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 0.5 mm:
Max. wire diameter 2 wires of 1 mm
Max. wire cross-section of stranded cable 2 x 0.75 mm^2

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 µA/µV 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 à 0.8 mm
Max. wire cross-section of stranded cable 1x 0.75 mm^2

Plug-in terminal 2.0 x 0.5 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 µs

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) ≤ 50 mΩ

Electrostatic breakdown value
≤ 15 KV (Keylock switch)

Switch rating
10 µA, 100 µV 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 °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

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^2

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^2 or 1 x 1.0 mm^2

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 (cosφ 1)
250 VAC, 3 A (cosφ 0.3)

Switch rating AC (cosφ 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)
15 g for 11 ms, as per IEC 60512-4-3, IEC 60068-2-27

Vibration resistance
(Sinusoidal)
10 g 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 (2 NC contact and 2 NO contact)

Switching element SE 2.8 mm 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 interminal	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 × 0.5 mm
Universal terminal with 2.0 × 0.5 mm plug-in/solder and PCB terminal

Tightening torque
for fixing nut max. 50 Ncm

Actuating force
4 … 6 N (depending on the switching element)

Mechanical lifetime
100 000 cycles of operation

Electrical characteristics

Switch rating

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