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Product Information

General notes

The series 97 contains indicators and illuminated pushbuttons with maintained and momentary action with one or two contacts which may be either normally open or normally closed or a combination of the two. The illuminated pushbuttons are equipped with the low-level switching system.

The front dimensions are 9 x 9 mm or 9 mm dia.; or with overhanging lens 12.2 x 12.2 mm.

Mounting

The illuminated pushbuttons of series 97 can be soldered to a printed circuit board. The contact layout conforms to the module of 2.54 mm (1/10 "). A centering pin ensures dimensionally exact mounting in rows or blocks and prevents the button from lifting when being soldered.

Cleaning of soldered PCB

In many cases the boards are cleaned following mechanical soldering. In this case it is essential to prevent the cleaning fluid containing dirt, grease and flux from entering the switch.

Lenses

The flat lenses, made of polycarbonate, are obtainable in various colours. The transparent lens is available with translucent or transparent support.

The overhanging lenses consist of a lens bezel, a text plate and a mat transparent lens plate, obtainable in flat form.

Marking

For further information about engraving, hot stamping and film inserts see part Marking.

Illumination

Perfect illumination of the different coloured lenses is assured by LED Bi-Pin T 1 lamps. The LEDs are soldered through the pushbutton housing direct onto the PC boards.

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

Position indication

The status of a maintained action switch can be determined by the position of the lens.

Specimen order

Indicator :

- Indicator actuator, 9 mm dia. 97-061.007

Essential accessories :

- Lens, plastic blue transparent flush, 9 mm dia. 97-932.6
 - Single-LED T1 Bi-Pin, 2.2 VDC, 20 mA, yellow 10-2602.3174F

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

Pushbutton illuminative





- 1 Lens plate
- 2 Marking plate
- 3 Lens bezel
- 4 Switching element

Indicator actuator



Essential Accessories:

-  Lens page 24
-  Single-LED page 25

	Front protection	Terminals	□ 9 x 9 mm Typ-Nr.	∅ 9 mm Typ-Nr.	Component layout	Mounting dimensions	Technical drawing	Circuit drawing	
Indicator actuator	IP 40	P	97-081.007	97-061.007	1	1	1	1	0.002



Terminals: P = PCB terminal

Component layout from page 28, Mounting dimensions from page 28, Technical drawing from page 29, Circuit drawing from page 29

Indicator actuator overhanging



Essential Accessories:

-  Lens overhanging complete page 24
-  Single-LED for overhanging version page 25

	Front protection	Terminals	□ 12.2 x 12.2 mm Typ-Nr.	Component layout	Mounting dimensions	Technical drawing	Circuit drawing	
Indicator actuator overhanging	IP 40	P	97-041.007	1	2	2	1	0.002

Terminals: P = PCB terminal

Component layout from page 28, Mounting dimensions from page 28, Technical drawing from page 29, Circuit drawing from page 29

Illuminated pushbutton actuator



Essential Accessories:

- Lens page 24
- Single-LED page 25

	Front protection	Contacts	Switching action	Terminals	9 x 9 mm Typ-Nr.	Ø 9 mm Typ-Nr.	Component layout	Mounting dimensions	Technical drawing	Circuit drawing	
Illuminated pushbutton actuator	IP 40	1 NC	MA	P	97-382.037	97-372.037	2	1	1	2	0.002
			M	P	97-352.037	97-332.037	2	1	1	6	0.002
		1 NC + 1 NO	MA	P	97-383.037	97-373.037	2	1	1	3	0.002
			M	P	97-353.037	97-333.037	2	1	1	7	0.002
		1 NO	MA	P	97-380.037	97-370.037	2	1	1	5	0.002
			M	P	97-350.037	97-330.037	2	1	1	9	0.002
		2 NO	MA	P	97-381.037	97-371.037	2	1	1	4	0.002
			M	P	97-351.037	97-331.037	2	1	1	8	0.002

Contacts: NC = Normally closed, NO = Normally open

Switching action: MA = Maintained action, M = Momentary action



Terminals: P = PCB terminal


Component layout from page 28, Mounting dimensions from page 28, Technical drawing from page 29, Circuit drawing from page 29

Illuminated pushbutton actuator overhanging



Essential Accessories:

-  Lens overhanging complete page 24
-  Single-LED for overhanging version page 25

	Front protection	Contacts	Switching action	Terminals	\varnothing 12.2 x 12.2 mm Typ-Nr.	Component layout	Mounting dimensions	Technical drawing	Circuit drawing	
Illuminated pushbutton actuator overhanging	IP 40	1 NC	MA	P	97-362.037	2	2	2	2	0.002
			M	P	97-322.037	2	2	2	6	0.002
		1 NC + 1 NO	MA	P	97-363.037	2	2	2	3	0.002
			M	P	97-323.037	2	2	2	7	0.002
		1 NO	MA	P	97-360.037	2	2	2	5	0.002
			M	P	97-320.037	2	2	2	9	0.002
		2 NO	MA	P	97-361.037	2	2	2	4	0.002
			M	P	97-321.037	2	2	2	8	0.002

Contacts: NC = Normally closed, NO = Normally open


Switching action: MA = Maintained action, M = Momentary action

Terminals: P = PCB terminal

Component layout from page 28, Mounting dimensions from page 28, Technical drawing from page 29, Circuit drawing from page 29

Front


Lens

	Lens	Lens holder	∅ 9 x 9 mm Typ-Nr.	∅ 9 mm Typ-Nr.	
Lens Plastic (not for film insert and LED)	black opaque flush	translucent	97-951.0	97-931.0	0.001
	blue translucent flush	translucent	97-951.6	97-931.6	0.001
	green translucent flush	translucent	97-951.5	97-931.5	0.001
	grey opaque flush	translucent	97-951.8	97-931.8	0.001
	red translucent flush	translucent	97-951.2	97-931.2	0.001
	white translucent flush	translucent	97-951.9	97-931.9	0.001
	yellow translucent flush	translucent	97-951.4	97-931.4	0.001
Plastic (not recommended for film insert)	blue transparent flush	transparent	97-952.6	97-932.6	0.001
	colourless transparent flush	transparent	97-952.7	97-932.7	0.001
	green transparent flush	transparent	97-952.5	97-932.5	0.001
	red transparent flush	transparent	97-952.2	97-932.2	0.001
	yellow transparent flush	transparent	97-952.4	97-932.4	0.001



Lens overhanging complete


for indicator and illuminated pushbutton overhanging

	Lens plate	∅ 12.2 x 12.2 mm Typ-Nr.	
Lens overhanging complete flush, mat	Plastic colourless transparent	97-910.9	0.001



Lens plate


for lens overhanging

	Lens plate	∅ 12.2 x 12.2 mm Typ-Nr.	
Lens plate convex for film insert or marking plate flush, mat	Plastic colourless transparent	97-929.7A	0.001
	Plastic blue transparent	97-927.6	0.001
	Plastic colourless transparent	97-927.7	0.001
	Plastic green transparent	97-927.5	0.001
	Plastic red transparent	97-927.2	0.001
	Plastic yellow transparent	97-927.4	0.001
flush for film insert or marking plate	Plastic blue transparent	97-921.6	0.001
	Plastic colourless transparent	97-921.7	0.001
	Plastic green transparent	97-921.5	0.001
	Plastic red transparent	97-921.2	0.001
	Plastic yellow transparent	97-921.4	0.001



Marking plate


for lens overhanging

	Marking plate	∅ 12.2 x 12.2 mm Typ-Nr.	
Marking plate	Plastic white translucent	97-908.9	0.001




Marking foil

for lens overhanging

	Marking foil	Typ-Nr.	
Marking foil	colourless	97-909.7	0.001

Lens bezel


for lens overhanging

	Lens bezel	Typ-Nr.	
Lens bezel rounded edges	Plastic grey	97-920.83	0.001
Lens bezel with edges	Plastic grey	97-920.8	0.001




Illumination

Single-LED

	Socket	Light colour	Operating voltage/-current	Typ-Nr.	
Single-LED	T1 Bi-Pin	green	2.2 VDC, 20 mA	10-2602.3175F	0.001
		rot	2.2 VDC, 20 mA	10-2602.3172F	0.001
		yellow	2.2 VDC, 20 mA	10-2602.3174F	0.001



Single-LED for overhanging version

	Socket	Light colour	Operating voltage/-current	Typ-Nr.	
Single-LED for overhanging version	T1 Bi-Pin	green	2.2 VDC, 20 mA	10-2602.3175G	0.001
		red	2.2 VDC, 20 mA	10-2602.3172G	0.001
		yellow	2.2 VDC, 20 mA	10-2602.3174G	0.001



Assembling

Lens remover

for lens standard

	Typ-Nr.	
Lens remover	19-910	0.002



Actuator with low level switching element

Switching system

This low-level switching system was designed for switching low powers in electronic circuits. The switching system assures reliable switching of loads.

Single-break momentary contact, as normally open or normally closed with 4 independent points of contact.

Special features are the long life, extremely short rebound time and stable contact resistance.

Contact combinations: 1 normally open contact, 2 normally open contacts, 1 normally closed/1 normally open contact, 1 normally closed contact

Material

Lens

Polycarbonate (PC)

Switch housing

Polyester, self-extinguishing

Material of contact

Gold plated

Mechanical characteristics

Actuating force

3.4 N \pm 0.3 N (130 g)

Actuating travel

Lead distance NC contact: 0.6 mm \pm 0.2 mm

Lead distance NO contact: 1.6 mm \pm 0.2 mm

Total distance: 3 mm \pm 0.2 mm

Rebound time

typ. \leq 200 μ s

Mechanical lifetime

\leq 5 million operations, as per IEC 60512-5-9a

Electrical characteristics

Contact resistance

Starting value (initial) \leq 50 m Ω , as per IEC 60512-2-2b

Isolation resistance

\geq 10¹² Ω between contacts at 100 VDC, as per IEC 60512-2-3a

Electrical life

\geq 2 million operations at 30 VDC/100 mA, as per IEC 60512-5-9c

Switch rating

min. 100 μ VDC/AC, 10 μ A

max. 42 VDC/AC, 100 mA

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 ... +85 °C

Service temperature

-25 °C ... +65 °C

Front protection

IP 40 front side, as per IEC 60529

Shock resistance

(single impacts, semi-sinusoidal)

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

Vibration resistance

(sinusoidal)

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

General notes

1. Engraving

In addition to the most commonly used world languages, in DIN 1451-3 close spacing, other typefaces are available as Scandinavian, Slavic, Greek, Russian and Polish.

Unless requested otherwise by customer, the lettering on white marking plates will be 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

For larger series it is worth considering markings by means of hot stamping or laser engraving. 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 for overhanging lens

Instead of using engraving the lenses can be fitted with transparent film inserts, placed between the lens plate and the marking plate.

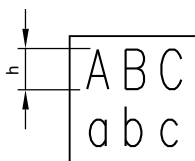
The film thickness is 0.2 mm.

Maximum film size 10 x 10 mm.

Lenses for Indicators | Illuminated pushbuttons

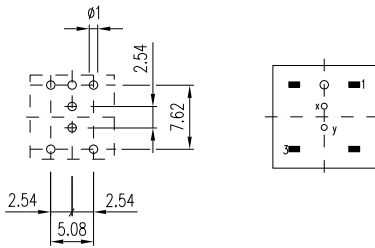
All dimensions in mm

Height of letters h	Number of lines	Number of (target value) capital letters per line	Number of (target value) small letters per line
2	3	6	7
3	2	5	6
4	2	4	4
5	1	3	3
6	1	2	3
8	1	1	1

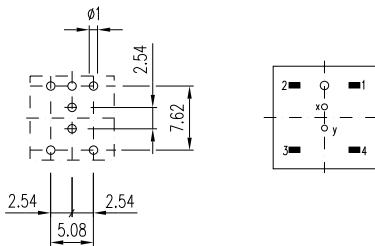


Component layout

1 Indicator actuator page 21 | Indicator actuator overhanging page 21

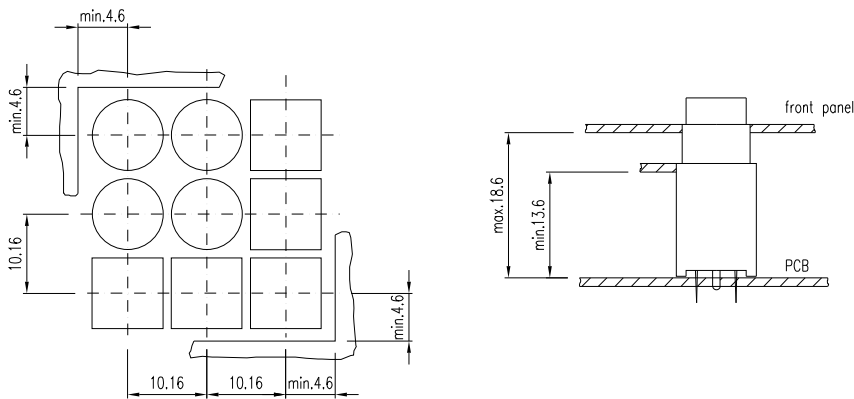


2 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23

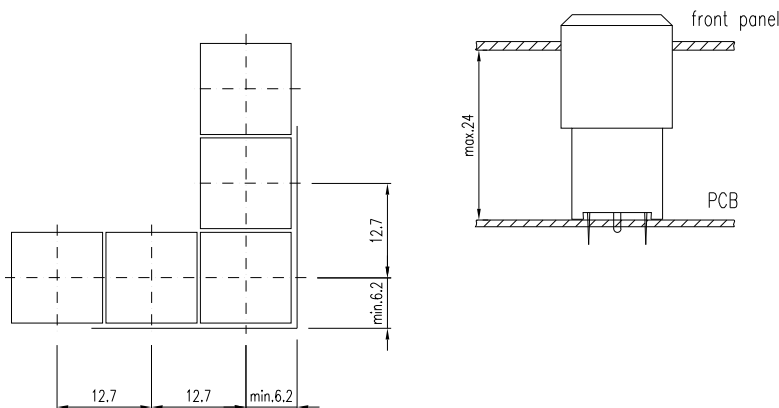


Mounting dimensions

1 Indicator actuator page 21 | Illuminated pushbutton actuator page 22

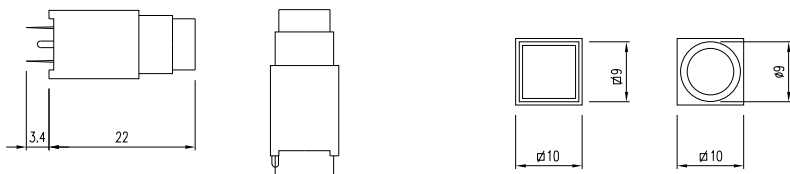


2 Indicator actuator overhanging page 21 | Illuminated pushbutton actuator overhanging page 23

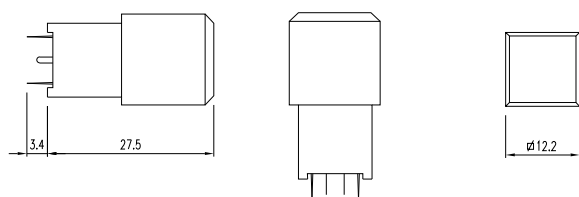


Technical drawing

1 Indicator actuator page 21 | Illuminated pushbutton actuator page 22



2 Indicator actuator overhanging page 21 | Illuminated pushbutton actuator overhanging page 23

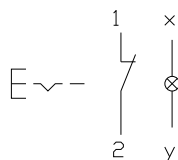


Circuit drawing

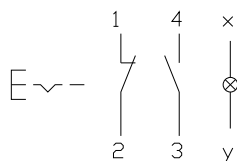
1 Indicator actuator page 21 | Indicator actuator overhanging page 21



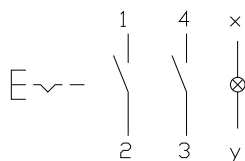
2 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23



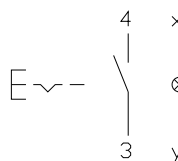
3 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23



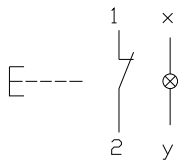
4 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23



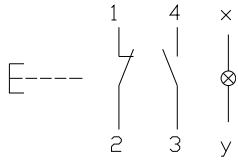
5 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23



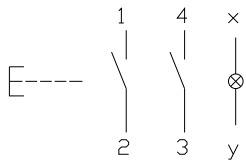
6 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23



7 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23



8 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23



9 Illuminated pushbutton actuator page 22 | Illuminated pushbutton actuator overhanging page 23

