






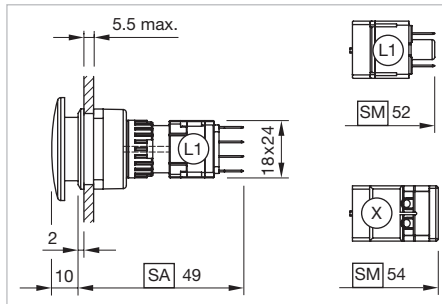
Mushroom-head pushbutton, IP 65

Equipment consisting of (schematic overview)

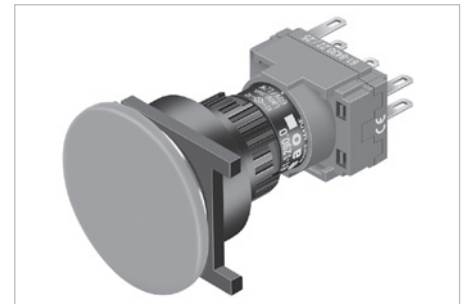
-  **Lens** page 637
-  **Actuator**
-  **Front bezel set** page 641
-  **Fixing nut**
-  **Switching element** page 651

Each Part Number listed below includes all the black components shown in the 3D-drawing.

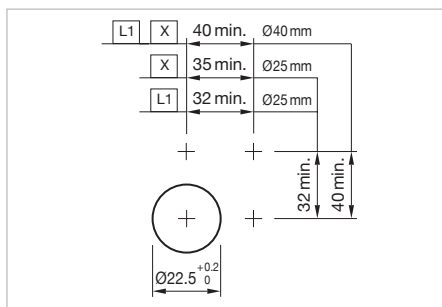
To obtain a complete unit, please select the red components from the pages shown.




Dimensions [mm]
 L1 = Solder terminal 2.8 x 0.5 mm,
 SA = Snap-action switching element,
 SM = Slow-make switching element,
 X = Screw terminal



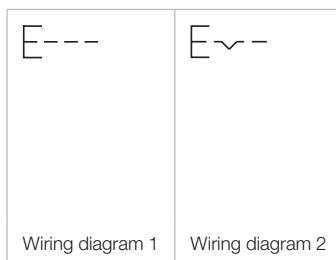
Product can differ from the current configuration.



Mounting cut-outs [mm]
 L1 = Solder terminal 2.8 x 0.5 mm,
 X = Screw terminal

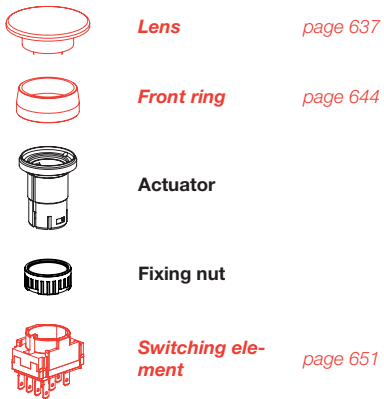
Product attribute	Switching action	Part No.	Wiring diagram	Weight
 Mushroom-head pushbutton actuator, Front dimension Ø 32 mm	B	61-1100.0	1	0.005 kg
	C	61-1200.0	2	0.005 kg
	B - C convertible from momentary to maintained action	B - C	61-1300.0	1

Switching action: B = Momentary, C = Maintain



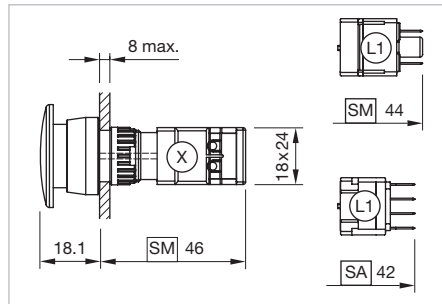
Mushroom-head pushbutton, IP 65

Equipment consisting of (schematic overview)



Each Part Number listed below includes all the black components shown in the 3D-drawing.

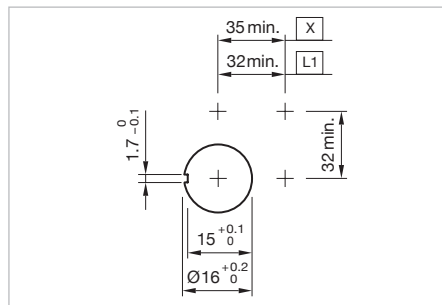
To obtain a complete unit, please select the red components from the pages shown.



Dimensions [mm]
 L1 = Solder terminal 2.8 x 0.5 mm,
 SA = Snap-action switching element,
 SM = Slow-make switching element,
 X = Screw terminal




Product can differ from the current configuration.



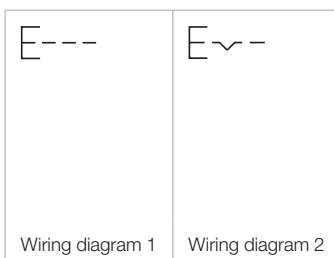
Mounting cut-outs [mm]
 L1 = Solder terminal 2.8 x 0.5 mm,
 X = Screw terminal

Additional Information

- For front dimension Ø 32 mm

Switching action	Part No.	Wiring diagram	Weight
 <p>Mushroom-head pushbutton actuator</p>	B	1	0.005 kg
	C	2	0.005 kg

Switching action: B = Momentary, C = Maintain




61 Accessories

Mushroom-head cap

Additional Information


- Non-illuminative

Mushroom-head cap	Part No.	Weight
 <p>Mushroom-head cap, Front dimension Ø 32 mm</p>		
Plastic black	61-9593.0	0.004 kg
Plastic red	61-9593.2	0.004 kg
Plastic yellow	61-9593.4	0.004 kg
Plastic green	61-9593.5	0.004 kg




Marking plate

Additional Information

- Can be hot stamped
- Only applicable with lens round Part No. 61-9642.X

Marking plate	Part No.	Weight
 <p>Legend plate for lens plastic</p>		
Plastic colourless transparent	61-9707.7	0.001 kg

Keylock front bezel flush design



Product attribute	Dimension	Material	Colour	Part No.	Weight
 <p>Keylock front bezel for keylock switch, flush design</p>					
for device with front dimension 24 x 24 mm	18 x 18 mm	Plastic	black	61-9220.0	0.001 kg
 <p>Keylock front bezel for keylock switch, flush design</p>					
for device with front dimension 24 x 30 mm	18 x 24 mm	Plastic	black	61-9230.0	0.001 kg
 <p>Keylock front bezel for keylock switch, flush design</p>					
fro device with front dimension Ø 25 mm	Ø 18 mm	Plastic	black	61-9210.0	0.001 kg

61 Accessories

Front bezel set mushroom

Additional Information

- The dimensions of the mounting cut-outs are shown in the product details
- The colour of anodized aluminium parts can vary due to technical production reasons

Dimension	Mounting cut-out	Front bezel	Part No.	Weight
 <p>Front bezel set for mushroom-head pushbutton, flush design, Front dimension Ø 40 mm</p>	Ø 22.5 mm	Aluminium natural anodized	61-9934.8	0.013 kg
	 <p>Front bezel set for mushroom-head pushbutton, flush design</p>			
Ø 25 mm	Ø 22.5 mm	Aluminium natural anodized	61-9933.0	0.006 kg
	Ø 22.5 mm	Aluminium black anodized	61-9933.1	0.006 kg
	Ø 22.5 mm	Aluminium red anodized	61-9933.2	0.006 kg
	Ø 22.5 mm	Aluminium gold anodized	61-9933.4	0.006 kg
	Ø 22.5 mm	Aluminium olive-green anodized	61-9933.5	0.006 kg
	Ø 22.5 mm	Aluminium blue anodized	61-9933.6	0.006 kg
	Ø 22.5 mm	Plastic black	61-9933.10	0.008 kg

61 Accessories

Flasher element

Additional Information

- Only for Indicator actuator (without indicator complete)
- Further information see «Technical data»


Operating voltage	Terminal	Part No.	Component layout	Weight
 <p>Flasher element</p>				
12 ... 28 ±10 % VAC/DC	Solder	61-8000.05	6	0.005 kg

The component layouts you will find from page 666

Switching element 2 positions

Additional Information

- We offer a dismantling tool Part No. 61-9711.0 for dismantling of the switching element


Product attribute	Diode 1N4007	Switching voltage	Switching current	Switching system	Contacts	Contact material	Terminal	Part No.	Component layout	Wiring diagram	Weight	
 <p>Switching element for pushbutton and keylock- and selector switch 2 positions</p>												
with lamp terminal	2	250 VAC	5 A	Snap-action switching element	1 NO	Silver	Solder 2.8 x 0.5 mm	61-8212.12	7	1	0.007 kg	
						Gold	Solder 2.8 x 0.5 mm	61-8212.22	7	1	0.007 kg	
			250 VAC	5 A	Snap-action switching element	1 NO	Silver	Solder 2.8 x 0.5 mm	61-8410.12	11	5	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8410.22	11	5	0.007 kg
						2 NO	Silver	Solder 2.8 x 0.5 mm	61-8420.12	14	8	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8420.22	14	8	0.007 kg
						3 NO	Silver	Solder 2.8 x 0.5 mm	61-8430.12	16	10	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8430.22	16	10	0.007 kg
						1 NC	Silver	Solder 2.8 x 0.5 mm	61-8440.12	8	2	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8440.22	8	2	0.007 kg
						2 NC	Silver	Solder 2.8 x 0.5 mm	61-8450.12	12	6	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8450.22	12	6	0.007 kg
						3 NC	Silver	Solder 2.8 x 0.5 mm	61-8460.12	15	9	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8460.22	15	9	0.007 kg
						1 NC + 1 NO	Silver	Solder 2.8 x 0.5 mm	61-8470.12	9	3	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8470.22	9	3	0.007 kg
						2 NC + 1 NO	Silver	Solder 2.8 x 0.5 mm	61-8480.12	13	7	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8480.22	13	7	0.007 kg
						1 NC + 2 NO	Silver	Solder 2.8 x 0.5 mm	61-8490.12	10	4	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8490.22	10	4	0.007 kg

61 Accessories

Flasher element

Additional Information

- Only for Indicator actuator (without indicator complete)
- Further information see «Technical data»


Operating voltage	Terminal	Part No.	Component layout	Weight
 Flasher element				
12 ... 28 ±10 % VAC/DC	Solder	61-8000.05	6	0.005 kg

The component layouts you will find from page 666

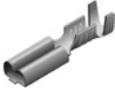

Switching element 2 positions

Additional Information


- We offer a dismantling tool Part No. 61-9711.0 for dismantling of the switching element

Product attribute	Diode 1N4007	Switching voltage	Switching current	Switching system	Contacts	Contact material	Terminal	Part No.	Component layout	Wiring diagram	Weight	
 Switching element for pushbutton and keylock- and selector switch 2 positions												
with lamp terminal	2	250 VAC	5 A	Snap-action switching element	1 NO	Silver	Solder 2.8 x 0.5 mm	61-8212.12	7	1	0.007 kg	
						Gold	Solder 2.8 x 0.5 mm	61-8212.22	7	1	0.007 kg	
			250 VAC	5 A	Snap-action switching element	1 NO	Silver	Solder 2.8 x 0.5 mm	61-8410.12	11	5	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8410.22	11	5	0.007 kg
						2 NO	Silver	Solder 2.8 x 0.5 mm	61-8420.12	14	8	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8420.22	14	8	0.007 kg
						3 NO	Silver	Solder 2.8 x 0.5 mm	61-8430.12	16	10	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8430.22	16	10	0.007 kg
						1 NC	Silver	Solder 2.8 x 0.5 mm	61-8440.12	8	2	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8440.22	8	2	0.007 kg
						2 NC	Silver	Solder 2.8 x 0.5 mm	61-8450.12	12	6	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8450.22	12	6	0.007 kg
						3 NC	Silver	Solder 2.8 x 0.5 mm	61-8460.12	15	9	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8460.22	15	9	0.007 kg
						1 NC + 1 NO	Silver	Solder 2.8 x 0.5 mm	61-8470.12	9	3	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8470.22	9	3	0.007 kg
						2 NC + 1 NO	Silver	Solder 2.8 x 0.5 mm	61-8480.12	13	7	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8480.22	13	7	0.007 kg
						1 NC + 2 NO	Silver	Solder 2.8 x 0.5 mm	61-8490.12	10	4	0.007 kg
							Gold	Solder 2.8 x 0.5 mm	61-8490.22	10	4	0.007 kg



Flat receptacle

Product attribute	Part No.	Weight
 <p>Flat receptacle</p>		
2.8 x 0.5 mm plug-in terminal	31-946	0.001 kg
 <p>Flat receptacle</p>		
2.8 x 0.5 mm multi-plug housing	51-943.1	0.001 kg

Insulation sleeve

Product attribute	Part No.	Weight
 <p>Insulation sleeve</p>		
for flat receptacle 2.8 mm	31-929	0.001 kg

Terminal cover

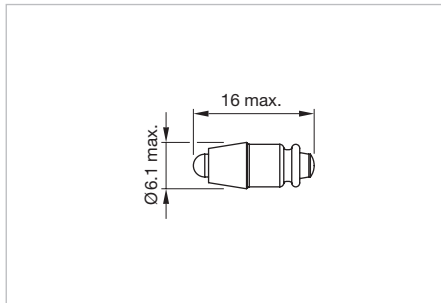
Product attribute	Part No.	Weight
 <p>Terminal cover</p>		
for snap-action switching element with soldering terminal	61-9830.2	0.002 kg
 <p>Terminal cover</p>		
for indicator complete	61-9831.2	0.001 kg

Illumination


Single-LED, T1 3/4 MG

Additional Information

- When using AC/DC types with AC operation, slight flickering can occur
- Luminous intensity data of the LEDs on direct voltage
- Electrical and optical data are measured at 25 °C
- The specified versions are built with a protection diode (half wave rectifier) in series and the LED
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination
- For supply voltages above 48V, a voltage reduction element (external series resistor or transformer) must be used
- Due to high surface temperatures, the surface resistors must be soldered directly to the terminals of the equipment (use a terminal plate)



Dimensions [mm]


LED colour	Operating voltage	Operation current	Lumi. intensity	Dom. wavelength	Part No.	Weight
 <p>Single-LED</p>						
red	6 VDC +10 %	15 mA ±15 %	350 mcd	630 nm	10-2J06.3142	0.002 kg
	12 VAC/DC +10 %	7/14 mA ±15 %	330 mcd	630 nm	10-2J09.1062	0.002 kg
	24 VAC/DC +10 %	7/14 mA ±15 %	330 mcd	630 nm	10-2J12.1062	0.002 kg
	28 VAC/DC +10 %	7/14 mA ±15 %	330 mcd	630 nm	10-2J13.1062	0.002 kg
	48 VAC/DC +10 %	4/8 mA ±15 %	200 mcd	630 nm	10-2J19.1042	0.002 kg
yellow	6 VDC +10 %	15 mA ±15 %	300 mcd	587 nm	10-2J06.3144	0.002 kg
	12 VAC/DC +10 %	7/14 mA ±15 %	280 mcd	587 nm	10-2J09.1064	0.002 kg
	24 VAC/DC +10 %	7/14 mA ±15 %	280 mcd	587 nm	10-2J12.1064	0.002 kg
	28 VAC/DC +10 %	7/14 mA ±15 %	280 mcd	587 nm	10-2J13.1064	0.002 kg
	48 VAC/DC +10 %	4/8 mA ±15 %	180 mcd	587 nm	10-2J19.1044	0.002 kg
green	6 VDC +10 %	7 mA ±15 %	1050 mcd	525 nm	10-2J06.3145	0.002 kg
	12 VAC/DC +10 %	4/7 mA ±15 %	1050 mcd	525 nm	10-2J09.1065	0.002 kg
	24 VAC/DC +10 %	4/7 mA ±15 %	1050 mcd	525 nm	10-2J12.1065	0.002 kg
	28 VAC/DC +10 %	4/7 mA ±15 %	1050 mcd	525 nm	10-2J13.1065	0.002 kg
	48 VAC/DC +10 %	2/4 mA ±15 %	600 mcd	525 nm	10-2J19.1045	0.002 kg
blue	6 VDC +10 %	15 mA ±15 %	680 mcd	470 nm	10-2J06.3146	0.002 kg
	12 VAC/DC +10 %	7/14 mA ±15 %	650 mcd	470 nm	10-2J09.1066	0.002 kg
	24 VAC/DC +10 %	7/14 mA ±15 %	650 mcd	470 nm	10-2J12.1066	0.002 kg
	28 VAC/DC +10 %	7/14 mA ±15 %	650 mcd	470 nm	10-2J13.1066	0.002 kg
	48 VAC/DC +10 %	4/8 mA ±15 %	400 mcd	470 nm	10-2J19.1046	0.002 kg
white	6 VDC +10 %	6 mA ±15 %	900 mcd	x0.31/y0.32 nm	10-2J06.3149	0.002 kg
	12 VAC/DC +10 %	3/6 mA ±15 %	900 mcd	x0.31/y0.32 nm	10-2J09.1069	0.002 kg
	24 VAC/DC +10 %	2.5/5 mA ±15 %	750 mcd	x0.31/y0.32 nm	10-2J12.1069	0.002 kg
	28 VAC/DC +10 %	2.5/5 mA ±15 %	750 mcd	x0.31/y0.32 nm	10-2J13.1069	0.002 kg
	48 VAC/DC +10 %	2/4 mA ±15 %	600 mcd	x0.31/y0.32 nm	10-2J19.1049	0.002 kg

61 Accessories



Tool set

Additional Information

- Consists of lens remover, lamp-and LED remover, mounting tool and dismantling tool
- For dismantling keep care of the enclosed assembly instruction

Part No.	Weight
 <p>Tool set</p>	
K61-999.100	0.048 kg


Lens remover

Product attribute	Part No.	Weight
 <p>Lens remover</p>		
for raised design	02-905	0.011 kg
 <p>Lens remover</p>		
for flush design	61-9730.0	0.011 kg

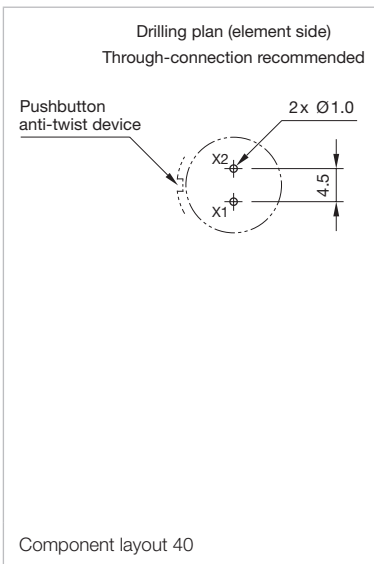
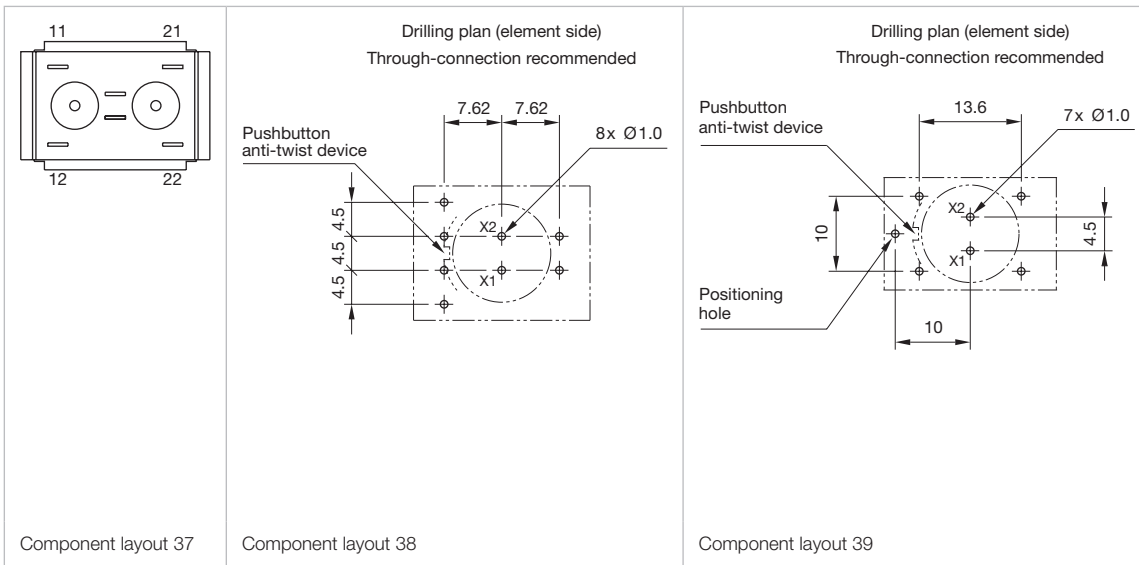
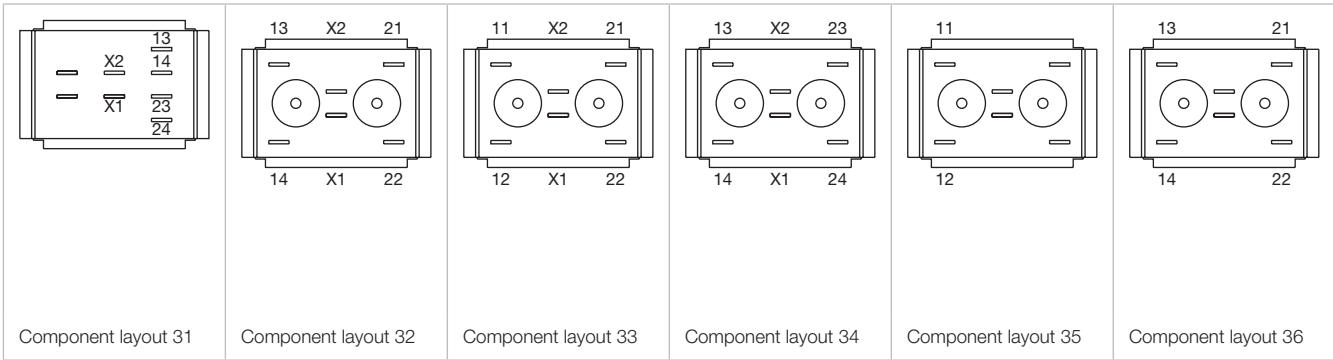
Lamp remover

Additional Information

- ▲ **Caution:** A switching process might be released when replacing the lamp

Part No.	Weight
 <p>Lamp remover</p>	
61-9740.0	0.003 kg

61 Drawings



Actuator with snap-action switching element

Switching system

Self-cleaning, double-break snap-action switching system with contact opening width 2 x 0.5 mm (switch with small contact opening width as per EN IEC 61058-1).
 The switching elements are optionally equipped with the following switching functions:
 One to three normally open (NO) or normally closed (NC), or any combination of NO and NC plus connections for T1 3/4 LED or lamp.
 The number of switching elements cannot exceed three.
 The switching elements provided for the 3-position switch actuators are equipped with max. 2 NC or 2 NO or any combination.
 The number of switching elements cannot exceed two.

Material

Lens

Raised mounting Polymethylmethacrylat (PMMA), as per UL 94 HB, flush mounting Polycarbonat (PC), as per UL 94 V0, or Aluminium anodized

Front bezel

Polyetherimid (PEI), as per UL 94 V0, or Aluminium anodized

Front ring

Aluminium anodized

Material of contact

Silver or silver with gold plating

Switching element

Diallylphthalate (DAP), as per UL 94 V0 and Polyamide (PA 66), as per UL 94 V0

Actuator housing

Polyetherimide (PEI), as per UL 94 V0, self-extinguishing

Mechanical characteristics

Terminals

Solder	rigid	flexible	superflexible
1 wire	0.5...1.5 mm ²	0.5...0.75 mm ²	0.5 mm ²
2 wires	0.75 mm ²	0.5 mm ²	

Tightening torque

for fixing nut max. 50 Ncm

Actuating torque

Selector-/Keylock switch 2.5... 10 Ncm

Actuating force

Pushbutton 2.7... 3.6 N

Actuating travel

Pushbutton 3 mm

Selector-/keylock switch	2 positions	3 positions
Momentary action	approx. 42°	approx. 2 x 42°
Maintained action	approx. 90°	approx. 2 x 90°

Rebound time

The rebound times apply to normal manual activation
 Contact making 3 ms
 Contact breaking 5 ms

Mechanical lifetime

as per DIN IEC 60512-5-6 and EN IEC 60947-5-1

Pushbutton maintained action	1 million cycles of operation
Pushbutton momentary action	2 million cycles of operation
Keylock switch	50 000 cycles of operation
Selector switch	100 000 cycles of operation

Electrical characteristics

Standards

The devices comply with: EN IEC 61058-1 and EN IEC 60947-5-1

Rated Operational Voltage U_e

250 VAC/DC as per EN IEC 60947-1

Rated Insulation Voltage U_i

320 VAC, as per EN IEC 60947-5-1

Rated Impulse Withstand Voltage U_{imp}

4 kV, as per EN IEC 60947-5-1

Contact resistance

New state with silver contact ≤ 100 mΩ
 as per DIN IEC 60512-2-4, measured at 100 mA, 10 V

New state with gold plated contact ≤ 50 mΩ
 as per DIN IEC 60512-2-3, measured at 20 mV, 10 mA

Electrical life

≥ 50 000 cycles of operation at 250 VAC, 5 A, cosφ 0.95,
 as per EN IEC 60947-5-1

Electrostatic discharge (ESD)

Keylock switch 11 kV

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 with silver contact or silver contact with gold plating, service category AC-15, as per EN IEC 60947-5-1

Voltage	125 VAC	250 VAC
Current	2.5 A	2 A

Switch rating DC for silver contact or silver contact with gold plating, service category DC-13, as per EN IEC 60947-5-1

Voltage	250 VDC
Current	0.15 A

Recommended minimum operational data

Material of contact	Silver	Silver with gold plating
Voltage	20 VAC/DC	5 VAC/DC
Current	100 mA	10 mA