

# Series 18

## Characteristics

The compact 8mm Series 18 is especially suited for:

- Flush design
- Raised design
- PCB (with adaptor)

## Functions

The Series 18 incorporates the following functions:

- Indicator
- Pushbutton
- Illuminated pushbutton

## Market segments

The EAO Series 18 is especially suited for applications in the segments:

- Audio and video
- Laboratory and measuring equipment

Please refer to the EAO website to obtain detailed information regarding this series [www.products.eao.com](http://www.products.eao.com)  
Configure a product to your exact needs and request a quotation.





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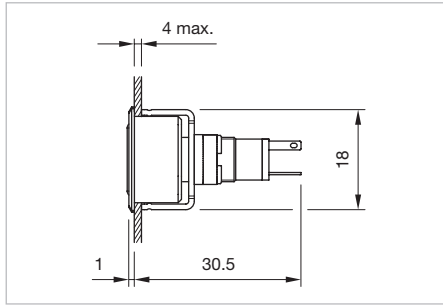
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# 18 Flush design

Indicator, IP 40



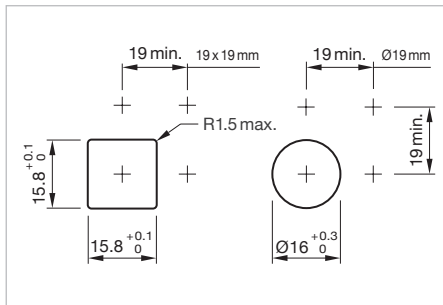
Product can differ from the current configuration.



Dimensions [mm]

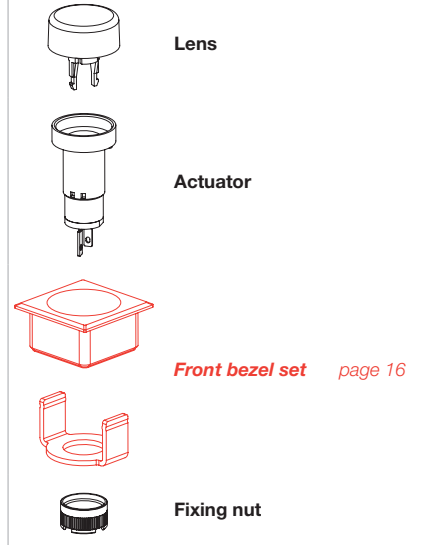
### Additional Information

- For front dimensions 19 x 19 mm or Ø 19mm
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination
- The series resistance for LEDs need to be determined and integrated by customers.




Mounting cut-outs [mm]


### Equipment consisting of (schematic overview)



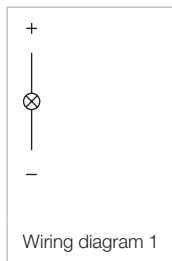
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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

LED colour	Forward voltage typ.	Operating voltage	Operation current	Lens	Terminal	Part No.	Component layout	Wiring diagram	Weight
	<b>Indicator actuator</b>								
red	2.0 VDC @ 20 mA	customer-specific	10 mA	Plastic red translucent	Solder	<b>18-080.0052L</b>	1	1	0.002 kg
white	3.0 VDC @ 20 mA	customer-specific	10 mA	Plastic yellow translucent	Solder	<b>18-080.0054L</b>	1	1	0.002 kg
green	3.2 VDC @ 20 mA	customer-specific	2 mA	Plastic green translucent	Solder	<b>18-080.0055L</b>	1	1	0.002 kg
		12 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-081.0052L</b>	1	1	0.002 kg
		24 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-082.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-082.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-082.0055L</b>	1	1	0.002 kg

LED colour	Forward voltage typ.	Operating voltage	Operation current	Lens	Terminal	Part No.	Component layout	Wiring diagram	Weight
 <p><b>Indicator actuator</b></p>									
red	2.0 VDC @ 20 mA	customer-specific	10 mA	Plastic red translucent	Solder	<b>18-060.0052L</b>	1	1	0.002 kg
white	3.0 VDC @ 20 mA	customer-specific	10 mA	Plastic yellow translucent	Solder	<b>18-060.0054L</b>	1	1	0.002 kg
green	3.2 VDC @ 20 mA	customer-specific	2 mA	Plastic green translucent	Solder	<b>18-060.0055L</b>	1	1	0.002 kg
		12 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-061.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-061.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-061.0055L</b>	1	1	0.002 kg
		24 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-062.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-062.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-062.0055L</b>	1	1	0.002 kg

The component layouts you will find from page 20

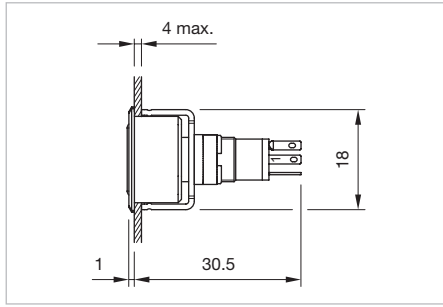


# 18 Flush design

## Pushbutton, IP 40



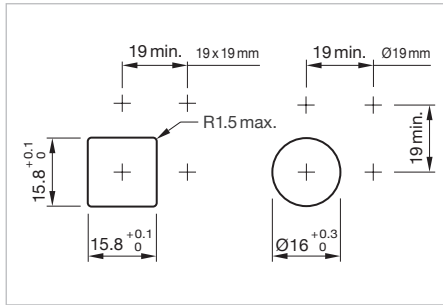
Product can differ from the current configuration.



Dimensions [mm]

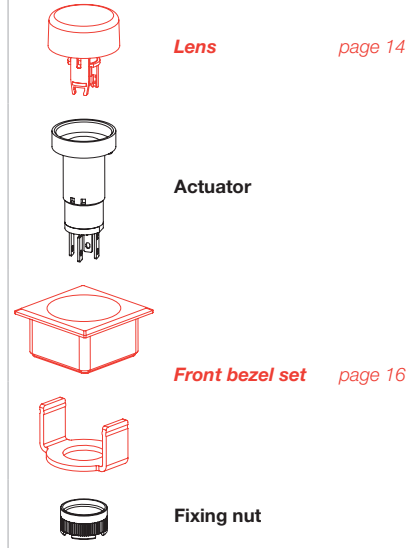
### Additional Information

- For front dimensions 19 x 19 mm or Ø 19mm
- +/- terminals are not connected





Mounting cut-outs [mm]

### Equipment consisting of (schematic overview)

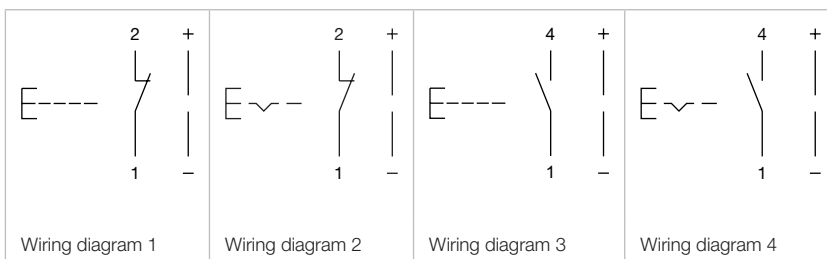


Each Part Number listed below includes all the black components shown in the 3D-drawing.

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

Switching system	Contacts	Switching action	Terminal	Part No.	Component layout	Wiring diagram	Weight
 <p><b>Pushbutton actuator</b></p>	1 NC	B	Solder	<b>18-188.035</b>	2	1	0.002 kg
		C	Solder	<b>18-288.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-187.035</b>	2	3	0.002 kg
		C	Solder	<b>18-287.035</b>	2	4	0.002 kg
 <p><b>Pushbutton actuator</b></p>	1 NC	B	Solder	<b>18-168.035</b>	2	1	0.002 kg
		C	Solder	<b>18-268.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-167.035</b>	2	3	0.002 kg
		C	Solder	<b>18-267.035</b>	2	4	0.002 kg

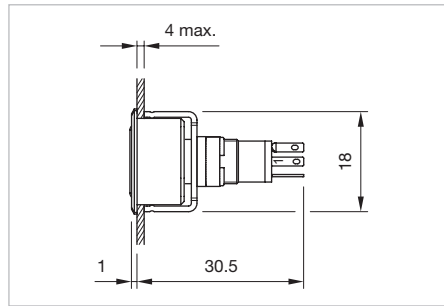
Contacts: NC = Normally closed, NO = Normally open  
 Switching action: B = Momentary, C = Maintain  
 The component layouts you will find from page 20



## Illuminated pushbutton, IP 40

**Equipment consisting of (schematic overview)**

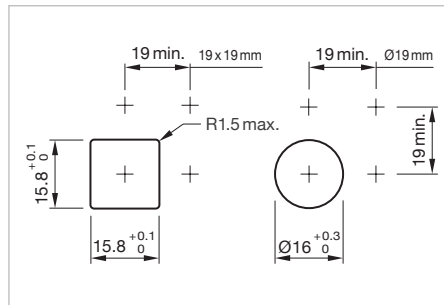
- Lens** *page 14*
- Actuator**
- Front bezel set** *page 16*
- Fixing nut**



Dimensions [mm]



Product can differ from the current configuration.





Mounting cut-outs [mm]

### Additional Information

- For front dimensions 19 x 19 mm or Ø 19mm

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

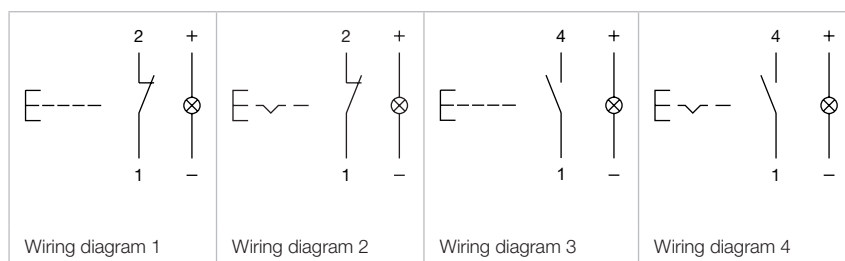
To obtain a complete unit, please select the red components from the pages shown.

Switching system	Contacts	Switching action	Terminal	Part No.	Component layout	Wiring diagram	Weight
 <p><b>Illuminated pushbutton actuator</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-188.035</b>	2	1	0.002 kg
		C	Solder	<b>18-288.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-187.035</b>	2	3	0.002 kg
		C	Solder	<b>18-287.035</b>	2	4	0.002 kg
 <p><b>Illuminated pushbutton actuator</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-168.035</b>	2	1	0.002 kg
		C	Solder	<b>18-268.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-167.035</b>	2	3	0.002 kg
		C	Solder	<b>18-267.035</b>	2	4	0.002 kg

Contacts: NC = Normally closed, NO = Normally open

Switching action: B = Momentary, C = Maintain

The component layouts you will find from page 20

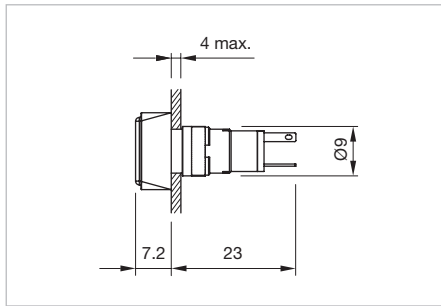


# 18 Raised design

Indicator, IP 40

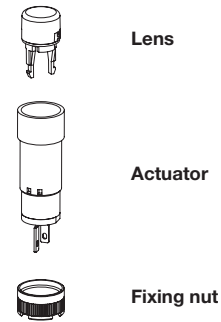


Product can differ from the current configuration.



Dimensions [mm]

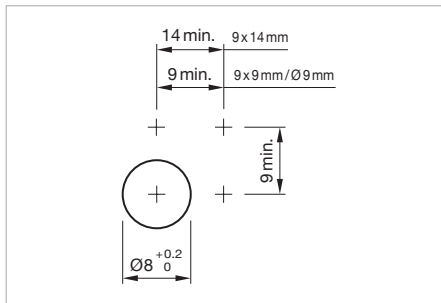
Equipment consisting of (schematic overview)





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

### Additional Information


- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination
- The series resistance for LEDs need to be determined and integrated by customers.



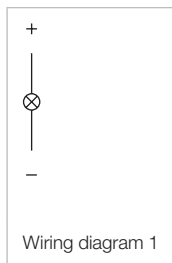
Mounting cut-outs [mm]

LED colour	Forward voltage typ.	Operating voltage	Operation current	Lens	Terminal	Part No.	Component layout	Wiring diagram	Weight
 <p><b>Indicator actuator, Front dimension 9 x 9 mm</b></p>									
red	2.0 VDC @ 20 mA	customer-specific	10 mA	Plastic red translucent	Solder	<b>18-050.0052L</b>	1	1	0.002 kg
white	3.0 VDC @ 20 mA	customer-specific	10 mA	Plastic yellow translucent	Solder	<b>18-050.0054L</b>	1	1	0.002 kg
green	3.2 VDC @ 20 mA	customer-specific	2 mA	Plastic green translucent	Solder	<b>18-050.0055L</b>	1	1	0.002 kg
		12 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-051.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-051.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-051.0055L</b>	1	1	0.002 kg
		24 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-052.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-052.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-052.0055L</b>	1	1	0.002 kg
 <p><b>Indicator actuator, Front dimension 9 x 14 mm</b></p>									
red	2.0 VDC @ 20 mA	customer-specific	10 mA	Plastic red translucent	Solder	<b>18-040.0052L</b>	1	1	0.002 kg
white	3.0 VDC @ 20 mA	customer-specific	10 mA	Plastic yellow translucent	Solder	<b>18-040.0054L</b>	1	1	0.002 kg
green	3.2 VDC @ 20 mA	customer-specific	2 mA	Plastic green translucent	Solder	<b>18-040.0055L</b>	1	1	0.002 kg
		12 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-041.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-041.0054L</b>	1	1	0.002 kg
		24 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-042.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-042.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-042.0055L</b>	1	1	0.002 kg



LED colour	Forward voltage typ.	Operating voltage	Operation current	Lens	Terminal	Part No.	Component layout	Wiring diagram	Weight
 <p><b>Indicator actuator, Front dimension Ø 9 mm</b></p>									
red	2.0 VDC @ 20 mA	customer-specific	10 mA	Plastic red translucent	Solder	<b>18-030.0052L</b>	1	1	0.002 kg
white	3.0 VDC @ 20 mA	customer-specific	10 mA	Plastic yellow translucent	Solder	<b>18-030.0054L</b>	1	1	0.002 kg
green	3.2 VDC @ 20 mA	customer-specific	2 mA	Plastic green translucent	Solder	<b>18-030.0055L</b>	1	1	0.002 kg
		12 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-031.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-031.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-031.0055L</b>	1	1	0.002 kg
		24 VDC ±10 %	10 mA	Plastic red translucent	Solder	<b>18-032.0052L</b>	1	1	0.002 kg
			10 mA	Plastic yellow translucent	Solder	<b>18-032.0054L</b>	1	1	0.002 kg
			2 mA	Plastic green translucent	Solder	<b>18-032.0055L</b>	1	1	0.002 kg

The component layouts you will find from page 20

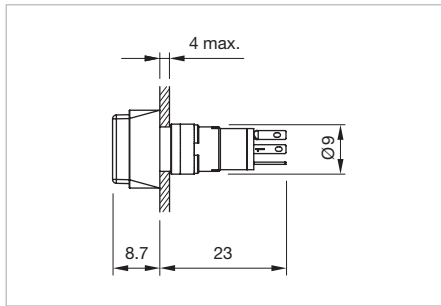


# 18 Raised design

## Pushbutton, IP 40



Product can differ from the current configuration.



Dimensions [mm]

### Equipment consisting of (schematic overview)



**Lens**

page 14



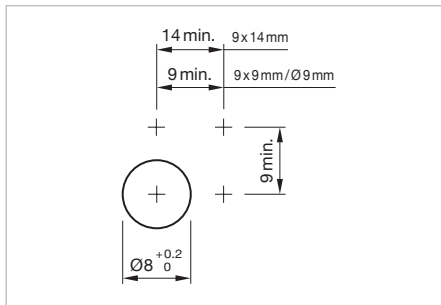
**Actuator**



**Fixing nut**

### Additional Information




- +/- terminals are not connected



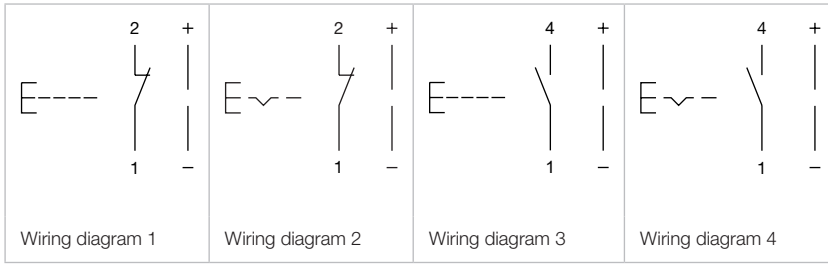
Mounting cut-outs [mm]

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.

Switching system	Contacts	Switching action	Terminal	Part No.	Component layout	Wiring diagram	Weight
 <p><b>Pushbutton actuator, Front dimension 9 x 9 mm</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-158.035</b>	2	1	0.002 kg
		C	Solder	<b>18-258.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-157.035</b>	2	3	0.002 kg
		C	Solder	<b>18-257.035</b>	2	4	0.002 kg
 <p><b>Pushbutton actuator, Front dimension 9 x 14 mm</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-148.035</b>	2	1	0.002 kg
		C	Solder	<b>18-248.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-147.035</b>	2	3	0.002 kg
		C	Solder	<b>18-247.035</b>	2	4	0.002 kg
 <p><b>Pushbutton actuator, Front dimension Ø 9 mm</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-138.035</b>	2	1	0.002 kg
		C	Solder	<b>18-238.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-137.035</b>	2	3	0.002 kg
		C	Solder	<b>18-237.035</b>	2	4	0.002 kg

Contacts: NC = Normally closed, NO = Normally open  
 Switching action: B = Momentary, C = Maintain  
 The component layouts you will find from page 20

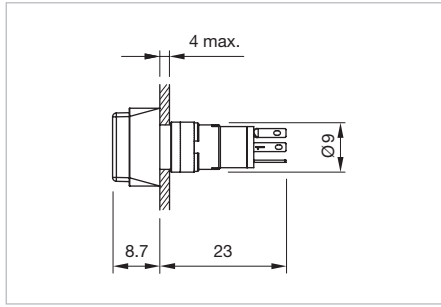


# 18 Raised design

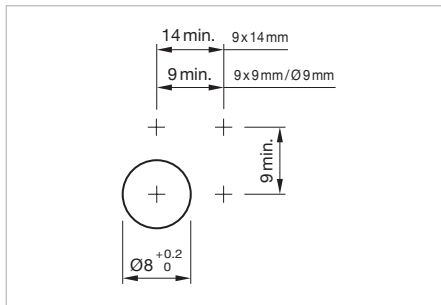
## Illuminated pushbutton, IP 40



Product can differ from the current configuration.



Dimensions [mm]



Mounting cut-outs [mm]

### Equipment consisting of (schematic overview)



**Lens**

page 14






**Actuator**



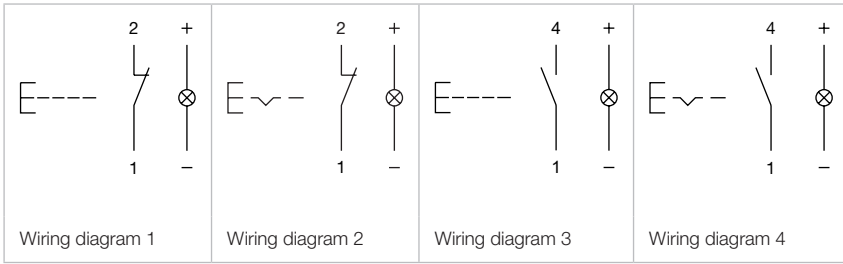
**Fixing nut**

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.

Switching system	Contacts	Switching action	Terminal	Part No.	Component layout	Wiring diagram	Weight
 <p><b>Illuminated pushbutton actuator, Front dimension 9 x 9 mm</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-158.035</b>	2	1	0.002 kg
		C	Solder	<b>18-258.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-157.035</b>	2	3	0.002 kg
		C	Solder	<b>18-257.035</b>	2	4	0.002 kg
 <p><b>Illuminated pushbutton actuator, Front dimension 9 x 14 mm</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-148.035</b>	2	1	0.002 kg
		C	Solder	<b>18-248.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-147.035</b>	2	3	0.002 kg
		C	Solder	<b>18-247.035</b>	2	4	0.002 kg
 <p><b>Illuminated pushbutton actuator, Front dimension Ø 9 mm</b></p>							
Snap-action switching element	1 NC	B	Solder	<b>18-138.035</b>	2	1	0.002 kg
		C	Solder	<b>18-238.035</b>	2	2	0.002 kg
	1 NO	B	Solder	<b>18-137.035</b>	2	3	0.002 kg
		C	Solder	<b>18-237.035</b>	2	4	0.002 kg

Contacts: NC = Normally closed, NO = Normally open  
 Switching action: B = Momentary, C = Maintain  
 The component layouts you will find from page 20





## Lens without LED flush design

Dimension	Lens	Part No.	Weight
 <p><b>Lens without LED flush design</b></p>			
13.8 x 13.8 mm	Plastic black opaque	<b>18-982.0</b>	0.001 kg
	Plastic red translucent	<b>18-982.2</b>	0.001 kg
	Plastic yellow translucent	<b>18-982.4</b>	0.001 kg
	Plastic green translucent	<b>18-982.5</b>	0.001 kg
	Plastic grey opaque	<b>18-982.8</b>	0.001 kg
	Plastic white translucent	<b>18-982.9</b>	0.001 kg
 <p><b>Lens without LED flush design</b></p>			
Ø 13.8 mm	Plastic black opaque	<b>18-962.0</b>	0.001 kg
	Plastic red translucent	<b>18-962.2</b>	0.001 kg
	Plastic yellow translucent	<b>18-962.4</b>	0.001 kg
	Plastic green translucent	<b>18-962.5</b>	0.001 kg
	Plastic grey opaque	<b>18-962.8</b>	0.001 kg
	Plastic white translucent	<b>18-962.9</b>	0.001 kg




## Lens with LED flush design

### Additional Information

- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

Dimension	Lens	Part No.	Weight
 <p><b>Lens with LED flush design</b></p>			
13.8 x 13.8 mm	Plastic red translucent	<b>18-981.2L</b>	0.001 kg
	Plastic yellow translucent	<b>18-981.4L</b>	0.001 kg
	Plastic green translucent	<b>18-981.5L</b>	0.001 kg
 <p><b>Lens with LED flush design</b></p>			
Ø 13.8 mm	Plastic red translucent	<b>18-961.2L</b>	0.001 kg
	Plastic yellow translucent	<b>18-961.4L</b>	0.001 kg
	Plastic green translucent	<b>18-961.5L</b>	0.001 kg

**Lens without LED raised design**




Dimension	Lens	Part No.	Weight
 <p><b>Lens without LED raised design</b></p>			
7.5 x 7.5 mm	Plastic black opaque	<b>18-952.0</b>	0.001 kg
	Plastic red translucent	<b>18-952.2</b>	0.001 kg
	Plastic yellow translucent	<b>18-952.4</b>	0.001 kg
	Plastic green translucent	<b>18-952.5</b>	0.001 kg
	Plastic grey opaque	<b>18-952.8</b>	0.001 kg
	Plastic white translucent	<b>18-952.9</b>	0.001 kg
 <p><b>Lens without LED raised design</b></p>			
7.5 x 12.5 mm	Plastic black opaque	<b>18-942.0</b>	0.001 kg
	Plastic red translucent	<b>18-942.2</b>	0.001 kg
	Plastic yellow translucent	<b>18-942.4</b>	0.001 kg
	Plastic green translucent	<b>18-942.5</b>	0.001 kg
	Plastic grey opaque	<b>18-942.8</b>	0.001 kg
	Plastic white translucent	<b>18-942.9</b>	0.001 kg
 <p><b>Lens without LED raised design</b></p>			
Ø 7.5 mm	Plastic black opaque	<b>18-932.0</b>	0.001 kg
	Plastic red translucent	<b>18-932.2</b>	0.001 kg
	Plastic yellow translucent	<b>18-932.4</b>	0.001 kg
	Plastic green translucent	<b>18-932.5</b>	0.001 kg
	Plastic grey opaque	<b>18-932.8</b>	0.001 kg
	Plastic white translucent	<b>18-932.9</b>	0.001 kg

# 18 Accessories


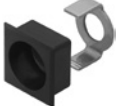

## Lens with LED raised design

### Additional Information

- Without built-in series resistor, typical forward voltage 2.2 VDC @ 20 mA
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

Dimension	Lens	Part No.	Weight
 <b>Lens with LED raised design</b>			
7.5 x 7.5 mm	Plastic red translucent	<b>18-951.2L</b>	0.001 kg
	Plastic yellow translucent	<b>18-951.4L</b>	0.001 kg
	Plastic green translucent	<b>18-951.5L</b>	0.001 kg
 <b>Lens with LED raised design</b>			
7.5 x 12.5 mm	Plastic red translucent	<b>18-941.2L</b>	0.001 kg
	Plastic yellow translucent	<b>18-941.4L</b>	0.001 kg
	Plastic green translucent	<b>18-941.5L</b>	0.001 kg
 <b>Lens with LED raised design</b>			
Ø 7.5 mm	Plastic red translucent	<b>18-931.2L</b>	0.001 kg
	Plastic yellow translucent	<b>18-931.4L</b>	0.001 kg
	Plastic green translucent	<b>18-931.5L</b>	0.001 kg

## Front bezel set



Product attribute	Mounting cut-out	Front bezel	Part No.	Weight
 <b>Front bezel set, flush design, Front dimension 19 x 19 mm</b>				
for square lens	15.8 x 15.8 mm	Plastic black	<b>18-920.1</b>	0.006 kg
 <b>Front bezel set, flush design, Front dimension 19 x 19 mm</b>				
for round lens	15.8 x 15.8 mm	Plastic black	<b>18-920.2</b>	0.006 kg
 <b>Front bezel set, flush design, Front dimension Ø 19 mm</b>				
for round lens	Ø 16 mm	Plastic black	<b>18-920.3</b>	0.006 kg



**Blind plug**

**Additional Information**

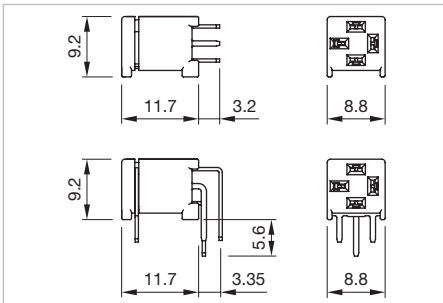
- The dimensions of the mounting cut-outs are shown in the product details

Dimension	Mounting cut-out	Material	Colour	Part No.	Weight
 <b>Blind plug</b>					
9 x 9 mm	Ø 8 mm	Plastic	black	<b>19-948.0</b>	0.001 kg
 <b>Blind plug</b>					
Ø 9 mm	Ø 8 mm	Plastic	black	<b>19-949.0</b>	0.001 kg



# 18 Accessories

Rear side

## PCB plug-in base




Dimensions [mm]

pins	Terminal	Part No.	Component layout	Weight
 <p><b>PCB plug-in base</b></p>				
axial	PCB	<b>18-945</b>	3	0.001 kg
 <p><b>PCB plug-in base</b></p>				
right-angled	PCB	<b>18-946</b>	4	0.001 kg

The component layouts you will find from page 20

Mounting


Lens remover

Part No.	Weight
 <p><b>Lens remover</b></p>	
18-910	0.002 kg

Mounting tool

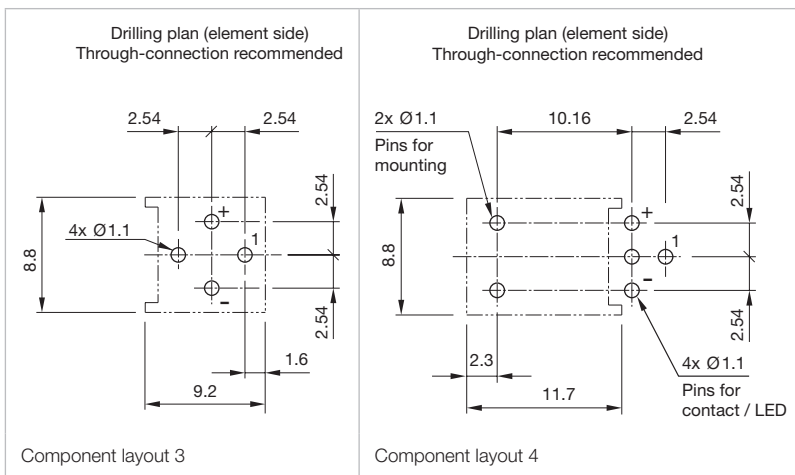
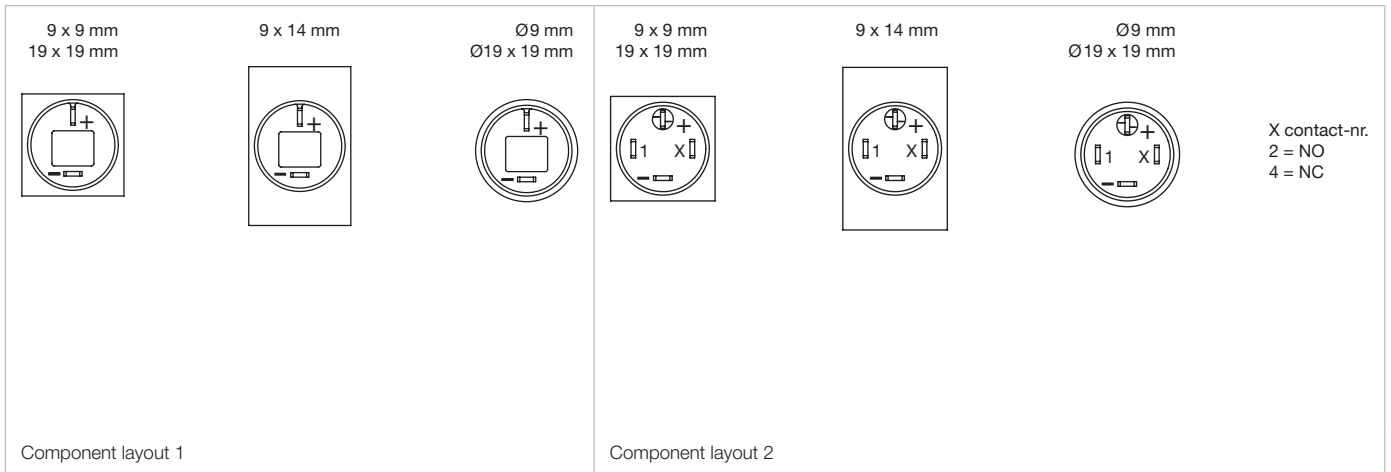
Additional Information

- For fixing nut long Part No. 19-991

Part No.	Weight
 <p><b>Mounting tool</b></p>	
19-905	0.011 kg

# 18 Drawings

## Drawings



**Actuator with snap-action switching element**
**Switching system**

The snap-action switching system was designed for switching low powers in electronic circuits.  
Single-break snap-action contact.

**Material**
**Lens**

Polymethylacrylate (PMMA), Polycarbonate (PC)

**Material of contact**

Gold contact on nickel plating

**Actuator housing**

Polyamide, colour black

**Mechanical characteristics**
**Terminals**

The terminals can be used as soldering terminals.  
Max. wire diameter: 2 x 0.5 mm<sup>2</sup>  
Max. wire cross-section of stranded cable 1 x 0.75 mm<sup>2</sup>  
Wire cross-section of terminal 1.6 x 0.4 mm

**Tightening torque**

for fixing nut max. 20 Ncm

**Actuating force**

1.4 N

**Actuating travel**

2.2 mm ± 0.2 mm

**Rebound time**

≤ 2.5 ms

**Mechanical lifetime**

Momentary action 2 million cycles of operation  
Maintained action 1 million cycles of operation,  
as per IEC 60512-5-9a

**Electrical characteristics**
**Illumination**

Operating voltage LED: 12 VDC ± 10 %  
24 VDC ± 10 %  
customer-specific \*)

\*) The series resistance for LEDs need to be determined and integrated by customers.

Operating current:	red	typ. 10 mA
	yellow	typ. 10 mA
	green	typ. 2 mA
	white	typ. 10 mA
	blue	typ. 10 mA

**Contact resistance**

≤ 100 mΩ starting value (initial), as per IEC 60512-2-2b

**Electrical life**

≥ 500 000 cycles of operation at 30 VDC, 100 mA, according to IEC 61058-1

**Switch rating**

min. 10 μA at 100 μV  
max. 100 mA at 42 VAC/VDC

**Electric strength**

500 VAC, 50 Hz, 1 min. between all terminals and earth,  
as per IEC 60512-2-11

**Environmental conditions**
**Storage temperature**

-40 °C ... +80 °C

**Service temperature**

-25 °C ... +65 °C

**Protection degree**

IP 40 front side, as per IEC 60529

**Shock resistance**

(Single impacts, semi-sinusoidal)  
50 g for 11 ms, as per IEC 60068-2-27

**Vibration resistance**

(sinusoidal) 10 g at 10–2000 Hz, amplitude 0.75 mm,  
as per IEC 60512-4-4

*EAO reserves the right to alter specifications without further notice.*

# 18 Application guidelines

## Suppressor circuits

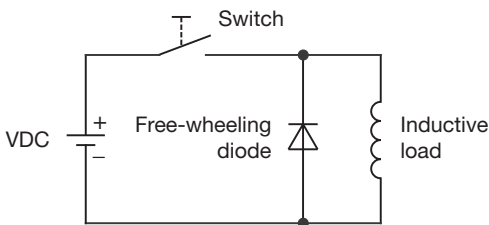
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e.g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

Fig. 1 shows an inductive load with a free-wheeling diode connected in parallel. This free-wheeling diode provides a path for the inductor current to flow when the current is interrupted by the switch. Without this free-wheeling diode, the voltage across the coil will be limited only by dielectric breakdown voltages of the circuit or parasitic elements of the coil. This voltage can be kilovolts in amplitude even when nominal circuit voltages are low (e.g. 12VDC) see Fig. 2.

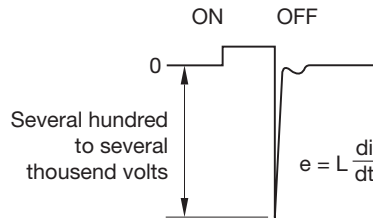
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage (VR) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum current flowing through the load.

**To get an efficient protection, the free-wheeling diode must be connected as close as possible to the inductive load!**

Switching with inductive load  
Fig. 1



Counter EMF  
over load without free-wheeling diode  
Fig. 2



## Index from Part No.

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18-030.0055L	9	18-287.035	7		
18-031.0052L	9	18-288.035	6		
18-031.0054L	9	18-288.035	7		
18-031.0055L	9	18-910	19		
18-032.0052L	9	18-920.1	16		
18-032.0054L	9	18-920.2	16		
18-032.0055L	9	18-920.3	16		
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18-040.0055L	8	18-931.5L	16		
18-041.0052L	8	18-932.0	15		
18-041.0054L	8	18-932.2	15		
18-041.0055L	8	18-932.4	15		
18-042.0052L	8	18-932.5	15		
18-042.0054L	8	18-932.8	15		
18-042.0055L	8	18-932.9	15		
18-050.0052L	8	18-941.2L	16		
18-050.0054L	8	18-941.4L	16		
18-050.0055L	8	18-941.5L	16		
18-051.0052L	8	18-942.0	15		
18-051.0054L	8	18-942.2	15		
18-052.0052L	8	18-942.4	15		
18-052.0054L	8	18-942.5	15		
18-052.0055L	8	18-942.8	15		
18-060.0052L	5	18-942.9	15		
18-060.0054L	5	18-945	18		
18-060.0055L	5	18-946	18		
18-061.0052L	5	18-951.2L	16		
18-061.0054L	5	18-951.4L	16		
18-061.0055L	5	18-951.5L	16		
18-062.0052L	5	18-952.0	15		
18-062.0054L	5	18-952.2	15		
18-062.0055L	5	18-952.4	15		
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18-082.0052L	4	18-961.4L	14		
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18-137.035	10	18-962.2	14		
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18-147.035	12	18-981.2L	14		
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18-157.035	10	18-982.0	14		
18-157.035	12	18-982.2	14		
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18-158.035	12	18-982.5	14		
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18-257.035	12				
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18-268.035	6				

