

**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 mm<sup>2</sup>

**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.  $42^\circ$  deflection momentary action

1 x ca.  $90^\circ$  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**

$-40^\circ\text{C}$  ...  $+85^\circ\text{C}$

**Service temperature**

$-25^\circ\text{C}$  ...  $+55^\circ\text{C}$

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 mm<sup>2</sup>

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 mm<sup>2</sup> or 1 x 1.0 mm<sup>2</sup>

**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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