04 Technical data

Slow-make switching element with VDE and UKCA

When using the switching element, the application guidelines must be observed.

Switching system

The double-break, slow-make switching element is equipped with one or two independent contact systems, acting as normally open or normally closed contact. The normally closed contact has forced opening.

Slow-make contacts with forced action are ideal for high switch ratings.

Up to three switching elements can be snapped to each actuator.

For the emergency-stop switch use the slow-make switching element (max. 2).

Special requirements for positive-opening auxiliary current switches

Positive opening travel	Emergency stop 12.5 mm
Minimum force	Emergency stop 50 N (actuating force at which is safely switched)
Max. travel	Emergency stop 12.5 mm

Material

Housing

The indicator lights/switches may be installed in enclosures with protection class 2 according to DIN EN 61140.
The enclosure must at least have enclosure class 2 according to UL50E.

Material of contact

Hard silver, gold-silver, silver-palladium (for aggressive atmospheres)

Switch housing

Plastic

Mechanical characteristics

Terminals

Screw terminal

- max. wire cross section	2.5 mm^2
- stripping length wire	10 mm
- max. number of wire	2
- max. strand cross section	1.5 mm^2
- stripping strands	use stranded wires only with wire end ferrules of 10 mm length
- max. number of strands	2

Only one polarity is allowed on each side when wiring.

Plug-in terminal 1 x 6.3 mm x 0.8 mm or 2 x 2.8 mm x 0.8 mm
For devises with plug-in connections, insulating sleeves are required and the mounting cut-out of 65 mm must be observed.

Double plug-in terminal 2 x 6.3 mm x 0.8 mm
For units with plug-in connections, insulating sleeves are required and the mounting cut-out of 65 mm must be observed.

Tightening torque

Screws at the plastic mounting flange max. 0.4 … 0.5 Nm
Screws at the metal mounting flange max. 0.25 … 0.3 Nm
Screws at switching element max. 0.8 Nm

Actuating force

1 Normally closed 2 N
1 Normally open 3 N

Actuating travel

Approx. 5.8 mm ± 0.2 mm

Mechanical lifetime

(with 1 switching element)

Pushbutton maintained action	1.5 million cycles of operation
Pushbutton momentary action	3 million cycles of operation
Selector switch maintained action	1.25 million cycles of operation
Selector switch momentary action	2.5 million cycles of operation
Emergency-stop switch	50 000 cycles of operation
Keylock switch maintained action	25 000 cycles of operation
Keylock switch momentary action	50 000 cycles of operation

Electrical characteristics

Standards

The switches comply with the “Standards for low-voltage switching devices” DIN EN 60947-5-1

Rated Insulation Voltage U_i

500 V, as per DIN EN 60947-5-1

Rated impulse withstand voltage U_{imp}

4 kV, according to EN/IEC 60947-5-1

Electrical life

50 000 cycles of operation

Thermal current I_{th}

Max. current at continuous operation and limit temperatures which do not exceed the specified max. values.
10 A

Switching voltage and switching current
as per EN IEC 60947-5-1

voltage	DC13	AC15
24 V	4.0 A	8.0 A
60 V	1.5 A	8.0 A
110 V	1.0 A	
120 V		8.0 A
230 V	0.4 A	7.0 A
400 V	0.2 A	5.0 A
500 V	0.15 A	4.0 A

Recommended minimum operational data
Gold-silver contacts:
Voltage 24 VDC 110 VDC
Current 5 mA 2 mA

Hard silver contacts:
Voltage 24 VDC 110 VDC
Current 50 mA 10 mA

Protection class
Indicators and switches, fit for mounting into devices with protection class II

Ambient conditions

Storage temperature
–40 °C … +85 °C

Operating temperature
–40 °C … +55 °C
(other temperatures on request)

Protection degree
IP00

Shock resistance
(single impacts, semi-sinusoidal)
300 m/s² pulse width 11 ms, as per EN IEC 60068-2-27

Vibration resistance
(sinusoidal)
100 m/s² at 10 Hz … 500 Hz, amplitude 0.75 mm, as per EN IEC 60068-2-6

Pollution degree
3

Climatic resistance
Relative humidity
10 ... 95 % non-condensing

Approvals

Approbations
CB (IEC 60947-5-1)
DNV
EAC
NFF
cULus
VDE

Conformities
CE
CCC
UKCA

Snap-action switching element with VDE and UKCA

When using the switching element, the application guidelines must be observed.

Switching system

The double-break, snap-action switching element is equipped with one or two independent contact systems, acting as normally open or normally closed contact. The snap-action switching element is fitted with self-cleaning contacts.

Up to three switching elements can be snapped to each actuator.

Snap-action switching elements are not permissible for emergency-stop pushbuttons!

Material

Housing
The indicator lights/switches may be installed in enclosures with protection class 2 according to DIN EN 61140.
The enclosure must at least have enclosure class 2 according to UL50E.

Material of contact
Hard silver, gold-silver, silver-palladium (for aggressive atmospheres)

Switch housing
Plastic

04 Technical data

Mechanical characteristics

Terminals

Screw terminal

- max. wire cross section	2.5 mm²
- stripping length wire	10 mm
- max. number of wire	2
- max. strand cross section	1.5 mm²
- stripping strands	use stranded wires only with wire end ferrules of 10 mm length
- max. number of strands	2

Only one polarity is allowed on each side when wiring.

Plug-in terminal 1 x 6.3 mm x 0.8 mm or 2 x 2.8 mm x 0.8 mm
For devises with plug-in connections, insulating sleeves are required and the mounting cut-out of 65 mm must be observed.

Double plug-in terminal 2 x 6.3 mm x 0.8 mm
For units with plug-in connections, insulating sleeves are required and the mounting cut-out of 65 mm must be observed.

Tightening torque

Screws at the plastic mounting flange max. 0.4 – 0.5 Nm
Screws at the metal mounting flange max. 0.25 – 0.3 Nm
Screws at switching element max. 0.8 Nm

Actuating force

1 Normally closed 1.9 N
1 Normally open 2 N

Actuating travel

Approx. 5.8 mm ± 0.2 mm

Mechanical lifetime

(with 1 switching element)

Pushbutton maintained action	1.5 million cycles of operation
Pushbutton momentary action	3 million cycles of operation
Selector switch maintained action	1.25 million cycles of operation
Selector switch momentary action	2.5 million cycles of operation
Keylock switch maintained action	25 000 cycles of operation
Keylock switch momentary action	50 000 cycles of operation

Electrical characteristics

Standards

The switches comply with the “Standards for low-voltage switching devices” DIN EN 60947-5-1

Rated Insulation Voltage U_i

500 V, as per DIN EN 60947-5-1

Rated impulse withstand voltage U_{imp}

4 kV, according to EN / IEC 60947-5-1

Electrical life

50 000 cycles of operation

Thermal current I_{th}

Max. current at continuous operation and limit temperatures which do not exceed the specified max. values.
10 A

Switching voltage and switching current

as per EN IEC 60947-5-1

voltage	DC13	AC15
24 V	2.5 A	4.5 A
60 V	0.8 A	4.5 A
110 V	0.6 A	
120 V		4.5 A
230 V	0.2 A	4.5 A
400 V	0.15 A	4.0 A
500 V	0.07 A	2.5 A

Recommended minimum operational data

Gold-silver contacts:

Voltage	5 VDC	24 VDC	110 VDC
Current	15 mA	5 mA	2 mA

Hard silver contacts:

Voltage	24 VDC	110 VDC
Current	50 mA	10 mA

Protection class

Indicators and switches, fit for mounting into devices with protection class II.

Ambient conditions

Storage temperature

– 40 °C … + 85 °C

Operating temperature

– 40 °C … + 55 °C
(other temperatures on request)

Protection degree

IP00

Shock resistance

(single impacts, semi-sinusoidal)
300 m / s² pulse width 11 ms, as per DIN EN 60068-2-27

Vibration resistance

(sinusoidal)
100 m3 / s² at 10 Hz … 500 Hz, amplitude 0.75 mm, as per DIN EN 60068-2-6

Pollution degree
3

Climatic resistance
Relative humidity
10 ... 95 % non-condensing

Approvals

Approbations
CB (IEC 60947-5-1)
DNV
EAC
NFF
cULus
VDE

Conformities
CE
CCC
UKCA

Slow-make switching element PIT with VDE and UKCA

When using the switching element, the application guidelines must be observed.

Switching system

The double-break, slow-make switching element is equipped with one or two independent contact systems, acting as normally open or normally closed contact. The normally closed contact has forced opening.

Slow-make contacts with forced action are ideal for high switch ratings.

Up to three switching elements can be snapped to each actuator.

For the emergency-stop pushbutton use the slow-make switching element (max. 2).

Special requirements for positive-opening auxiliary current switches

Positive opening travel	Emergency stop 12.5 mm
Minimum force	Emergency stop 50 N (actuating force at which is safely switched)
Max. travel	Emergency stop 12.5 mm

Material

Housing
The indicator lights/switches may be installed in enclosures with protection class 2 according to DIN EN 61140.
The enclosure must at least have enclosure class 2 according to UL50E.

Material of contact
Hard silver and gold-silver

Switch housing
Plastic

Mechanical characteristics

Terminals
PIT push-in terminal

- max. wire cross section	1.0 mm²
- stripping length wire	8 mm
- max. number of wire	2
- max. strand cross section	0.75 mm²
- stripping strands	use stranded wires only with wire end ferrules of 8 mm length
- max. number of strands	2

Only one polarity is allowed on each side when wiring.

Tightening torque
Screws at the plastic mounting flange max. 0.4 – 0.5 Nm
Screws at the metal mounting flange max. 0.25 – 0.3 Nm

Actuating force
1 Normally closed 2 N
1 Normally open 3 N

Actuating travel
approx. 5.8 mm ± 0.2 mm

Mechanical lifetime
(with 1 switching element)

Pushbutton maintained action	1.5 million cycles of operation
Pushbutton momentary action	3 million cycles of operation
Selector switch maintained action	1.25 million cycles of operation
Selector switch momentary action	2.5 million cycles of operation
Emergency-stop switch	50 000 cycles of operation
Keylock switch maintained action	25 000 cycles of operation
Keylock switch momentary action	50 000 cycles of operation

04 Technical data

Electrical characteristics

Standards
The switches comply with DIN EN 60947-1/EN IEC 60947-5-1

Rated Insulation Voltage U_i
500 V, as per DIN EN 60947-5-1

Rated impulse withstand voltage U_{imp}
4 kV, according to EN / IEC 60947-5-1

Electrical life
50 000 cycles of operation

Thermal current I_{th}
Max. current at continuous operation and limit temperatures which do not exceed the specified max. values.
6 A

Switching voltage and switching current
as per EN IEC 60947-5-1

voltage	DC13	AC15
24 V	4,0 A	6,0 A
48 V		6,0 A
60 V	1,5 A	
110 V	1,0 A	
120 V		6,0 A
230 V		7,0 A

Recommended minimum operational data
Gold-silver contacts:
Voltage 24 VDC
Current 5 mA

Hard silver contacts:
Voltage 24 VDC
Current 50 mA

Protection class
Indicators and switches, fit for mounting into devices with protection class II

Ambient conditions

Storage temperature
– 40 °C … + 85 °C

Operating temperature
– 40 °C … + 55 °C
(other temperatures on request)

Protection degree
IP20

Shock resistance
(single impacts, semi-sinusoidal)
300 m / s² pulse width 11 ms, as per DIN EN 60068-2-27

Pollution degree
3

Climatic resistance
Relative humidity
10 ... 95 % non-condensing

Approvals

Approbations
CB (IEC 60947-5-1)
DNV
EAC
NFF
cULus
VDE

Conformities
CE
CCC
UKCA

Snap-action switching element PIT with VDE and UKCA

When using the switching element, the application guidelines must be observed.

Switching system

The double-break, snap-action switching element is equipped with one or two independent contact systems, acting as normally open or normally closed contact. The snap-action switching element is fitted with self-cleaning contacts.

Up to three switching elements can be snapped to each actuator.

Snap-action switching elements are not permissible for emergency stop pushbuttons!

Material

Housing
The indicator lights/switches may be installed in enclosures with protection class 2 according to DIN EN 61140.
The enclosure must at least have enclosure class 2 according to UL50E.

Material of contact
Hard silver and gold-silver

Switch housing
Plastic

Mechanical characteristics

Terminals
PIT push-in terminal

- max. wire cross section	1.0 mm²
- stripping length wire	8 mm
- max. number of wire	2
- max. strand cross section	0.75 mm²
- stripping strands	use stranded wires only with wire end ferrules of 8 mm length
- max. number of strands	2

Only one polarity is allowed on each side when wiring.

Tightening torque
Screws at the plastic mounting flange max. 0.4 – 0.5 Nm
Screws at the metal mounting flange max. 0.25 – 0.3 Nm

Actuating force
1 Normally closed 1.9 N
1 Normally open 2 N

Actuating travel
Approx. 5.8 mm ± 0.2 mm

Mechanical lifetime
(with 1 switching element)

Pushbutton maintained action	1.5 million cycles of operation
Pushbutton momentary action	3 million cycles of operation
Selector switch maintained action	1.25 million cycles of operation
Selector switch momentary action	2.5 million cycles of operation
Keylock switch maintained action	25 000 cycles of operation
Keylock switch momentary action	50 000 cycles of operation

Electrical characteristics

Standards
The switches comply with DIN EN 60947-1/DIN EN 60947-5-1

Rated Insulation Voltage U_i
500 V, as per DIN EN 60947-5-1

Rated impulse withstand voltage U_{imp}
4 kV, according to EN/IEC 60947-5-1

Electrical life
50 000 cycles of operation

Thermal current I_{th}
Max. current at continuous operation and limit temperatures which do not exceed the specified max. values.
6 A

Switching voltage and switching current
as per EN IEC 60947-5-1

voltage	DC13	AC15
24 V	2,5 A	6,0 A
48 V		6,0 A
60 V	0,8 A	
110 V	0,6 A	
120 V		6,0 A
230 V		6,0 A

Recommended minimum operational data
Gold-silver contacts:
Voltage 24 VDC
Current 5 mA

Hard silver contacts:
Voltage 24 VDC
Current 50 mA

Protection class
Indicators and switches, fit for mounting into devices with protection class II

04 Technical data

Ambient conditions

Storage temperature
–40 °C … +85 °C

Operating temperature
–40 °C … +55 °C
(other temperatures on request)

Protection degree
IP20

Shock resistance
(single impacts, semi-sinusoidal)
300 m/s² pulse width 11 ms, as per DIN EN 60068-2-27

Vibration resistance
(sinusoidal)
100 m/s² at 10 Hz … 500 Hz, as per DIN EN 60068-2-6 and EN 61373 Increased broad band noise, class 1B

Pollution degree
3

Climatic resistance
Relative humidity
10 ... 95 % non-condensing

Approvals

Approbations
CB (IEC 60947-5-1)
DNV
EAC
NFF
cULus
VDE

Conformities
CE
CCC
UKCA