

Snap-Action Switches

S840, S845, S846 series

Single-break changeover, NC or NO contacts, positive opening operation and wiping action

Catalogue D40.en



SCHALTBAU

DC Power Under Control

Snap-action switches, S840, S845, S846 series

Single-break SPDT with positive opening operation and self-cleaning contacts

S840 Series snap-action switches feature VDE-approved positive opening operation, which guarantees a reliable opening of the NC contact even when welded due to a short-circuit or overload currents. Self-cleaning, wiping contacts ensure high reliability even at low electric loads.

The snap mechanism allows for fast and precise switching at a speed essentially independent of actuator speed. S845 and S846 Series switches are SPST versions with NC and NO contacts respectively.

Features



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.



Single-break contacts: SPDT but also SPST-NC and SPST-NO versions available. Compact design.



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

Self-cleaning contacts: Constantly low contact resistance ensures high contact reliability over the entire design life of the switch	Por start
Ingress protection rating: IP40 in accordance with IEC 60529	IP40 max

Contact finish: Silver or gold-plated



Design and function

S840/S845/S846 series

S840/S845/S846 series



Competence

The success of a product is owed to its quality

The Schaltbau product line is clearly defined and adapted to customer needs. 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.

Applications

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S840/S845/S846 series

The switches are designed for use with systems and components that require a high degree of safety and reliability, such as

- Gear limit switches for wind energy applications
- Safety limit switches in electrical installations and control systems

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S840/S845/S846

S840 k 20 Plain lever, short and flat tabs 6.3 x 0.8

Ordering code

		Example:	S840 r10/20			
Series —			「 「 「		Terminals	
S840 S845 S846	SPDT SPST-NC SPST-NO			Captive screws Flat tabs Solder lugs	* 20 28	No. of the second secon
Actuator				Cont	act material	S840 b Push button (standard)
b r	Push button (standard) Roller lever			Silver Gold	* 10	and captive screws
v k l n	Roller lever, short Plain lever, short Plain lever, long Simulated roller lever				* No index	
						Company of the

 \triangle Note:

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

Special variant: 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.

					S840 k 28 Plain lever, short and
Parameter	Identification		Option		solder lugs
Series / contact configuration		S840 / SPDT	S845 / SPST-NC	S846 / SPST-NO	
Actuator styles					
Push button (standard)	b		<u> </u>		
 Roller lever 	r		e June do		S840 I Plain lever, long and
 Roller lever, short 	V				captive screws
 Plain lever, short 	k		Certain and the second		
 Plain lever, long 					S840 n 20 Simulated roller lever an flat tabs 6.3 x 0.8
 Simulated roller lever 	n		C MO		٥
Series SPDT SPST-NC SPST-NO	<u>5840</u> / <u>5845</u> /				
Contact material	No Index / 10				S840 r 20 Boller lever and
Terminal styles					flat tabs 6.3 x 0.8
Captive screws	No Index				9
 Flat tabs 	20				
 Solder lugs 	28				S840 v Roller lever, short and captive screws





S840 n 20 ulated roller lever and flat tabs 6.3 x 0.8



S840 r 20 Roller lever and flat tabs 6.3 x 0.8



Specifications

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S840/S845/S846 series

Series	Standard	S840	S845	S846
Contact configuration	IEC 60947	Single-break Form C (SPDT) switch with 3 terminals	Single-break Form B (SPST-NC) switch with 2 terminals	Single-break Form A (SPST-NO) switch with 2 terminals
Conventional thermal current I _{th}	IEC 60947 UL 508		6 A at T = 85° C	
Rated insulation voltage U _i	IEC 60947 UL 508		250 V 300 V	
Pollution degree	IEC 60947 UL 508		PD3 PD3	
Rated impulse withstand voltage U_{imp}	IEC 60947		4 kV	
Overvoltage category	IEC 60947 UL 508		OV3 OV3	
Utilization category for silver contacts *1	IEC 60947 UL 508	240 V AC / 1 A General Pu	AC-15, 230 VAC / 1.5 A rpose, 240 V AC / 6 A resist	ive, 24 V DC / 6 A resistive
Contact gap, typical			1x 1.2 mm	
Contact force, typical			0.3 N min.	
Contact resistance, typical, without leads connected			100 mΩ	
Positive opening force *2	IEC 60947		25 N	
Actuator travel for positive opening	IEC 60947	see page 5		
Maximum actuator travel *2	IEC 60947		2.5 mm	
Actuation speed	IEC 60947		1 m/s max. 1 mm/s min.	
Vibration resistance *3 10 500 Hz all directions at 0.1 ms max. opening time	IEC 60068-2-6		5 g	
Shock resistance *3 at 0.1 ms max. opening time	IEC 60068-2-27		15 g, half sinus	
Short-circuit protection for silver contacts *1	IEC 60269-2		6 A gG	
Max. operating frequency	IEC 60947		300 cycles/minute	
Actuation force *2	IEC 60947	2.4 N max.	2.4 N max.	3.1 N max.
Release force *2	IEC 60947		0.5 N max.	
Degree of protection Contacts Terminals	IEC 60529		IP40 IP00	
Mechanical endurance	IEC 60947		10 million cycles min.	
Temperature range	IEC 60947		-40 ℃ +85 ℃	
Material Contacts Terminals Housing		Silver	(Ag90Ni10) or gold (AuNi3 Brass, silver or gold plated PC, light green, transparent	Ag26) t
Mounting position			Any	
Weight, version S840 b 20			approx. 10 g	
Approvals				

Notes:

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

*1 Data for gold contacts upon request *2 Measured next to actuator *3 No auxiliary actuator

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S840/S845/S846 series

Dimension and circuit diagram

• Dimension diagram S840 b20/S845 b20/S846 b20 SPDT/SPST-NC/SPST-NO



Actuator options, actuator positions

• **S840 b xx/xx** Push button (standard)



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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.

• S840 r xx/xx / S840 v xx/xx Roller lever / Roller lever, short



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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.

• S840 k xx/xx / S840 xx/xx Plain lever, short / Plain lever, long



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.





S840/S845/S846 series

Actuator position	Push button (standard) b Actuator travel 🕥 in mm
Free position	16.0 ± 0.1
Operating position	14.8 ± 0.2
Release position	15.0 ± 0.2
Total positive opening travel	13.6
Total travel position	13.5 min.
Movement differential (between operating and release position)	0.2 (typical)

Actuator position	Roller lever r Travel 🐼 in mm	Roller lever v Travel 🐼 in mm
Lever length	22.7	19.1
Free positon	22.4 ± 0.3	21.9 ± 0.3
Operating position	21.1 ± 0.4	20.7 ± 0.4
Release position	21.3 ± 0.4	20.9 ± 0.4
Total positive opening travel	19.5	19.6
Total travel position	19.4 min.	19.4 min.
Movement differential (between operating and release position)	0.3 (typical)	0.3 (typical)

Actuator positions	Plain lever k Travel 🗴 in mm	Plain lever Travel 🗴 in mm
Lever length 🕚	25.7	49.2
Free position	17.3 ± 0.2	21.5 ± 0.8
Operating position	15.9 ± 0.3	17.6 ± 1.0
Release position	16.1 ± 0.3	18.3 ± 1.0
Total positive opening travel	14.15	
Total travel position	14.0 min.	13.5 min.
Movement differential (between operating and release position)	0.2 (typical)	0.7 (typical)

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S840/S845/S846 series

S840/S845/S846 series

- Actuator options, actuator positions (continued)
- S840 n xx/xx Simulated roller lever



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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.

Actuator positions	Simulated roller lever n Actuator travel 🐼 in mm
Free position	22.4 ± 0.3
Operating position	21.1 ± 0.4
Release position	21.3 ± 0.4
Total positive opening travel	19.3
Total travel position	19.2 min.
Movement differential (between operating and release position)	0.3 (typical)

Terminal styles

• S840 x xx/ M3 screws



• **S840 x xx/20** Flat tabs



• S840 x xx/28 Solder lugs



(i) Note:

- Single and multiple-wire conductors with wire gauges AWG 18 ... 12 (0.75 mm²... 2.5 mm²) can be clamped without wire end ferrules. If a ferrule is used the maximum wire gauge is 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 0.5 Nm.
- Ingress protection rating of terminals: IP00



- Suitable for flat tabs 6.3 x 0.8 mm
- Ingress protection rating of terminals: IP00

(j) Note:

- Hand soldering:
- Soldering apparatus: Hand-held soldering iron
- Solder: Flux-filled solder wire, leadfree
- Temperature/duration: 400°C;5s*max.
- Ingress protection rating of terminals: IP00

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- When to use a roller lever?
 - 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.

Mounting and safety instructions, environmental conditions, standards

3.8 max.

S840/S845/S846 series

Mounting instructions:

Snap-action switches should be mounted by qualified professional staff only.

22.2 ±0.03

30-0.2

- 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.
- 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.

Non-permissible environmental conditions:

- Cleaning agents, adhesives, solvents, or screw-retaining varnish must be compatible with polycarbonate. Never use chemicals not compatible with polycarbonate.
- Using chemicals which are not compatible with polycarbonate 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.
- Improper handling of the switch, e.g. when hitting the floor with 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: <u>schaltbau.info/download2en</u>!

Standards:

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- 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 41636-2, type A
- 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)
- IEC 60068-2-27: Environmental testing Part 2-27: Tests Test Ea and guidance: Shock

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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	 Single and multi-pole DC contactors
Emergency disconnect switches	 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