

# Series 95

**Characteristics**

The Series 95 PCB pushbuttons can be used in combination with 1.5 to 2.5 mm PCBs. The buttons are self-attaching until they are soldered. Depending on the design, they can be equipped with 2 or 3 SMD LEDs. The series is available in the following sizes:

- 19.05 × 19.05 mm
- 15.88 × 15.88 mm
- 12.7 × 12.7 mm

**Functions**

The Series 95 incorporates the following functions:

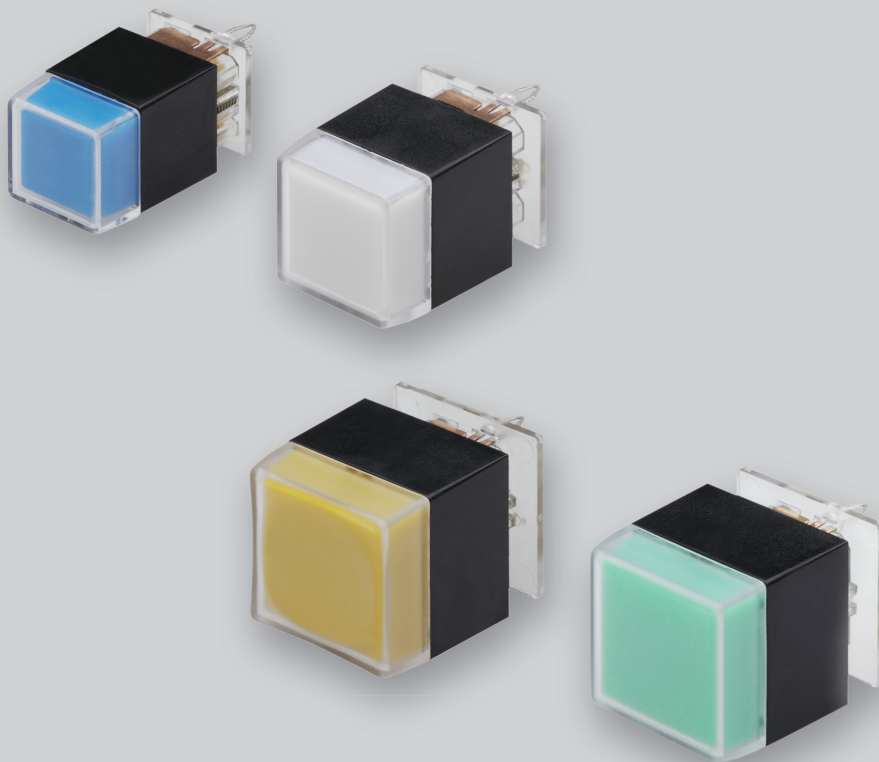
- Pushbutton
- Illuminated pushbutton

**Market segments**

The EAO Series 95 is especially suited for applications in the segment:

- Audio and video

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.





**Overview**

**Printtasten**

Illuminated pushbutton

4

**Accessories**

5

**Drawings**

9

**Technical data**

10

**Application guidelines**

11

**Index**

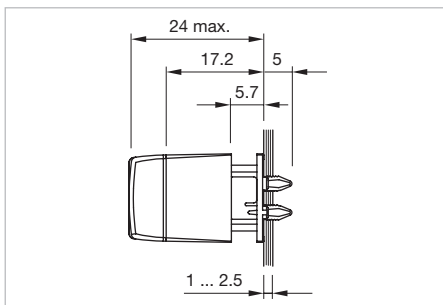
12

# 95 PCB pushbuttons

## Illuminated pushbutton, IP 40



Product can differ from the current configuration.



Dimensions [mm]

### Equipment consisting of (schematic overview)



Lens



Diffuser



Switching element

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

### Additional Information

- Lens plastic, colourless, transparent
- Suitable for PCB thickness 1.5 to 2.5 mm
- Special spring clip contacts position and hold the pushbutton in place during the soldering process. The soldering provides the contacting and the mechanical strength. The pushbutton is designed for panel mounting only.

| Lens                                                                                                                                               | Contacts | Switching action | Terminal | Part No.          | Component layout | Weight   |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|----------|-------------------|------------------|----------|
|  <b>Illuminated pushbutton, Front dimension 19.05 x 19.05 mm</b> |          |                  |          |                   |                  |          |
| convexe mat                                                                                                                                        | 1 NO     | B                | PCB      | <b>95-414.730</b> | 1                | 0.004 kg |
| concave mat                                                                                                                                        | 1 NO     | B                | PCB      | <b>95-414.740</b> | 1                | 0.004 kg |
| flat high gloss finished                                                                                                                           | 1 NO     | B                | PCB      | <b>95-414.750</b> | 1                | 0.004 kg |
| concave high gloss finished                                                                                                                        | 1 NO     | B                | PCB      | <b>95-414.770</b> | 1                | 0.004 kg |
|  <b>Illuminated pushbutton, Front dimension 15.88 x 15.88 mm</b> |          |                  |          |                   |                  |          |
| flat mat                                                                                                                                           | 1 NO     | B                | PCB      | <b>95-515.720</b> | 2                | 0.004 kg |
| concave mat                                                                                                                                        | 1 NO     | B                | PCB      | <b>95-515.740</b> | 2                | 0.004 kg |
| flat high gloss finished                                                                                                                           | 1 NO     | B                | PCB      | <b>95-515.750</b> | 2                | 0.004 kg |
| concave high gloss finished                                                                                                                        | 1 NO     | B                | PCB      | <b>95-515.770</b> | 2                | 0.004 kg |
|  <b>Illuminated pushbutton, Front dimension 12.7 x 12.7 mm</b>   |          |                  |          |                   |                  |          |
| flat mat                                                                                                                                           | 1 NO     | B                | PCB      | <b>95-313.720</b> | 3                | 0.003 kg |
| flat high gloss finished                                                                                                                           | 1 NO     | B                | PCB      | <b>95-313.750</b> | 3                | 0.003 kg |

Contacts: NO = Normally open

Switching action: B = Momentary

The component layouts you will find from page 9

**Front****Lens****Additional Information**

- Lens plastic, colourless, transparent

| Dimension                                                                                       | Lens             | Part No.                    | Weight                     |
|-------------------------------------------------------------------------------------------------|------------------|-----------------------------|----------------------------|
|  <b>Lens</b>   | 15.88 x 15.88 mm | flat mat                    | <b>95-705.720</b> 0.001 kg |
|                                                                                                 | 19.05 x 19.05 mm | flat mat                    | <b>95-704.720</b> 0.001 kg |
|                                                                                                 |                  | flat high gloss finished    | <b>95-704.750</b> 0.001 kg |
|                                                                                                 | 12.7 x 12.7 mm   | flat mat                    | <b>95-703.720</b> 0.001 kg |
|                                                                                                 |                  | flat high gloss finished    | <b>95-703.750</b> 0.001 kg |
|                                                                                                 |                  |                             |                            |
|  <b>Lens</b>  | 15.88 x 15.88 mm | convexe mat                 | <b>95-705.730</b> 0.001 kg |
|                                                                                                 | 19.05 x 19.05 mm | convexe mat                 | <b>95-704.730</b> 0.001 kg |
|                                                                                                 |                  | convexe high gloss finished | <b>95-704.760</b> 0.001 kg |
|                                                                                                 |                  |                             |                            |
|  <b>Lens</b> | 15.88 x 15.88 mm | concave mat                 | <b>95-705.740</b> 0.001 kg |
|                                                                                                 |                  | concave high gloss finished | <b>95-705.770</b> 0.001 kg |
|                                                                                                 | 19.05 x 19.05 mm | concave mat                 | <b>95-704.740</b> 0.001 kg |
|                                                                                                 |                  | concave high gloss finished | <b>95-704.770</b> 0.001 kg |
|                                                                                                 |                  |                             |                            |
|  <b>Lens</b> |                  |                             |                            |
|                                                                                                 | 19.05 x 38.1 mm  | concave mat                 | <b>95-724.740</b> 0.002 kg |

## Diffuser

| Dimension                                                                                         | Diffuser         | Part No.                       | Weight                     |
|---------------------------------------------------------------------------------------------------|------------------|--------------------------------|----------------------------|
|  <b>Diffuser</b> | 19.05 x 19.05 mm | Plastic red translucent        | <b>95-804.220</b> 0.001 kg |
|                                                                                                   |                  | Plastic yellow translucent     | <b>95-804.420</b> 0.001 kg |
|                                                                                                   |                  | Plastic green translucent      | <b>95-804.520</b> 0.001 kg |
|                                                                                                   |                  | Plastic colourless transparent | <b>95-804.720</b> 0.001 kg |
|                                                                                                   |                  | Plastic white translucent      | <b>95-804.920</b> 0.001 kg |
|                                                                                                   | 15.88 x 15.88 mm | Plastic white translucent      | <b>95-805.920</b> 0.001 kg |
|  <b>Diffuser</b>  | 12.7 x 12.7 mm   | Plastic yellow translucent     | <b>95-803.420</b> 0.001 kg |
|                                                                                                   |                  | Plastic green translucent      | <b>95-803.520</b> 0.001 kg |
|                                                                                                   |                  | Plastic colourless transparent | <b>95-803.720</b> 0.001 kg |
|                                                                                                   |                  | Plastic white translucent      | <b>95-803.920</b> 0.001 kg |
|                                                                                                   | 19.05 x 38.1 mm  | Plastic white translucent      | <b>95-824.920</b> 0.001 kg |

## Rear side

## Switching element

## Additional Information

- Switching system slow-make element
- For combining with lens and diffuser
- Suitable for PCB thickness 1.5 to 2.5 mm
- Special spring clip contacts position and hold the pushbutton in place during the soldering process. The soldering provides the contacting and the mechanical strength. The pushbutton is designed for panel mounting only.

| Contacts                                                                                                                             | Switching action | Terminal | Part No.          | Component layout | Weight   |
|--------------------------------------------------------------------------------------------------------------------------------------|------------------|----------|-------------------|------------------|----------|
|  <b>Switching element square, 19.05 x 19.05 mm</b>  |                  |          |                   |                  |          |
| 1 NO                                                                                                                                 | B                | PCB      | <b>95-414.000</b> | 1                | 0.003 kg |
|  <b>Switching element square, 15.88 x 15.88 mm</b> |                  |          |                   |                  |          |
| 1 NO                                                                                                                                 | B                | PCB      | <b>95-515.000</b> | 2                | 0.002 kg |
|  <b>Switching element square, 12.7 x 12.7 mm</b>  |                  |          |                   |                  |          |
| 1 NO                                                                                                                                 | B                | PCB      | <b>95-313.000</b> | 3                | 0.002 kg |

Contacts: NO = Normally open

Switching action: B = Momentary

The component layouts you will find from page 9

Mounting

Lens remover

Additional Information

- In case a lens gets damaged when being removed, it has to be replaced

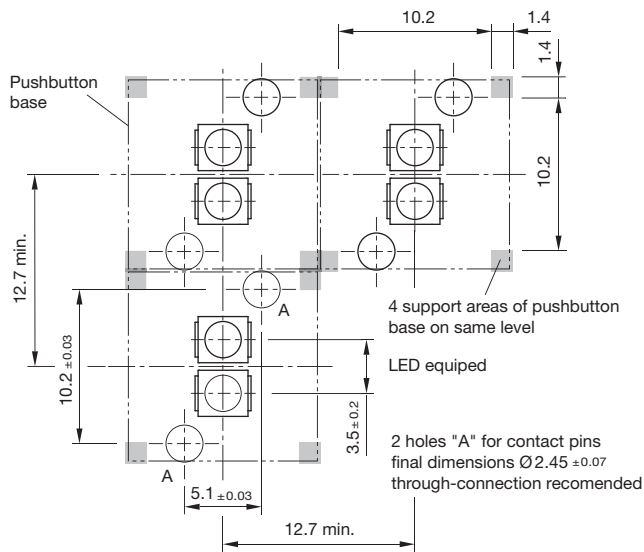
| Part No.                                                                                                        | Weight   |
|-----------------------------------------------------------------------------------------------------------------|----------|
| <div> <b>Lens remover</b></div> |          |
| 95-900.005                                                                                                      | 0.003 kg |

Mounting tool

| Part No.                                                                                                           | Weight   |
|--------------------------------------------------------------------------------------------------------------------|----------|
| <div> <b>Mounting tool</b></div> |          |
| 95-900.009                                                                                                         | 0.003 kg |

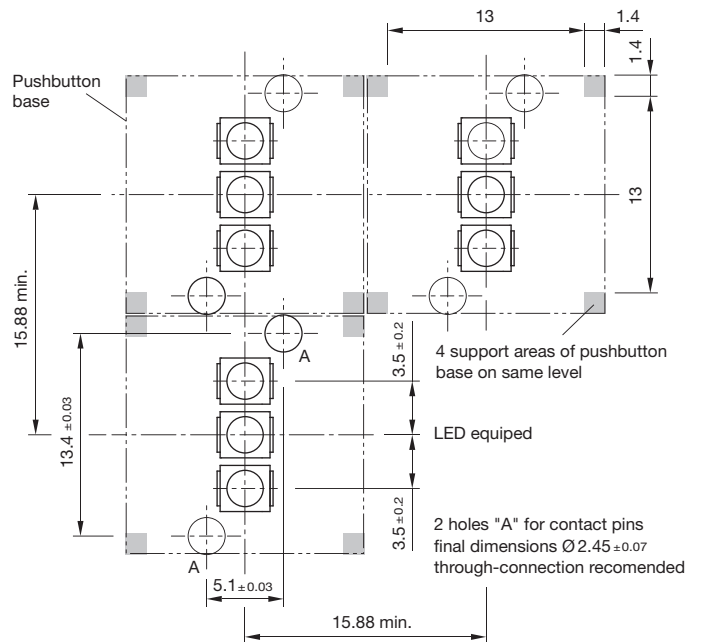
## Drawings

Layout (element side)



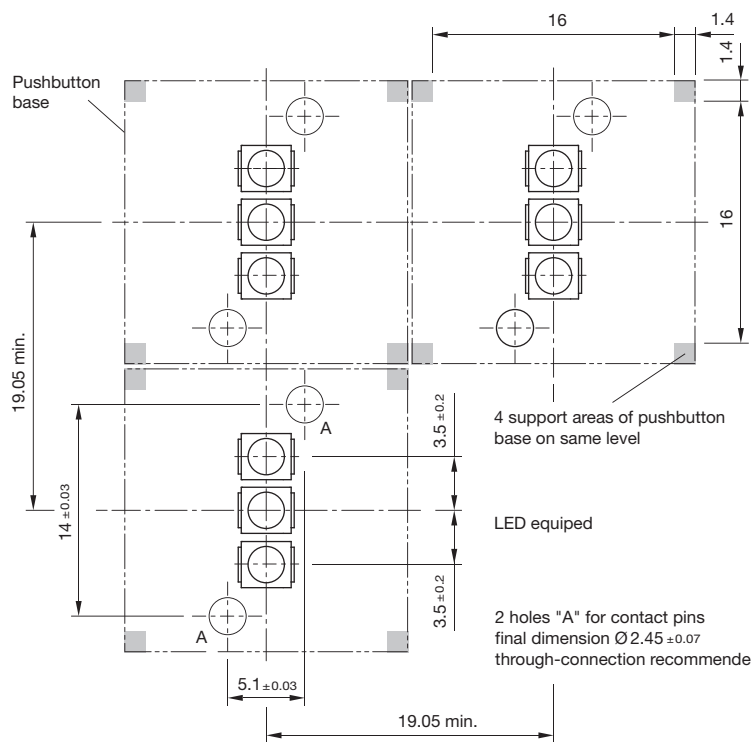
Component layout 3

Layout (element side)



Component layout 2

Layout (element side)



Component layout 1

## Pushbutton and Illuminated pushbutton

### Switching system

Gold plated momentary contact, 1 normally open, self-cleaning

### Material

#### Plastic parts

PC, as per UL 94 HB, Cd-free

#### Material of contacts

CuSn, contact gold-plated, soldering terminal tinned

### Mechanical characteristics

#### Actuating travel

4.5 mm

#### Actuating force

3 N to end position

#### Switching point

2.3 mm  $\pm$  0.8 mm at operation

#### Resistance to heat of soldering

260 °C, 5 s, per IEC 60068-2-20

#### Life time

> 5 million operations, as per IEC 60512-5-9a

### Electrical characteristics

#### Illumination

recommended SMD-LED types:  
P-LCC package or similar, radiation angle approx. 120°;  
use of smaller SMD-LED is possible.

SMD-LED configurations size:

max. 2 SMD-LEDs for switch size 12.7 mm

max. 3 SMD-LEDs for switch size 15.88 mm and 19.05 mm,  
single colour or multi-colour.

Height of SMD-LED:

max. 2.1 mm

### Electric strength

$\leq$  50 m $\Omega$ , as per IEC 60512-2-2b at new state

### Isolation resistance

> 1 T $\Omega$ , as per IEC 60512-2-3a between contacts

### Switch rating

min. 1 mVDC, 100  $\mu$ A

max. 48 VDC, 50 mA

### Electric strength

2.5 kVAC, as per IEC 60512-2-11

### Environmental conditions

#### Front protection

IP 40 before front plate for complete switch

#### Operating temperature

-25 °C ... +70 °C

#### Storage temperature

-40 °C ... +80 °C

#### Vibration resistance

10 g, at 10–2000 Hz, 0.75 mm, as per IEC 60512-4-4

#### Shock resistance

Pushbutton and Illuminated pushbutton 50 g, 11 ms,  
as per IEC 60512-4-3

### Approvals

#### Declaration of conformity

CE

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

**Suppressor circuits**

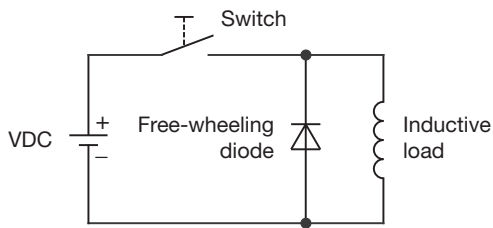
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e.g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

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.

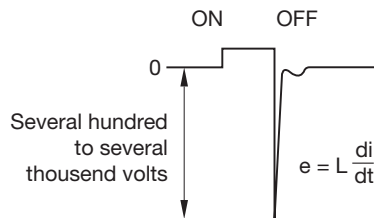
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage ( $V_R$ ) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum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



# Index

Index from Part No.

| Part No.         | Page |
|------------------|------|
| 95-313.000 ..... | 7    |
| 95-313.720 ..... | 4    |
| 95-313.750 ..... | 4    |
| 95-414.000 ..... | 7    |
| 95-414.730 ..... | 4    |
| 95-414.740 ..... | 4    |
| 95-414.750 ..... | 4    |
| 95-414.770 ..... | 4    |
| 95-515.000 ..... | 7    |
| 95-515.720 ..... | 4    |
| 95-515.740 ..... | 4    |
| 95-515.750 ..... | 4    |
| 95-515.770 ..... | 4    |
| 95-703.720 ..... | 5    |
| 95-703.750 ..... | 5    |
| 95-704.720 ..... | 5    |
| 95-704.730 ..... | 5    |
| 95-704.740 ..... | 5    |
| 95-704.750 ..... | 5    |
| 95-704.760 ..... | 5    |
| 95-704.770 ..... | 5    |
| 95-705.720 ..... | 5    |
| 95-705.730 ..... | 5    |
| 95-705.740 ..... | 5    |
| 95-705.770 ..... | 5    |
| 95-724.740 ..... | 5    |
| 95-803.420 ..... | 6    |
| 95-803.520 ..... | 6    |
| 95-803.720 ..... | 6    |
| 95-803.920 ..... | 6    |
| 95-804.220 ..... | 6    |
| 95-804.420 ..... | 6    |
| 95-804.520 ..... | 6    |
| 95-804.720 ..... | 6    |
| 95-804.920 ..... | 6    |
| 95-805.920 ..... | 6    |
| 95-824.920 ..... | 6    |
| 95-900.005 ..... | 8    |
| 95-900.009 ..... | 8    |