SCHALTBAU

Connect · Contact · Control

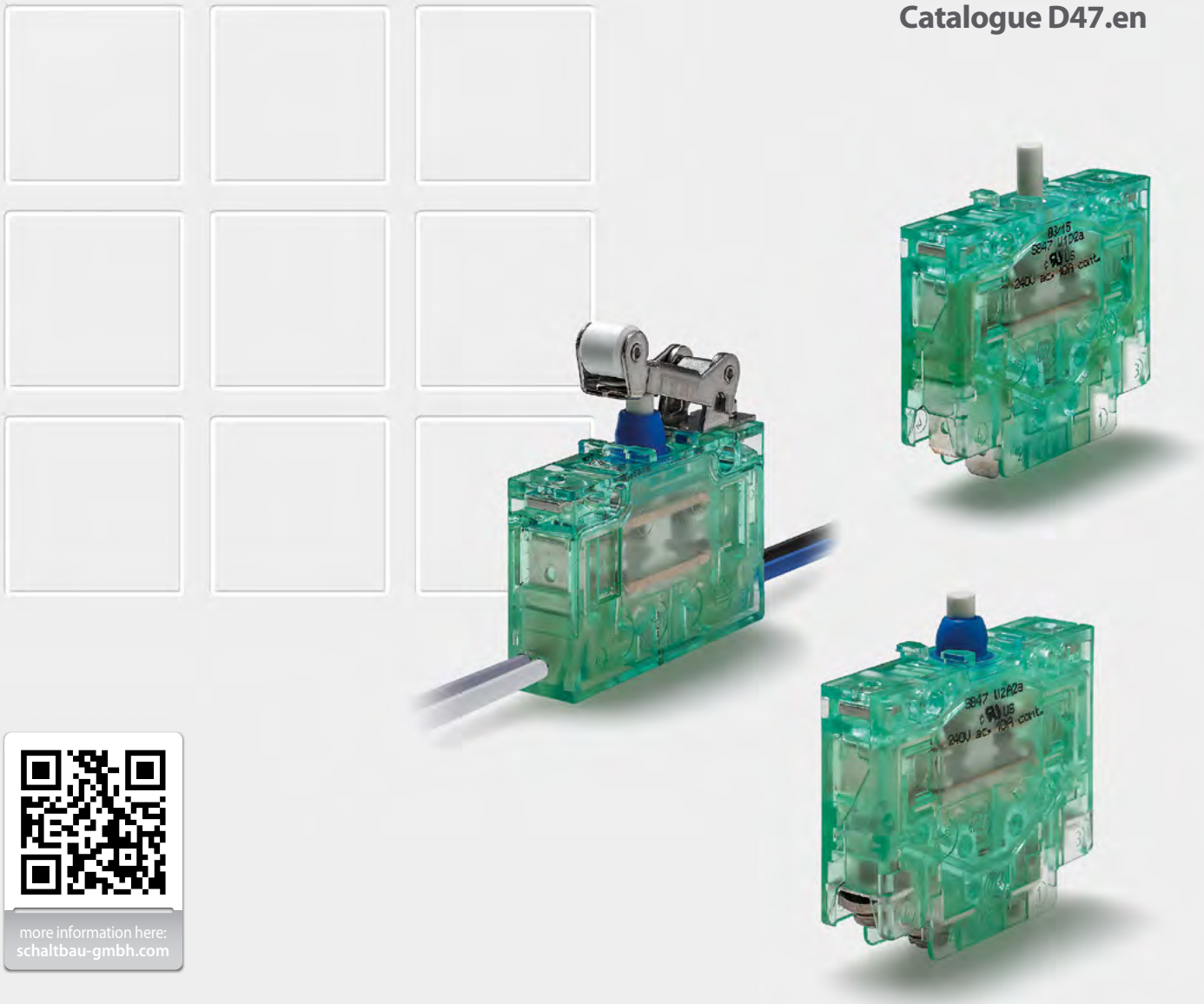
2

Snap-action switches

Series S847

Changeover switches featuring wiping, galvanically isolated, double-break contacts and positive opening operation

Catalogue D47.en



more information here:
schaltbau-gmbh.com

Snap-action switches, S847 Series

Dual changeover switches featuring wiping, galvanically isolated, double-break contacts and positive opening operation

S847 series snap-action switches are VDE approved and come with positive opening operation which guarantees that these switches will function even if the contacts have become welded due to a short-circuit. They have two galvanically isolated, mechanically linked contact bridges which prevent a circuit closing failure. Protected against dust, moisture and pollutants (IP40, IP60 and IP67 rated versions available) and with wiping, double-break contacts, S847 series switches stand for high reliability even at low currents and voltages. The snap-action mechanism of these switches allows extremely fast switching independent of the actuation speed, thus making them suitable for applications which are characterized by slow actuating speeds, such as limit switches for machine and door control.

Features

Series S847

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 double-break contacts: Continuous low contact resistance ensures high contact reliability over the entire design life of the switch

Form Z-SPDT-DB: Galvanically isolated, mechanically locked contact bridges

IP rating: IP40, IP60 or IP67 in compliance with IEC 60529 (IP code)

IP67 max

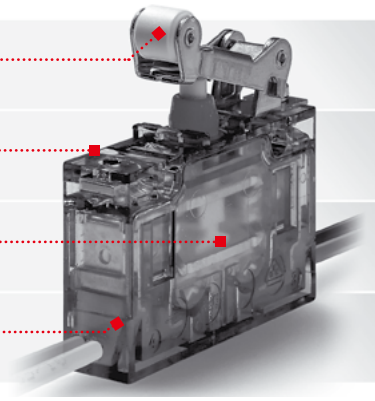
Precision switch: High switching accuracy and resistance to shock and vibration

Contact material: Silver or silver with gold plating

Ag / Au

Switch design and function

Series S847



- **Actuator**
  - Standard: push button
  - Auxiliary actuator: roller lever
- **Mounting**
  - Front mount
  - Side mount (ganging)
- **Contact area**
  - Form Z-SPDT-DB with galvanically isolated contact bridges
  - Positive opening operation and wiping action
  - Contact material: Silver or silver with gold plating
- **Terminals**
  - M3 screws with saddle clamp
  - Leads, potted
  - Flat tabs 6.3 x 0.8 mm

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 is visible - with their transparent-green housing, they are known all over the world.

Applications

Series S847

S847 series snap-action switches are designed for use with systems and components that require a high degree of safety and reliability, such as:

- Safety limit switches in control circuits and systems, e.g. in NC drives, PLCs and computer controls
- Limit switches for machine and plant control systems
- Limit switches for vehicles, e.g. in door controls

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Ordering code

Example: **S847 W1A2a B**

Series

S847	Snap-action switch

Contact configuration

W	Form Z-SPDT-DB

IP rating

	Contacts	Terminals
1	IP40	IP00
2	IP60	IP00
5	IP67	IP00
3*1	IP67	IP67

Terminals

A	M3 screws with saddle clamps
B	Leads, potted, L = 500 mm
D	Flat tabs 6.3 x 0.8 mm

Contact material

2	Silver
8	Silver, gold-plated

Special designs, optional

Spring, return spring and plunger spring, reinforced	B
Magnetic blowout	L

Actuator styles

Actuator	Front mount	
Push button	no mounting brackets	a
	with mounting brackets	c
Roller lever	no mounting brackets	e
	with mounting brackets	b

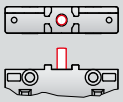
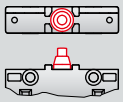
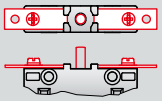
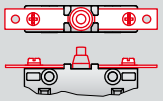
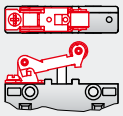
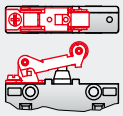
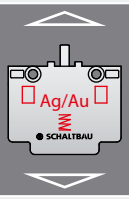
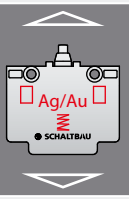
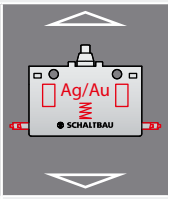
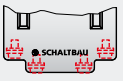
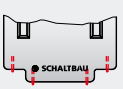
*1 *Only with terminal type B: Leads, potted*

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.

Parameter	Identification	Versions (contacts/terminals)			
IP rating (IP code to IEC 60529)		IP40/00 1	IP60/00 2	IP67/00 5	IP67/67 3
Actuator styles					
▶ **Push button (standard),** no mounting brackets	a				
▶ **Push button,** with mounting brackets	c				
▶ **Roller lever,** with mounting brackets	b				
▶ **Roller lever,** no mounting brackets	e				
Series Contact configuration Contact material Spring, return spring and plunger spring, reinforced** Magnetic blowout**	S847 W 2 / 8 B L				
Terminals					
▶ **M3 screws with saddle clamps**	A				---
▶ **Leads, potted** Length 500 mm	B		---		
▶ **Flat tabs** 6.3 x 0.8 mm	D				---

** *Special design*

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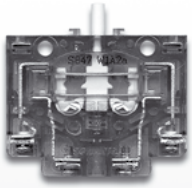
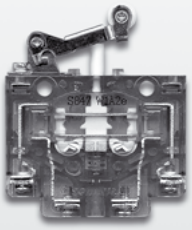
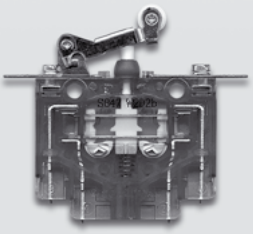
Series S847



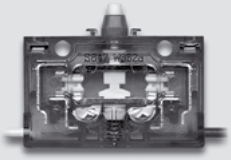
S847 W1A2a
Sealed to IP40/00
Push button (standard)
M3 screws with saddle clamps



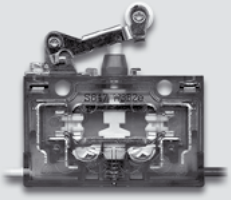
S847 W1A2e
Sealed to IP40/00
Roller lever
M3 screws with saddle clamps



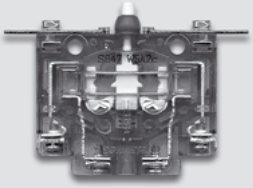
S847 W2D2b
Sealed to IP60/00
Roller lever with brackets
Flat tabs



S847 W3B2a
Sealed to IP67/67
Push button (standard)
Leads, length 500 mm



S847 W3B2e
Sealed to IP67/67
Roller lever
Leads, length 500 mm



S847 W5A2c
Sealed to IP67/00
Push button (standard),
Mounting brackets
M3 screws with saddle clamps

Specifications

Series S847

S847 Series IP rating contacts ▶	Standard	S847 W1___ IP40	S847 W2___ S847 W5___ S847 W3___ IP60 or IP67
Contact configuration	IEC 60947	1x Form Z-SPDT-DB 4 terminals, galvanically isolated contact bridges, positive opening operation and wiping action	
Conv. thermal current I_{th}	IEC 60947	10 A at T = 85° C	
	UL 508	10 A at T = 85° C	
Rated insulation voltage U_i	IEC 60947	400 V	
	UL 508	300 V	
Pollution degree	IEC 60947	PD3	
	UL 508	PD3	
Rated impulse withstand voltage U_{imp}	IEC 60947	4 kV	
Overvoltage category	IEC 60947	OV3	
Utilization category for silver contacts *1	IEC 60947	AC-15: 230 V AC / 1.5 A / DC-13, 110 V DC / 1.0 A	
	UL 508 *3	AC 240 V / 1.5 A / DC 120 V / 1.0 A	
Contact gap, typ.	IEC 60947	2x 1.1 mm	
Contact force, typ.	IEC 60947	0.4 N	
Contact resistance, typ. no leads connected	IEC 60947	100 mΩ	
Positive opening force *2	IEC 60947	20 N	
Actuator travel for positive opening operations	IEC 60947	see page 5	
Maximum actuator travel *2	IEC 60947	4.9 mm	
Actuation speed	IEC 60947	1.0 m/s max. 0.1 mm/s min.	
Vibration resistance 10 … 500 Hz all directions at 10 µs opening time max.	EN 60068-2-6	1	2 / 5 / 3
Push button		30 g	30 g / 30 g / 8 g
Roller lever		30 g	30 g / 30 g / 6 g
Shock resistance at 10 µs opening time max., half sinus	EN 60068-2-27	1	2 / 5 / 3
Push button, roller lever		50 g	50 g / 50 g / 20 g
Short-circuit protection for silver contacts *1	IEC 60269-2	10 A gR	
Max. operating frequency	IEC 60947	300 cycles/minute	
Actuation force *2	IEC 60947	3.0 N max.	3.0 N max.
Release force *2	IEC 60947	0.2 N min.	0.2 N min.
IP rating		1	2 / 5 / 3
Contacts	IEC 60529	IP40	IP60 / IP67 / IP67
Terminals M3 screws	IEC 60529	IP00	IP00 / IP00 / ---
Terminals Flat tabs	IEC 60529	IP00	IP00 / IP00 / ---
Terminals Leads / cables	IEC 60529	---	--- / --- / IP67
Mechanical endurance	IEC 60947	10 million cycles max.	5 million cycles max.
Temperature range	IEC 60947	-40 °C … +85 °C	-40 °C … +85 °C *4
Material			
Contact finish	---	Silver (AgCu3F40) or silver (AgCu3F40), gold-plated (Au6)	
Seals	---	Silicon, blue	
Housing	---	PC, light-green, transparent	
Leads	UL/CSA	PVC insulated leads AWG 18	
Mounting orientation	---	any	
Weight, no magnetic blowout/leads	---	depending on version: 22 g ... 37 g	
Approvals	---	VDE c UL us PCT CCC	

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*1 Data for gold contacts upon request *2 Measured next to push button
*3 General Purpose *4 Leads -20 °C...+85 °C

Note:

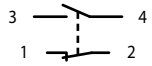
Data valid for new switches under laboratory conditions and at room temperature, unless otherwise mentioned.

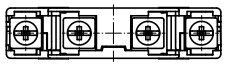
Dimension and circuit diagrams

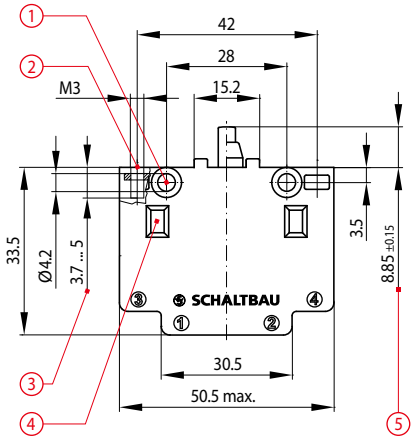
Series S847

- **Dimensions S847 W1A2a / S847 W2A2a / S847 W5A2a**
  Form Z-SPDT-DB: 4 terminals, galvanically isolated contact bridges, positive opening operation and wiping action

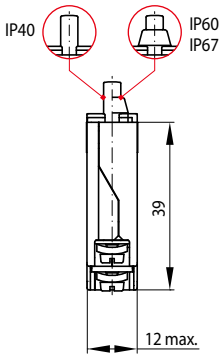
- **Circuit diagram**

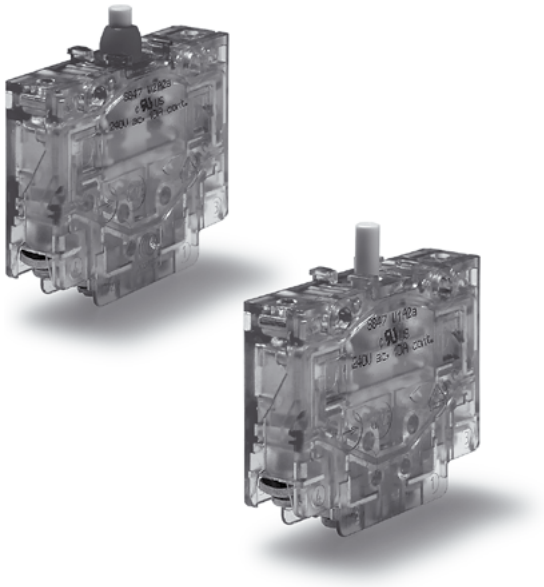






Actuator style





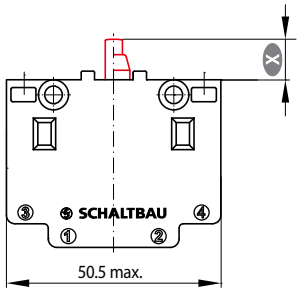
S847 W1A2a / S847 W2A2a / S847 W5A2a	
S847 W[W]____	Form Z-SPDT-DB
S847 W[1]____	Contacts IP40 / Terminals IP00
S847 W[2]____	Contacts IP40 / Terminals IP00
S847 W[5]____	Contacts IP67 / Terminals IP00
S847 W_[A]___	M3 screws
S847 W___[2]_	Contact material: silver
S847 W____[a]	Push button (standard)

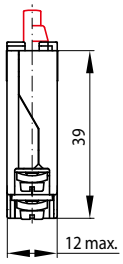
① *Ganging, torque 1.0 Nm max.*
② *Front mount, torque 0.7 Nm max.*
③ *Screwable thread length of fastening screw*
④ *Magnetic blowout (optional) for increased DC breaking capability*
⑤ *Free position*

Actuator styles and positions

Series S847

- **S847 W____[a] / S847 W____[c] Push button (standard)**

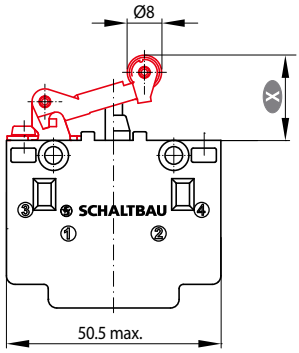


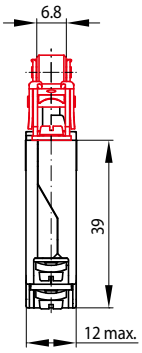


Actuator position	Push button (standard) [a] / [c] Actuator travel (X) in mm
Free position	8.85 ± 0.15
Operating position	6.6 ± 0.25
Release position	8.0 ± 0.25
Total positive opening travel	4.2
Total travel position	< 3.9
Movement differential (between operating and release position)	1.4 (typical)

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.

- **S847 W____[b] / S847 W____[e] Roller lever**





Actuator position	Roller lever [b] / [e] Actuator travel (X) in mm
Free position	20.6 ± 0.35
Operating position	16.9 ± 0.5
Release position	19.3 ± 0.5
Total positive opening travel	13.5
Total travel position	13.0 min.
Movement differential (between operating and release position)	2.4 (typical)

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.

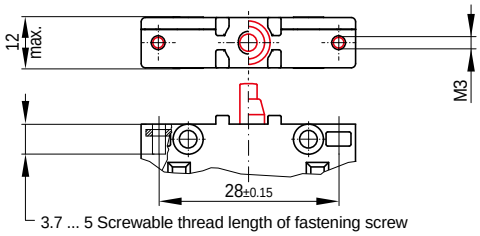
Mounting

Series S847

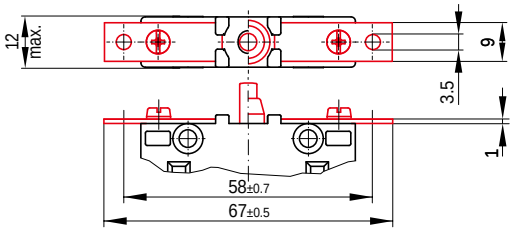
Front mount

- **Without mounting brackets (standard):** Fastening by way of the retainer nuts (M3) which are fixed in the housing of the switch. Tightening torque 0.7 Nm max.
- **With mounting brackets:** Mounting brackets are available for all actuator options. Tightening torque 0.9 Nm max.

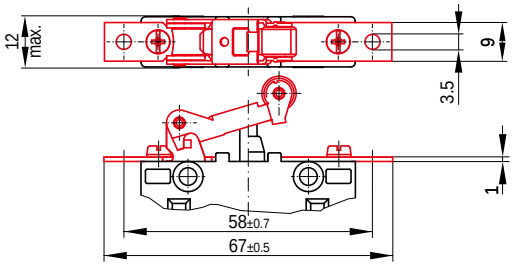
1. Push button (standard) no mounting brackets [a]



2. Push button with mounting brackets [c]



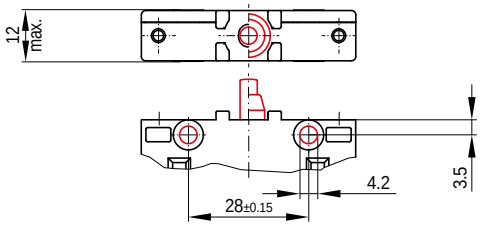
3. Roller lever with mounting brackets [b]



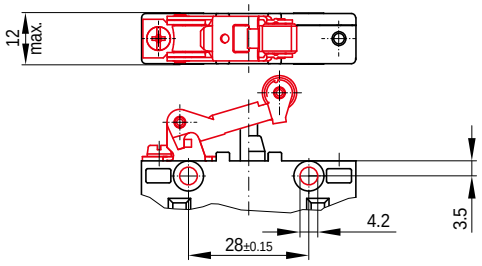
Ganging (side mount)

- 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.

1. Push button (standard) no mounting brackets [a]



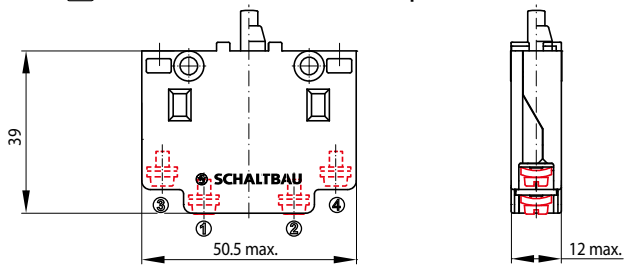
2. Roller lever no mounting brackets [e]



Terminals

Series S847

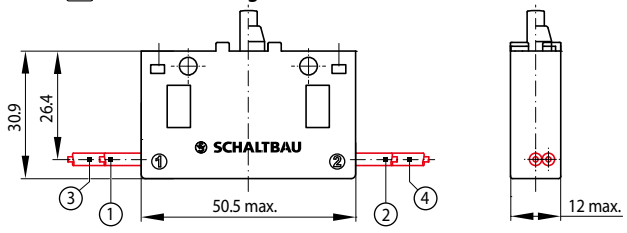
- **S847 W_A___ M3 screws with saddle clamps**



Note:

- *Screw terminals for single and multiple-wire conductors:*
  - *No ferrules AWG 18 ... 12 (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*

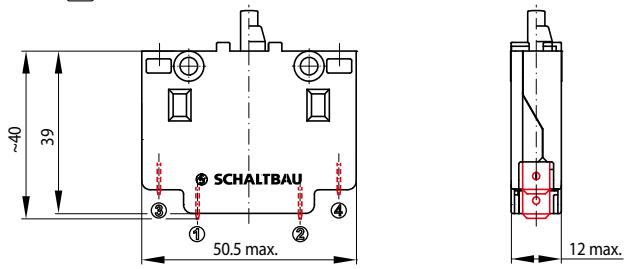
- **S847 W_B___ Leads, length 500 mm**



Versions with pre-assembled leads:

- *Terminal style: Leads AWG18*
- *Length: 500 mm*
- *Assignment:* ③ *blue* ④ *white* ① *black* ② *grey*

- **S847 W_D___ Flat tabs 6.3 x 0.8 mm**

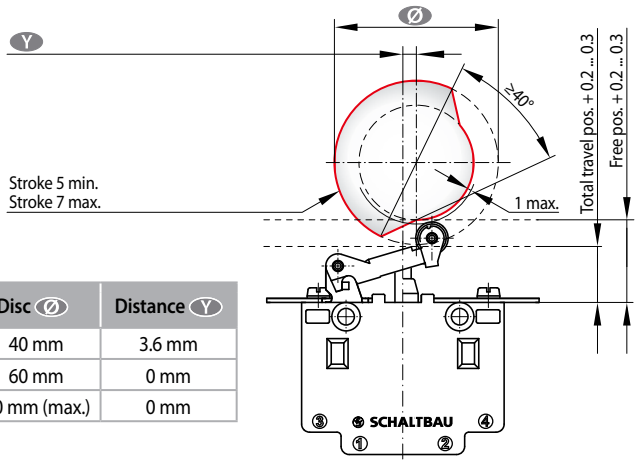


Mounting Use of roller levers

Series S847

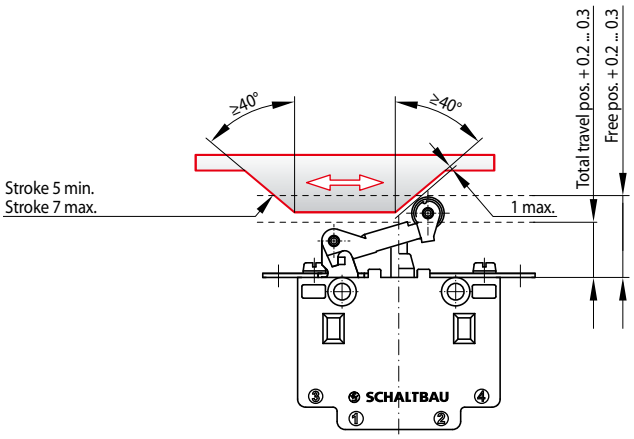
Snap-action switches are designed for actuation with and without a roller lever.
A roller lever is required if the direction of actuation deviates more than ±15° from the plunger axis.

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



Disc Ø	Distance Y
40 mm	3.6 mm
60 mm	0 mm
100 mm (max.)	0 mm

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



Mounting and safety instructions, environmental conditions

Series S847

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 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 end point of the positive opening travel.
- To prevent mechanical destruction of the switch, make sure that actuation of the switch does not exceed the specified total travel position. Do not use 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 correct 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. Never use chemicals not compatible with polycarbonate.
- 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 visual inspections regularly.
- Improper handling of the switch, e. g. when hitting the floor with some impact, can result in breakage, visible cracks and deformation.

⚠ **Defective parts must be replaced immediately!**

Standards

Series S847

- **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
- **DIN 41636-6:** Sensitive switches for communication technology; dimensions, 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)
- **IEC 60068-2-27:** Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock

Schaltbau GmbH

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