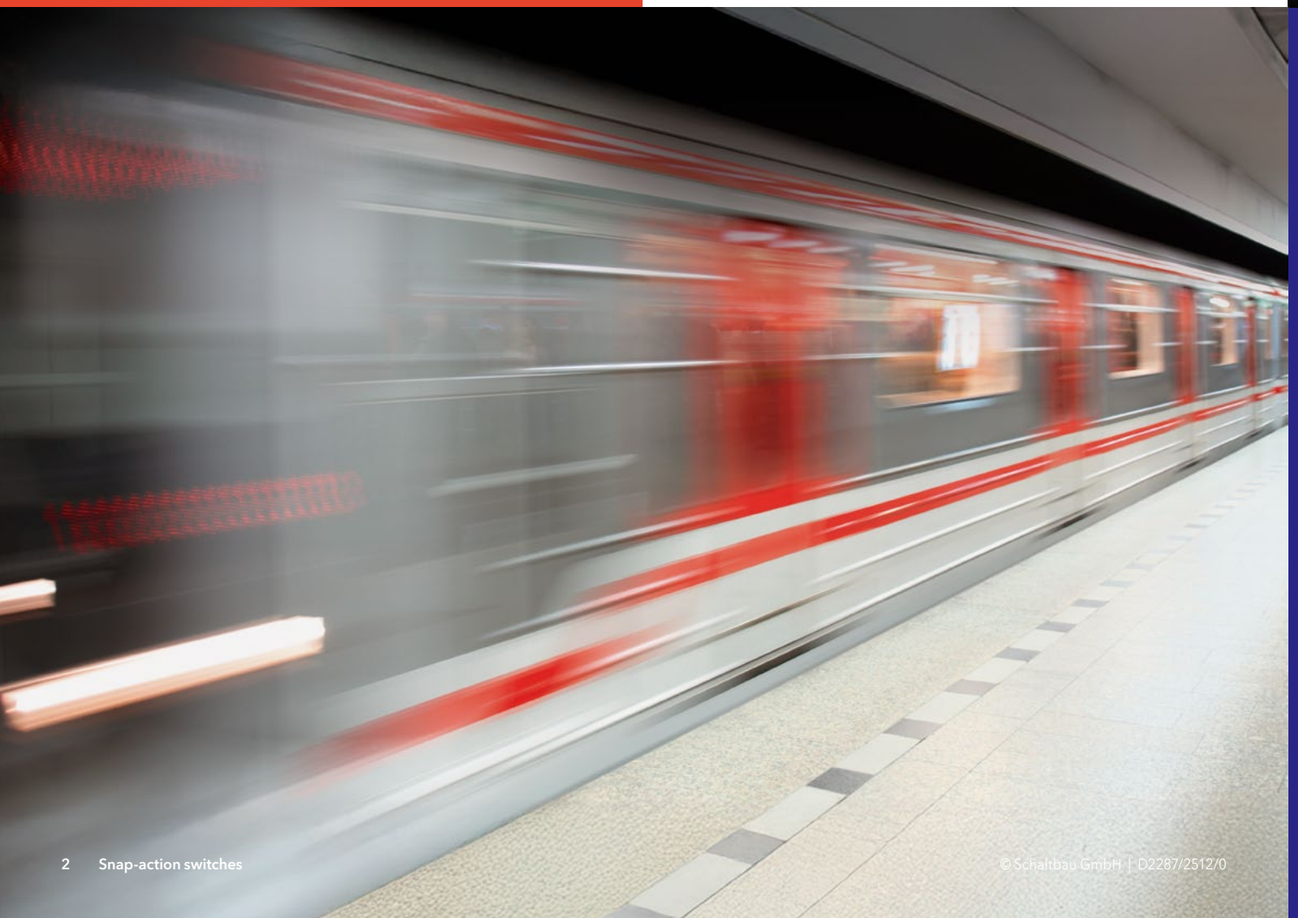


Snap-Action Switches

Precision switches for safety applications
with robust switching mechanism and
positive opening operation

SCHALTBAU

As a pioneer in electrification, Schaltbau has been committed to rail safety since 1929. With our patented snap-action switches, we set the market standard for modern rail transport. Schaltbau snap-action switches are used worldwide in driver's consoles, emergency brake switches, and door controls on rail vehicles and are characterized by a high degree of quality, reliability, and durability to minimize downtime and maintenance costs.



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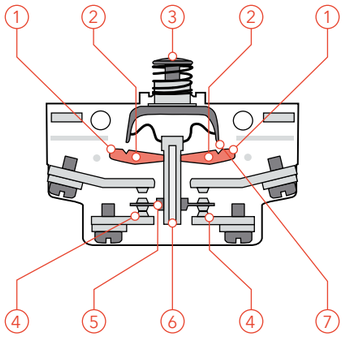
A Schaltbau Brand

Our proven snap-action switches are used for safe and reliable switching of DC applications in the energy and e-mobility sectors. With our expertise, we strive to become the global leader in direct current technology.

Snap-action switches from Schaltbau are switches with a snap mechanism that enables fast switching of the contact bridge almost independently of the actuation speed. The advantages are precisely reproducible switching points and the effective extinguishing of switching arcs. These special properties are ideal for applications with the highest reliability requirements in components and systems – depending on the series, for up to 10 million switching operations. Snap-action switches from Schaltbau can switch both control currents and loads safely and precisely.



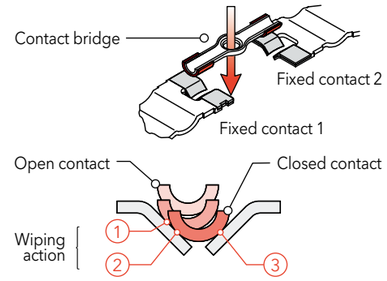
Positive opening operation

Snap-action switches from Schaltbau feature positive opening. The form-fitting mechanism (patented in 1975) ensures that the contact opens automatically even if it is welded or the spring is defective. Ideal for safety-related applications, in particular safety components in accordance with the EU Machinery Directive, which require positive opening switching elements.

Mode of operation: The movement of the positive opening levers 1 at pivot point 2 causes plunger 6 to move upwards, resulting in the forced disconnection of contact bridge 5 from the NC contacts 4. The actuating force is transmitted from top to bottom: The tips 7 of the actuator 3 act on the positive opening levers 1, and the actuating force is transmitted via the pivot point 2 to the plunger 6 with the contact bridge 5. This opens the circuit through positive force transmission from the actuator 3 to the contact bridge 5.

Wiping double-break contacts

The contact bridge is loosely supported by the plunger inside the switch and initially meets the V-shaped fixed contacts at one point only (position 1) before it is straightened between them by the coaxial pressure of the snap spring. The contact bridge thereby slides from position 1 to position 2 and creates a defined friction. During each operation this wiping action results in self-cleaning of the contacts at least on one side. In the total travel position the contact is closed on either side of the V-shaped fixed contact at 2 and 3.



Variants for extreme conditions

For applications characterized by harsh environmental conditions Schaltbau has developed some special variants. The S926, S947 and S970 series switches have a ruggedised housing made from polyetherimide (PEI). The high-performance thermoplastic used as housing material stands for better resistance to:

- Higher temperature resistance up to –55 °C … +150 °C (depending on variant)
- Better chemical resistance to acids and alkalis
- Increased impact resistance compared to polycarbonate (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 and the extremes of temperature. The 9xx series switches have the same design, dimensions and technical features as the switches of the standard S8xx series, allowing for the easy replacement of a standard switch without additional implementation effort. So upgrading will be no problem.

- **Higher temperature**
- **Better chemical and**
- **Increased impact resistance**

Series overview	S800	S804	S814	S820	S840
Positive opening operation *1	⊖	⊖	---	⊖	⊖
Wiping contacts	---	---	✓	---	✓
Circuit diagram					
Contact elements *3	Form Za	Form Za	Form Za	Form Zb *2	Form C
Actuator					
Push button / Plain lever	✓ / ---	✓ / ---	✓ / ---	✓ / ---	✓ / ✓
Roller lever / Sim. roller	✓ / ---	--- / ---	--- / ---	✓ / ---	✓ / ✓
Terminals					
Flat tabs / Screws	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
Leads / Cable	--- / ---	--- / ---	--- / ---	--- / ---	--- / ---
Solder pins / Lugs	--- / ---	--- / ---	--- / ---	--- / ---	--- / ✓
Material					
Contact material	Silver / Gold	Silver / ---	Silver / Gold	Silver / ---	Silver / Gold
Housing material *4	PC / ---	PC / ---	PC / ---	PESU / ---	PC / ---
Magnetic blowout	✓	---	---	✓	---
Flammability rating	UL 94V-0	UL 94V-0	UL 94V-0	UL 94V-0	UL 94V-0
Description	Page 6	Page 6	Page 6	Page 8	Page 8

*1 Positive opening operation according to IEC 60947-5-1, Annex K *2 Form Z circuitry SPDT-DB, galvanically isolated
*3 Categorisation, see page 13 *4 PC – Polycarbonate, green transparent; PEI – Polyetherimide, amber transparent

Series overview	S826 / S926	S847 / S947	S870 / S970	S880	S850
Positive opening operation *1	⊖	⊖	⊖	⊖	⊖
Wiping contacts	✓	✓	✓	✓	✓
Circuit diagram					
Contact elements *3	Form Zb *2	Form Zb *2	Form C	Form C	2 NC contacts
Actuator					
Push button / Plain lever	✓ / ---	✓ / ---	✓ / ✓	✓ / ✓	✓ / ---
Roller lever / Sim. roller	✓ / ---	✓ / ---	✓ / ✓	✓ / ✓	✓ / ---
Terminals					
Flat tabs / Screws	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ---	--- / ✓
Leads / Cable	--- / ---	✓ / ---	✓ / ✓	✓ / ---	--- / ---
Solder pins / Lugs	--- / ---	--- / ---	✓ / ✓	✓ / ✓	--- / ---
Material					
Contact material	Silver / Gold	Silver / Gold	Silver / Gold	Silver / Gold	Silver / Gold
Housing material *4	PC / PEI	PC / PEI	PC / PEI	PC / ---	PC / ---
Magnetic blowout	✓	✓	---	---	✓
Flammability rating	UL 94V-0	UL 94V-0	UL 94V-0	UL 94V-0	UL 94V-0
Description	Page 7	Page 9	Page 10	Page 11	Page 11

*1 Positive opening operation according to IEC 60947-5-1, Annex K *2 Form Z circuitry SPDT-DB, galvanically isolated
*3 Categorisation, see page 13 *4 PC – Polycarbonate, green transparent; PEI – Polyetherimide, amber transparent

S800 series

Snap-action switches with positive opening operation

Schaltbau S800 series snap-action switches have been in use for decades and proved their reliability in innumerable applications. They feature double-break contacts, snap-action mechanism and positive opening operation which ensures a forced breaking of the normally closed contacts in case of spring failure or contact welding due to a short-circuit. This makes them ideally suited for use in safety related applications.

Features

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1, Annex K and dimensions according to DIN 41636-6, type F
- Degree of protection IP40, IEC 60529
- High electrical rating due to solid contact bridge
- Contact material: silver or gold-plated silver
- High resistance to shock and vibration
- Magnetic blowout, optional

Web link S800

S804 series

Snap-action switches with positive opening operation

S804 series switches add to the product line featuring the same snap-action mechanism and positive opening operation as the S800 series switches. They differ, however, in form, dimensions and position of the screw-type terminals.

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1, Annex K
- Degree of protection IP40 according to IEC 60529
- High electrical rating due to solid contact bridge
- High resistance to shock and vibration

Web link S804

S814 series

Snap-action switch with plunger running full-length through the switch

Unlike S800 and S804, Schaltbau's S814 series snap-action switches do not feature positive opening operation. They normally come with silver-plated contacts, but are also available with gold contacts. Due to an actuator running straight through the switch, it is possible to connect two snap-action switches in series – one on top of the other. Thus two switching operations can be triggered by just one actuation.

- Performance according to IEC 60947-5-1
- Degree of protection IP40 according to IEC 60529
- High electrical rating due to solid contact bridge
- Contact material: hard silver or gold alloy
- High resistance to shock and vibration
- Wiping, self-cleaning contacts

Web link S814

Specifications

Series	S800	S804	S814
Conventional thermal current I_{th}	10 A	10 A	10 A
Utilization category for silver contacts*	AC-15 230 V / 3 A DC-13 110 V / 1 A	AC-15 230 V / 3 A DC-13 110 V / 1 A	AC-15 230 V / 1 A DC-13 60 V / 0.5 A
Rated impulse withstand voltage U_{imp}	4 kV / PD3	4 kV / PD3	2.5 kV / PD3
Degree of protection	IP40	IP40	IP40
Actuating force	3.3 N	3.3 N	3.2 N
Actuating travel	3.2 mm	3.2 mm	2.0 mm
Mechanical endurance	10 million cycles	10 million cycles	10 million cycles
Ambient temperature	-40° C ... +85° C	-40° C ... +85° C	-40° C ... +85° C
Dimensions in mm (L x H x D)	50 x 30 x 12	36 x 30 x 22	36 x 31 x 22
Weight without leads	S800 b: 26 g	S804 b: 25 g	S814 b: 25 g

* Data for gold contacts upon request

S826 series

Switches with positive opening operation and wiping double-break contacts

S826 series switches feature galvanically isolated contact bridges that make it possible to control two separate load circuits with independent voltage levels at the same time. This makes them ideally suited for automation tasks with separate electric loads. The wiping, double-break contacts ensure high reliability even at low electrical loads. Switches with gold contacts are particularly suitable for low currents and voltages.

Features

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1 Annex K
- Dimensions according to DIN 41636-6, type F
- Degree of protection IP40, IEC 60529
- Self-cleaning, double-break contacts
- Form Z SPDT-DB, galvanically isolated
- Contact material: hard silver or gold alloy
- Magnetic blowout, optional

Web link S826

S926 series PEI

Variant with ruggedised housing made from polyetherimide (PEI)

Thanks to the high-performance thermoplastic housing material, S926 series snap-action switches feature both a better resistance to temperature and chemicals as well as a higher impact resistance compared to polycarbonate (PC). They are ideally suited for applications characterised by harsh environmental conditions. Sharing the same design as the S826 switches, they can easily replace a standard switch without additional implementation effort.

- Housing made of polyetherimide (PEI) particularly robust against:
  - Extreme temperatures
  - Aggressive chemicals
  - Heavy impact forces (more shock-resistant than polycarbonate)
- Self-cleaning, double-break contacts
- Form Z SPDT-DB, galvanically isolated
- All other features, see S826 series

Web link S926

Specifications

Series	S826	S926
Conventional thermal current I_{th}	10 A	10 A
Utilization category for silver contacts*	AC-15 230 V / 1 A DC-13 110 V / 0.5 A	AC-15 230 V / 1 A DC-13 110 V / 0.5 A
Rated impulse withstand voltage U_{imp}	4 kV / PD3	4 kV / PD2
Degree of protection	IP40	IP40
Actuating force	3.6 N	3.6 N
Actuating travel	3.2 mm	3.2 mm
Mechanical endurance	10 million cycles	10 million cycles
Ambient temperature	-40° C ... +85° C	-55° C ... +85° C**
Dimensions in mm (L x H x D)	50 x 28.5 x 12	50 x 28.5 x 12
Weight without leads	S826 b: 18 g	S926 b: 18 g

* Data for gold contacts upon request ** Versions up to 105° C available

S820 series

Snap-action switches with enhanced current-carrying capacity

The S820 snap-action switch is a robust microswitch with positive opening. Its contact system is designed for conducting and disconnecting high currents. At 20 amps, the continuous thermal current is twice as high as in other snap-action switches of the 'F' design. The S820 series switch is a Form Z SPDT-DB. Its two mechanically linked rigid contact bridges are galvanically separated.

Features

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1 Annex K,
- Dimensions according to DIN 41636-6, type F
- Degree of protection IP40 according to IEC 60529
- High electrical rating due to rigid contact bridge
- Form Z SPDT-DB, galvanically isolated
- Contact material: hard silver
- High resistance to shock and vibration

Web link S820

S840 series

Compact snap-action switches with positive opening operation and self-cleaning contacts

The S840 snap-action switch is a high-quality microswitch in a conventional design. The mechanical positive opening ensures an opening of the contacts, even if they have been fused by a short circuit. The self-cleaning contacts also connect low voltages and currents safely and reliably. S845 and S846 series switches are SPST versions with NC and NO contacts respectively.

Features

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1 Annex K
- Dimensions according to DIN 41636-2, type A
- Degree of protection IP40 according to IEC 60529
- Self-cleaning contacts
- Contact material: hard silver or gold alloy

Web link S840

Specifications

Series	S820	S840
Conventional thermal current I_{th}	20 A	6 A
Utilization category for silver contacts*	AC-15 230 V / 5 A DC-13 110 V / 1 A	AC-15 230 V / 1.5 A ---
Rated impulse withstand voltage U_{imp}	4 kV / PD3	2.5 kV / PD3
Degree of protection	IP40	IP40
Actuating force	8.0 N	2.4 N
Actuating travel	4.0 mm	2.5 mm
Mechanical endurance	1 Mio. Schaltspiele	10 Mio. Schaltspiele
Ambient temperature	–40° C ... +85° C	–40° C ... +85° C
Dimensions in mm (L x H x D)	50 x 45 x 12	30 x 16.5 x 10.3
Weight without leads	S820 b: 45 g	S840 b: 10 g

* S840: Data for gold contacts upon request

S847 series

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

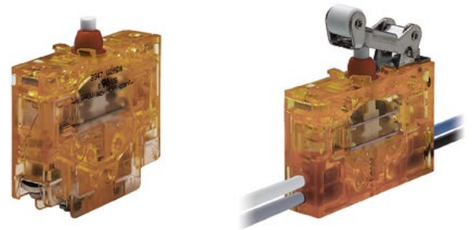
S847 series snap-action switches in modular design are available with three degrees of protection according to IEC 60529: IP40 (protected against solid particles), IP60 (dustproof), and IP67 (waterproof). Due to their self-cleaning double-break contacts as well as protection against dust, moisture and pollutants, S847 series switches are highly reliable even at low contact ratings. The switches are therefore also often used for handling low currents and voltages.

Features

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1 Annex K
- Dimensions according to DIN 41636-6, type F
- Degree of protection up to IP67 for contact area and terminals according to IEC 60529
- Self-cleaning, double-break contacts
- Form Z SPDT-DB, galvanically isolated
- Contact material: Hard silver or gold alloy
- Long overtravel after positive opening operation
- Magnetic blowout, optional

Web link S847

S947 series PEI



Variant with ruggedised housing made from polyetherimide (PEI)

Thanks to the high-perfomance thermoplastic housing material, S947 series snap-action switches feature both a higher resistance to temperature and chemicals as well as a higher impact resistance compared to polycarbonate (PC). They are ideally suited for applications characterised by harsh environmental conditions. Sharing the same design as the S847 series switches, they can easily replace a standard switch without additional implementation effort.

Features

- Housing made of polyetherimide (PEI) particularly robust against:
  - Extreme temperatures
  - Aggressive chemicals
  - Heavy impact forces (more shock-resistant than polycarbonate)
- Degree of protection up to IP67 for contact area and terminals according to IEC 60529
- Self-cleaning, double-break contacts
- Form Z circuitry SPDT-DB, galvanically isolated
- All other features, see S847 series

Web link S947

Specifications

Series	S847			S947		
Conventional thermal current I_{th}	10 A			10 A		
Utilization category for silver contacts*	AC-15 230 V / 1.5 A DC-13 110 V / 1 A			AC-15 230 V / 1.5 A DC-13 110 V / 1 A		
Rated impulse withstand voltage U_{imp}	4 kV / PD3			4 kV / PD2		
Degree of protection	IP40	IP60	IP67	IP40	IP60	IP67
Actuating force	3 N			3 N		
Actuating travel	4.9 mm			4.9 mm		
Mechanical endurance	10 million	5 million	5 million	10 million	5 million	5 million
Ambient temperature	–40° C ... +85° C**			–55° C ... +85° C**		
Dimensions in mm (L x H x D)	50 x 36 x 12			50 x 36 x 12		
Weight without leads	S847 W1D2 a: 22 g			S947 W1D2 a: 22 g		

* Data for gold contacts upon request ** Leads –20° C ... +85° C

S870 series

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

Self-cleaning contacts and protection against dust, humidity and polluting agents allow high reliability even at low contact load. In telecommunications and automation, the S870 is used for switching low voltages and currents. Its compact dimensions, protection class up to IP67 and special variants, e.g. with pre-assembled cable, make this switch suitable for a wide range of applications.

Features

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1 Annex K
- Dimensions according to DIN 41636-2, type A
- Degree of protection: contacts IP40, IP60, IP67, terminals IP00, IP20, IP67 according to IEC 60529
- Self-cleaning contacts
- Contact material: hard silver or gold alloy
- High resistance to shock and vibration

Web link S870

S970 series

Variant with ruggedised housing made from polyetherimide (PEI)

Thanks to the high-perfomance thermoplastic housing material, S970 series snap-action switches feature both a higher resistance to temperature and chemicals as well as a higher impact resistance compared to polycarbonate (PC). They are ideally suited for applications characterised by harsh environmental conditions. Sharing the same design as the S870 series switches, they can easily replace a standard switch without additional implementation effort.

- Housing made of polyetherimide (PEI) particularly robust against:
  - Extreme temperatures
  - Aggressive chemicals
  - Heavy impact forces (more shock-resistant than polycarbonate)
- Degree of protection: contacts IP40, IP60, IP67, terminals IP00, IP20, IP67 according to IEC 60529
- Self-cleaning contacts
- Contact material: hard silver or gold alloy
- All other features, see S870 series

Web link S970

Specifications

Series	S870			S970		
Conventional thermal current I_{th}	10 A			10 A		
Utilization category for silver contacts*	AC-15 230 V / 1.5 A DC-13 60 V / 0.5 A			AC-15 230 V / 1.5 A DC-13 60 V / 0.5 A; DC-13 24 V / 2 A		
Rated impulse withstand voltage U_{imp}	4 kV / PD3			4 kV / PD3		
Degree of protection	IP40	IP60	IP67	IP40	IP60	IP67
Actuating force	2.4 N	3 N	3 N	2.4 N	3 N	3 N
Actuating travel	3 mm			3 mm		
Mechanical endurance	10 Mio.	5 Mio.	5 Mio.	10 Mio.	5 Mio.	5 Mio.
Ambient temperature	–40° C ... +85° C	–40° C ... +85° C	–30° C ... +85° C**	–55° C ... +150° C	–55° C ... +150° C	–30° C ... +85° C**
Dimensions in mm (L x H x D)	30 x 16 x 10.5			30 x 16 x 10.5		
Weight without leads	S870 W1D1 a: 7 g			S970 W1D1 a: 7 g		

* Data for gold contacts upon request ** Leads –20° C ... +85° C

S880 series

The world's smallest snap switch with positive opening operation

Schaltbau subminiature S880 snap-action switches feature both, self-cleaning contacts as well as a positive opening function. Minimum size in combination with maximum reliability make this V4 snap-action switch ideally suited for a host of applications such as a safety limit switch in medical engineering or limit switch for machine, door and system control projects or in the driver's consoles of locomotives. Self-cleaning contacts and protection class up to IP67 against dust, humidity and pollutants all contribute to the high reliability of the switch, even at low currents.

Features

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1 Annex K,
- Dimensions to DIN 41636-3, type B (V4 subminiature switch)
- Degree of protection: contacts IP40, IP60, IP67, terminals IP00, IP67 according to IEC 60529
- Self-cleaning contacts
- Contact material: hard silver or gold alloy
- Snap mechanism highly resistant to shock and vibration

Web link S880

S850 series

Snap-action switches with double NC contacts Two safety switches in one housing

To meet the safety requirements of the Machinery Directive ISO 13849-1: it is necessary that the safety-related parts of control systems for machines and plants are designed to be fully redundant. With the S850 switch Schaltbau offers a favourably priced solution for designers of control systems who want to step up the safety level without the need to invest in additional hardware, installation and programming of equipment. Typical applications for the S850 are components and systems that require maximum reliability and safety such as door controls in trains, off-track and pull cord switches, cranes and lifts.

- Performance according to IEC 60947-5-1
- Positive opening operation, IEC 60947-5-1 Annex K
- Double NC contacts: safety switch featuring two galvanically isolated circuits in one housing. Used for applications complying with ISO 13849-1.
- Dimensions according to DIN 41636-6, type F
- Degree of protection: contacts IP40, terminals IP20 according to IEC 60529
- Self-cleaning, double-break contacts
- Contact material: hard silver or gold alloy
- Magnetic blowout, optional

Web link S850

Specifications

Series	S880			S850
Conventional thermal current I_{th}	6 A			10 A
Utilization category for silver contacts*	AC-15 230 V / 1 A DC-13 60 V / 0.5 A			AC-15 230 V / 1.5 A DC-13 24 V / 1.5 A
Rated impulse withstand voltage U_{imp}	2.5 kV / PD3			4 kV / PD3
Degree of protection	IP40	IP60	IP67	IP40
Actuating force	2 N			8.5 N
Actuating travel	1.95 mm			3.2 mm
Mechanical endurance	1.5 Mio.			1.5 Mio.
Ambient temperature	–40° C ... +85° C	–25° C ... +85° C	–25° C ... +85° C	–55° C ... +85° C
Dimensions in mm (L x H x D)	20 x 9.3 x 6.5	20 x 9.3 x 6.5	20 x 15.1 x 6.5	50.2 x 38 x 12
Weight without leads	S880 W1G6 a: 1.5 g			S850 O6A2 a: 30 g

* Data for gold contacts upon request

Snap-action switch glossary

Snap-action switches are microswitches with a snap-action mechanism which is directly operated by a defined force through a defined travel. The resulting indirect contacting action may be such that the speed of contacting is independent of the speed of the actuation. [IEV 581-10-03]

Actuator positions

Free position
Here the actuator is free from any external application of force

Operating position
The point of travel at which the snap action is triggered by the actuator

Total travel position
The position where the actuator has reached the end of its travel

Release position
The point of travel at which the returning actuator releases the snap mechanism in order to revert to its normal position

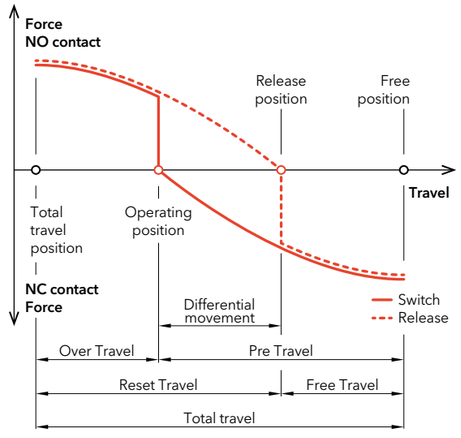
Positive opening operation

An opening operation which, in accordance with specified requirements, ensures that all the main contacts are in the open position when the actuator is in the position corresponding to the open position of the device [IEV 441-16-11]. 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 pressed beyond total travel position.

Silver or gold contacts

Silver contacts have high conductivity and are therefore found in most snap-action switches for standard applications with normal switching capacity. Unlike silver contacts, gold contacts are corrosion-resistant. They therefore have a consistently lower contact resistance and should be selected for applications with long downtimes or in sulfur-containing or corrosive environments.

Contact force travel diagram of a snap-action switch



Pre-travel
Maximum actuator travel between free position and operating position during which there is no movement of the contact elements

Over-travel
Path of the actuator between the operating position and total travel position after all contact elements have reached their ON/OFF position. To ensure fail-safe switching, at least 50% of the distance should be covered by the actuator

Reset travel
Path of the returning actuator between total travel position and release position during which the snap mechanism has not yet snapped back to its original position

Free travel
Path of the returning actuator between release position and free position after the snap mechanism has reverted to its original position

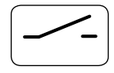
Total travel
The total of either pre-travel and over-travel, or reset travel and free travel

Differential movement
The difference between operating position and release position

Contact elements

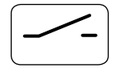
Configuration letters are used for the systematic categorisation of contact elements.

Form A
SPST-NO: Single gap contact element with 2 terminals.

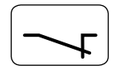


Form B
SPST-NC: Single gap contact element with 2 terminals.

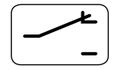
Form X
SPST-DB-NO: Double gap contact element with 2 terminals.



Form Y
SPST-DB-NC: Double gap contact element with 2 terminals.



Form C
SPDT: Single gap changeover contact element with 3 terminals.



Form Za
SPDT-DB: Double gap changeover contact element with 4 terminals. The contacts have the same polarity.

Form Zb
Double gap changeover contact element with 4 terminals. The two moving contacts are electrically separated.

Utilization categories

The utilization categories listed in the table below relate to the most frequent applications by which the contact elements can also be classified:

Current	Utilization category for silver contacts	Typical applications
AC	AC-12	Control of resistive and semiconductor loads in input circuits of opto-couplers
	AC-13	Control of semiconductor loads with transformer disconnection
	AC-14	Control of low electromagnetic loads (≤ 72 VA)
	AC-15	Control of electromagnetic loads (> 72 VA)
DC	DC-12	Control of resistive and semiconductor loads in input circuits of opto-couplers
	DC-13	Control of electromagnetic loads
	DC-14	ditto with economy resistors in the circuit

Safety and efficiency in rail, energy, and e-mobility

Schaltbau is a global industry leader specializing in DC power and providing products and solutions that that enable electrification. With a broad portfolio of contactors, connectors, switches, and safety components, Schaltbau helps partners and customers solve today's challenges in rail.

Building on this experience, with our brand Eddicy we also create future-oriented products and solutions with the highest standards of safety and reliability to switch and protect DC applications in energy and e-mobility.

Schaltbau is headquartered in Munich, Germany and represented globally, with over 1,000 employees worldwide.

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