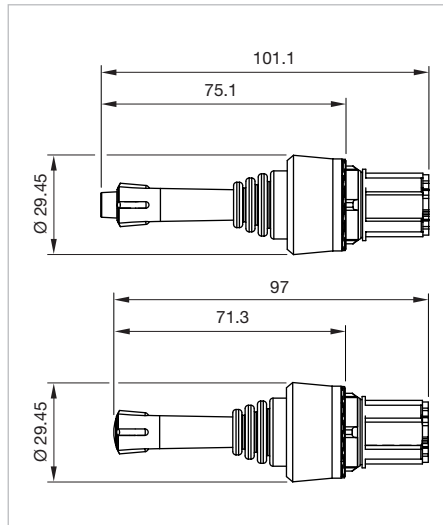


# 45 Raised design

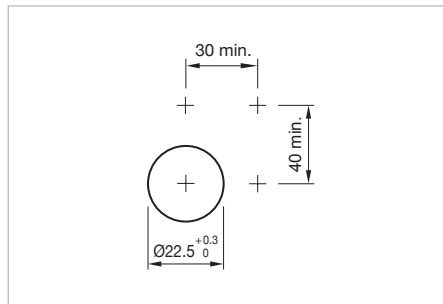
## Toggle stick, IP 65



Product can differ from the current configuration.

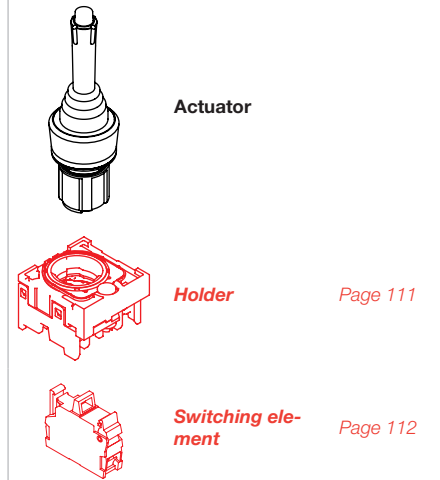


Dimensions [mm]





Mounting cut-outs [mm]





### Equipment consisting of (schematic overview)



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

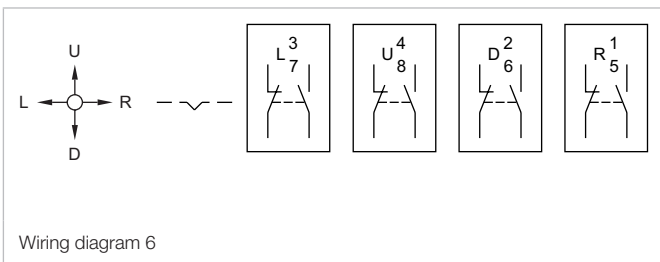
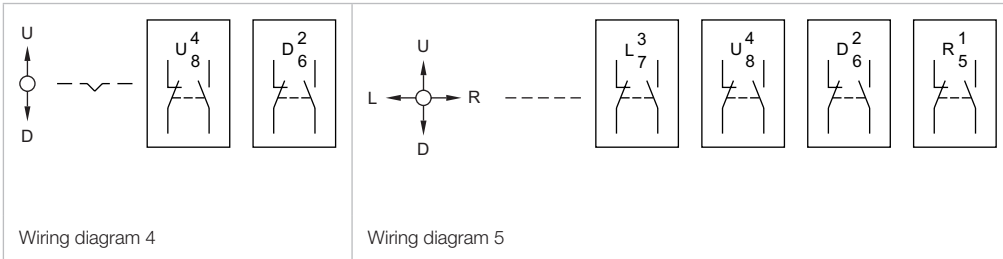
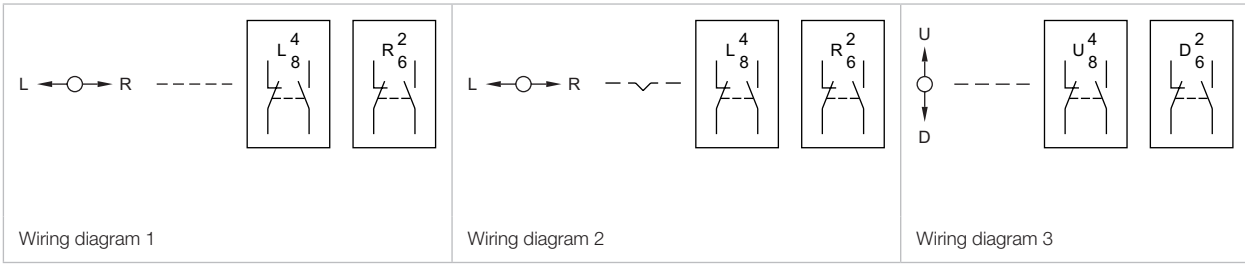
To obtain a complete unit, please select the red components from the pages shown.

Product attribute	Front ring	Housing material	Switching action	Part No.	Wiring diagram	Weight
 <p><b>Toggle stick, Front dimension Ø 29.45 mm</b></p>						
2 positions (L-R) without latch position, lockable	Plastic black	Plastic	B	<b>45-2F13.1010.000</b>	1	0.035 kg
2 positions (LR) with latch position, lockable	Plastic black	Plastic	C	<b>45-2F26.1010.000</b>	2	0.035 kg
2 positions (U-D) without latch position, lockable	Plastic black	Plastic	B	<b>45-2F40.1010.000</b>	3	0.035 kg
2 positions (UD) with latch position, lockable	Plastic black	Plastic	C	<b>45-2F43.1010.000</b>	4	0.035 kg
4 positions without latch position, lockable	Plastic black	Plastic	B	<b>45-2F14.1010.000</b>	5	0.035 kg
4 positions with latch position, lockable	Plastic black	Plastic	C	<b>45-2F27.1010.000</b>	6	0.035 kg
 <p><b>Toggle stick, Front dimension Ø 29.45 mm</b></p>						
2 positions (L-R) without latch position, lockable	Metal sandgrey	Plastic	B	<b>45-2F13.3010.000</b>	1	0.042 kg
2 positions (LR) with latch position, lockable	Metal sandgrey	Plastic	C	<b>45-2F26.3010.000</b>	2	0.042 kg
2 positions (U-D) without latch position, lockable	Metal sandgrey	Plastic	B	<b>45-2F40.3010.000</b>	3	0.042 kg
2 positions (UD) with latch position, lockable	Metal sandgrey	Plastic	C	<b>45-2F43.3010.000</b>	4	0.042 kg
4 positions without latch position, lockable	Metal sandgrey	Plastic	B	<b>45-2F14.3010.000</b>	5	0.042 kg
4 positions with latch position, lockable	Metal sandgrey	Plastic	C	<b>45-2F27.3010.000</b>	6	0.042 kg

Product attribute	Front ring	Housing material	Switching action	Part No.	Wiring diagram	Weight
 <p><b>Toggle stick, Front dimension Ø 29.45 mm</b></p>						
2 positions (L-R) without latch position, lockable	Metal silver	Metal	B	<b>45-2F13.2010.000</b>	1	0.081 kg
2 positions (LR) with latch position, lockable	Metal silver	Metal	C	<b>45-2F26.2010.000</b>	2	0.081 kg
2 positions (U-D) without latch position, lockable	Metal silver	Metal	B	<b>45-2F40.2010.000</b>	3	0.081 kg
2 positions (UD) with latch position, lockable	Metal silver	Metal	C	<b>45-2F43.2010.000</b>	4	0.081 kg
4 positions without latch position, lockable	Metal silver	Metal	B	<b>45-2F14.2010.000</b>	5	0.081 kg
4 positions with latch position, lockable	Metal silver	Metal	C	<b>45-2F27.2010.000</b>	6	0.081 kg
 <p><b>Toggle stick, Front dimension Ø 29.45 mm</b></p>						
2 positions (L-R) without latch position	Plastic black	Plastic	B	<b>45-2F0T.1010.000</b>	1	0.035 kg
2 positions (LR) with latch position	Plastic black	Plastic	C	<b>45-2F20.1010.000</b>	2	0.035 kg
2 positions (U-D) without latch position	Plastic black	Plastic	B	<b>45-2F38.1010.000</b>	3	0.035 kg
2 positions (UD) with latch position	Plastic black	Plastic	C	<b>45-2F41.1010.000</b>	4	0.035 kg
4 positions without latch position	Plastic black	Plastic	B	<b>45-2F0V.1010.000</b>	5	0.035 kg
4 positions with latch position	Plastic black	Plastic	C	<b>45-2F21.1010.000</b>	6	0.035 kg
 <p><b>Toggle stick, Front dimension Ø 29.45 mm</b></p>						
2 positions (L-R) without latch position	Metal sandgrey	Plastic	B	<b>45-2F0T.3010.000</b>	1	0.042 kg
2 positions (LR) with latch position	Metal sandgrey	Plastic	C	<b>45-2F20.3010.000</b>	2	0.042 kg
2 positions (U-D) without latch position	Metal sandgrey	Plastic	B	<b>45-2F38.3010.000</b>	3	0.042 kg
2 positions (UD) with latch position	Metal sandgrey	Plastic	C	<b>45-2F41.3010.000</b>	4	0.042 kg
4 positions without latch position	Metal sandgrey	Plastic	B	<b>45-2F0V.3010.000</b>	5	0.042 kg
4 positions with latch position	Metal sandgrey	Plastic	C	<b>45-2F21.3010.000</b>	6	0.042 kg
 <p><b>Toggle stick, Front dimension Ø 29.45 mm</b></p>						
2 positions (L-R) without latch position	Metal silver	Metal	B	<b>45-2F0T.2010.000</b>	1	0.081 kg
2 positions (LR) with latch position	Metal silver	Metal	C	<b>45-2F20.2010.000</b>	2	0.081 kg
2 positions (U-D) without latch position	Metal silver	Metal	B	<b>45-2F38.2010.000</b>	3	0.081 kg
2 positions (UD) with latch position	Metal silver	Metal	C	<b>45-2F41.2010.000</b>	4	0.081 kg
4 positions without latch position	Metal silver	Metal	B	<b>45-2F0V.2010.000</b>	5	0.081 kg
4 positions with latch position	Metal silver	Metal	C	<b>45-2F21.2010.000</b>	6	0.081 kg

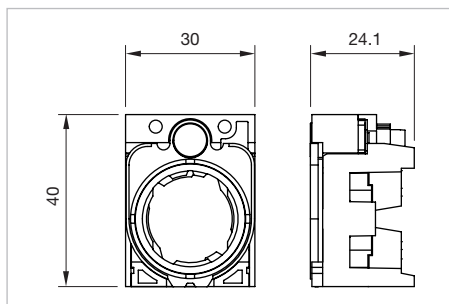
Switching action: B = Momentary, C = Maintain

# 45 Raised design





Rear side

Holder for 3 elements

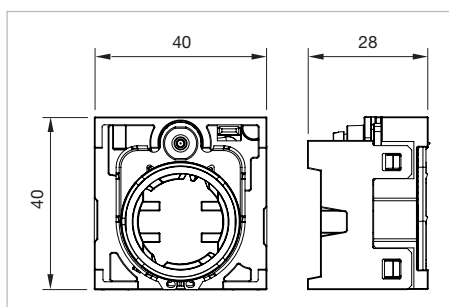


Dimensions [mm]


Material	Part No.	Component layout	Weight
 <p><b>Holder for 3 switching elements</b></p>			
Plastic	45-2300.1000.000	2	0.028 kg
 <p><b>Holder for 3 switching elements</b></p>			
Metal	45-2300.2000.000	2	0.046 kg

The component layouts you will find from Page 116


Holder for 4 elements



Dimensions [mm]

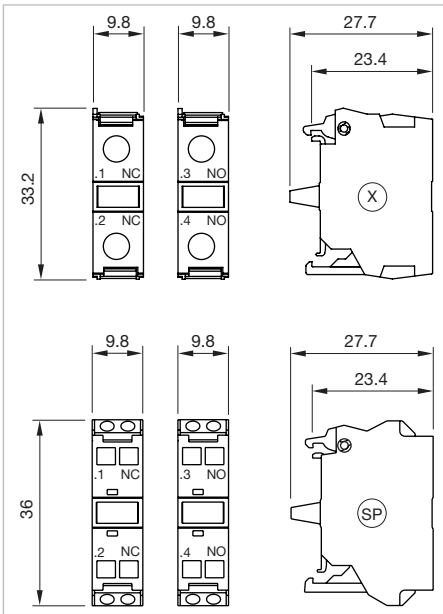
Material	Part No.	Component layout	Weight
 <p><b>Holder for 4 switching elements</b></p>			
Plastic	45-2400.1000.000	3	0.028 kg

# 45 Accessories

Material	Part No.	Component layout	Weight
 <p><b>Holder for 4 switching elements</b></p>			
Metal	45-2400.2000.000	3	0.046 kg



The component layouts you will find from Page 116

## Switching element front mounting



Dimensions [mm]

X = Screw terminal, SP = Spring-type terminal

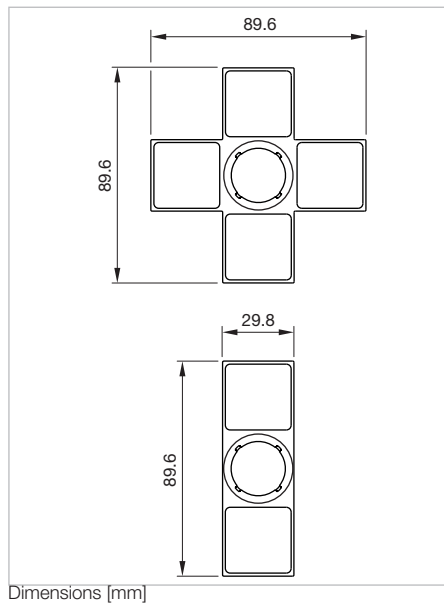
Switching current	Contacts	Contact material	Terminal	Part No.	Wiring diagram	Weight
 <p><b>Switching element</b></p>						
10 A	1 NO	Silver	Screw	45-311.1Z10	1	0.010 kg
10 A	1 NC	Silver	Screw	45-312.1Z10	2	0.010 kg
 <p><b>Switching element</b></p>						
10 A	1 NO	Silver	Spring-type terminal	45-311.1Z40	1	0.010 kg
10 A	1 NC	Silver	Spring-type terminal	45-312.1Z40	2	0.010 kg

Product attribute	Material	Colour	Part No.	Weight
 <b>Legend support without legend</b>				
for legend plate 27 x 27 mm	Plastic	black	<b>45-570.1105</b>	0.002 kg
 <b>Legend support without legend</b>				
for legend plate 27 x 12.5 mm	Plastic	black	<b>45-564.1110</b>	0.002 kg
 <b>Legend support without legend</b>				
for legend plate 27 x 17.5 mm	Plastic	black	<b>45-567.1111</b>	0.002 kg
 <b>Legend support without legend</b>				
for legend plate 27 x 27 mm	Plastic	black	<b>45-569.1112</b>	0.002 kg

**Legend support without legend for toggle stick**

**Additional Information**

- For sticking or snapping in place



Product attribute	Material	Colour	Part No.	Weight
 <b>Legend support without legend for toggle stick</b>				
for legend plate 27 x 27 mm	Plastic	black	<b>45-571.1105</b>	0.002 kg

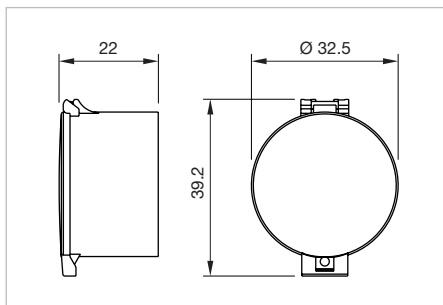
# 45 Accessories

Product attribute	Material	Colour	Part No.	Weight
 <p><b>Legend support without legend for toggle stick</b></p>				
for legend plate 27 x 27 mm	Plastic	black	<b>45-572.1105</b>	0.002 kg



## Protective cover, IP66, IP67

### Additional Information



- Hinged, with means for sealing
- Please note that bigger minimum distances are necessary



Dimensions [mm]

Front protection	Material	Colour	Optics	Part No.	Weight
 <p><b>Protective cover</b></p>					
IP66, IP67	Plastic	black	opaque	<b>45-555.1100</b>	0.012 kg
 <p><b>Protective cover</b></p>					
IP66, IP67	Plastic	colourless	transparent	<b>45-555.1K00</b>	0.012 kg

## Protective cap, IP66, IP67

Product attribute	Front protection	Material	Colour	Optics	Part No.	Weight
 <p><b>Protective cap for pushbutton</b></p>						
for lens raised above bezel	IP66, IP67	Silicone	colourless	transparent	<b>45-544.1K00</b>	0.008 kg
for lens flush	IP66, IP67	Silicone	colourless	transparent	<b>45-545.1K00</b>	0.008 kg
 <p><b>Protective cap for</b></p>						
for selector switch, short lever	IP66, IP67	Silicone	colourless	transparent	<b>45-546.1K00</b>	0.006 kg

**Potentiometer**
**Material**
**Actuator element**

Round lever, plastic

**Front ring**

Plastic or metal

**Actuator housing**

Plastic or metal

**Mechanical characteristics**
**Terminals**

Screw terminal

- Solid 2 x (1.0 ... 1.5 mm<sup>2</sup>)
- With end sleeves 2 x (0.5 ... 0.75 mm<sup>2</sup>)
- Finely stranded
- Without end sleeves 2 x (0.5 ... 0.75 mm<sup>2</sup>)
- With end sleeves 2 x (0.5 ... 1.5 mm<sup>2</sup>)
- For AWG cables for auxiliary contacts 2 x (18 ... 14)

Spring-type terminal (SP)

- Solid 2 x (0.25 ... 1.5 mm<sup>2</sup>)
- Finely stranded
- Without end sleeves 2 x (0.5 ... 1.5 mm<sup>2</sup>)
- With end sleeves 2 x (0.5 ... 0.75 mm<sup>2</sup>)
- For AWG cables for auxiliary contacts 2 x (24 ... 16)

**Tightening torque**

0.8 ... 1 Nm

**Operating frequency**

max. 1 800/h

**Mechanical lifetime**

25 000 switching cycles

**Vibration resistance**

according to IEC 60068-2-6  
10 ... 500 Hz: 5 g

**Shock resistance**

according to IEC 60068-2-27  
Sinusoidal half-wave 50 g /11 ms

**Slewing range**

210°–150°

**Electrical characteristics**
**Active power consumption**

0.5 W

**Insulation voltage**

Rated value 500 V

**Environmental conditions**
**Operating temperature**

–25 °C ... +70 °C

**Storage temperature**

–40 °C ... +80 °C

**Protection degree**

IP66, IP67, IP69K

**Environmental category**

during operation according to IEC 60721:  
3K6, 3C3,3S2, 3M6

**Toggle stick actuator**
**Material**
**Actuator element**

Plastic

**Front ring**

Plastic or metal

**Actuator housing**

Plastic or metal

**Mechanical characteristics**
**Operating frequency**

3 600/h

**Mechanical lifetime**

170 000 switching cycles

**Vibration resistance**

according to IEC 60068-2-6  
10 ... 500 Hz: 5 g

**Shock resistance**

according to IEC 60068-2-27  
Sinusoidal half-wave 50 g /11 ms

**Environmental conditions**
**Operating temperature**

–25 °C ... +70 °C



# 45 Technical data

## Storage temperature

-40 °C ... +80 °C

## Protection degree

IP66, IP67, IP69K

## Environmental category

during operation according to IEC 60721:  
3K6, 3C3,3S2, 3M6

## Slow-make switching element

### Switching system

The double-break, slow-make switching element is equipped with 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 six switching elements can be snapped to each holder.

The NC contact opens automatically upon disconnection of the actuator. On delivery, the contact is open (= safe state). Activation (= NC contacts on the non-actuated commanding device are closed) takes place upon first-time actuation after the contact block is snapped onto the actuator.

### Material

#### Material of contact

Silver alloy

#### Housing

Plastic

### Mechanical characteristics

#### Terminals

Screw terminal

- Solid 2 x (1.0 ... 1.5 mm<sup>2</sup>)
- With end sleeves 2 x (0.5 ... 0.75 mm<sup>2</sup>)
- Finely stranded
- Without end sleeves 2 x (0.5 ... 0.75 mm<sup>2</sup>)
- With end sleeves 2 x (0.5 ... 1.5 mm<sup>2</sup>)
- For AWG cables for auxiliary contacts 2 x (18 ... 14)

Spring-type terminal (SP)

- Solid 2 x (0.25 ... 1.5 mm<sup>2</sup>)
- Finely stranded
- Without end sleeves 2 x (0.5 ... 1.5 mm<sup>2</sup>)
- With end sleeves 2 x (0.5 ... 0.75 mm<sup>2</sup>)
- For AWG cables for auxiliary contacts 2 x (24 ... 16)

#### Tightening torque

Screw terminal, spring-type terminal 0.8 ... 0.9 Nm

#### Operating frequency

max. 3 600/h

#### Mechanical lifetime

10 000 000 switching cycles

### Vibration resistance

according to IEC 60068-2-6  
2 ... 500 Hz: 5 g

### Shock resistance

according to IEC 60068-2-27  
Sinusoidal half-wave 50 g /11 ms

### Electrical characteristics

#### Standards

The switches comply with the "Standards for low-voltage switching devices" EN IEC 60947-5-1

#### Thermal current

10 A

#### Insulation voltage

Rated value 500 V

#### Pollution degree

3

#### Surge voltage resistance

Rated value 6 kV

#### Contact reliability

One contact failure per 100 million switching operations  
(17 V, 5 mA)

One contact failure per 10 million switching operations (5 V, 1 mA)

#### Operating voltage

at AC

- Rated value 5 ... 500 V

at DC

- Rated value 5 ... 500 V

#### Operating current

at AC-12

Voltage	24 V	230 V	500 V
Current	10 A	10 A	10 A

at AC-15

Voltage	24V	230 V	400 V	500 V
Current	6 A	6 A	3 A	1.4 A

at DC-12

Voltage	24 V	48 V	110 V	230 V	400 V	500 V
Current	10 A	5 A	2.5 A	1 A	0.3 A	0.2 A