

# Series 92

## Characteristics

The Series 92 with its short stroke pushbuttons, making it especially suited for:

- PCB mounting

This series can be used to replace a membrane keypad if only a few buttons are needed.

## Functions

The Series 92 incorporates the following functions:

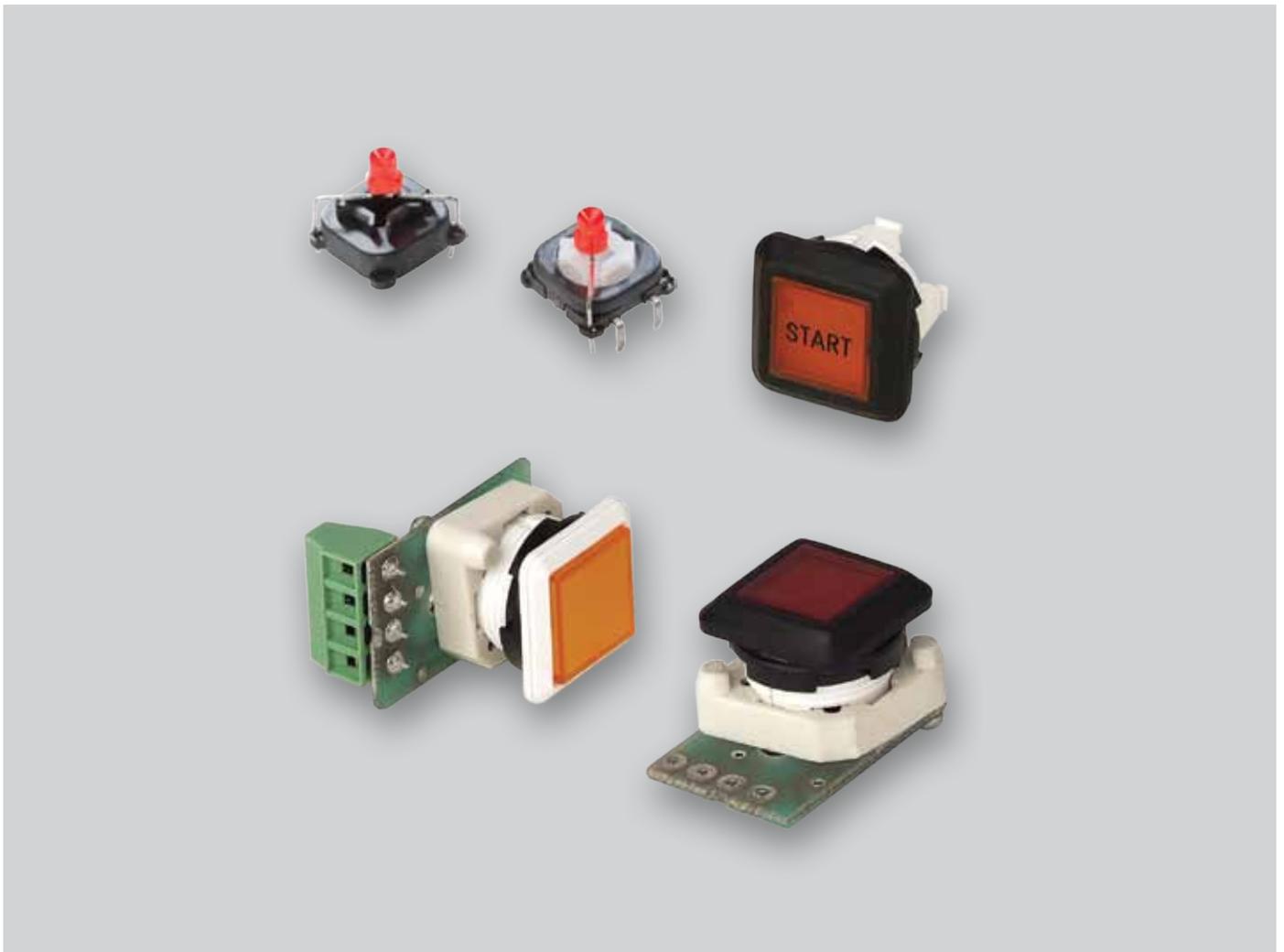
- Indicator
- Pushbutton
- Illuminated pushbutton

## Market segments

The EAO Series 92 is especially suited for applications in the segments:

- Machinery and Automation
- Medicinal technology
- 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.





<b>Overview</b>	
<b>PCB pushbuttons</b>	
Indicator	812
Pushbutton	814
Illuminated pushbutton	815
Indicator actuator	817
Pushbutton actuator	818
Illuminated pushbutton actuator	819
<b>Accessories</b>	<b>822</b>
<b>Drawings</b>	<b>829</b>
<b>Technical data</b>	<b>830</b>
<b>Application guidelines</b>	<b>832</b>

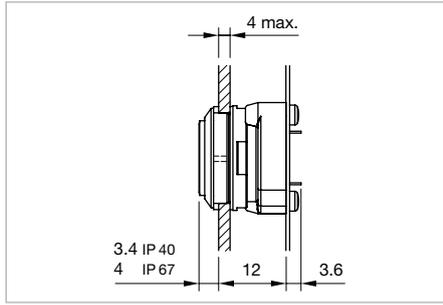
01
02
03
04
10
14
17
18
19
22
31
41
44
51
56
57
61
70
71
82
84
<b>92</b>
95
96
97
99
ST

# 92 PCB pushbuttons

## Indicator



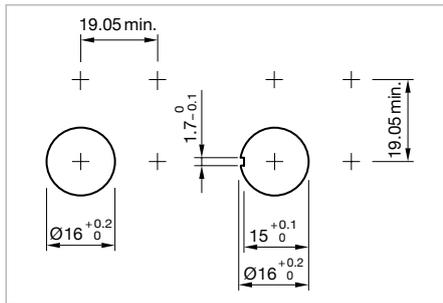
Product can differ from the current configuration.



Dimensions [mm]

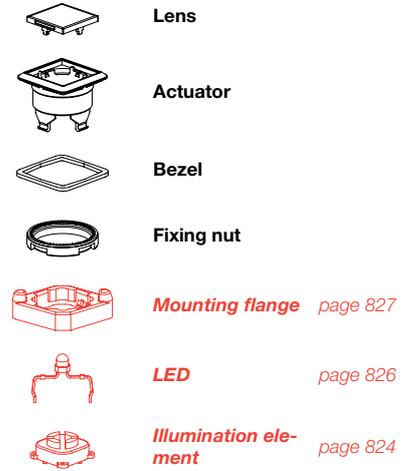
### Additional Information

- Transparent lens and pressure plate
- IP 67 version without bezel



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.

Front protection	Front	Pressure plate	Lens	Part No.	Weight	
 <p><b>Indicator actuator, Front dimension 18.8 x 18.8 mm</b></p>	IP 67	Plastic white	Plastic red	<b>92-043.200</b>	0.003 kg	
			Plastic orange	<b>92-043.300</b>	0.003 kg	
			Plastic yellow	<b>92-043.400</b>	0.003 kg	
			Plastic green	<b>92-043.500</b>	0.003 kg	
			Plastic blue	<b>92-043.600</b>	0.003 kg	
			Plastic colourless	<b>92-043.700</b>	0.003 kg	
			Plastic black	Plastic red	<b>92-143.200</b>	0.003 kg
	Plastic orange	<b>92-143.300</b>		0.003 kg		
	Plastic yellow	<b>92-143.400</b>		0.003 kg		
	Plastic green	<b>92-143.500</b>		0.003 kg		
	Plastic blue	<b>92-143.600</b>		0.003 kg		
	Plastic colourless	<b>92-143.700</b>		0.003 kg		
	 <p><b>Indicator actuator, Front dimension 18.4 x 18.4 mm</b></p>	IP 40		Plastic white	Plastic smoked	<b>92-058.100</b>
			Plastic red		<b>92-058.200</b>	0.003 kg
Plastic orange			<b>92-058.300</b>		0.003 kg	
Plastic yellow			<b>92-058.400</b>		0.003 kg	
Plastic green			<b>92-058.500</b>		0.003 kg	
Plastic blue			<b>92-058.600</b>		0.003 kg	
Plastic colourless			<b>92-058.700</b>		0.003 kg	

Front protection	Front	Pressure plate	Lens	Part No.	Weight
IP 40	Plastic black		Plastic smoked	<b>92-158.100</b>	0.003 kg
			Plastic red	<b>92-158.200</b>	0.003 kg
			Plastic orange	<b>92-158.300</b>	0.003 kg
			Plastic yellow	<b>92-158.400</b>	0.003 kg
			Plastic green	<b>92-158.500</b>	0.003 kg
			Plastic blue	<b>92-158.600</b>	0.003 kg
			Plastic colourless	<b>92-158.700</b>	0.003 kg

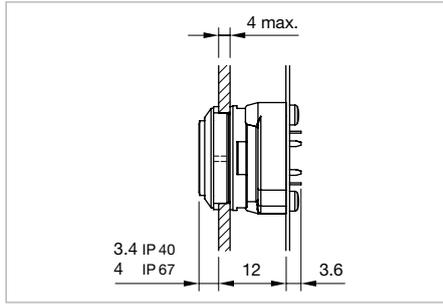
- 01
- 02
- 03
- 04
- 10
- 14
- 17
- 18
- 19
- 22
- 31
- 41
- 44
- 51
- 56
- 57
- 61
- 70
- 71
- 82
- 84
- 92**
- 95
- 96
- 97
- 99
- ST

# 92 PCB pushbuttons

## Pushbutton



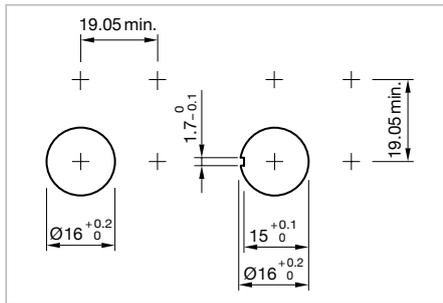
Product can differ from the current configuration.



Dimensions [mm]

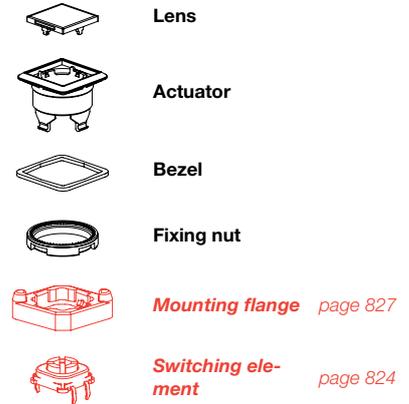
### Additional Information

- Lens opaque
- IP 67 version without bezel



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.

Front protection	Front	Pressure plate	Lens	Switching action	Part No.	Wiring diagram	Weight
 <p><b>Pushbutton actuator, Front dimension 18.8 x 18.8 mm</b></p>							
IP 67	Plastic white	Plastic black		B	<b>92-341.000</b>	1	0.002 kg
		Plastic grey		B	<b>92-341.800</b>	1	0.002 kg
	Plastic black	Plastic black		B	<b>92-441.000</b>	1	0.002 kg
		Plastic grey		B	<b>92-441.800</b>	1	0.002 kg
 <p><b>Pushbutton actuator, Front dimension 18.4 x 18.4 mm</b></p>							
IP 40	Plastic white		Plastic black	B	<b>92-356.000</b>	1	0.002 kg
			Plastic grey	B	<b>92-356.800</b>	1	0.002 kg
			Plastic white	B	<b>92-356.900</b>	1	0.002 kg
	Plastic black		Plastic black	B	<b>92-456.000</b>	1	0.002 kg
			Plastic grey	B	<b>92-456.800</b>	1	0.002 kg
			Plastic white	B	<b>92-456.900</b>	1	0.002 kg

Switching action: B = Momentary

E---

Wiring diagram 1

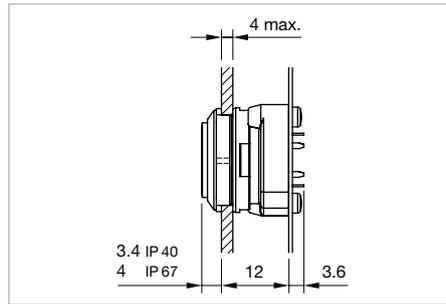
**Illuminated pushbutton**

**Equipment consisting of (schematic overview)**

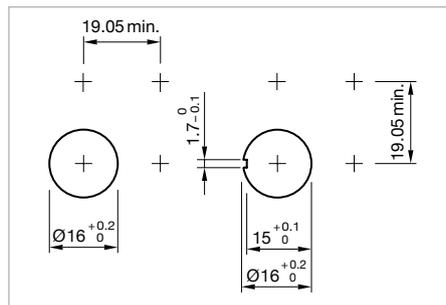
-  **Lens**
-  **Actuator**
-  **Bezel**
-  **Fixing nut**
-  **Mounting flange** *page 827*
-  **LED** *page 826*
-  **Switching element** *page 824*

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]



Mounting cut-outs [mm]



Product can differ from the current configuration.

**Additional Information**

- Transparent lens and pressure plate
- IP 67 version without bezel

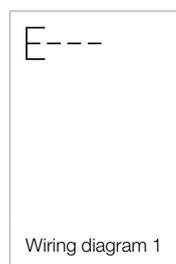
Front protection	Front	Pressure plate	Lens	Switching action	Part No.	Wiring diagram	Weight
 <p><b>Illuminated pushbutton actuator, Front dimension 18.8 x 18.8 mm</b></p>							
IP 67	Plastic white	Plastic red		B	<b>92-343.200</b>	1	0.003 kg
		Plastic orange		B	<b>92-343.300</b>	1	0.003 kg
		Plastic yellow		B	<b>92-343.400</b>	1	0.003 kg
		Plastic green		B	<b>92-343.500</b>	1	0.003 kg
		Plastic blue		B	<b>92-343.600</b>	1	0.003 kg
		Plastic colourless		B	<b>92-343.700</b>	1	0.003 kg
	Plastic black	Plastic red		B	<b>92-443.200</b>	1	0.003 kg
		Plastic orange		B	<b>92-443.300</b>	1	0.003 kg
		Plastic yellow		B	<b>92-443.400</b>	1	0.003 kg
		Plastic green		B	<b>92-443.500</b>	1	0.003 kg
		Plastic blue		B	<b>92-443.600</b>	1	0.003 kg
		Plastic colourless		B	<b>92-443.700</b>	1	0.003 kg
 <p><b>Illuminated pushbutton actuator, Front dimension 18.4 x 18.4 mm</b></p>							
IP 40	Plastic white	Plastic smoked		B	<b>92-358.100</b>	1	0.003 kg
		Plastic red		B	<b>92-358.200</b>	1	0.003 kg
		Plastic orange		B	<b>92-358.300</b>	1	0.003 kg
		Plastic yellow		B	<b>92-358.400</b>	1	0.003 kg
		Plastic green		B	<b>92-358.500</b>	1	0.003 kg
		Plastic blue		B	<b>92-358.600</b>	1	0.003 kg
		Plastic colourless		B	<b>92-358.700</b>	1	0.003 kg

01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
**92**  
95  
96  
97  
99  
ST

# 92 PCB pushbuttons

Front protection	Front	Pressure plate	Lens	Switching action	Part No.	Wiring diagram	Weight
IP 40	Plastic black		Plastic smoked	B	<b>92-458.100</b>	1	0.003 kg
			Plastic red	B	<b>92-458.200</b>	1	0.003 kg
			Plastic orange	B	<b>92-458.300</b>	1	0.003 kg
			Plastic yellow	B	<b>92-458.400</b>	1	0.003 kg
			Plastic green	B	<b>92-458.500</b>	1	0.003 kg
			Plastic blue	B	<b>92-458.600</b>	1	0.003 kg
			Plastic colourless	B	<b>92-458.700</b>	1	0.003 kg

Switching action: B = Momentary



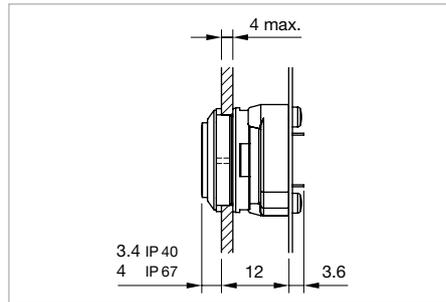
Indicator actuator IP 67

Equipment consisting of (schematic overview)

-  **Pressure plate** *page 822*
-  **Front bezel**
-  **Actuator**
-  **Fixing nut**
-  **Mounting flange** *page 827*
-  **LED** *page 826*
-  **Illumination element** *page 824*

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

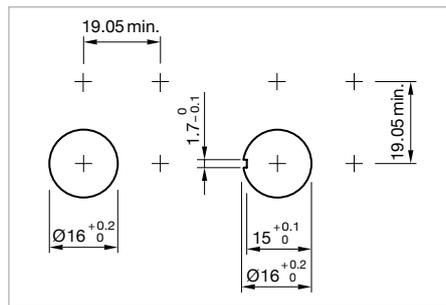
To obtain a complete unit, please select the red components from the pages shown.



Dimensions [mm]



Product can differ from the current configuration.



Mounting cut-outs [mm]

Front	Part No.	Weight
 <p><b>Indicator actuator IP 67, Front dimension 18.8 x 18.8 mm</b></p>		
Plastic black	<b>92-140.000</b>	0.003 kg

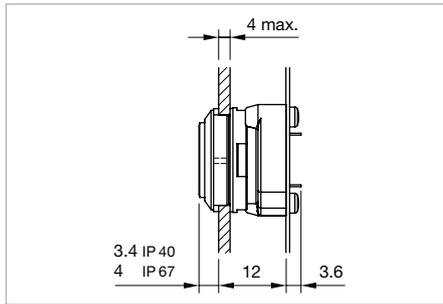
01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
**92**  
95  
96  
97  
99  
ST

# 92 PCB pushbuttons

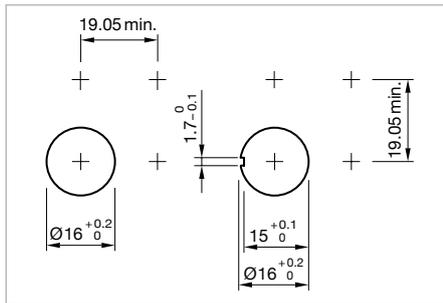
## Pushbutton actuator IP 40



Product can differ from the current configuration.



Dimensions [mm]



Mounting cut-outs [mm]

### Equipment consisting of (schematic overview)

-  **Lens** page 822
-  **Actuator**
-  **Bezel** page 823
-  **Fixing nut**
-  **Mounting flange** page 827
-  **Switching element** page 824

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.

Front	Switching action	Part No.	Wiring diagram	Weight
				
<b>Pushbutton actuator IP 40, Front dimension 18.4 x 18.4 mm</b>				
Plastic white	B	<b>92-350.000</b>	1	0.003 kg
Plastic black	B	<b>92-450.000</b>	1	0.003 kg

Switching action: B = Momentary



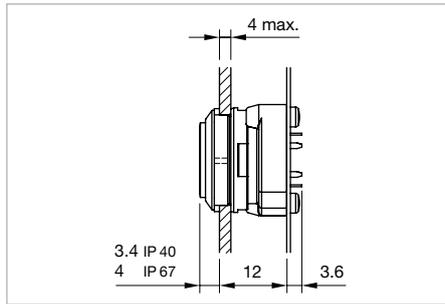
Pushbutton actuator IP 67

Equipment consisting of (schematic overview)

-  **Pressure plate** *page 822*
-  **Front bezel**
-  **Actuator**
-  **Fixing nut**
-  **Mounting flange** *page 827*
-  **Switching element** *page 824*

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

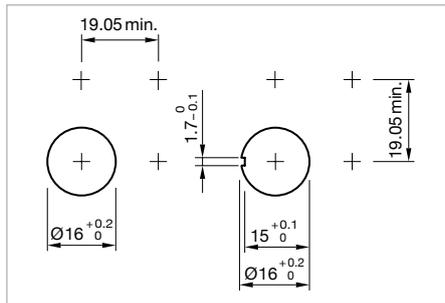
To obtain a complete unit, please select the red components from the pages shown.



Dimensions [mm]



Product can differ from the current configuration.



Mounting cut-outs [mm]

Front	Switching action	Part No.	Wiring diagram	Weight
				
<b>Pushbutton actuator IP 67, square 18.8 x 18.8 mm</b>				
Plastic white	B	<b>92-340.000</b>	1	0.003 kg
Plastic black	B	<b>92-440.000</b>	1	0.003 kg

Switching action: B = Momentary



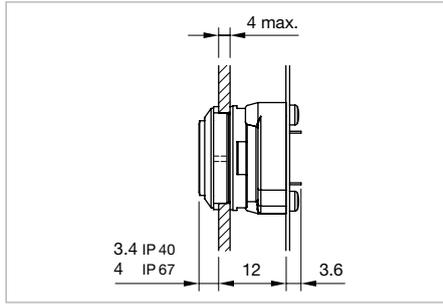
01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
**92**  
95  
96  
97  
99  
ST

# 92 PCB pushbuttons

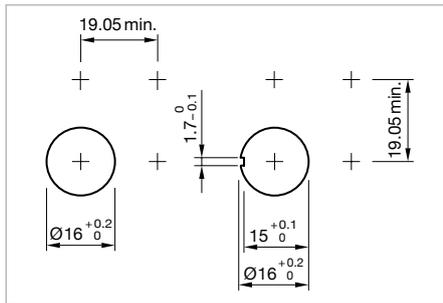
## Illuminated pushbutton actuator IP 40



Product can differ from the current configuration.



Dimensions [mm]



Mounting cut-outs [mm]

### Equipment consisting of (schematic overview)

-  **Lens** page 822
-  **Actuator**
-  **Bezel** page 823
-  **Fixing nut**
-  **Mounting flange** page 827
-  **LED** page 826
-  **Switching element** page 824

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.*

Front	Switching action	Part No.	Wiring diagram	Weight
	<b>Illuminated pushbutton actuator IP 40, Front dimension 18.4 x 18.4 mm</b>			
Plastic white	B	<b>92-350.000</b>	1	0.003 kg
Plastic black	B	<b>92-450.000</b>	1	0.003 kg

Switching action: B = Momentary



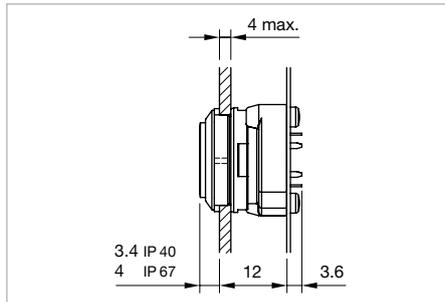
**Illuminated pushbutton actuator IP 67**

**Equipment consisting of (schematic overview)**

-  **Pressure plate** *page 822*
-  **Front bezel**
-  **Actuator**
-  **Fixing nut**
-  **Mounting flange** *page 827*
-  **LED** *page 826*
-  **Switching element** *page 824*

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

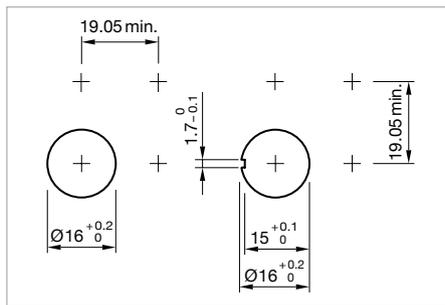
*To obtain a complete unit, please select the red components from the pages shown.*



Dimensions [mm]



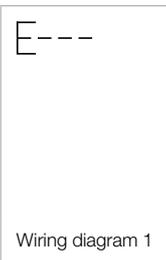
Product can differ from the current configuration.



Mounting cut-outs [mm]

Front	Switching action	Part No.	Wiring diagram	Weight
				
<b>Illuminated pushbutton actuator IP 40, square 18.8 x 18.8 mm</b>				
Plastic white	B	<b>92-340.000</b>	1	0.003 kg
Plastic black	B	<b>92-440.000</b>	1	0.003 kg

Switching action: B = Momentary



01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
**92**  
95  
96  
97  
99  
ST

## Front

### Lens plate IP 67

#### Additional Information

- Material plastic

Product attribute	Dimension	Pressure plate	Part No.	Weight
 <p><b>Lens plate for pushbutton and indicator IP 67</b></p>				
non-illuminative	12 x 12 mm	black opaque	<b>92-941.000</b>	0.001 kg
		grey opaque	<b>92-941.800</b>	0.001 kg
illuminative	12 x 12 mm	red transparent	<b>92-941.200</b>	0.001 kg
		orange transparent	<b>92-941.300</b>	0.001 kg
		yellow transparent	<b>92-941.400</b>	0.001 kg
		green transparent	<b>92-941.500</b>	0.001 kg
		blue transparent	<b>92-941.600</b>	0.001 kg
		colourless transparent	<b>92-941.700</b>	0.001 kg

### Lens IP 40

#### Additional Information

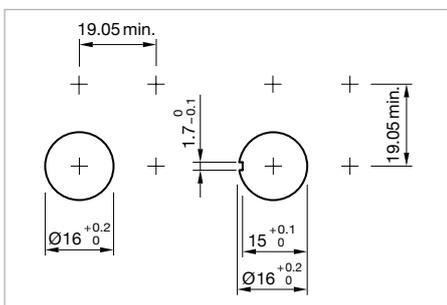
- Material plastic
- With white marking plate

Product attribute	Dimension	Lens	Part No.	Weight
 <p><b>Lens for pushbutton and indicator IP 40</b></p>				
non-illuminative	13.2 x 13.2 mm	black opaque	<b>92-956.000</b>	0.001 kg
		grey opaque	<b>92-956.800</b>	0.001 kg
		white opaque	<b>92-956.900</b>	0.001 kg
illuminative	13.2 x 13.2 mm	red translucent	<b>92-956.200</b>	0.001 kg
		orange translucent	<b>92-956.300</b>	0.001 kg
		yellow translucent	<b>92-956.400</b>	0.001 kg
		green translucent	<b>92-956.500</b>	0.001 kg
		blue translucent	<b>92-956.600</b>	0.001 kg
		smoked transparent	<b>92-958.100</b>	0.001 kg
		red transparent	<b>92-958.200</b>	0.001 kg
		orange transparent	<b>92-958.300</b>	0.001 kg
		yellow transparent	<b>92-958.400</b>	0.001 kg
		green transparent	<b>92-958.500</b>	0.001 kg
		blue transparent	<b>92-958.600</b>	0.001 kg
		colourless transparent	<b>92-958.700</b>	0.001 kg

**Bezel IP 40**

Material	Colour	Part No.	Weight
 <p><b>Front bezel for pushbutton and indicator IP 40</b></p>	black	<b>92-912.0</b>	0.001 kg
	white	<b>92-912.9</b>	0.001 kg

**Blind plug**



Mounting cut-outs [mm]

Dimension	Material	Colour	Part No.	Weight
 <p><b>Blind plug</b></p>	Plastic	black	<b>51-948.0</b>	0.003 kg
18 x 18 mm				

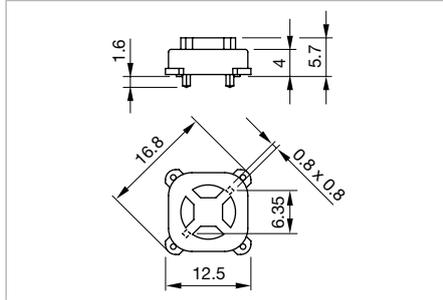
- 01
- 02
- 03
- 04
- 10
- 14
- 17
- 18
- 19
- 22
- 31
- 41
- 44
- 51
- 56
- 57
- 61
- 70
- 71
- 82
- 84
- 92**
- 95
- 96
- 97
- 99
- ST

## Rear side

### Illumination element PCB

#### Additional Information

- The customer has to decide what series resistor shall be used to the LED



Dimensions [mm]

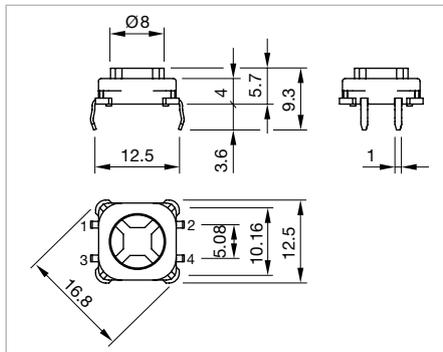
Terminal	Part No.	Component layout	Weight
			
<b>Illumination element PCB mounting</b>			
PCB	<b>92-800.042</b>	1	0.001 kg

The component layouts you will find from page 829

### Switching element PCB illuminative

#### Additional Information

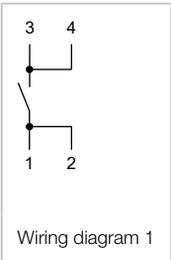
- The customer has to decide what series resistor shall be used to the LED



Dimensions [mm]

Contacts	Terminal	Part No.	Component layout	Wiring diagram	Weight
					
<b>Switching element PCB mounting illuminative</b>					
1 NO	PCB	<b>92-851.342</b>	2	1	0.001 kg

The component layouts you will find from page 829



**Spacer**

- Additional Information**
- Adjustable for front plate thickness of 1.5/2/2.5/3/3.5/4 mm
  - When fitting, ensure that back of panel is free of grease and dirt

Part No.	Weight
	
<b>Spacer</b>	
92-965.0	0.003 kg

**PCB assembled**

- Additional Information**
- For discrete switching applications including switching element and mounting flange, soldering terminal (assembled PCB incl. series resistor and LED on request)

Part No.	Weight
	
<b>PCB assembled</b>	
92-981.0	0.003 kg

01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
**92**  
95  
96  
97  
99  
ST

## Illumination

### Single-LED, T1 Bi-Pin

#### Additional Information

- The customer has to decide what series resistor shall be used to the LED
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

LED colour	Forward voltage typ.	Lumi. intensity	Dom. wavelength	Part No.	Weight
 <p><b>Single-LED</b></p>					
Single-LED red	2.1 VDC @ 20 mA	200 mcd	625 nm	<b>10-2602.3202L</b>	0.001 kg
Single-LED orange	2.1 VDC @ 20 mA	220 mcd	590 nm	<b>10-2602.3203L</b>	0.001 kg
Single-LED yellow	3.3 VDC @ 20 mA	500 mcd	570 nm	<b>10-2602.3204L</b>	0.001 kg
Single-LED green	3.5 VDC @ 20 mA	250 mcd	525 nm	<b>10-2602.3205L</b>	0.001 kg
Single-LED blue	3.5 VDC @ 20 mA	450 mcd	470 nm	<b>10-2602.3206L</b>	0.001 kg
Single-LED white	3.3 VDC @ 20 mA	600 mcd	x=0.29/y=0.31 nm	<b>10-2602.3209L</b>	0.001 kg

### Bi-colour-LED, T1 Bi-Pin

#### Additional Information

- The customer has to decide what series resistor shall be used to the LED
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

LED colour	Forward voltage typ.	Lumi. intensity	Dom. wavelength	Part No.	Weight
 <p><b>Bi-colour-LED</b></p>					
Bi-colour LED red/green	2.0/3.2 VDC @ 20 mA	310/800 mcd	625/528 nm	<b>10-2603.308AL</b>	0.001 kg
Bi-colour LED yellow/green	2.0/3.2 VDC @ 20 mA	350/750 mcd	591/528 nm	<b>10-2603.308CL</b>	0.001 kg

**Mounting**

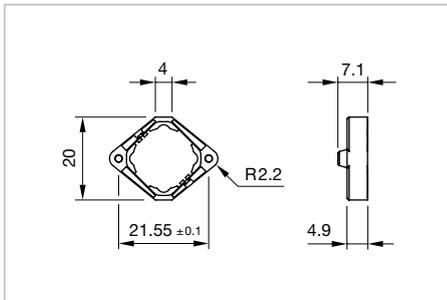
**Anti-twist ring**

**Additional Information**

- For front panel thickness max. 2 mm

Mounting cut-out	Part No.	Weight
 <p><b>Anti-twist ring</b></p>		
Ø 16 mm	<b>51-910</b>	0.001 kg

**Mounting flange**



Dimensions [mm]

Part No.	Weight
 <p><b>Mounting flange</b></p>	
<b>92-960.0</b>	0.001 kg

**Lens remover**

**Additional Information**

- For lens IP 40 only

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

01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
92  
95  
96  
97  
99  
ST

01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
**92**  
95  
96  
97  
99  
ST

## Mounting tool

### Additional Information

- For tightening or loosening of the fixing nut

Part No.	Weight
 <p><b>Mounting tool</b></p>	
01-907	0.020 kg

## Dismantling tool

### Additional Information

- For actuator dismantling of switching element, illumination element and mounting flange

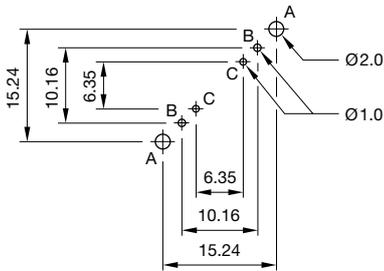
Part No.	Weight
 <p><b>Dismantling tool</b></p>	
92-971.0	0.002 kg

Drawings

Single-LED

Drilling plan (element side)

- A Fixing holes for mounting flange (92-960.0)
- B Holes for LED
- C Holes for centering pins

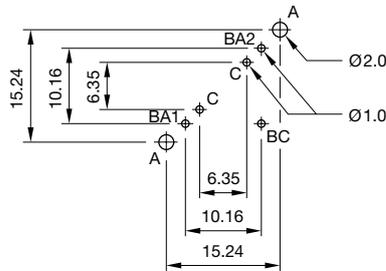


Component layout 1

Bi-colour-LED

Drilling plan (element side)

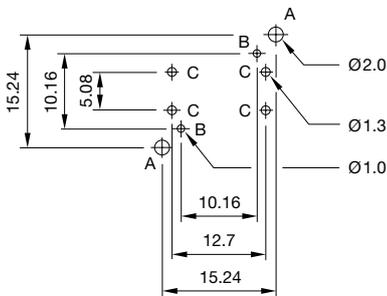
- A Fixing holes for mounting flange (92-960.0)
- B Holes for Bi-colour LED:  
BA1 (green) + BA2 (yellow or red) = Anodes, BC = Cathode
- C Holes for centering pins



Single-LED

Drilling plan (element side)

- A Fixing holes for mounting flange (92-960.0)
- B Holes for LED
- C Holes for contact pins  
Pad max. Ø 2.5 mm  
Through-connection recommended

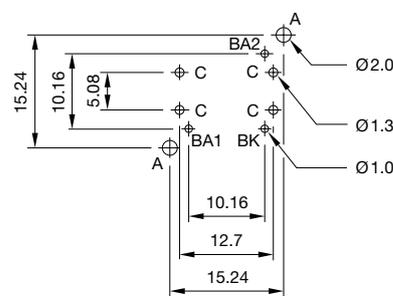


Component layout 2

Bi-colour-LED

Drilling plan (element side)

- A Fixing holes for mounting flange (92-960.0)
- B Holes for Bi-colour LED:  
BA1 (green) + BA2 (yellow or red) = Anodes, BK = Cathode
- C Holes for contact pins  
Pad max. Ø 2.5 mm  
Through-connection recommended



01  
02  
03  
04  
10  
14  
17  
18  
19  
22  
31  
41  
44  
51  
56  
57  
61  
70  
71  
82  
84  
**92**  
95  
96  
97  
99  
ST

## Pushbutton and Illuminated pushbutton

### Switching system

Short-travel switching system with 2 independent contact points and tactile operation.  
Guarantees reliable switching even of very light loads.  
Fitted with 1 normally open contact.

### Material

#### Lens

Polycarbonate (PC)

#### Front bezel

Thermoplastic Elastomer (TPE)

#### Frame

Thermoplastic Polyester (PBT)

#### Material of contact

Gold (Au)

#### Switching element

Thermoplastic Polyester (PET, PBT) and Polyacetale (POM)

#### Actuator housing

Thermoplastic Polyester (PBT)

### Mechanical characteristics

#### Tightening torque

Fixing screw 40Ncm recommended  
Fixing nut max. 50Ncm

#### Actuating force

2.7 N  $\pm$  1 N measured at the switching element  
5 N measured at the lens

#### Actuating travel

Switching element 0.4 mm

#### Rebound time

$\leq$  1 ms

#### Resistance to heat of soldering

260 °C, 5 s, as per IEC 60068-2-20

#### Mechanical lifetime

$\geq$  1 Million operations as per IEC 60512-5-9a

### Electrical characteristics

#### Contact resistance

Starting value (initial)  $\leq$  100 m $\Omega$  as per IEC 60512-2-2b

#### Isolation resistance

$\geq$  10<sup>9</sup>  $\Omega$  between all terminals at 100 VDC, as per IEC 60512-2-3a

#### Electrical life

$\geq$  500 000 operations at 42 VDC, 50 mA as per IEC 60512-5-9c.  
When attention is paid to the direction of current flow from terminal 3/4 to 1/2 the electrical life can be prolonged.

#### Electrostatic discharge (ESD)

15 kV

#### Switch rating

Switching voltage	min. 50 mV AC/DC max. 42 V AC/DC
Switching current	min. 10 $\mu$ A AC/DC max. 100 mA AC/DC
Power rating	max. 2 W

#### Electric strength

500 VAC, 50 Hz, 1 min, as per IEC 60512-2-4a

### Environmental conditions

#### Storage temperature

-40 °C ... +80 °C

#### Operating temperature

-25 °C ... +70 °C

#### Front protection

Switching element IP 40 (fluxproof to DIN 41640 Part 84)  
front IP 67 or IP 40

#### Shock resistance

(semi-sinusoidal)  
max. 500 m/s<sup>2</sup>, pulse width 11 ms, 3-axis,  
as per EN IEC 60068-2-27

#### Vibration resistance

(sinusoidal)  
max. 100 m/s<sup>2</sup> at 10 Hz ... 500 Hz, 10 cycles, 3-axis,  
as per EN IEC 60068-2-6

### Approvals

#### Declaration of conformity

CE

EAO reserves the right to alter specifications without further notice.

## General notes

If desired, the actuators of the series 92 can be supplied ready marked. With your order please enclose a list of the desired markings or a drawing, showing the type or size of script or the symbols desired.

### 1. Laser engraving (Fig. 1)

In addition to the most commonly used world languages, in DIN1451-3 close spacing, other typefaces are available as Scandinavian, Slavic, Greek, Russian and Polish. Red, blue and black lenses are filled with white colour. Other colour lenses are filled in black. Standard height of letters is 2 mm. If the height is not specified, we will supply 2 mm engraved letters.

### 2. Hot stamping (Fig. 1)

For larger series it is worth considering markings by means of hot stamping. We will be pleased to advise you. For letters and figures, typefaces with 2.5 mm, 3 mm and 4 mm are available.

### 3. Film inserts (Fig. 2)

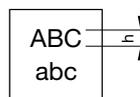
Instead of using engraving, the actuator can be fitted with transparent film inserts. However, for this purpose the use of transparent lens caps is recommended. If smoked lens caps are used the lettering does not become visible until the LED is alight. Max. size of film insert 11.4 x 11.4 mm for IP 40 10.4 x 10.4 mm for IP 67 Film thickness 0.2 mm.

All dimensions in mm

Height of letters h	Number of lines	Number of capital letters per line (target value)	Number of small letters per line (target value)
3	2	5-6	6
4	2	4	4
5	1	3	3-4
6	1	2-3	3
8	1	2	2

Fig. 1

Fig. 2



## Suppressor circuits

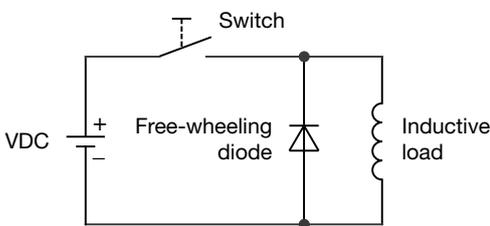
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e.g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

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.

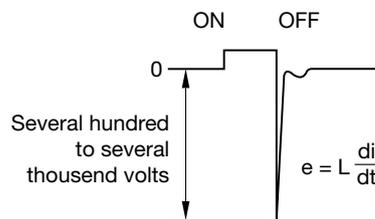
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage ( $V_R$ ) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum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

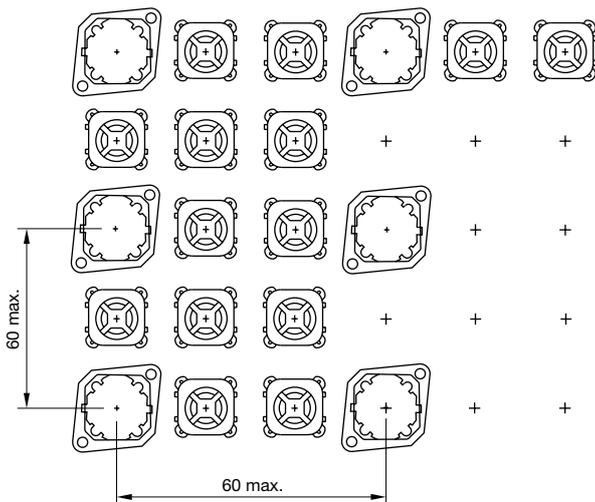
**To get an efficient protection, the free-wheeling diode must be connected as close as possible to the inductive load!**

Switching with inductive load  
Fig. 1



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



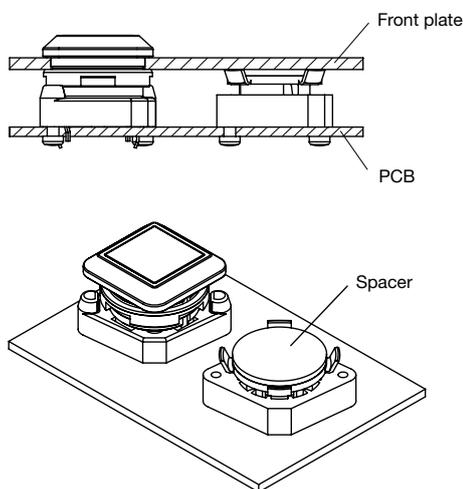
**Arrangement mounting flange**


The arrangement of the mounting flanges and their number is determined by the size of the front panel or PCB. To ensure uniform, tactile switching, we recommend a layout of the flanges as per adjacent sketch.

For large PCBs with several switching elements we recommend the following procedure:

1. Fit the actuator to the front panel.
2. Clip the mounting flange to the rear of the intended actuator.
3. Screw the PCB with the components soldered to it to the assembled mounting flange.

This arrangement applies to PCBs 1.6 mm thick.

**Dismantling mounting flange**


The tool Part No. 92-971.0 must be used for removing the mounting flange from the actuator. Before removing the flange, the PCB fixing screws must be loosened.

If the number of actuators is insufficient, use the spacer Part. No. 92-965.0 which can be attached to the front panel.

The spacer can be adjusted to the following front panel thicknesses: 1.5/2/2.2/3/3.5/4 mm and can be stuck to the back of the panel free of dirt and grease.

