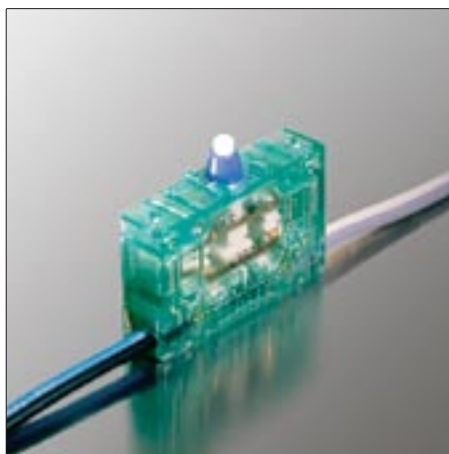
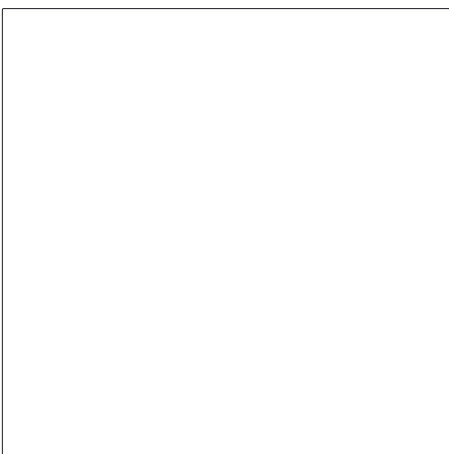
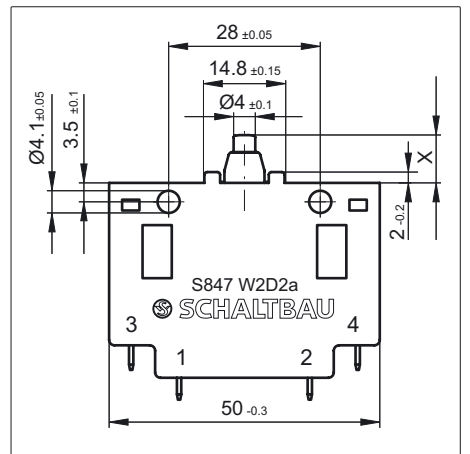
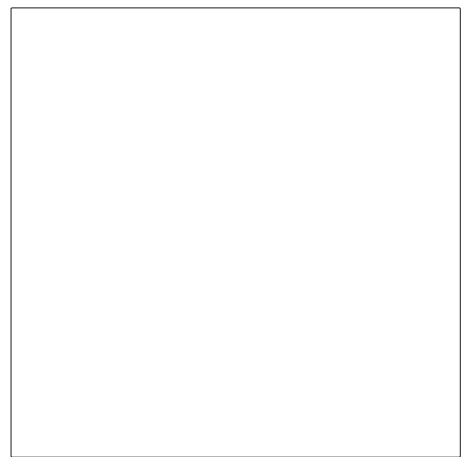


**Snap-action switches
with positive opening
operation and self-
cleaning double-break
contacts
Sealed to IP40 ... IP67
S847 Series**



S847 series snap-action switches

S847 series snap-action switches in modular design are available with three degrees of protection according to EN 60529: IP 40 (protected against electric shock), IP 60 (dustproof), and IP 67 (waterproof).

The positive opening mechanism guarantees that these switches will always function even if the contacts have become welded due to a short-circuit or in the unlikely event of spring failure. This makes them also suitable for use in safety circuits.

Another characteristic is the fast motion of the contact bridge induced by the force of a pretensioned spring. This snap-action mechanism provides a maximum independence of contact making from operating speed - thus allowing for switching relatively high rated loads in spite of the small, compact design of the switches.

On the other hand they can also handle low currents and voltages due to their self-cleaning contacts as well as their

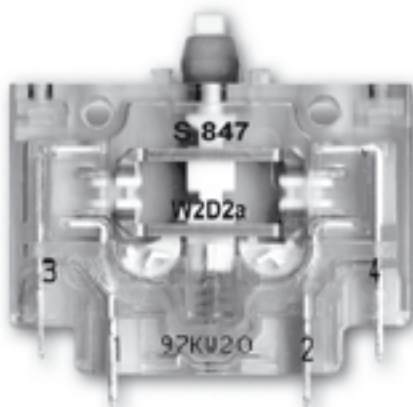
protection against dust, moisture and pollutants, which results in high reliability even at low contact rating.

S847 series snap-action switches feature galvanically isolated, mechanically linked contact bridges which prevent circuit closing failures.


Standards:

- Performance according to IEC 60947-5-1, VDE 0660 part 200
- Positive opening operation. Mechanical form-locking feature according to IEC 60947-5-1 annex K, VDE 0660 part 200 annex K
- Protection degree IP 40, IP 60 and IP 67 according to IEC 60529, VDE 0470 part 1, DIN 40050-9
- Fire retardant according to UL 94V-0
- Dimensions according to DIN 41636-6, type F
- Flat quick-connect terminals according to DIN 46247-3

Specifications*



S847 W2D2a

Conventional thermal current I_{th}	10 A
Rated insulation voltage U_i	400 V
Pollution degree	PD3
Rated impulse withstand voltage U_{imp}	4 kV
Overvoltage category	OV3
Contact material	Hard silver, gold
Contact gap	2 x 1.1 mm typical
Contact force	0.40 N
Contact resistance, typical, without leads connected	100 mΩ
Utilization categories	AC-15, 230 V AC / 1.5 A DC-13, 110 V DC / 1.0 A
Positive opening force**	20 N
Actuator travel for positive opening	see page 6
Maximum actuator travel**	4.9 mm
Actuating speed	1 m/s max. 0.1 mm/s min.
Vibration resistance, 10 ... 500 Hz, all directions (without aux. actuator at 10 μs maximal opening time)	Actuator: 8 g Roller lever: 6 g
Shock resistance (without aux. actuator at 10 μs maximal opening time)	20 g, half sinus
Short-circuit protection	10 A gG (IEC 60269-2)
Maximum operating frequency	300 cycles / minute
Protection degree IP40 Actuating force Release force Mechanical life Operating temperature range	2.6 N max. 0.2 N min. 10 million operations min. -40°C ... +85°C
Protection degree IP60 Actuating force Release force Mechanical life Operating temperature range	3 N max. 0.2 N min. 5 million operations min. -40°C ... +85°C
Protection degree IP67 Actuating force Release force Mechanical life Operating temperature range	3 N max. 0.2 N min. 5 million operations min. -20°C ... +85°C
Weight per switch, without leads	25 g
Approvals	

* valid for switches when new ** measured next to actuator

Design characteristics **Terminal options** *Housing*

- NO + NC, galvanically isolated double-break contacts
- Self cleaning of the contact points by wiping action
- Positive opening operation with long overtravel
- Low contact resistance
- High reproducibility of operating point
- Flat profile lends itself to the ganging of switches in applications where space is limited
- Transparent housing means the contact condition and switching mechanism can easily be checked at all times
- Available terminal options and accessories:
 - Flat quick-connect terminals
 - Screw-type terminals
 - Leads, assembled
 - Auxiliary actuators
 - Protective housing

Applications

- Limit switch for use on machines, door and plant controls
- Auxiliary switch in e.g. cam groups and control devices
- Electromechanical switching element for automation tasks with different electric loads
- Safety switch in control units and systems

Ordering code

e.g.: **S847 W 2 D 2 a**

Series _____

Contact configuration _____
 W NO + NC

Degree of protection _____

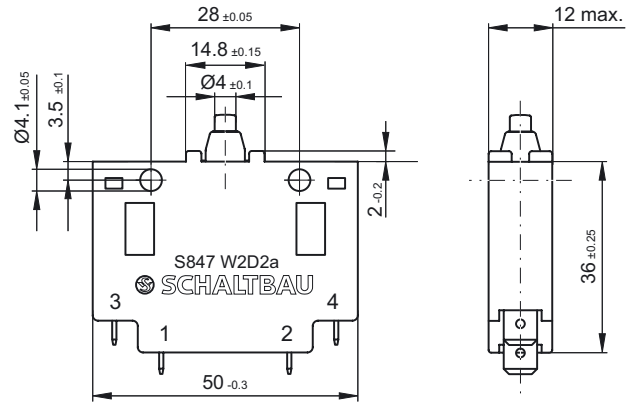
	Contacts	Terminals
1	IP 40	IP 00
2	IP 60	IP 00
3	IP 67	IP 67

Terminal type _____
 A Screw-type
 B Leads, attached at ends (standard)
 D Flat tab 6.3 mm x 0.8 mm

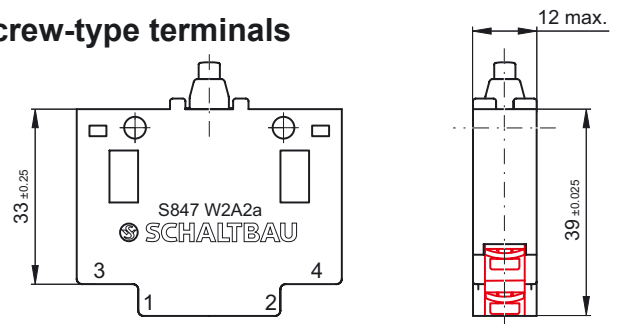
Contact material _____
 2 Hard silver (AgCu3F40)
 4 Gold (AuNi3Ag26)

Actuator options _____
 a Standard push-button
 b Roller lever with fixing brackets
 e Roller lever only

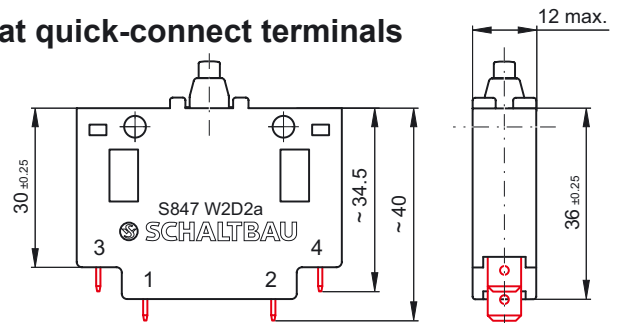
● **Dimension diagram**



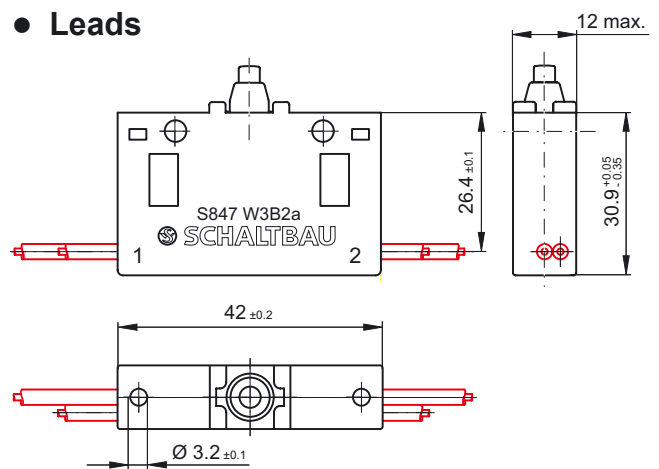
● **Screw-type terminals**



● **Flat quick-connect terminals**



● **Leads**



Termination		Tinned copper wire; AWG 18 / 0.88 mm ² ; length 500 mm	
Connecting leads	black	1	NC contact
	grey	2	NC contact
	blue	3	NO contact
	white	4	NO contact

Accessories

● Auxiliary actuators

● Areas of application

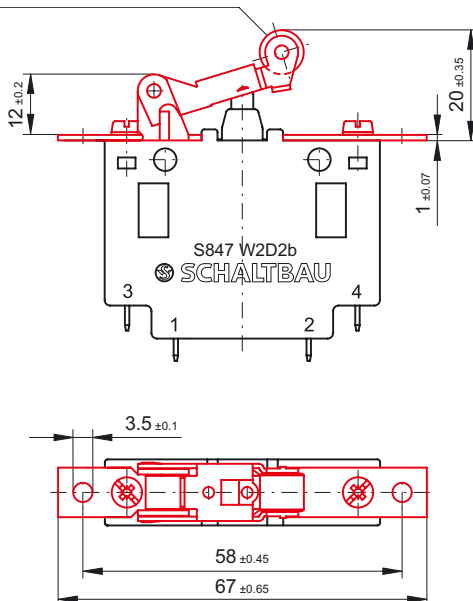
- if direction of actuation deviates more than $\pm 15^\circ$ from the perpendicular actuating line
- if actuating is done by transverse actuators such as cam disks, switch rods or push rods
- if max. operating speed of transverse actuators ≤ 1.5 m/s

● Roller lever characteristics

- The roller itself is manufactured of wear-resistant and smooth-running thermoplastic
- Integral part of ordered type of switch (see "Ordering code", p. 3)

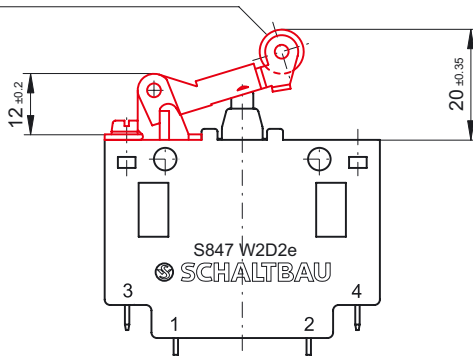
● Roller lever with fixing brackets, type b

Roller diameter: 8.0
Roller width: 6.5



● Roller lever only, type e

Roller diameter: 8.0
Roller width: 6.5

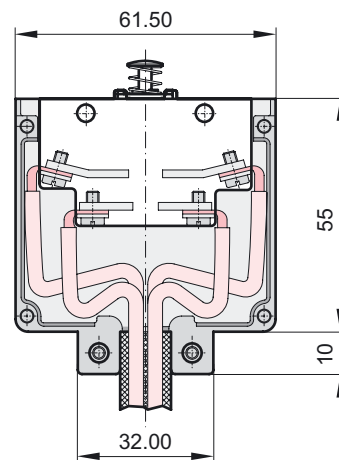


- Special auxiliary actuators and terminal options as well as gold contacts are available on request.

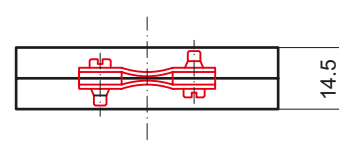
● Protective housing SK-100 with strain-relief clamp



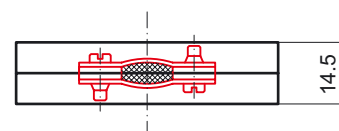
- Housing consists of two half shells made of impact resistant polycarbonate GV
- For use with screw-type terminal versions
- Terminals sealed to IP 40 (protected against contact with live parts)
- Ordering code: SK-100



- Strain-relief clamp for cable diameter 5 to 8 mm
Minimum retention force 80 N



- Strain-relief clamp for cable diameter 5 to 10.9 mm
Minimum retention force 80 N



Electrical rating and operating life

● Electrical life

is a measure of contact life depending on external conditions such as:

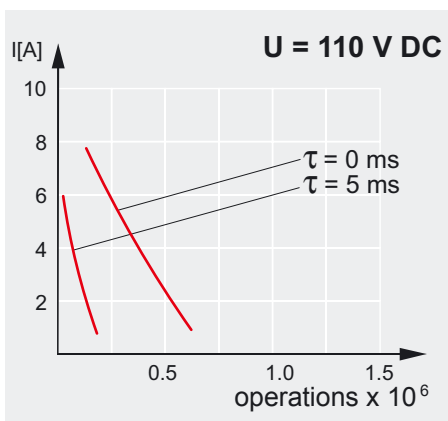
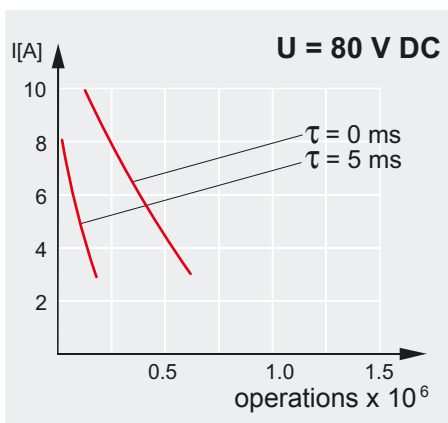
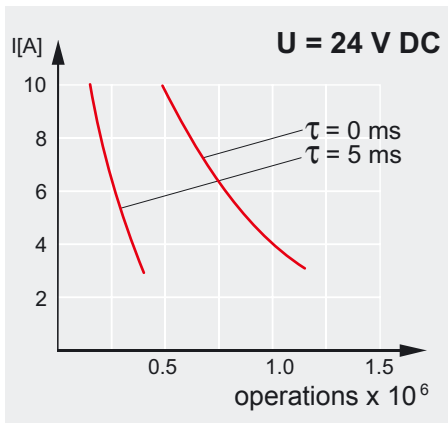
- rated voltage and rated current
- type of load (inductive / capacitive / resistive)
- switching rate (operations / minute)
- arc-extinguishing rate / capacity (especially in DC applications)
- pollution, e.g. dust, harmful substances, noxious gases and vapours

Note:

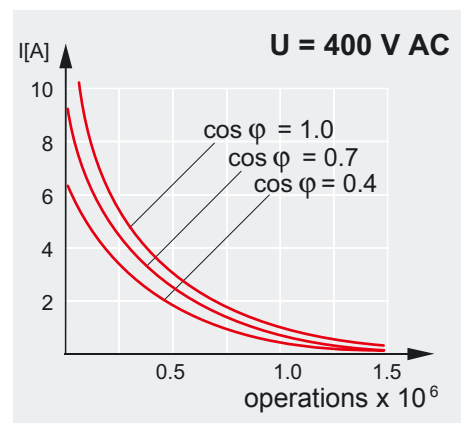
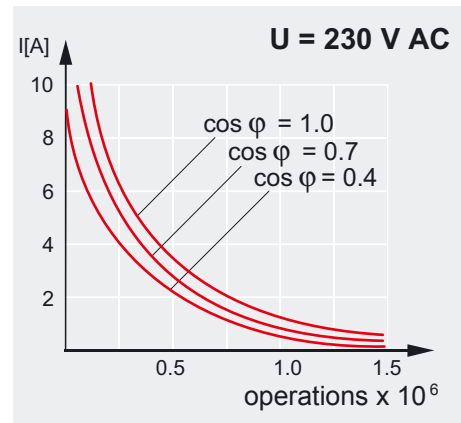
These curves are based on the results of electrical life tests carried out under laboratory conditions. The values shown in the diagrams are representative.

We reserve the right to make technical changes without prior notice.

● DC electrical rating



● AC electrical rating



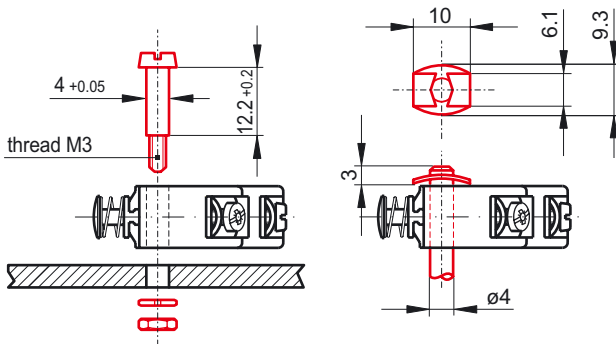
Notes for project planning

Mechanical fastening

- Top-down mounting of all options with screws M3, tightening torque 0.9 Nm max.
- Ganging or lateral mounting through the two transversal bore holes with 4 mm screws or bolts, tightening torque 1.3 Nm max. Alternatively, DUO-Clips or retaining rings can be used.

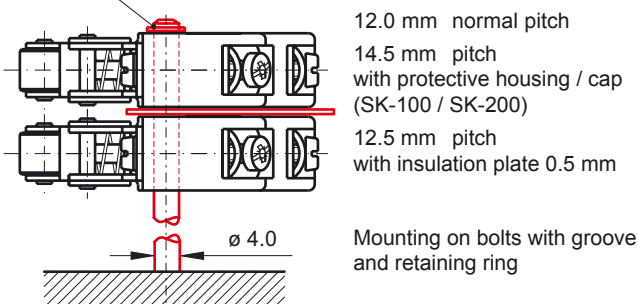
Manner of ganging:

Screws	DUO-Clips
with cylinder head thread length 10 mm BS-ZK	DC-800 to put on bolts BS-ZK
with hexagonal head thread length 10 mm BS-SK	



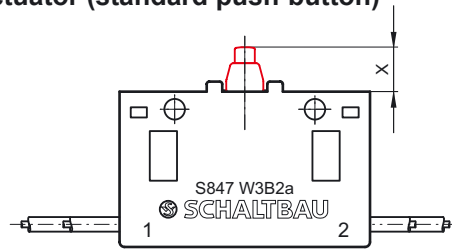
- Front mounting through bore holes in fixing brackets of roller lever (auxiliary actuator type b) or by nuts inserted in housing of standard button version (without auxiliary actuator) type a
- When fastening mechanically, please make sure there are 2 attachment points.
- Insulating plates are required both for mounting S847 versions with screw-type- or flat quick-connect terminals in series and for mounting them on uninsulated surfaces to comply with standards for clearance and creepage distances.

Retaining ring for shaft



Actuator travel

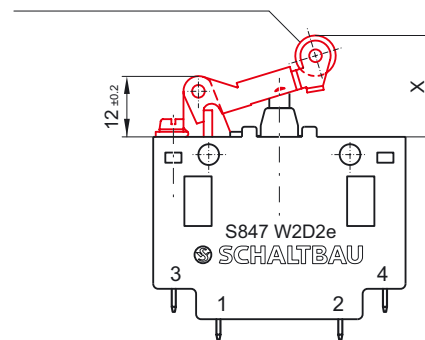
Actuator (standard push-button)



Dimension x (mm)	Actuator position
8.85 ±0.15	Free position
6.60 ±0.25	Operating position
8.00 ±0.25	Release position
4.20	Total positive opening travel
3.90	Total travel position
1.40 (typical)	Differential movement (between operating and release position)

Auxiliary actuator with roller lever

Roller diameter: 8.0
Roller width: 6.5



Dimension x (mm)	Actuator position
20.25 ±0.35	Free position
16.80 ±0.50	Operating position
18.95 ±0.50	Release position
13.30	Total positive opening travel
12.90	Total travel position
2.15 (typical)	Differential movement (between operating and release position)

Note: The stated dimensions of actuator positions apply to all corresponding actuator styles (see page 3).

Notes for project planning

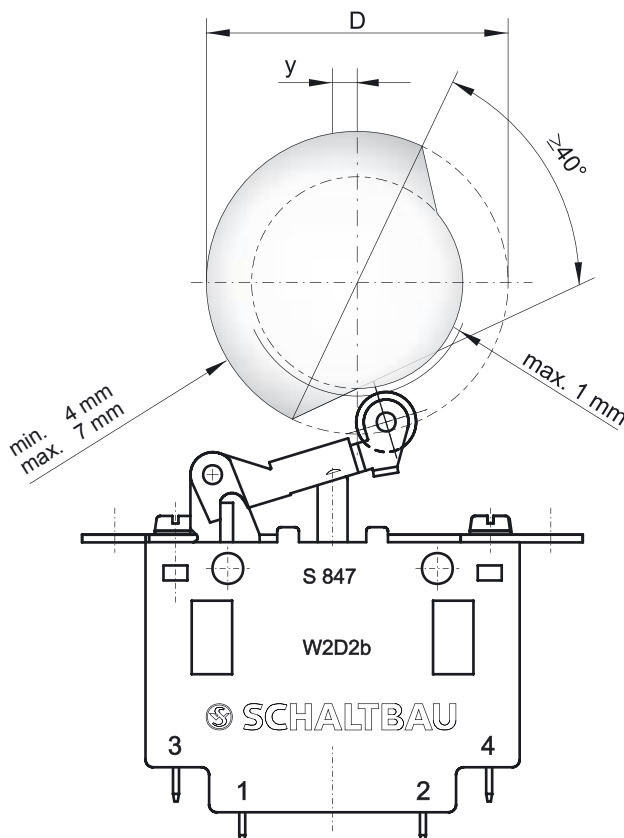
Snap-action switches are designed for actuation with and without roller lever.

A roller lever is required if direction of actuation deviates more than $\pm 15^\circ$ from the perpendicular line or actuating is carried out by means of transverse actuators such as cam disks, switch rods or push rods.

Positive opening operation implies that actuator travel meets at least value x "Total travel for positive opening". Actuators squeezed beyond the limit of "Total travel position" are likely to cause mechanical destruction (see "Actuator travel", p. 6).

● Switch with roller lever actuated by cam disk

Disk diameter D (mm)	Distance y (mm)
40	3.6
60	0
100 max.	0



Instruction: Cleaning agents, adhesives, solvents, or screw-retaining varnish must be compatible with polycarbonate. Never use chemicals not compatible with polycarbonate.

Dimensions in mm

● Screw-type terminals

- Single- and multiple-wire conductors with wire gauges 0.75 ... 2.5 mm² / AWG 18 ... 13 can be clamped without wire end ferrule. If ferrule is used the maximum wire gauge is 1.5 mm² / AWG 15.
- 2 conductors max. with same wire gauge can be clamped per terminal
- Wire insulation must be flush with the clamping unit
- The tightening torque of terminal screws should be 0.5 Nm min. and 0.9 Nm max.
- Wire end ferrules according to DIN 46 228:

Wire gauge	Shape			
	A	B	C	D
1.0 mm ² / AWG 17	x	x	x	x
1.5 mm ² / AWG 15			x	x

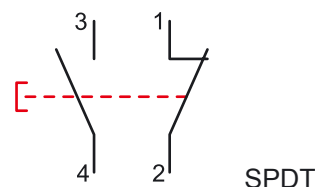
● Flat quick-connect terminals

- Flat female tabs according to DIN 46 247 sheet 3 (6.3 x 0.8 mm), preferably with insulated cable sleeves.

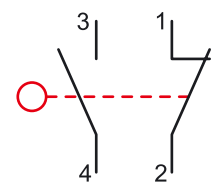
Note: Make sure that strain-relief of the connected cable works.

● Circuit diagram

- Actuator (push-button)



- Auxiliary actuator (roller lever)



● Degree of protection

- Protection degree IP40 and IP60 resp. of the corresponding S847 versions refer to the contacts of the switches. The protection degree of the terminals is IP00.
- The terminals of the screw-type terminal versions used with protective housing SK-100 are sealed to IP40.
- The versions with wire ended terminations are rated IP67 for the contacts as well as the terminals.



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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
- 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 stop 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

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