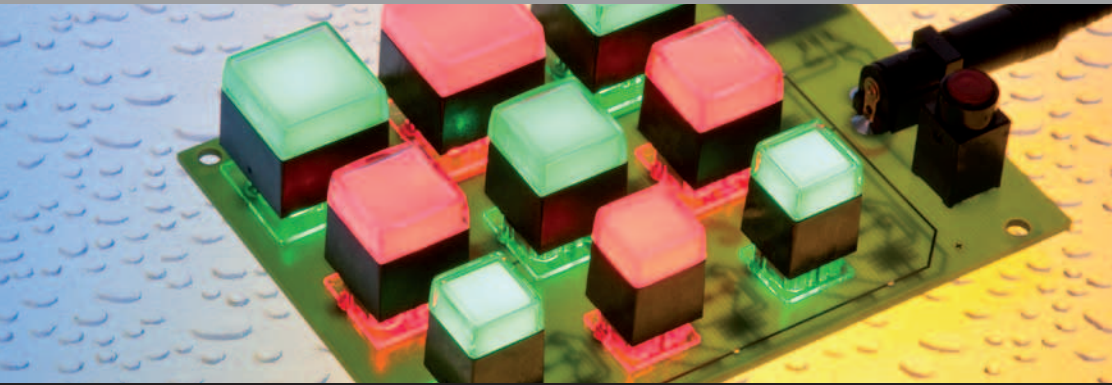


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EAO Product Information

Series 95

eao ■

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Product Information

General notes

The Series 95 is a high quality switch range containing illuminated and non-illuminated pushbuttons for professional Audio and Video applications. According to the switch version, the pushbuttons may be equipped with 2 or 3 SMD LED's with PLCC housing (height 2.1 mm) with a radiation angle of approx. 120 ° and thus generate up to 3 different colors on one pushbutton. The lenses are available matt translucent or clear transparent in flat, concave or convex form.

Fitting

The pushbutton should be plugged-in to the mounting hole and soldered onto the printed circuit board (PCB), after the soldering of the SMD LED's.

Mounting

Suitable for mounting on PCB's with thickness of 1.5 to 2.5 mm. The separated spring clip contact holds the switch in place during the assembly and soldering process. The soldered joint makes the electrical contact and fixes the switch in the PCB. Maximum soldering-temperature is 260 °C for 5 seconds. There is a solder stop between the SMD-LED's and the contact mounting areas. The PCB layout and mounting details are shown in the dimensional drawings. The switch must be used in a front panel.

Marking

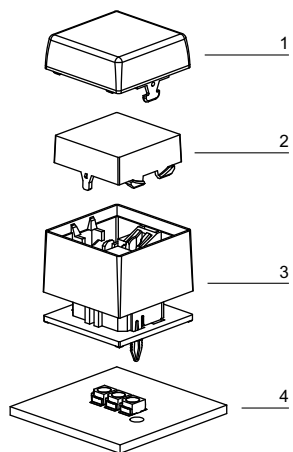
The diffuser can either be printed or engraved, or a film insert can be fitted between the diffuser and the lens.

Illumination

Luminosity and wave length scattering caused by the technology used in the LED manufacturing processes may lead to visual differences in our products.

*We reserve the right to modify technical data
All dimensions in mm*

Pushbutton illuminated



- 1 Lens
- 2 Diffuser
- 3 Switching element
- 4 PCB with LEDs (supplied by customer)

Illuminated pushbutton



	Front protection	Contacts	Switching action	Terminals	Lens	Typ-Nr.	Typ-Nr.	Typ-Nr.	Component layout	Technical drawing	
Illuminated pushbutton high gloss finished	IP 40	1 NO	M	P	Plastic colourless transparent concave	95-414.770			3	3	0.004
					Plastic colourless transparent flush	95-414.750			3	3	0.004
mat	IP 40	1 NO	M	P	Plastic colourless transparent concave	95-414.740			3	3	0.004
					Plastic colourless transparent convex	95-414.730			3	3	0.004
high gloss finished	IP 40	1 NO	M	P	Plastic colourless transparent concave		95-515.770		2	2	0.004
					Plastic colourless transparent flush		95-515.750		2	2	0.004
mat	IP 40	1 NO	M	P	Plastic colourless transparent concave		95-515.740		2	2	0.004
					Plastic colourless transparent flush		95-515.720		2	2	0.004
high gloss finished	IP 40	1 NO	M	P	Plastic colourless transparent flush			95-313.750	1	1	0.003
mat	IP 40	1 NO	M	P	Plastic colourless transparent flush			95-313.720	1	1	0.003

Contacts: NO = Normally open


Switching action: M = Momentary action

Terminals: P = PCB terminal

Component layout from page 10, Technical drawing from page 11


Front

Lens

	Lens	∅ 19.05 x 19.05 mm Typ-Nr.	∅ 15.88 x 15.88 mm Typ-Nr.	∅ 12.7 x 12.7 mm Typ-Nr.	
Lens high gloss finished	Plastic colourless transparent concave	95-704.770	95-705.770		0.001
	Plastic colourless transparent convex	95-704.760			0.001
	Plastic colourless transparent flush	95-704.750		95-703.750	0.001
mat	Plastic colourless transparent concave	95-704.740	95-705.740		0.001
	Plastic colourless transparent convex	95-704.730	95-705.730		0.001
	Plastic colourless transparent flush	95-704.720	95-705.720	95-703.720	0.001




Diffuser

	Diffuser	∅ 19.05 x 19.05 mm Typ-Nr.	∅ 15.88 x 15.88 mm Typ-Nr.	∅ 12.7 x 12.7 mm Typ-Nr.	
Diffuser	Plastic blue translucent	95-804.620		95-803.620	0.001
	Plastic colourless transparent	95-804.720		95-803.720	0.001
	Plastic green translucent	95-804.520		95-803.520	0.001
	Plastic orange translucent	95-804.320		95-803.320	0.001
	Plastic red translucent	95-804.220		95-803.220	0.001
	Plastic white translucent	95-804.920	95-805.920	95-803.920	0.001
	Plastic yellow translucent	95-804.420		95-803.420	0.001



Backside

Switching element


	Switching action	Contacts	∅ 19.05 x 19.05 mm Typ-Nr.	∅ 15.88 x 15.88 mm Typ-Nr.	∅ 12.7 x 12.7 mm Typ-Nr.	Component layout	
Switching element without Lens and Diffuser	M	1 NO	95-414.000			3	0.003
				95-515.000		2	0.002
					95-313.000	1	0.002



for combining with Lens and Diffuser
 Switching action: M = Momentary action
 Contacts: NO = Normally open
 Component layout from page 10

Assembling


Lens remover

	Typ-Nr.	 kg
Lens remover	95-900.005	0.003

Owing to possible mechanical damage removed lens must be replaced by a new part



Mounting tool

	Typ-Nr.	 kg
Mounting tool	95-900.009	0.003



Pushbutton- and Illuminated pushbutton

Shock resistance

50 g, 11 ms, as per IEC 60512-4-3

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

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 12.70 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 Ω , as per IEC 60512-2-2b at new state

Isolation resistance

>1 T Ω , as per IEC 60512-2-3a between contacts

Switch rating

min. 1 mVDC, 100 μ 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

Suppressor circuits

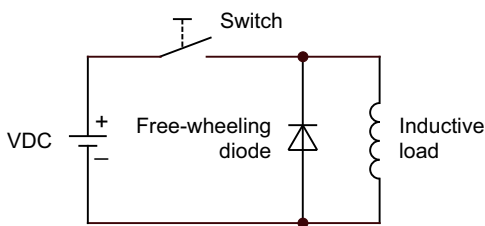
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e.g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

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. 12 VDC) 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



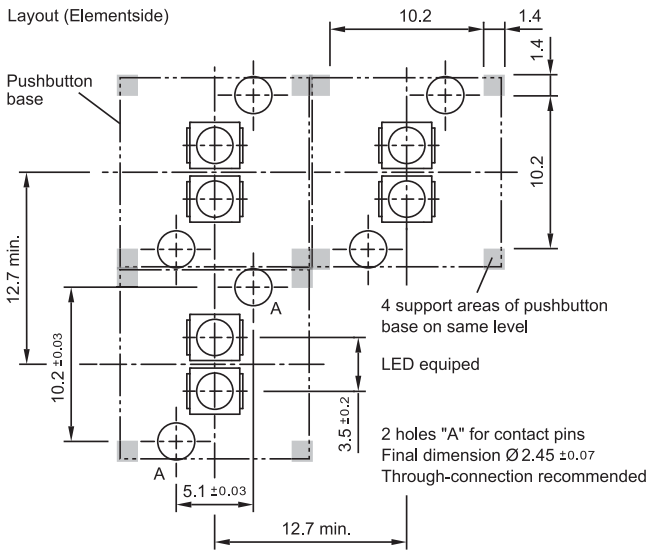
Counter emf
over load without free-wheeling diode
Fig. 2



Component layout

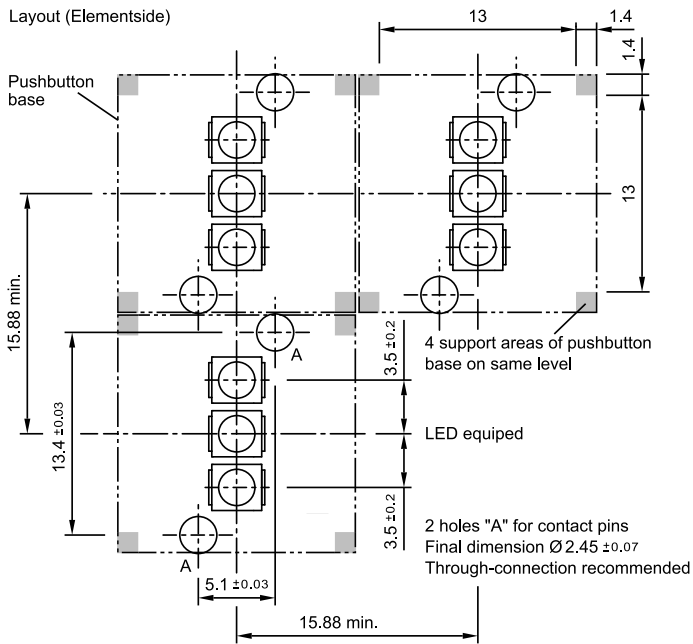
1 Illuminated pushbutton page 5 | Switching element page 6

Layout (Elementside)



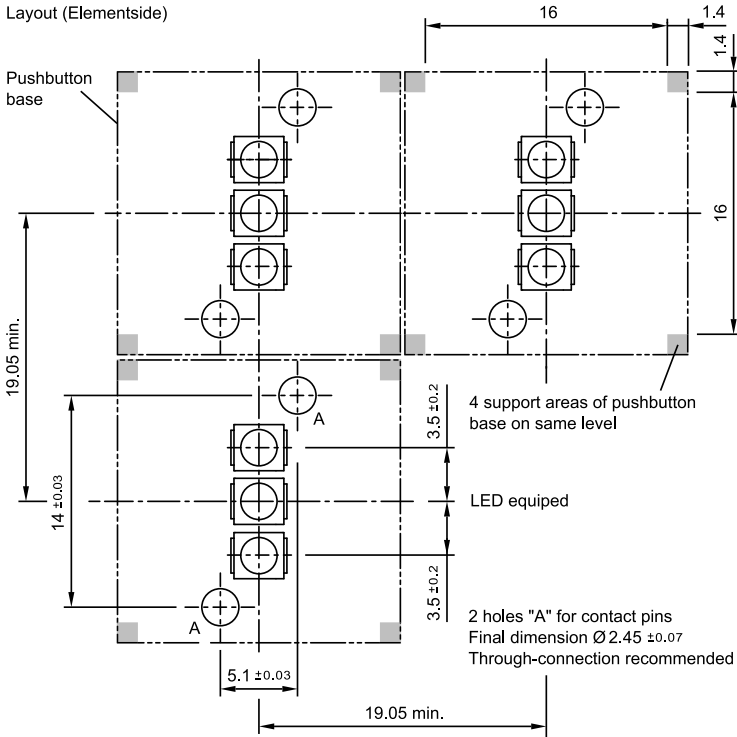
2 Illuminated pushbutton page 5 | Switching element page 6

Layout (Elementside)



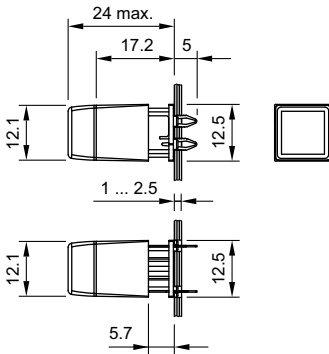
3 Illuminated pushbutton page 5 | Switching element page 6

Layout (Elementside)

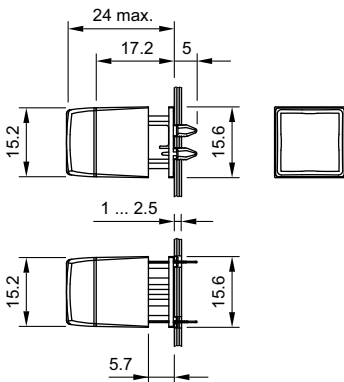


Technical drawing

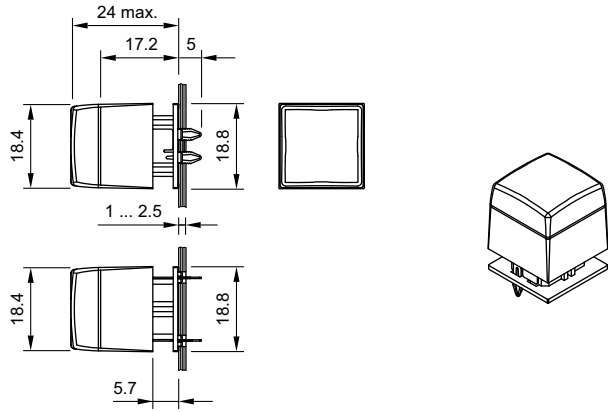
1 Illuminated pushbutton page 5



2 Illuminated pushbutton page 5



3 Illuminated pushbutton page 5



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95-313.720	5				
95-313.750	5				
95-414.000	6				
95-414.730	5				
95-414.740	5				
95-414.750	5				
95-414.770	5				
95-515.000	6				
95-515.720	5				
95-515.740	5				
95-515.750	5				
95-515.770	5				
95-703.720	6				
95-703.750	6				
95-704.720	6				
95-704.730	6				
95-704.740	6				
95-704.750	6				
95-704.760	6				
95-704.770	6				
95-705.720	6				
95-705.730	6				
95-705.740	6				
95-705.770	6				
95-803.220	6				
95-803.320	6				
95-803.420	6				
95-803.520	6				
95-803.620	6				
95-803.720	6				
95-803.920	6				
95-804.220	6				
95-804.320	6				
95-804.420	6				
95-804.520	6				
95-804.620	6				
95-804.720	6				
95-804.920	6				
95-805.920	6				
95-900.005	7				
95-900.009	7				