

Actuator with snap-action switching element block (Keylock- and Selector switch 3 positions)**Switching system**

Self-cleaning, double-break snap action switching system
1 normally closed and 1 normally open contact per element.

Material

Material of contact
Gold plated hardsilver

Switch housing
Diallylphthalate (DAP), heat-resistant and self-extinguishing

Actuator housing
Polyetherimide, self-extinguishing

Mechanical characteristics

Terminals
Soldering terminal which can also be used as plug-in terminal
2.8 x 0.5mm:
Max. wire diameter 2 wires of 1 mm
Max. wire cross-section of stranded cable 2 x 0.75 mm²

Tightening torque
for fixing nut max. 50 Ncm

Actuating torque
2.5 Ncm ... 5.5 Ncm, depending on the number of switching elements. Measured at the key or lever of the keylock- or selector switch.

Actuating travel
Keylock-/selector switch actuator with 3 positions
2 x ca. 42° deflection momentary action
2 x ca. 90° deflection maintained action

Rebound time
≤ 5 ms

Mechanical lifetime
Keylock switch 50 000 cycles of operation
Selector switch 100 000 cycles of operation

Electrical characteristics

Electrostatic discharge (ESD)
≤ 15 kV (Keylock switch)

Conventional free air thermal current
5 A
The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating
250 VAC, 5 A (cosφ 0.75)

Electric strength
2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60512-2-11

Protection class
II

Environmental conditions

Storage temperature
-40 °C ... +85 °C

Service temperature
-25 °C ... +55 °C
for selector switches mounted as a block, make sure the heat can escape freely

Protection degree
Front side, as per IEC 60529
IP 65 keylock switch
IP 40 selector switch

Approvals

Approbations
CB (IEC 61058)
CSA
CQC
ENEC (EN 61058)
Germanischer Lloyd
UL

Declaration of conformity
CE

Actuator with low level switching element**Switching system**

This low level switching element was designed for switching low powers in electronic circuits. The mechanism assures reliable switching of loads ranging from a few $\mu\text{A}/\mu\text{V}$ up to 100 mA/42 VAC/DC.

Single-break momentary contact, as normally open or normally closed with 4 independent points of contact. 2 momentary contacts per switching element; combination of normally open and normally closed is possible.

Special features are the long life, extremely short rebound time and stable contact resistance.

Material**Material of contact**

Gold plated

Switch housing

Polysulfone, heat-resistant and self-extinguishing

Actuator housing

Polyetherimide, self-extinguishing

Mechanical characteristics**Terminals**

The universal terminals permit these units to be mounted on printed circuit boards (PCB). These terminals can also be used as soldering or plug-in terminals.

For these terminals we can also supply a plug-in base which, when soldered on to the board, enables the switch to be plugged in.

Soldering terminal:

Max. wire diameter 2 wires $\leq 0.8\text{ mm}$

Max. wire cross-section of stranded cable $1 \times 0.75\text{ mm}^2$

Plug-in terminal $2.0 \times 0.5\text{ mm}$

Tightening torque

for fixing nut max. 50 Ncm

Actuating torque

2.5 Ncm ... 5.5 Ncm, measured at the key or lever of the keylock- or selector switch

Actuating force

3 N ... 3.5 N

Actuating travel

Illuminated pushbutton 3 mm

Keylock-/selector switch actuator 2 positions:

1 x ca. 42° deflection momentary action

1 x ca. 90° deflection maintained action

Rebound time

Typ. $< 100\ \mu\text{s}$

Mechanical lifetime

Momentary action 5 million cycles of operation

Maintained action 1 million cycles of operation

Keylock switch 50 000 cycles of operation

Electrical characteristics**Contact resistance**

Starting value (initial) $\leq 50\text{ m}\Omega$

Electrostatic breakdown value

$\leq 15\text{ kV}$ (Keylock switch)

Switch rating

$10\ \mu\text{A}$, $100\ \mu\text{V}$ to 100 mA at 42 VAC/VDC

Electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60512-2-11

Environmental conditions**Storage temperature**

-40°C ... $+85^\circ\text{C}$

Service temperature

-25°C ... $+55^\circ\text{C}$

For indicators and illuminated pushbuttons mounted as a block, make sure the heat can escape freely.

Protection degree

IP 65 front side, as per IEC 60529

Shock resistance

(Single impacts, semi-sinusoidal)

15 g for 11 ms, as per IEC 60512-4-3, IEC 60068-2-27

Actuator with snap-action switching element**Switching system**

Self-cleaning, double-break snap action switching system (with contact gap 2 x 0.5 mm).

1 normally closed and 1 normally open contact per element.

Snap-action switching elements with soldering terminals at the sides: up to 4 switching element can be on a pushbutton

(max. 4 normally closed and 4 normally open contacts).

Snap-action switching element with axial plug-in terminals 2.8 mm is not stackable, only 1 switching element can be on a pushbutton.

Material**Material of contact**

Gold plated silver

Switch housing

Axial soldering-/plug-in terminal 2.8 mm:

Diallylphthalate DAP, Polyamide 66, Polysulfone, heat-resistant and self-extinguishing.

Soldering terminal: PA 6.6 Ultramid

Actuator housing

Polyetherimide, self-extinguishing

Mechanical characteristics**Terminals**

Snap-action switching element with tinned soldering terminals at the sides:

Max. wire diameter 2 wires à 1.2 mm

Max. wire cross-section of stranded cable 1 x 1 mm²

Snap-action switching element with axial soldering terminals, which can also be used as plug-in terminals 2.8 x 0.5 mm:

Max. wire diameter 2 wires of 1 mm

Max. wire cross-section of stranded cable 2 of 0.75 mm² or 1 x 1.0 mm²

Tightening torque

for fixing nut max. 50 Ncm

Actuating torque

2.5 Ncm ... 5.5 Ncm, depending on the number of switching elements. Measured at the key or lever of the keylock- or selector switch.

Actuating force

4 N ... 6 N, depending on the number of switching elements

Actuating travel

Illuminated pushbutton 3 mm

Keylock-/selector switch actuator 2 positions:

1 x ca. 42° deflection momentary action

1 x ca. 90° deflection maintained action

Rebound time

≤ 5 ms

Mechanical lifetime

Momentary action 2 million cycles of operation

Maintained action 1 million cycles of operation

Keylock switch 50 000 cycles of operation

Electrical characteristics**Standards**

IEC 61058, EN 61058

Rated voltage

250 VAC/VDC

Rated current

5 A

Contact resistance

Starting value (initial) ≤ 50 mΩ

Electrostatic discharge (ESD)

≤ 15 kV (Keylock switch)

Conventional free air thermal current

5 A

The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating

250 VAC, 5 A (cos φ 1)

250 VAC, 3 A (cos φ 0.3)

Switch rating AC (cos φ 0.7)

Voltage 125 VAC 250 VAC

Current 3 A 2 A

Switch rating DC (inductive) L: R = 30 ms

Voltage 24 VDC 60 VDC 110 VDC 220 VDC

Current 2 A 0.7 A 0.2 A 0.1 A

Electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60512-2-11

Protection class

II

Environmental conditions**Storage temperature**

-40 °C ... +85 °C

Service temperature

-25 °C ... +55 °C

For indicators and illuminated pushbuttons mounted as a block, make sure the heat can escape freely.

Protection degree

IP 65 front side, as per IEC 60529

Actuator with snap-action switching element**Shock resistance**

(Single impacts, semi-sinusoidal)

15g for 11 ms, as per IEC 60512-4-3, IEC 60068-2-27

Vibration resistance

(Sinusoidal)

10g at 10 Hz ... 1500 Hz, amplitude 0.75 mm,
as per IEC 60512-4-4, IEC 60068-2-6

Climate resistance

Standard condition, as per IEC 60068-2-3 and 2-30

Changing condition, as per IEC 60068-2-14 and 2-33

Approvals

Approbations
CB (IEC 61058)

CSA

ENEC (EN 61058)

Germanischer Lloyd

UL

Declaration of conformity

CE

Stop Switch

Switching system

Switching element SE16 with solder terminal

Self-cleaning, double-break snap-action switching system
1 NC contact and 1 NO contact per switching element.
Available with up to two switching elements (2NC contact and 2NO contact)

Switching element SE 2.8mm with solder-/ plug-in terminal

Self-cleaning, double-break snap-action switching system
(1 NC contact and 1 NO contact)

Low-level switching element with universal terminal

Single-break momentary contact switch system. Two contacts per switching element with a combination of NC and NO contacts

Material

Actuator housing

Polyamide (PA66), Thermoplastic elastomer (TPE)

Lens

Polyamide (PA6)

Actuator

Polybutylene Terephthalate (PBT)

Label

R-640 polyester

Switching element

Solder terminal	Polyamide (PA 6.6)
Solder-/plug-in interterminal	Diallyl Phthalate (DAP), Polyamide (PA), Polysulfone (PSU)
Universal terminal	Polysulfone (PSU)

Contact material

Snap action solder terminal	gold-plated silver
Snap action plug-in/solder terminal	gold-plated silver
Low level plug-in/solder/PCB terminal	gold-plated

Mechanical characteristics

Terminals

Solder or solder/plug terminal, 2.8 × 0.5mm

Universal terminal with 2.0 × 0.5mm plug-in/solder and PCB terminal

Tightening torque

for fixing nut max. 50Ncm

Actuating force

4 ... 6N (depending on the switching element)

Mechanical lifetime

100 000 cycles of operation

Electrical characteristics

Switch rating

Solder terminal	min. 5VAC/DC, 1 mA max. 250VAC/DC, 5 A
Solder-/plug-in terminal	min. 5VAC/DC, 1 mA max. 250VAC/DC, 5 A
Universal terminal	min. 100µV/10µA max. 42VAC/DC, 100 mA

Environmental conditions

Storage temperature

-40°C ... +85°C

Operating temperature

-25°C ... +55°C

Degree of front protection

IP 65

Approvals

Approbations

UL
CSA
CB
ENEC (EN 61058)

Declaration of conformity

CE

Lens plastic with symbols

Chemical and mechanical tests

1. Wipe resistance according to EN 61058-1 section 8.9
(Petrol/gasoline, distilled water, diluted alcohol)
2. Graffiti-Killer Test
3. Railway cleaning agents (Walo)
4. Damp/dry heat durability
5. UV test according to EN 60068-2-5 / 56 days
6. Mechanical life time 2 Mio. Operations (abrasive test)

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