Device

General

Swisstac switches are modularly designed. They are divided in three groups:

1. Front Interface Human-Switch with state detector.

2. Intermediate section Set and reset device, lamp holder, latching funktion.

3. Switching element block Up to 5 switching elements can be integrated in a switching element block.

Each switch is tested fully mounted. Electrical output and service life are determinated by the switching element. Front and intermediate section are designed for maximum service life of the switching element. They determine in what way the switches are protected against external influences. The type approvals relate to the complete switch.

Environmental conditions

Shock resistance

(single impacts, semi-sinusoidal) 500 m/s², puls width 11 ms, as per EN IEC 60068-2-27 max. 150 m/s², pulse width 11 ms, as per EN IEC 60068-2-29

Vibration resistance

(sinusoidal) max. 100 m/s² at 10 Hz \ldots 500 Hz, as per EN IEC 60068-2-6

Approvals

Approbations

CSA ENEC (EN 61058) UL VDE

Declaration of conformity CE

Front

General

The front notifies the switching status, serves for activation of the switch and determines its type of protection. With the exeption of the front 18 mm dia. of the illuminated pushbuttons 55 and 70 mm, all front bezel elements have activation protection.

Material

Lens Polycarbonate (PC), as per UL94 V0

Front bezel Polybutylene terephthalate (PBT), as per UL94 V0

Actuator 35 mm

Polybutylene terephthalate (PBT), as per UL94 V0

Lock housing

Polybutylene terephthalate (PBT), as per UL94 V0

Lock cylinder

Polybutylenterephthalat reinforced with carbon fibre (PBT) sealing bulb IP 65 (Silicone)

Environmental conditions

Protection degree

IP 67, IP 65 or IP 40, as per EN IEC 60529

Intermediate section

General

The intermediate section integrates characteristics as setting, reset function and click-stop device. Besides all for a switch necessary parts, like front parts, switching block and lamps, are fastened at the intermediate section.

Material

Housing Polycarbonate (PC), as per UL94 V0

Lamp terminal Nickel silver

Mechanical characteristics

Mechanical lifetime

Illuminated pushbutton Keylock- and Selector switch Emergency-stop switch Illuminated push-pull switch > 2 million cycles of operation
> 50 000 cycles of operation
> 8000 cycles of operation
> 250 000 cycles of operation

Switching element block

General

Up to five independent switching elements can be integrated in the switching element block as a switching unit. There are four different types of switching elements available.

1. Snap-action switching element

- 2. Slow-make Stop switching element
- 3. Diode element
- 4. Blind element

Material

Holder for 2 switching elements Polyamide (PA 6), as per UL 94 VO

Holder for 3 switching elements Stainless steel

Electrical characteristics

Electric strength 3750 VAC, 50 Hz, 1 min., as per EN IEC 61058-1

Isolation resistance > 1012Ω as per DIN IEC 60512-2-10

Environmental conditions

Storage temperature -40 °C ... +85 °C, as per EN IEC 60068

Operating temperature -25 °C ... +55 °C, as per EN IEC 60068-2

Lamp terminal CuBe, 2 µm Optalloy

Mechanical characteristics

Terminals

Soldering terminal (also pluggable 2.8 x 0.5 mm) or PCB terminal, Brass gold plated Wire cross-section $1.0\,\text{mm}^2$ max.

Electrical characteristics

Electric strength 2500 VAC, 50 Hz, 1 min. (functional isolation)

Isolation resistance

 $> 1012 \Omega$

Snap-action switching element

Switching system

Is equipped with double-break jump contacts. Owing to the large cleaning path, outstanding self-cleaning is possible. The multilayer contacts are designed for universal use. They are gilded with a $2\,\mu$ m gold coating. Each snap-action switching element comprises a NC (normally closed contact) and a NO (normally open contact).

Material

Housing Polyethylene terephthalate (PETP), as per UL 94 V0

Contacts AgNi, 2 µm gold plated

Contact carrier Brass or CuBe

Mechanical characteristics

 $\begin{array}{l} \textbf{Terminals} \\ \text{Soldering terminal (also pluggable 2.8 x 0.5 mm) or PCB terminal,} \\ \text{Brass gold plated} \\ \text{Wire cross-section 1.0 mm}^2 \text{ max.} \end{array}$

Actuating force For each snap-action switching element approx. 2N

Rebound time typically 0.5 µs

Contact opening width 2 x 0.65 mm

Contact cleaning path 2 x 0.6 mm

Mechanical lifetime 2 million cycles of operation

Electrical characteristics

Contact resistance

New state with gold plated contact $\leq 50 \,\mathrm{m}\Omega$, statically

Electrical life

> 10000 cycles of operation

EN IEC 60947-5-1, AC-12 Voltage 24V 48V 75V 110V 250V Current 6A 6A 5A 2A 0.5A

EN IEC 61058-1 (inductive) Voltage 250V Current 1.5A

Conventional free air thermal current Ith

6A from 1 to 3-poles switching element block 4A for 4- and 5-poles Switching element block. Limited on thermal reasons to I_{max} = 4A

Switch rating

as per EN IEC 61058-1 250 V, 5 A (non-inductive) 250 V, 4 A (non-inductive) 250 V, 1.5 A (inductive) 250 V, 1 A (inductive) 5 VAC/DC, 1 mA min.

up to 3 switching elements with 4 or 5 switching elements up to 3 switching elements with 4 or 5 switching elements

Environmental conditions

Storage temperature

-40 °C ... +85 °C, as per EN IEC 60068

Operating temperature

-25 °C ... +55 °C, as per EN IEC 60068-2

General_technical_data Series 55

Slow-make switching element Stop switch

Switching system

Is equipped with rigid contact link. The slow-make element opens positively and simply consists of a double-break NC. The multilayer contacts are designed for universal use and are gilded with a $2 \mu m$ gold coating. The Stop slow-make element is designed according to EN IEC 60947-5-1.

Material

Housing Rynite (PET), as per UL 94 V0

Contacts AgNi, 2 µm gold plated

Contact carrier Brass or CuBe

Mechanical characteristics

 $\begin{array}{l} \mbox{Terminals} \\ \mbox{Soldering terminal (also pluggable 2.8 $\times 0.5$ mm) or PCB terminal,} \\ \mbox{Brass gold plated} \\ \mbox{Wire cross-section 1.0$ mm^2 max.} \end{array}$

Contact opening width > 2 x 1.5 mm

Mechanical lifetime 8000 cycles of operation

Diode element

General

No switching function. Diodes are soldered into the switching element housing between the contact connections.

Material

Housing Polyethylene terephthalate (PETP), as per UL 94 V0

Electrical characteristics

Rated Operational Voltage U_e 250 VAC, as per EN IEC 60947-1

Rated Insulation Voltage U_i 250 V, as per EN IEC 60947-1

Electrical life 8000 cycles of operation at 250 VAC, 1 A

Conventional free air thermal current I_{th} 5A, as per EN IEC 60947-5-1

Switch rating Switch rating AC with silver contact (gold plated), 250 VAC, 1 A, service category AC-15, as per EN IEC 60947-5-1

Short-circuit protection Series-connected blow-out fuse 5A gL

Environmental conditions

Storage temperature -40 °C...+85 °C, as per EN IEC 60068

Operating temperature -25 °C...+55 °C, as per EN IEC 60068-2

Mechanical characteristics

Terminals

Soldering terminal (also pluggable $2.8 \times 0.5 \text{ mm}$) or PCB terminal, Brass gold plated Wire cross-section $1.0 \text{ mm}^2 \text{ max}$.

Electrical characteristics

Diode

1N4007, rated current = 1.0A, VRRM = 1000V

Blind element

General

Insert in empty places in the switching element block. Nonconducting and without electrical function.

Material

Housing Polybutylene terephthalate (PBT), as per UL94 V0

Buzzer

General

Device with reverse-connect protection.

Mechanical characteristics

Terminals Soldering terminal (also pluggable $2.8 \times 0.5 \text{ mm}$) or PCB terminal, Brass gold plated Wire cross-section 1.0 mm^2 max.

Electrical characteristics

Operating voltage 6, 12 and 24 V AC/DC ±10 %

Power consumption approx. 13 mA

Acoustics approx. 84 dB at 0.1 m

Frequency (tone) approx. 2.3 kHz

Emergency-stop switch foolproof

Switching system

Self cleaning, double-break slow-make element with four-path contacts (contact opening width 2×1.5 mm). The slow-make elements are constructed as per EN IEC 60947-5-1.

Material

Mushroom-head cap Polyamide (PA)

Actuator housing Polyetherimide (PEI), self-extinguishing

Switching element Polyamide (PA), Polysulfon (PSU)

Material of contact Silver (Ag)

Mechanical characteristics

Terminals Soldering terminal max. wire-cross section 2 x 1.0 mm² max. wire-cross section of stranded cable 1 x 0.75 mm² also pluggable 2.8 x 0.5 mm

Actuating force max. 65 N (measured on mushroom-head cap)

Tightening torque for fixing nut max. 50 Ncm

Unlock torque 15 Ncm

Actuating travel 10mm

Rebound time ≤ 2 ms

Mechanical lifetime 50000 cycles of operations

Electrical characteristics

Rated Operational Voltage U_e 250 VAC, as per EN IEC 60947-1

Rated Insulation Voltage U_i 300 VAC, as per EN IEC 60947-5-1

Contact resistance New state $\leq 50 \text{ m}\Omega$, as per DIN IEC 60512-2-5

Electrical life 6050 cycles of operation

Conventional free air thermal current I_{th}

5 A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

Switch rating

Switch rating AC (inductive) with silver contact (gold plated),service category AC-13, as per EN IEC 60947-5-1Voltage24 VAC60 VAC120 VAC250 VACCurrent6A6A5A3A

Switch rating AC (inductive) with silver contact (gold plated),service category AC-14, as per EN IEC 60947-5-1Current24 VAC60 VAC120 VAC250 VACVoltage5A4A3A2A

Switch rating (non-inductive) with silver contact (gold-plated)Voltage24 VDC60 VDC110 VDC240 VDCCurrent6A2A0.7A0.5A

Switch rating DC with silver contact (gold plated), service category DC-13, as per EN IEC 60947-5-1 Voltage 24VDC 60VDC 110VDC 240VDC Current 2A 1A 0.4A 0.2A

Recommended minimum operational data

Silver contact (Soldering terminal) 20 VAC, 10 mA

Electric strength

4000 VAC, 50 Hz, 1 min., as per DIN IEC 60512-2 between all terminals and earth

Short-circuit protection Series-connected blow-out fuse 10A gL

Overvoltage category III, as per EN IEC 60947-5-1

Degree of pollution 3, as per EN IEC 60947-1

Environmental conditions

Storage temperature -40 °C ... +85 °C, as per EN IEC 60068

Operating temperature -25 °C...+55 °C, as per EN IEC 60068-2

Shock resistance (single impacts, semi-sinusoidal) 500 m/s²puls width 11 ms, as per EN IEC 60068-2-27

Vibration resistance (sinusoidal) max. 100 m/s² at 10 Hz ... 2000 Hz, amplitude 0.75 mm, as per EN IEC 60068-2-6

Protection degree as per EN IEC 60529 Frontside IP 65, backside IP 40 **Emergency-stop switch foolproof**

Approvals

Approbations

CSA UL VDE

Declaration of conformity

CE

Keylock switch

Standard lock number is B2 300 (Part No. 240-2001-00). Further standard locks are available: B2 301, B2 302, B2 303, B2 304 A further 95 locks are available in or without passepartout version on request. By order please note the Part No. and the additional marking, specimen order: Part No. 240-2001-00 B2 303.

Stop switch with key to release

Standard lock number is B2 390 (Part No. 240-3001-00). Further standard locks are available: B2 391, B2 392, B2 393, B2 394. By order please note the Part No. and the additional marking, specimen order: Part No. 240-3001-00 B2 394.

Emergency-stop switch, foolproof with key to release

Standard lock number is KABA 1001 (Part No. 240-4001-00). Spare keys may be ordered under Part No. 240-4001-00 1001.