

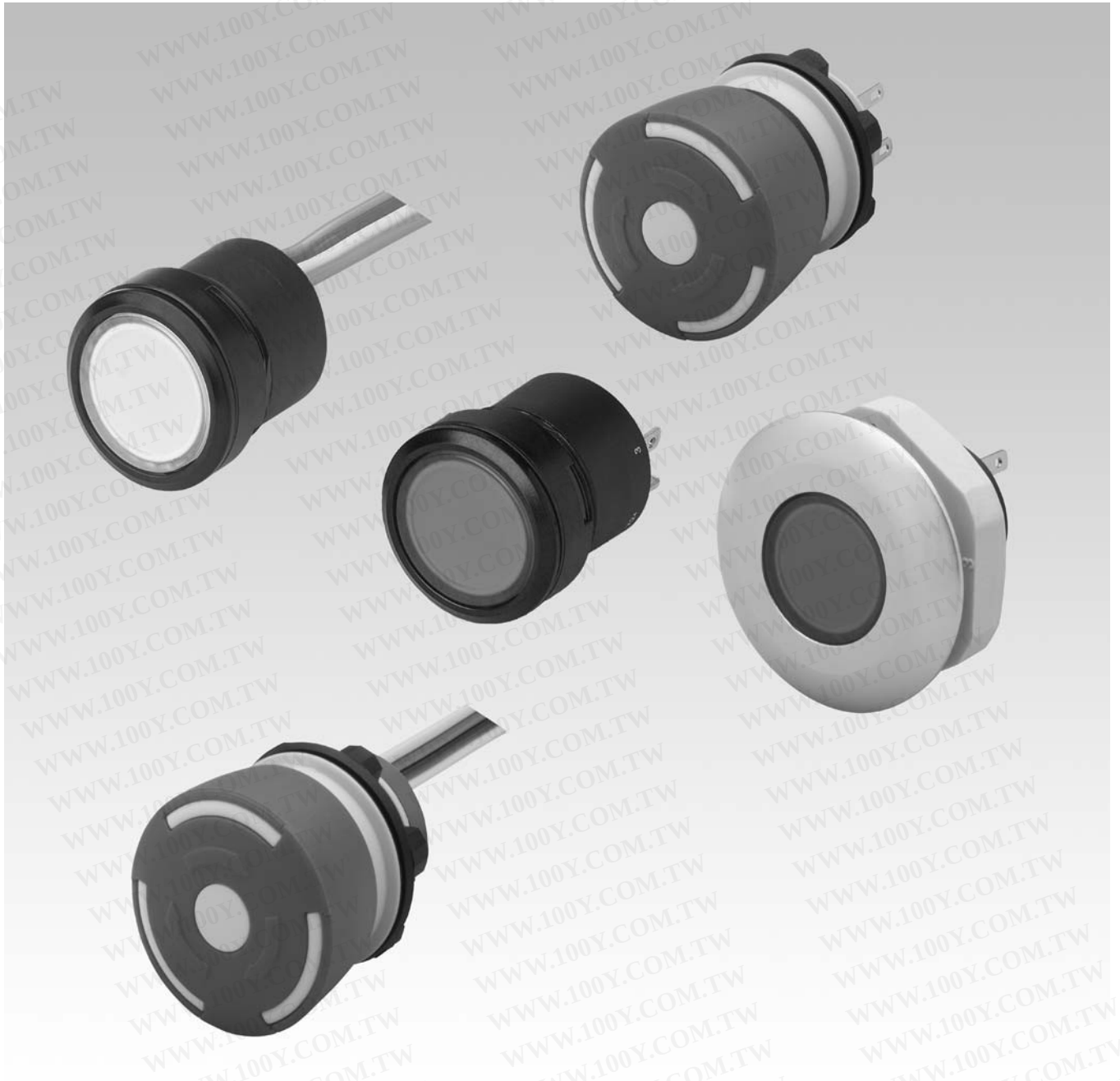
EAO – Your Expert Partner for Human Machine Interfaces



EAO Product Information

Series 84

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)



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Product Information

General notes

The Series 84 consists of indicators, pushbuttons and emergency-stop switches. The indicators and pushbuttons are a modular system of lens, actuator, switching element and a variety of means of connection and mounting. Different front protection of IP 67, IP 65 or IP 40 ensure that the pushbuttons are suited for industrial use.

Anodized aluminium parts can have visible variations due production-technical reasons.

Mounting

The actuators of the Series 84 are inserted in a 22.5 mm diameter mounting hole and the switching units are clipped on to the rear of the actuators. The pushbutton system can be mounted as a complete unit (actuator and switching unit). Mounting from the front with the wiring already attached is also possible.

When mounted on printed circuit boards the actuators are inserted in the mounting hole 22.5 mm dia. and the switching elements are fixed on the board. The printed circuit board is connected to the preassembled actuator by means of the mounting flange. There is no need for subsequent adjustment or spacing studs.

Lenses

The lenses are available in various colours and made either from plastic or anodized aluminium.

Marking

The marking plates of the Series 84 can be marked by engraving or hot stamping.

Specific symbols and markings are available on request.

The lenses are without holder not engravable, since by mounting no accurate position of the engraving text is reached.

Illumination

To ensure full illumination, the switching elements can be supplied with integrated single LEDs in the colours red, orange, yellow, green, blue or white. The series resistor is integrated.

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

Emergency-stop pushbutton, foolproof

The E-stop pushbutton can be mounted in front panels with a thickness between 1 and 4 mm. It has a low behind-panel depth of 13.5 mm (max.) respectively 18.5 mm with plug-in terminlas and can be safely and easily adapted to PCBs of different heights. The front protection degree is IP 65.

Importantly, the Series 84 emergency-stop requires no additional assembly because of its single-piece 'monoblock' design.

The switch's status is clearly indicated by a black or green colour ring on the shaft, and the foolproof actuator design conforms to DIN EN ISO 13850 and EN IEC 60947.

It can be supplied with LED illumination that is visible even from the side.

Specimen order

Indicator :

- Indicator actuator, IP67 84-0100.0

Essential accessories :

- Lens plastic blue 84-7111.600
- Illumination element 84-8001.6620
Single-LED blue 24VDC, plug-in terminal

or

Indicator with PCB terminal :

- Indicator actuator, IP67 84-3100.1

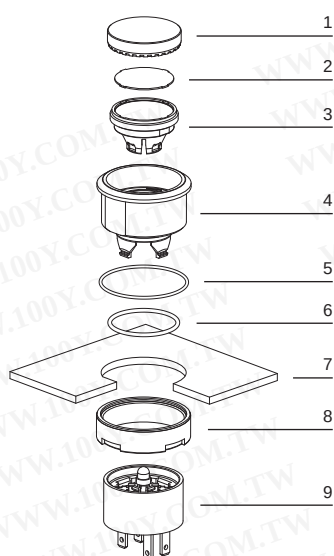
Essential accessories :

- Lens plastic red 84-7111.200
- Illumination element with PCB terminal 92-800.042
- Single-LED red 2.1VDC 10-2602.3202L
- Mounting flange 92-960.0

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

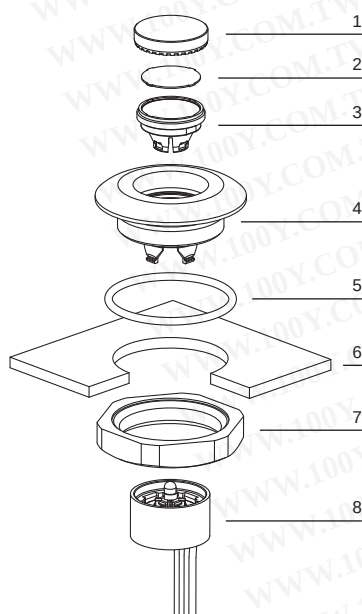
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Indicator and pushbutton illuminative, 25 mm dia.



- 1 Lens
- 2 Marking plate
- 3 Lens holder
- 4 Actuator housing
- 5 Outer sealing
- 6 Inner sealing
- 7 Front panel
- 8 Fixing nut
- 9 Switching-Illumination element with plug-in terminal (solderable)

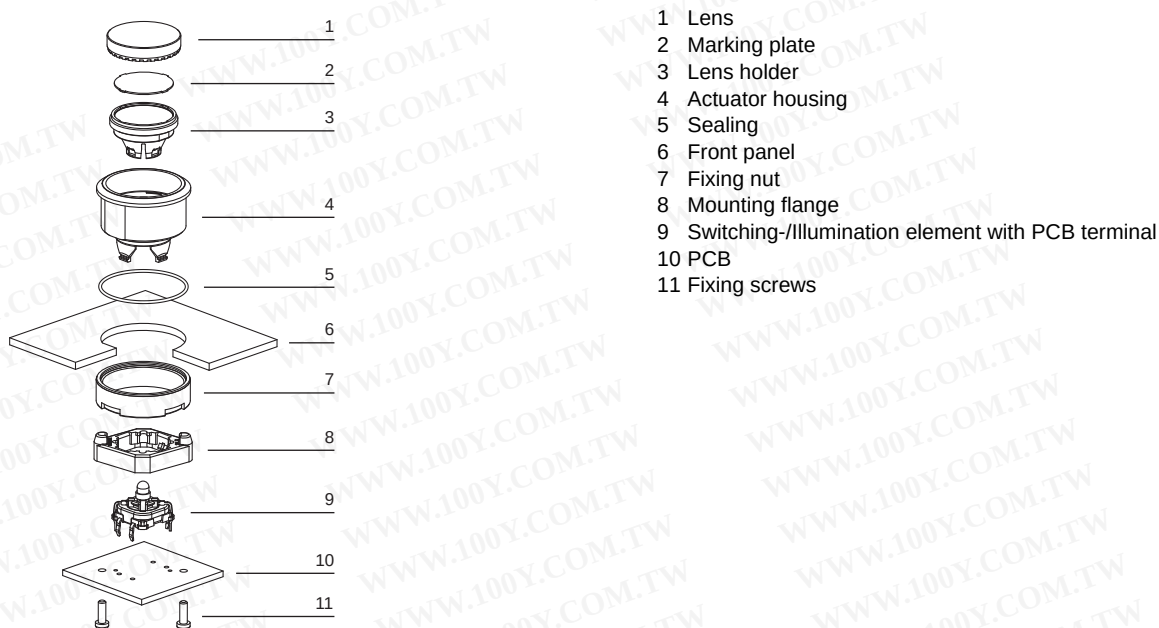
Indicator and pushbutton illuminative, 40 mm dia.



- 1 Lens
- 2 Marking plate
- 3 Lens holder
- 4 Actuator housing
- 5 Sealing
- 6 Front panel
- 7 Fixing nut
- 8 Switching-Illumination element with flat ribbon cable

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Indicator and pushbutton illuminative, 25 mm dia., PCB version

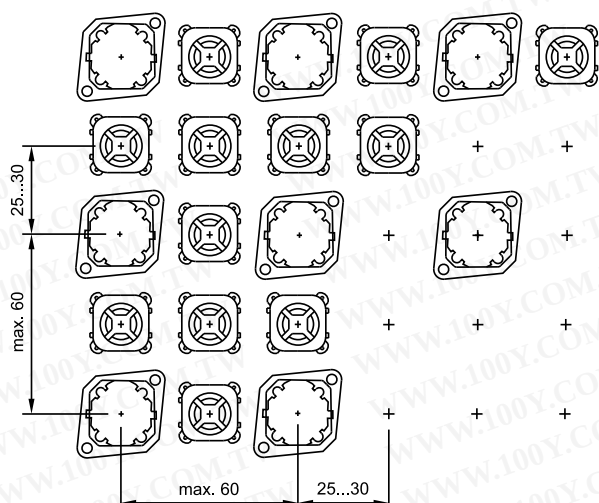


Emergency-stop pushbutton



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Arrangement mounting flange for switching- and illumination element, PCB mounting



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 84-998 must be used for removing the mounting flange from the actuator. Before removing the flange, the PCB fixing screws must be loosened.

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Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete

Application as per DIN EN ISO 13850 and EN 60204-1



	Front protection	Switching action	Mushroom had cap	Illumination	Terminals	Contacts	Ø 32 mm Typ-Nr.	Component layout	Mounting dimensions	Technical drawing	Circuit drawing	
Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete Position indication ring black Twist to unlock clockwise	IP 65	MA	Plastic red	without	FR	1 NC	84-5020.0040	2	2	17	8	0.036
						1 NC + 1 NO	84-5030.0040	2	2	17	9	0.036
						2 NC	84-5040.0040	2	2	17	10	0.036
					PT 2.8 s	1 NC	84-5020.0020	1	2	17	8	0.028
						1 NC + 1 NO	84-5030.0020	1	2	17	9	0.028
						2 NC	84-5040.0020	1	2	17	10	0.028
Position indication ring black Twist to unlock clockwise LED operating voltage: 5 ... 30 VDC Current consumption: 9.7 ... 12.4 mA	IP 65	MA	Plastic red	LED red	FR	1 NC	84-5021.2B40	2	2	17	11	0.036
						1 NC + 1 NO	84-5031.2B40	2	2	17	12	0.036
						2 NC	84-5041.2B40	2	2	17	13	0.036
					PT 2.8 s	1 NC	84-5021.2B20	1	2	17	11	0.028
						1 NC + 1 NO	84-5031.2B20	1	2	17	12	0.028
						2 NC	84-5041.2B20	1	2	17	13	0.028
Position indication ring green Twist to unlock clockwise	IP 65	MA	Plastic red	without	FR	1 NC	84-5120.0040	2	2	17	8	0.036
						1 NC + 1 NO	84-5130.0040	2	2	17	9	0.036
						2 NC	84-5140.0040	2	2	17	10	0.036
					PT 2.8 s	1 NC	84-5120.0020	1	2	17	8	0.028
						1 NC + 1 NO	84-5130.0020	1	2	17	9	0.028
						2 NC	84-5140.0020	1	2	17	10	0.028
Position indication ring green Twist to unlock clockwise LED operating voltage: 5 ... 30 VDC Current consumption: 9.7 ... 12.4 mA	IP 65	MA	Plastic red	LED red	FR	1 NC	84-5121.2B40	2	2	17	11	0.036
						1 NC + 1 NO	84-5131.2B40	2	2	17	12	0.036
						2 NC	84-5141.2B40	2	2	17	13	0.036
					PT 2.8 s	1 NC	84-5121.2B20	1	2	17	10	0.028
						1 NC + 1 NO	84-5131.2B20	1	2	17	12	0.028
						2 NC	84-5141.2B20	1	2	17	13	0.028

Standard version:

Flat ribbon-cable length 300 mm; Plug-in terminal 2.8 x 0.5 mm.

Other options on request:

Customisation of flat ribbon-cable and connectors.

Switching action: MA = Maintained action

Terminals: FR = Flat ribbon cable, PT 2.8 s = Plug-in terminal 2.8 mm (solderable)

Contacts: NC = Normally closed, NO = Normally open

Component layout from page 31, Mounting dimensions from page 34, Technical drawing from page 35, Circuit drawing from page 43

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Stop pushbutton grey, complete



	Front protection	Switching action	Mushroom had cap	Illumination	Terminals	Contacts	Ø 32 mm Typ-Nr.	Component layout	Mounting dimensions	Technical drawing	Circuit drawing	
Stop pushbutton grey, complete Position indication ring black Twist to unlock clockwise	IP 65	MA	Plastic grey	without	FR	1 NC	84-6020.0040	2	2	17	8	0.036
						1 NC + 1 NO	84-6030.0040	2	2	17	9	0.036
						2 NC	84-6040.0040	2	2	17	10	0.036
					PT 2.8 s	1 NC	84-6020.0020	1	2	17	8	0.028
						1 NC + 1 NO	84-6030.0020	1	2	17	9	0.028
						2 NC	84-6040.0020	1	2	17	10	0.028
Position indication ring black Twist to unlock clockwise LED operating voltage: 5 ... 30 VDC Current consumption: 9.7 ... 12.4 mA	IP 65	MA	Plastic grey	LED red	FR	1 NC	84-6021.2B40	2	2	17	11	0.036
						1 NC + 1 NO	84-6031.2B40	2	2	17	12	0.036
						2 NC	84-6041.2B40	2	2	17	13	0.036
					PT 2.8 s	1 NC	84-6021.2B20	1	2	17	11	0.028
						1 NC + 1 NO	84-6031.2B20	1	2	17	12	0.028
						2 NC	84-6041.2B20	1	2	17	13	0.028

Standard version:

Flat ribbon-cable length 300 mm; Plug-in terminal 2.8 x 0.5 mm.

Other options on request:

Customisation of flat ribbon-cable and connectors.

Switching action: MA = Maintained action

Terminals: FR = Flat ribbon cable, PT 2.8 s = Plug-in terminal 2.8 mm (solderable)

Contacts: NC = Normally closed, NO = Normally open

Component layout from page 31, Mounting dimensions from page 34, Technical drawing from page 35, Circuit drawing from page 43

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Indicator actuator

Illuminated lens, non-illuminated bezel



Essential Accessories:

- Illumination element page 17
- Lens plastic page 13

	Front protection	Front ring	Ø 25 mm Typ-Nr.	Mounting dimensions	Technical drawing	
Indicator actuator	IP 40	Plastic black	84-3100.0	1	16	0.004
	IP 67	Aluminium natural	84-0200.7	1	16	0.008
		Plastic black	84-0100.0	1	16	0.003

Mounting dimensions from page 34, Technical drawing from page 35

Illuminated pushbutton actuator

Illuminated lens, non-illuminated bezel



Essential Accessories:

- Lens plastic page 13
- Switching element illuminated page 19

	Switching action	Front protection	Front ring	Ø 40 mm Typ-Nr.	Ø 25 mm Typ-Nr.	Mounting dimensions	Technical drawing	Circuit drawing	
Illuminated pushbutton actuator	M	IP 67	Aluminium natural	84-1221.7					
		IP 40	Plastic black		84-2101.0	1	16	4	0.004
	IP 67		Aluminium black		84-1201.0	1	16	4	0.008
			Aluminium blue		84-1201.6	1	16	4	0.008
			Aluminium gold		84-1201.4	1	16	4	0.008
			Aluminium natural		84-1201.7	1	16	4	0.008
			Aluminium olive-green		84-1201.5	1	16	4	0.008
			Aluminium red		84-1201.2	1	16	4	0.008
			Plastic black		84-1101.0	1	16	4	0.003

Switching action: M = Momentary action

Mounting dimensions from page 34, Technical drawing from page 35, Circuit drawing from page 43

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Pushbutton actuator

Non-illuminated lens and bezel



Essential Accessories:

- Shopping cart icon Lens metal page 14
- Shopping cart icon Switching element non-illuminated page 20

	Front protection	Switching action	Front ring	Ø 40 mm Typ-Nr.	Ø 25 mm Typ-Nr.	Mounting dimensions	Technical drawing	Circuit drawing	
Pushbutton actuator	IP 67	M	Aluminium natural	84-1221.7		3	18	4	0.022
	IP 40	M	Plastic black		84-2101.0	1	16	4	0.004
	IP 67	M	Aluminium black		84-1201.0	1	16	4	0.008
			Aluminium blue		84-1201.6	1	16	4	0.008
			Aluminium gold		84-1201.4	1	16	4	0.008
			Aluminium natural		84-1201.7	1	16	4	0.008
			Aluminium olive-green		84-1201.5	1	16	4	0.008
			Aluminium red		84-1201.2	1	16	4	0.008
			Plastic black		84-1101.0	1	16	4	0.003

Switching action: M = Momentary action

Mounting dimensions from page 34, Technical drawing from page 35, Circuit drawing from page 43

Indicator actuator with ring illumination (illuminated bezel)



Essential Accessories:

- Shopping cart icon Illumination element page 17
- Shopping cart icon Lens metal for Ring illumination page 14

	Front protection	Front ring	Ø 25 mm Typ-Nr.	Mounting dimensions	Technical drawing	
Indicator actuator with ring illumination (illuminated bezel)	IP 67	Plastic translucent	84-0090.7	1	16	0.006

Accessories for ring illumination:

Essential lenses Typ-Nr. 84-7202.x00A and 84-7205.x00A

Bi-colour illumination elements are not recommended.

Mounting dimensions from page 34, Technical drawing from page 35

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Pushbutton actuator with ring illumination (illuminated bezel)



Essential Accessories:

- Lens metal for Ring illumination page 14
- Switching element illuminated page 19

	Switching action	Front protection	Front ring	Ø 25 mm Typ-Nr.	Mounting dimensions	Technical drawing	Circuit drawing
Pushbutton actuator with ring illumination (illuminated bezel)	M	IP 67	Plastic translucent	84-1091.7	1	16	4 0.006

Accessories for ring illumination:

Essential lenses Typ-Nr. 84-7202.x00A and 84-7205.x00A

Bi-colour switching elements are not recommended.

Switching action: M = Momentary action

Mounting dimensions from page 34, Technical drawing from page 35, Circuit drawing from page 43

Indicator actuator with ring illumination (illuminated multi-colour bezel)



Essential Accessories:

- Illumination element PCB mounting page 21
- Lens plastic page 13
- Mounting flange page 21
- Single-LED page 22

	Front protection	Front ring	Ø 25 mm Typ-Nr.	Mounting dimensions	Technical drawing
Indicator actuator with ring illumination (illuminated multi-colour bezel)	IP 67	Plastic transparent	84-0080.7	1	16 0.006

Mounting dimensions from page 34, Technical drawing from page 35

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Pushbutton actuator with ring illumination (illuminated multi-colour bezel)



Essential Accessories:

-  Lens plastic page 13
-  Mounting flange page 21
-  Single-LED page 22
-  Switching element PCB mounting illuminative page 21

	Switching action	Front protection		Ø 25 mm Typ-Nr.	Mounting dimensions	Technical drawing	Circuit drawing	
Pushbutton actuator with ring illumination (illuminated multi-colour bezel)	M	IP 67	Front ring Plastic transparent	84-1081.7	1	16	4	0.006

Switching action: M = Momentary action

Mounting dimensions from page 34, Technical drawing from page 35, Circuit drawing from page 43

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Front

Lens plastic

	Mounting type	Lens	Ø 25 mm Typ-Nr.	
Lens plastic flush - level, illuminative	level with bezel	blue transparent	84-7111.600	0.001
		colourless transparent	84-7111.700	0.001
		green transparent	84-7111.500	0.001
		orange transparent	84-7111.300	0.001
		red transparent	84-7111.200	0.001
		yellow transparent	84-7111.400	0.001
flush - level, non-illuminative	level with bezel	black opaque	84-7121.000	0.001
	level with bezel	grey opaque	84-7121.800	0.001
flush - raised, illuminative	raised above bezel	blue transparent	84-7115.600	0.001
		colourless transparent	84-7115.700	0.001
		green transparent	84-7115.500	0.001
		orange transparent	84-7115.300	0.001
		red transparent	84-7115.200	0.001
		yellow transparent	84-7115.400	0.001
flush - raised, non-illuminative	raised above bezel	black opaque	84-7125.000	0.001
		grey opaque	84-7125.800	0.001



Marking plate for lens plastic

can be hot stamped

	Marking plate	Typ-Nr.	
Marking plate for lens plastic	Plastic colourless transparent	61-9707.7	0.001



Lens plastic with symbol

	Mounting type	Symbol	Lens	Ø 25 mm Typ-Nr.	
Lens plastic with symbol flush - level, illuminative	level with bezel	ON/OFF	blue transparent	84-7111.602	0.002
			colourless transparent	84-7111.702	0.002
			green transparent	84-7111.502	0.002
			red transparent	84-7111.202	0.002
		Ring	blue transparent	84-7111.601	0.002
			colourless transparent	84-7111.701	0.002
			green transparent	84-7111.501	0.002
			orange transparent	84-7111.301	0.002
	level with bezel	Ring	red transparent	84-7111.201	0.002
			yellow transparent	84-7111.401	0.002
		Stand by	blue transparent	84-7111.603	0.002
			colourless transparent	84-7111.703	0.002
			green transparent	84-7111.503	0.002
			red transparent	84-7111.203	0.002



The silvery coat is being applied on the lens (screen print) with an additional protective lacquer.

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Lens metal

	Mounting type	Lens	Ø 25 mm Typ-Nr.	
Lens metal convex - level, non-illuminative	level with bezel	Aluminium black	84-7202.000	0.003
		Aluminium blue	84-7202.600	0.003
		Aluminium gold	84-7202.400	0.003
		Aluminium natural	84-7202.800	0.003
		Aluminium olive-green	84-7202.500	0.003
		Aluminium red	84-7202.200	0.003
flush - level, non-illuminative	level with bezel	Aluminium black	84-7201.000	0.003
		Aluminium blue	84-7201.600	0.003
		Aluminium gold	84-7201.400	0.003
		Aluminium natural	84-7201.800	0.003
		Aluminium olive-green	84-7201.500	0.003
		Aluminium red	84-7201.200	0.003
flush - raised, non-illuminative	raised above bezel	Aluminium black	84-7205.000	0.003
		Aluminium blue	84-7205.600	0.003
		Aluminium gold	84-7205.400	0.003
		Aluminium natural	84-7205.800	0.003
		Aluminium olive-green	84-7205.500	0.003
		Aluminium red	84-7205.200	0.003



Lens metal for Ring illumination

	Mounting type	Lens	Ø 25 mm Typ-Nr.	
Lens metal for Ring illumination convex - raised, non-illuminative	raised above bezel	Aluminium black	84-7202.000A	0.004
		Aluminium blue	84-7202.600A	0.004
		Aluminium gold	84-7202.400A	0.004
		Aluminium natural	84-7202.800A	0.004
		Aluminium olive-green	84-7202.500B	0.004
		Aluminium red	84-7202.200A	0.004
flush - raised, non-illuminative	raised above bezel	Aluminium black	84-7205.000A	0.003
		Aluminium blue	84-7205.600A	0.003
		Aluminium gold	84-7205.400A	0.003
		Aluminium natural	84-7205.800A	0.003
		Aluminium olive-green	84-7205.500A	0.003
		Aluminium red	84-7205.200A	0.003



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Lens metal with spot

	Mounting type	Lens	Ø 25 mm Typ-Nr.	
Lens metal with spot flush - level, illuminative	level with bezel	Aluminium black	84-7211.000	0.002
		Aluminium blue	84-7211.600	0.002
		Aluminium gold	84-7211.400	0.002
		Aluminium natural	84-7211.800	0.002
		Aluminium olive-green	84-7211.500	0.002
		Aluminium red	84-7211.200	0.002
flush - raised, illuminative	raised above bezel	Aluminium black	84-7215.000	0.002
		Aluminium blue	84-7215.600	0.002
		Aluminium gold	84-7215.400	0.002
		Aluminium natural	84-7215.800	0.002
		Aluminium olive-green	84-7215.500	0.002
		Aluminium red	84-7215.200	0.002



Mushroom-head cap

	Mushroom had cap	Ø 32 mm Typ-Nr.	
Mushroom-head cap	Plastic black opaque	84-7124.000A	0.004
	Plastic blue opaque	84-7124.600A	0.004
	Plastic blue transparent	84-7114.600A	0.004
	Plastic green opaque	84-7124.500A	0.004
	Plastic red opaque	84-7124.200A	0.004
	Plastic yellow opaque	84-7124.400A	0.004



Front protective cap

for flush - level lenses only for protection IP 68

	Front protective cap	Typ-Nr.	
Front protective cap	Silicone natural transparent	84-9103.7	0.001

ATTENTION

when using the front protection cover the external sealing in the actuator has to be removed !

Legend frame

for devices 25 mm dia.

	Typ-Nr.	Technical drawing	
Legend frame 30 x 50 mm, adhesive, Aluminium black	61-9980.0	7	0.001

Technical drawing from page 35



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Legend plate insert

for Legend frame 61-9980.0

	Typ-Nr.	kg
Legend plate insert	704.968.1	0.001
14.5 x 23.5 mm, adhesive, Aluminium black		
14.5 x 23.5 mm, adhesive, Aluminium natural	704.968.0	0.001

**Blind plug**

		Typ-Nr.	Technical drawing	kg
Blind plug	Blind plug			
Size 25 mm dia., for mounting hole 22.5 mm dia.	Plastic black	61-9453.0	8	0.006
Size 36 mm dia., for mounting hole 30.5 mm dia.	Plastic black	704.964.8	1	0.007



Technical drawing from page 35

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Backside

Illumination element



	Protection degree	Illumination	Operating voltage/-current	Terminals	Typ-Nr.	Circuit drawing	
Illumination element LED and built-in resistor included	IP 40	Single-LED blue	12 VDC, 10 mA	FR	84-8001.6340	5	0.010
				PT 2.8 s	84-8001.6320	5	0.005
			24 VDC, 10 mA	FR	84-8001.6640	5	0.010
				PT 2.8 s	84-8001.6620	5	0.005
		Single-LED green	12 VDC, 10 mA	FR	84-8001.5340	5	0.010
				PT 2.8 s	84-8001.5320	5	0.005
			24 VDC, 10 mA	FR	84-8001.5640	5	0.010
				PT 2.8 s	84-8001.5620	5	0.005
		Single-LED orange	12 VDC, 10 mA	FR	84-8001.3340	5	0.010
				PT 2.8 s	84-8001.3320	5	0.005
			24 VDC, 10 mA	FR	84-8001.3640	5	0.010
				PT 2.8 s	84-8001.3620	5	0.005
		Single-LED red	12 VDC, 10 mA	FR	84-8001.2340	5	0.010
				PT 2.8 s	84-8001.2320	5	0.005
			24 VDC, 10 mA	FR	84-8001.2640	5	0.010
				PT 2.8 s	84-8001.2620	5	0.005
		Single-LED white	12 VDC, 10 mA	FR	84-8001.9340	5	0.010
				PT 2.8 s	84-8001.9320	5	0.005
			24 VDC, 10 mA	FR	84-8001.9640	5	0.010
				PT 2.8 s	84-8001.9620	5	0.005
		Single-LED yellow	12 VDC, 10 mA	FR	84-8001.4340	5	0.010
				PT 2.8 s	84-8001.4320	5	0.005
			24 VDC, 10 mA	FR	84-8001.4640	5	0.010
				PT 2.8 s	84-8001.4620	5	0.005

Standard version:

Cable length 300 mm with insulated ferrule; Plug-in terminal 2.8 x 0.8 mm.

Other options on request:

Customisation of cable and connectors; Rear side fully sealed (IP 67).

Protection degree (rear side):

IP 40, upgrade to IP 67 with plug typ-Nr. 84-900 possible; With applications where strong vibrations occur, the plugs may become loose.

Terminals: FR = Flat ribbon cable, PT 2.8 s = Plug-in terminal 2.8 mm (solderable)

Circuit drawing from page 43

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Illumination element with Bi-colour illumination

	Illumination	Operating voltage/- current	Protection degree	Terminals	Typ-Nr.	Circuit drawing	
Illumination element with Bi-colour illumination LED and built-in resistor included	Bi-colour LED red/green	24 VDC, 20 mA	IP 40	PT 2.8 s	84-8005.8620	1	0.005
			IP 67	FR	84-8005.8640	2	0.011
	Bi-colour LED yellow/green	24 VDC, 20 mA	IP 40	PT 2.8 s	84-8005.7620	1	0.005
			IP 67	FR	84-8005.7640	2	0.011



Standard version:

Cable length 300 mm with insulated ferrule; Plug-in terminal 2.8 x 0.8 mm.

Other options on request:

Customisation of cable and connectors; Rear side fully sealed (IP 67).

Best illumination level will be reached with Alu lens with window, Typ-Nr. 84-7215.x00 and 84-7211.x00.

Protection degree (rear side):

- Plug-in terminal IP 40, upgrade to IP 67 with plug typ-Nr. 84-900 possible. With applications where strong vibrations occur, the plugs may become loose.

- Cable connection IP 67, rear side fully sealed. The illumination element of the cable version cannot be disconnected from the actuator any longer.

Terminals: PT 2.8 s = Plug-in terminal 2.8 mm (solderable), FR = Flat ribbon cable

Circuit drawing from page 43

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Switching element illuminated



	Protection degree	Contacts	Illumination	Operating voltage/-current	Terminals	Typ-Nr.	Circuit drawing	
Switching element illuminated LED and built-in resistor included	IP 40	1 NO	Single-LED blue	12 VDC, 10 mA	FR	84-8511.6340	7	0.015
					PT 2.8 s	84-8511.6320	7	0.006
			24 VDC, 10 mA		FR	84-8511.6640	7	0.015
					PT 2.8 s	84-8511.6620	7	0.006
			Single-LED green	12 VDC, 10 mA	FR	84-8511.5340	7	0.015
					PT 2.8 s	84-8511.5320	7	0.006
			24 VDC, 10 mA		FR	84-8511.5640	7	0.015
					PT 2.8 s	84-8511.5620	7	0.006
			Single-LED orange	12 VDC, 10 mA	FR	84-8511.3340	7	0.015
					PT 2.8 s	84-8511.3320	7	0.006
			24 VDC, 10 mA		FR	84-8511.3640	7	0.015
					PT 2.8 s	84-8511.3620	7	0.006
			Single-LED red	12 VDC, 10 mA	FR	84-8511.2340	7	0.015
					PT 2.8 s	84-8511.2320	7	0.006
			24 VDC, 10 mA		FR	84-8511.2640	7	0.015
					PT 2.8 s	84-8511.2620	7	0.006
			Single-LED white	12 VDC, 10 mA	FR	84-8511.9340	7	0.015
					PT 2.8 s	84-8511.9320	7	0.006
			24 VDC, 10 mA		FR	84-8511.9640	7	0.015
					PT 2.8 s	84-8511.9620	7	0.006
			Single-LED yellow	12 VDC, 10 mA	FR	84-8511.4340	7	0.015
					PT 2.8 s	84-8511.4320	7	0.006
			24 VDC, 10 mA		FR	84-8511.4640	7	0.015
					PT 2.8 s	84-8511.4620	7	0.006

Standard version:

Cable length 300 mm with insulated ferrule; Plug-in terminal 2.8 x 0.8 mm.

Other options on request:

Customisation of cable and connectors; Rear side fully sealed (IP 67).

Protection degree (rear side):

IP 40, upgrade to IP 67 with plug typ-Nr. 84-900 possible; With applications where strong vibrations occur, the plugs may become loose.

Contacts: NO = Normally open

Terminals: FR = Flat ribbon cable, PT 2.8 s = Plug-in terminal 2.8 mm (solderable)

Circuit drawing from page 43

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Switching element with Bi-colour illumination

	Protection degree	Contacts	Illumination	Operating voltage/-current	Terminals	Typ-Nr.	Circuit drawing	
Switching element with Bi-colour illumination LED and built-in resistor included	IP 67	1 NO	Bi-colour LED red/green	24 VDC, 20 mA	FR	84-8515.8640	3	0.015
			Bi-colour LED yellow/green	24 VDC, 20 mA	FR	84-8515.7640	3	0.015



Protection degree IP 67, rear side fully sealed. The switching element cannot be disconnected from the actuator any longer.

Best illumination level will be reached with Alu lens with window, Typ-Nr. 84-7215.x00 and 84-7211.x00.

Standard version:

Cable length 300 mm with insulated ferrule.

Other options on request:

Customisation of cable and connectors.

Contacts: NO = Normally open

Terminals: FR = Flat ribbon cable

Circuit drawing from page 43

Switching element non-illuminated

	Protection degree	Contacts	Terminals	Typ-Nr.	Circuit drawing	
Switching element non-illuminated	IP 40	1 NO	FR	84-8510.0040	6	0.010
			PT 2.8 s	84-8510.0020	6	0.005



Standard version:

Cable length 300 mm with insulated ferrule; Plug-in terminal 2.8 x 0.8 mm (solderable).

Other options on request:

Customisation of cable and connectors; Rear side fully sealed (IP 67).

Protection degree (rear side):

IP 40, upgrade to IP 67 with plug typ-Nr. 84-900 possible; With applications where strong vibrations occur, the plugs may become loose.

Contacts: NO = Normally open

Terminals: FR = Flat ribbon cable, PT 2.8 s = Plug-in terminal 2.8 mm (solderable)

Circuit drawing from page 43

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Switching element PCB mounting illuminative

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

	Contacts	Terminals	Typ-Nr.	Component layout	Technical drawing	Circuit drawing	
Switching element PCB mounting illuminative	1 NO	P	92-851.342	4	15	14	0.001



Illumination and mounting flange to be ordered separately.

Contacts: NO = Normally open

Terminals: P = PCB terminal

Component layout from page 31, Technical drawing from page 35, Circuit drawing from page 43

Illumination element PCB mounting

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

	Terminals	Typ-Nr.	Component layout	Technical drawing	
Illumination element PCB mounting	P	92-800.042	3	9	0.001



Illumination and mounting flange to be ordered separately.

Terminals: P = PCB terminal

Component layout from page 31, Technical drawing from page 35

Mounting flange

	Typ-Nr.	Technical drawing	
Mounting flange	84-960.0	13	0.001
Ring illumination (illuminated multi-color bezel)			
Standard version (non-illuminated)	92-960.0	10	0.001



Technical drawing from page 35

Flat receptacle

	Typ-Nr.	
Flat receptacle 2.8 x 0.8 mm	84-9420	0.001



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Insulation sleeve

	Typ-Nr.	
Insulation sleeve for Flat receptacles 84-9420	31-929	0.001



Plug

	Typ-Nr.	
Plug	84-900	0.001



for back protection IP67 of switching elements and illumination elements.
Two plugs are necessary per element.

Illumination

Single-LED

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

	Socket	Light colour	Operating voltage/-current	Typ-Nr.	
Single-LED	T1 Bi-Pin	blue	3.5 VDC, 20 mA	10-2602.3206L	0.001
		green	3.5 VDC, 20 mA	10-2602.3205L	0.001
		orange	2.1 VDC, 20 mA	10-2602.3203L	0.001
		red	2.1 VDC, 20 mA	10-2602.3202L	0.001
		white	3.5 VDC, 20 mA	10-2602.3209L	0.001
		yellow	2.2 VDC, 20 mA	10-2602.3174D	0.001



Bi-colour LED

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

	Socket	Light colour	Operating voltage/-current	Typ-Nr.	
Bi-colour LED	T1 Bi-Pin	red/green	1.9/3.5 VDC, 20 mA	10-2603.320AL	0.001
		yellow/green	2.0/3.2 VDC, 20 mA	10-2603.320CL	0.001



Multi-LED

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

	Socket	Light colour	Operating voltage/-current	Typ-Nr.	
Multi-LED	T1 Bi-Pin	yellow	12 VDC, 40 mA	10-5609.3174D	0.001



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Emergency-stop and Stop pushbutton

Emergency-stop label

front panel thickness 3 mm max.

	Marking	Typ-Nr.	
Emergency-stop label 60 mm dia., yellow, Mounting hole size 22.5 mm dia.	ARRET D'URGENCE	704.963.7	0.011
	EMERGENCY STOP	704.963.6	0.011
	NOT AUS	704.963.5	0.011
	NOT HALT	704.963.8	0.011
90 mm dia., yellow, Mounting hole size 22.5 mm dia.	ARRET D'URGENCE	704.963.2	0.011
	EMERGENCY STOP	704.963.1	0.011
	NOT AUS	704.963.0	0.011
	NOT HALT	704.963.3	0.011



Emergency-stop protective shroud

Front panel thickness 1 ... 3 mm

	Protective shroud	Marking	Typ-Nr.	Technical drawing	
Emergency-stop protective shroud 45 mm dia., IP 40, mounting hole 22.5 mm dia., with anti-twist device	Metal yellow RAL 1004	without	84-909	12	0.021
50 mm dia., IP 65, mounting hole 22.5 mm dia., with anti-twist device	Plastic yellow	EMERGENCY STOP	84-902B	14	0.006
		NOT - AUS	84-902A	14	0.006
		NOT - HALT	84-902D	14	0.006
		without	84-902	14	0.006



Please note: By using the protective shroud Typ-Nr. 84-909 the E-stop or Stop-Switch has to be mounted twisted by 180 °. Consult the dimensional drawing therefore.
Technical drawing from page 35

Fixing nut

	Fixing nut	Typ-Nr.	
Fixing nut 28 mm dia., for limited-space applications	Plastic black	84-905	0.002
30 mm dia., standard delivery	Plastic black	84-908	0.002



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Emergency-stop enclosures

Bottom grey similar RAL 7035; cover lead-sealable, yellow similar RAL 1004

	Dimension	Typ-Nr.	Technical drawing	kg
Emergency-stop enclosures with mounting hole 22.5 mm dia., with anti- twist device	L 65 mm, W 65 mm, H 57 mm	84-910	11	0.099



Openings for cable gland M16 or M20.

Protection class IP 66.

Technical drawing from page 35

Stop pushbutton enclosure

Grey similar RAL 7035; cover lead-sealable

	Dimension	Typ-Nr.	Technical drawing	kg
Stop pushbutton enclosure with mounting hole 1 x 22.5 mm dia., with anti-twist device	L 94 mm, W 94 mm, H 81 mm	704.945.1	2	0.211
with mounting hole 2 x 22.5 mm dia., with anti-twist device	L 130 mm, W 94 mm, H 81 mm	704.945.2	3	0.251
with mounting hole 3 x 22.5 mm dia., with anti-twist device	L 180 mm, W 94 mm, H 81 mm	704.945.3	4	0.313
with mounting hole 4 x 22.5 mm dia., with anti-twist device	L 180 mm, W 182 mm, H 110 mm	704.945.4	5	0.572
with mounting hole 6 x 22.5 mm dia., with anti-twist device	L 180 mm, W 182 mm, H 110 mm	704.945.5	6	0.568



Technical drawing from page 35

Cable gland

	Typ-Nr.	kg
Cable gland M16, Plastic grey	61-9481.6	0.007
M20, Plastic grey	704.945.6	0.011



with traction relief; protection degree IP 68.

Flat receptacle

	Typ-Nr.	kg
Flat receptacle 2.8 x 0.5 mm for Plug-in terminal	31-946	0.001



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Insulation sleeve

Insulation sleeve
for Flat receptacles 31-946

Typ-Nr.	
31-929	0.001



Stop request pushbutton

Housing, pole mounting 35 mm dia.

	Housing	Colour	Typ-Nr.	Technical drawing	
Housing, pole mounting 35 mm dia.	Plastic blue	RAL 5017 traffic blue	84-9500.6A	19	0.035
	Plastic grey	RAL 7016	84-9500.8	19	0.035
	Plastic yellow	RAL 1023	84-9500.4	19	0.035



Screws are not contained in the scope of supply.
Technical drawing from page 35

Housing, pole mounting 38 mm dia.

	Housing	Colour	Typ-Nr.	Technical drawing	
Housing, pole mounting 38 mm dia.	Plastic grey	RAL 7016	84-9600.8	20	0.030
	Plastic yellow	RAL 1023	84-9600.4	20	0.030



Screws are not contained in the scope of supply.
Technical drawing from page 35

Adaptor, reducing to 30 mm dia.

	Housing	Colour	Typ-Nr.	Technical drawing	
Adaptor, reducing to 30 mm dia. for housing, pole mounting 35 mm dia.	Plastic grey	RAL 7016	84-9700.8	23	0.024
	Plastic yellow	RAL 1023	84-9700.4	23	0.024



Technical drawing from page 35

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Adaptor, reducing to 25 mm dia.

	Housing	Colour	Typ-Nr.	Technical drawing	kg
Adaptor, reducing to 25 mm dia. for housing, pole mounting 35 mm dia.	Plastic grey	RAL 7016	84-9300.8	22	0.008
	Plastic yellow	RAL 1023	84-9300.4	22	0.008



Technical drawing from page 35

Housing, wall mounting

	Housing	Colour	Typ-Nr.	Technical drawing	kg
Housing, wall mounting	Plastic grey	RAL 7016	84-9800.8	21	0.024
	Plastic yellow	RAL 1023	84-9800.4	21	0.024



Screws are not contained in the scope of supply.

Technical drawing from page 35

Assembling

Lens remover

	Typ-Nr.	kg
Lens remover	61-9730.0	0.011



Mounting tool

	Typ-Nr.	kg
Mounting tool for tightening or loosening of Emergency-stop and Stop-Switch fixing nut	84-996	0.014
for tightening or loosening of Fixing nut, Indicator and Pushbutton	84-997	0.027



Dismantling tool

	Typ-Nr.	kg
Dismantling tool for actuator dismantling of switching- and illumination element and mounting flange	84-998	0.002



Emergency-stop

Switching system

The double-break switching system can be supplied for the following switching functions:

1 Normally closed, 2 Normally closed, 1 Normally closed + 1 Normally open.

The Normally closed contacts have forced opening according to EN IEC 60947-5-1

Material

Connection cable

Polyvinylchloride (PVC), operating temperature up to +65 °C

Mushroom-head cap

Polybutylenterephthalate (PBT), as per UL 94 V0 (red items)

Actuator housing

Polyamide (PA 66), as per UL 94 V0, Flat ribbon cable-cover
Polyamide (PA 6.6), as per UL 94 V0

Material of contact

Silver alloy gold plated

Mechanical characteristics

Front panel thickness

Standard 1 ... 4 mm
with E-stop protective shroud Typ-Nr. 84-902 1 ... 3 mm

Mounting hole

22.5 mm dia. as per EN IEC 60947-5-1 with anti-twist device

Terminals

Soldering terminals 2.8 x 0.5 mm (solderable), CuSn6 tin-plated
Flat ribbon cable 2-, 4-, or 6-poles 0.35 mm² (AWG 22)

Tightening torque

Fixing nut 80 Ncm

Actuating force

22 N ±4 N

Actuating travel

approx. 4 mm to release the internal operation part

Mechanical lifetime

≥50.000 cycles of operations

Electrical characteristics

Standards

The devices comply with : EN IEC 60947-5-1, EN IEC 60947-5-5 (Emergency-stop), DIN EN ISO 13850, EN IEC 60204

Illumination

LED red with pole reversal, constant current source

Operation Voltage 5 VDC ... 30 VDC
Current consumption 9.7 mA ... 12.4 mA

Rated Operational Voltage U_e

250 VAC, as per EN IEC 60947-1

Rated Insulation Voltage U_i

250 V, as per EN IEC 60947-1

Rated Impulse Withstand Voltage U_{imp}

2.5 kV, as per EN IEC 60947-1

Contact resistance

New state ≤ 50 mΩ, as per DIN IEC 60512-2-3

Isolation resistance

>10¹¹ Ω between the open contacts at 500 VDC, as per DIN IEC 60512-2-10

Electrical life

≥50 000 cycles of operations (inductive cosφ 0.4), as per EN IEC 60947-5-1

Voltage	120 VAC	240 VAC	125 VDC	250 VDC
Current	3 A	1.5 A	0.55 A	0.27 A

Reduced load ≥50'000 cycles of operations (resistive)

Voltage	1 VAC/DC	42 VAC/DC
Current	100 mA	200 mA

Conventional free air thermal current I_{th}

5 A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

Switch rating

Switch rating AC with silver contact (gold plated), service category AC-15, as per EN IEC 60947-5-1

Voltage	120 VAC	240 VAC
Current	3 A	1.5 A

Switch rating DC for silver contact (gold plated), service category DC-13, as per EN IEC 60947-5-1 (inductive)

Voltage	12 VDC	24 VDC	48 VDC	60 VDC	125 VDC	250 VDC
Current Plug	5 A	4 A	2.1 A	1.7 A	0.55 A	0.27 A
Current Cable	3 A	3 A	2.1 A	1.7 A	0.55 A	0.27 A

Recommended minimum operational data

Silver contacts (gold plated)

Voltage	1 VAC/DC
Current	1 mA

Electric strength

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

Rated conditional short-circuit current

1000 A, type of short-circuit unit 6 A gG, as per EN IEC 60947-5-1

Protection class

Class II, as per EN IEC 60947-5

Overvoltage category

II, as per EN IEC 60947-1

Degree of pollution

3, as per EN IEC 60947-1

Environmental conditions

Storage temperature

-25 °C ... +80 °C

Operating temperature

-25 °C ... +65 °C

Front protection

IP 65, as per EN IEC 60529

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Shock resistance

(semi-sinusoidal)

max. 150 m/s², pulse width 11 ms, 3-axis, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

max. 50 m/s² at 10 Hz ... 500 Hz, 10 cycles, 3-axis, as per EN IEC 60068-2-6

Climate resistance

Damp heat, cyclic

96 hours, +25 °C / 97 %, +55 °C / 93 % relative humidity, as per EN IEC 60068-2-30

Damp heat, steady

56 days, +40 °C / 93 % relative humidity, as per EN IEC 60068-2-78

Dry heat

96 hours, +70 °C, as per EN IEC 60068-2-2

Low temperature

96 hours, -40 °C, as per EN IEC 60068-2-1

Saline mist

96 Stunden, +35 °C in chemical solution NaCl, as per EN IEC 60068-2-11

Approvals

Approbations

SEV

UL

Declaration of conformity

CE

Rebound time

≤1 ms

Resistance to heat of soldering

260 °C, 5 s (PCB assembly)

350 °C, 10 s (when using a soldering iron)

as per EN IEC 60068-2-20

Mechanical lifetime

≥1 million cycles of operations

Electrical characteristics

Illumination

Single-Chip or Multi-Chip LED, green, orange, red, yellow, white and blue

Operation Voltage 12 VDC 24 VDC

Current consumption 40 mA 20 mA

Contact resistance

Starting value (initial) ≤100 mΩ, as per DIN IEC 60512-2

Isolation resistance

≥1 G Ω between all terminals at 100 VDC, as per DIN IEC 60512-2

Electrical life

as per EN IEC 60512-5

5 million	cycles of operation	24 VAC, 50 mA at 480 Ω
5 million	cycles of operation	24 VAC, 100 mA at 240 Ω
2 million	cycles of operation	42 VAC, 50 mA at 840 Ω
2 million	cycles of operation	42 VAC, 100 mA at 420 Ω
300 000	cycles of operation	42 VAC, 100 mA at cosφ 0,4
250 000	cycles of operation	42 VAC, 200 mA at cosφ 0,395

1 million	cycles of operation	12 VDC, 250 mA at 48 Ω
1 million	cycles of operation	24 VDC, 50 mA at 480 Ω
1 million	cycles of operation	24 VDC, 100 mA at 240 Ω
5 million	cycles of operation	42 VDC, 25 mA at 1680 Ω
1.5 million	cycles of operation	42 VDC, 50 mA at 840 Ω
100 000	cycles of operation	42 VDC, 100 mA at 420 Ω

500 000	cycles of operation	24 VDC, 200 mA at L/R=30 ms
300 000	cycles of operation	42 VDC, 100 mA at L/R=30 ms
100 000	cycles of operation	42 VDC, 200 mA at L/R=30 ms

Switch rating

Voltage 50 mVAC/DC ... 42 VAC/DC

Current 10 uA ... 100 mA

Power max. 2 W

Electric strength

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

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +70 °C

Protection degree

Back protection:

IP 40, standard version

IP 67, fully sealed version, with mounted actuator only.

Switching element 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

Connection cable

Polyvinylchloride (PVC), short-time heat-resistant up to 105 °C

Material of contact

Silver alloy gold plated

Switching element

Thermoplastic polyester (PET, PBT), as per UL 94 V0 and Polyacetale (POM), as per UL 94 HB

Mechanical characteristics

Terminals

Plug-in terminals 2.8 x 0.8 mm (solderable)

Flat ribbon cable 0.5 mm²

PCB terminal

Actuating force

4.0 N ±0.2 N (measured at the lens)

Actuating travel

~0.5 mm

Shock resistance

(semi-sinusoidal)

max. 100 m/s², pulse width 11 ms, 3-axis, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

max. 50 m/s² at 10 Hz ... 500 Hz, 10 cycles, 3-axis, as per EN IEC 60068-2-6

Actuator

Material

Lens

Polycarbonate (PC), as per UL 94 V2 or Aluminium anodised

Actuator housing

Polyetherimid (PEI), as per UL 94 V0 or Aluminium anodised

Mechanical characteristics

Mounting hole

22.5 mm dia. and 30.5 mm dia.

Tightening torque

Fixing nut max. 80 Ncm

Actuating force

4.0 N ±0.2 N (measured at the lens)

Actuating travel

Total switching travel 1.2 mm

Mechanical lifetime

≥1 million cycles of operations

Electrical characteristics

Electrostatic breakdown value

Plastic case ≥15 kV

Aluminium case ≥5 kV

as per IEC 61000-4-2, mounted in plastic front panel

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Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +70 °C

Front protection

IP 67 and IP40, as per EN IEC 60529

Climate resistance

Damp heat, cyclic

96 hours, +25 °C / 97 %, +55 °C / 93 % relative humidity, as per EN IEC 60068-2-30

Damp heat, state

56 days, +40 °C / 93 % relative humidity, as per EN IEC 60068-2-78

Rapid change of temperature

100 cycles, -40 °C ... +80 °C, as per EN IEC 60068-2-14

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.

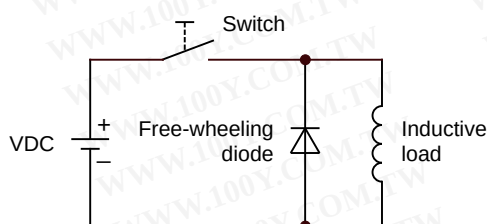
Fig. 1 shows an inductive load with a free-wheeling diode connected in parallel. This free-wheeling diode provides a path for the inductor current to flow when the current is interrupted by the switch. Without this free-wheeling diode, the voltage across the coil will be limited only by dielectric breakdown 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!

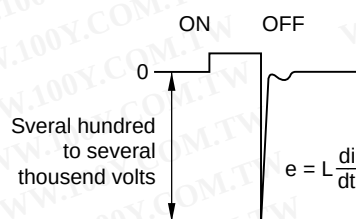
Switching with inductive load

Fig. 1



Counter emf over load without free-wheeling diode

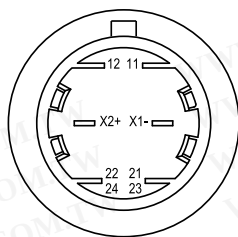
Fig. 2



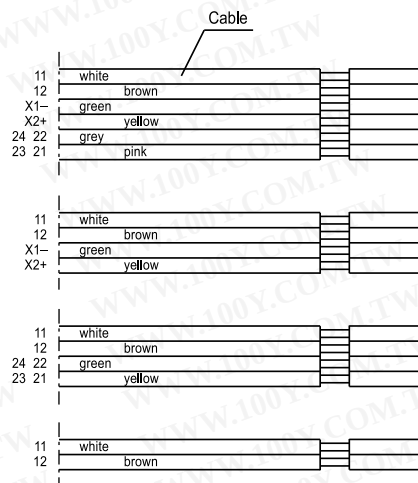
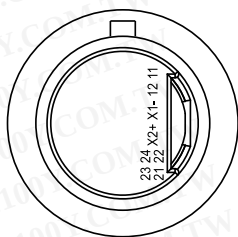
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Component layout

1 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



2 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



	Terminals
1 NC + 1 NO	11 / 12 + 23 / 24
2 NC	11 / 12 + 21 / 22
Illumination	X1- / X2+

	Terminals
1 NC	11 / 12
Illumination	X1- / X2+

	Terminals
1 NC + 1 NO	11 / 12 + 23 / 24
2 NC	11 / 12 + 21 / 22

	Terminals
1 NC	11 / 12

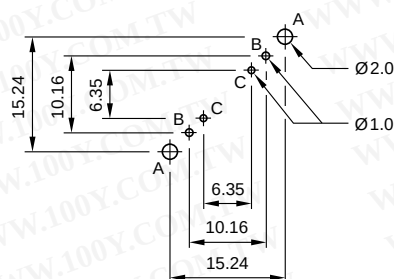
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3 Illumination element PCB mounting page 21

Single-LED

Drilling plan (Elementside)

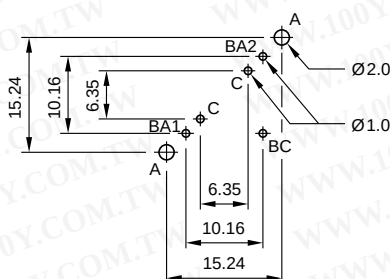
- A Fixing holes for mounting flange (92-960.0)
- B Holes for LED
- C Holes for centering pins



Bi-colour-LED

Drilling plan (Elementside)

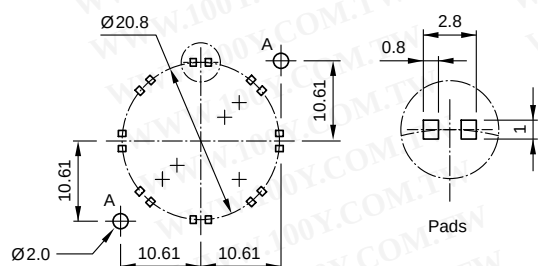
- A Fixing holes for mounting flange (92-960.0)
- B Holes for Bi-colour LED:
BA1 (green) + BA2 (yellow or red) = Anodes, BC = Cathode
- C Holes for centering pins



Hyper mini SMD-LED

Drilling plan (Elementside)

- A Fixing holes for mounting flange (84-960.0)



Libraries for the PCB layout-system p-cad 200X see : www.pcad.com/en/library Third-party Libraries

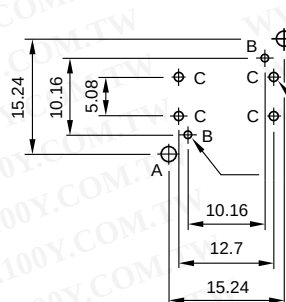
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4 Switching element PCB mounting illuminative page 21

Single-LED

Drilling plan (Elementside)

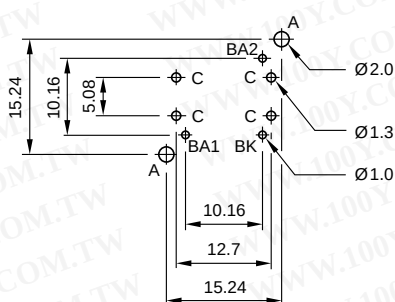
- A Fixing holes for mounting flange (92-960.0)
- B Holes for LED
- C Holes for contact pins
Pad max. Ø 2.5 mm
Through-connection recommended



Bi-colour-LED

Drilling plan (Elementside)

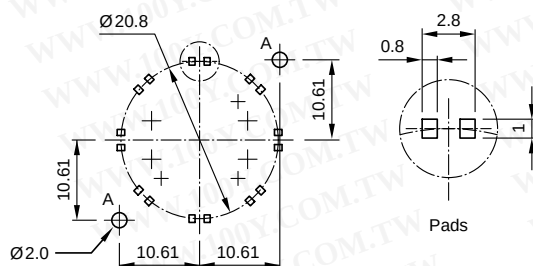
- A Fixing holes for mounting flange (92-960.0)
- B Holes for Bi-colour LED:
BA1 (green) + BA2 (yellow or red) = Anodes, BK = Cathode
- C Holes for contact pins
Pad max. Ø 2.5 mm
Through-connection recommended



Hyper mini SMD-LED

Drilling plan (Elementside)

- A Fixing holes for mounting flange (84-960.0)

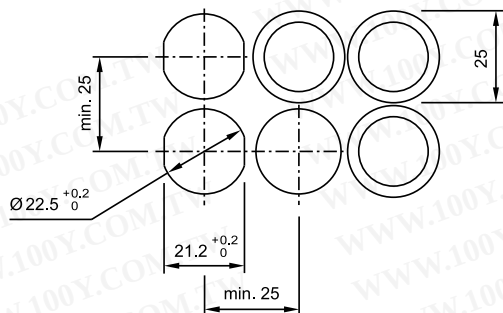


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Libraries for the PCB layout-system p-cad 200X see : www.pcad.com/en/library Third-party Libraries

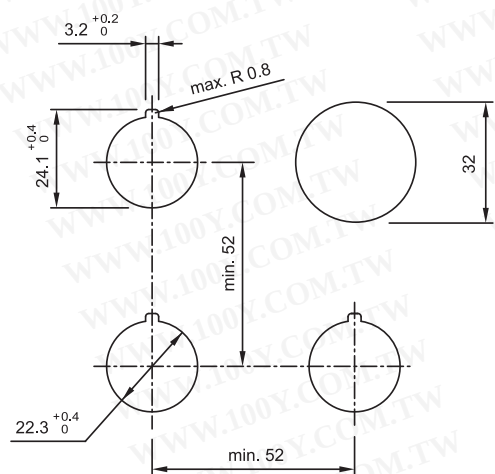
Mounting dimensions

1 Indicator actuator page 9 | Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10 | Indicator actuator with ring illumination (illuminated bezel) page 10 | Pushbutton actuator with ring illumination (illuminated bezel) page 11 | Indicator actuator with ring illumination (illuminated multi-colour bezel) page 11 | Pushbutton actuator with ring illumination (illuminated multi-colour bezel) page 12



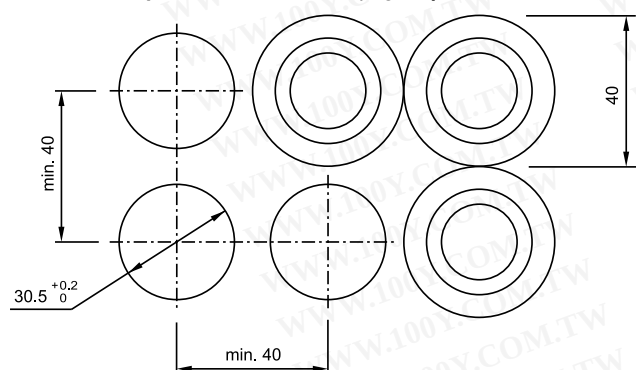
Hole spacing 31 mm min. by using blind plug 704.960.4

2 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



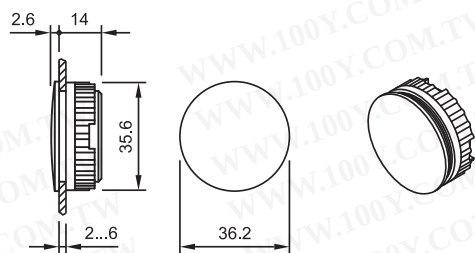
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3 Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10

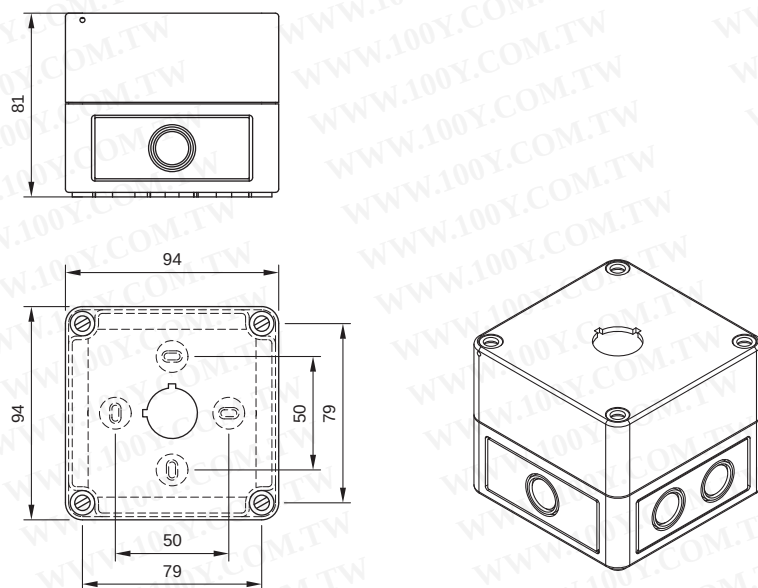


Technical drawing

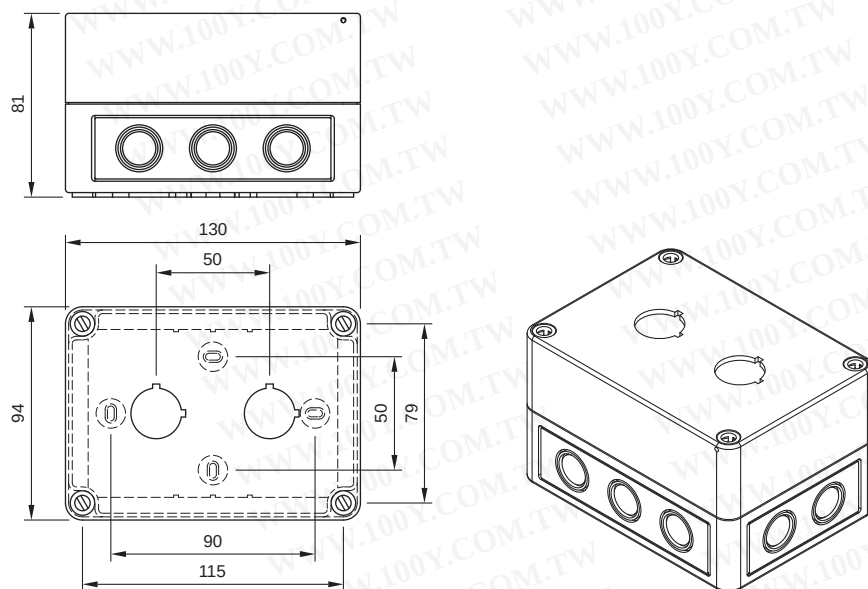
1 Blind plug page 16



2 Stop pushbutton enclosure page 24

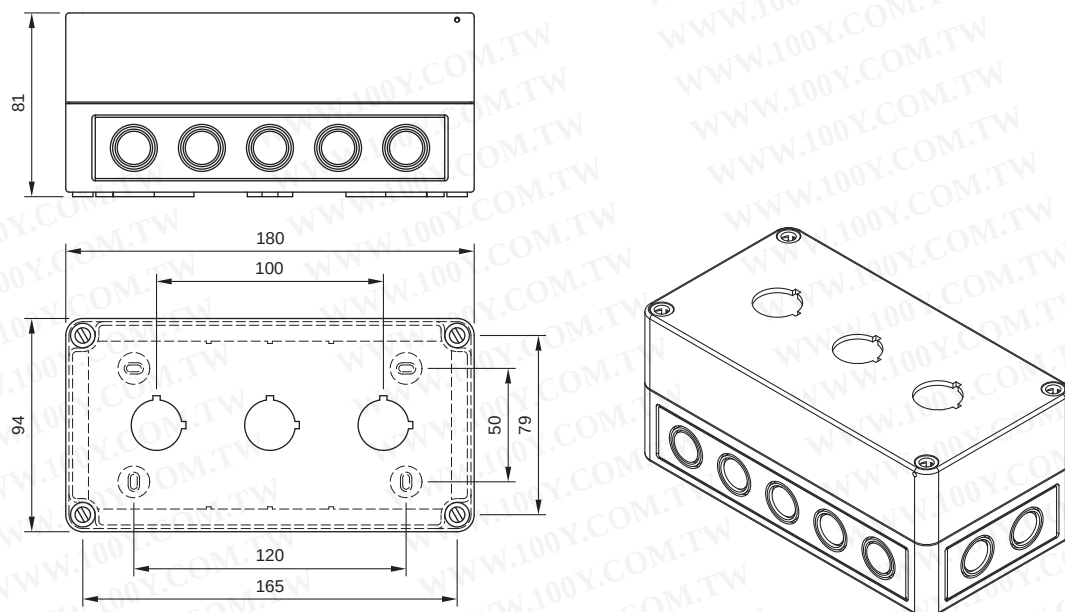


3 Stop pushbutton enclosure page 24

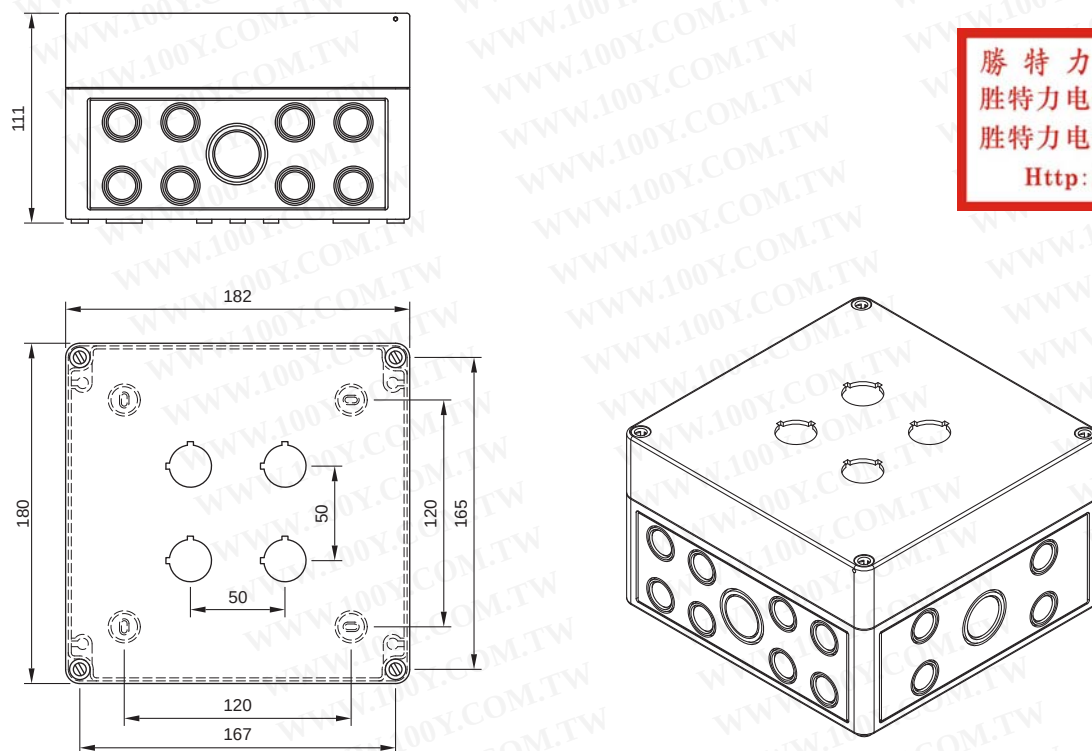


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4 Stop pushbutton enclosure page 24

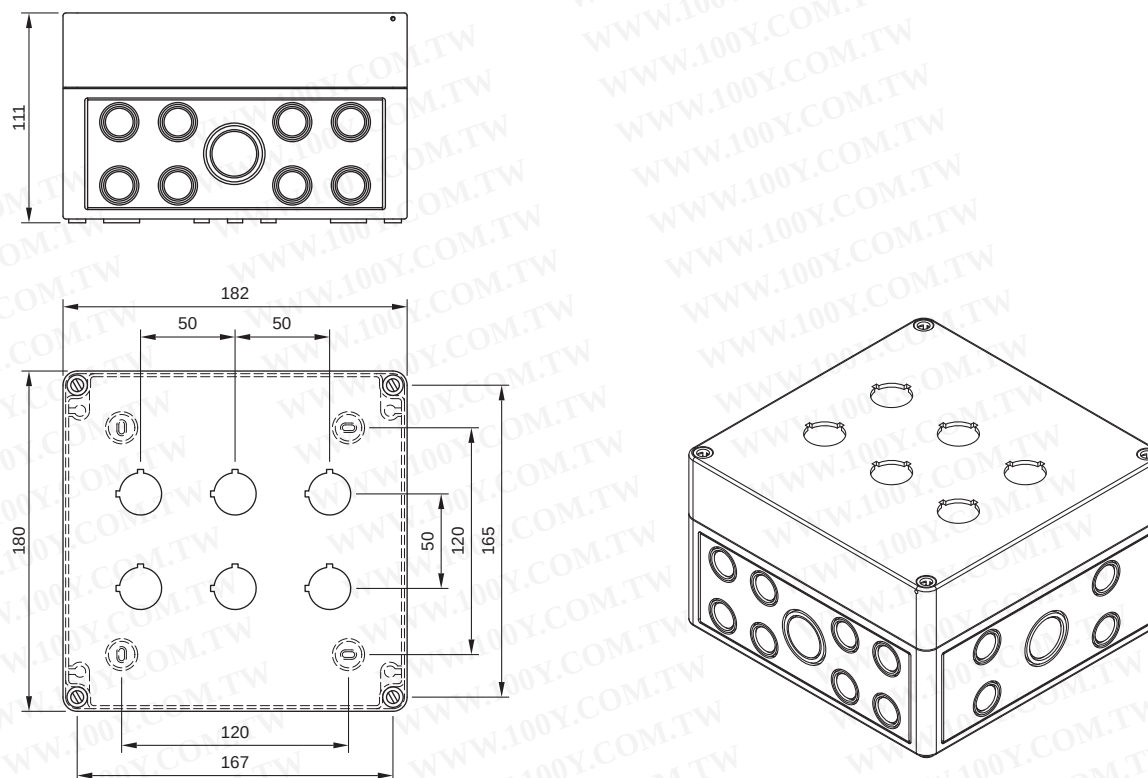


5 Stop pushbutton enclosure page 24

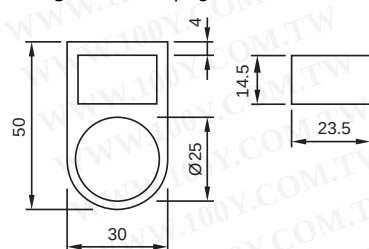


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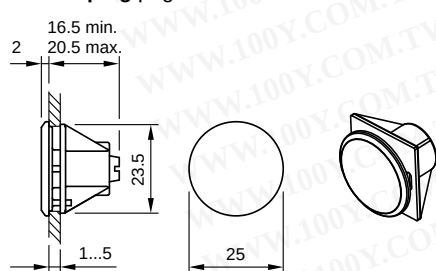
6 Stop pushbutton enclosure page 24



7 Legend frame page 15



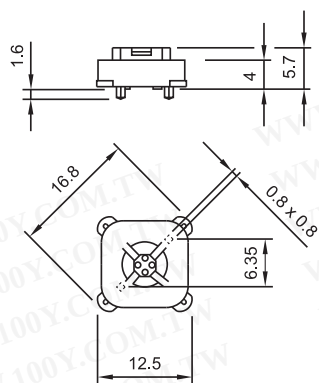
8 Blind plug page 16



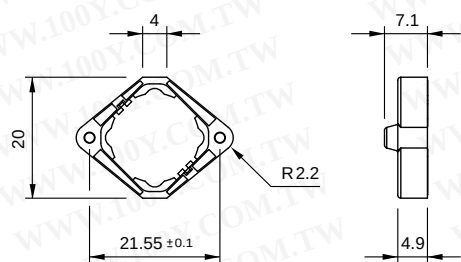
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With this print version of the series 84, the panel thickness is reduced to 2.5 mm max.

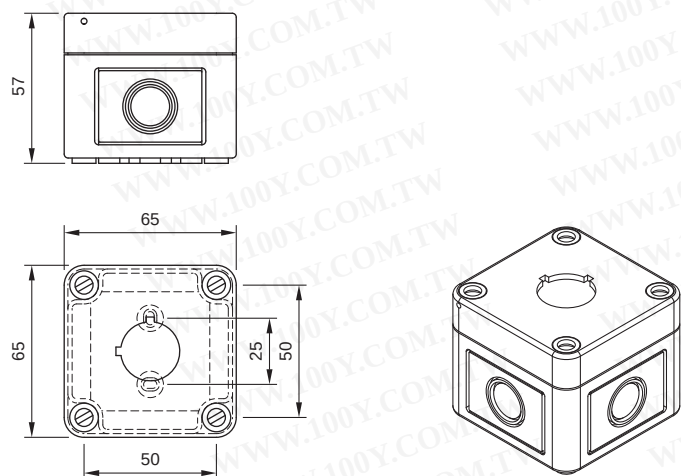
9 Illumination element PCB mounting page 21



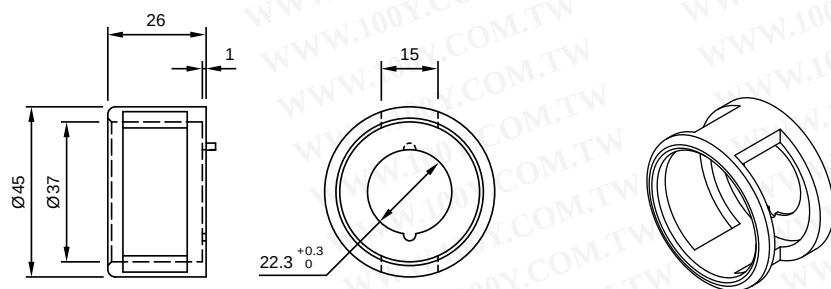
10 Mounting flange page 21



11 Emergency-stop enclosures page 24

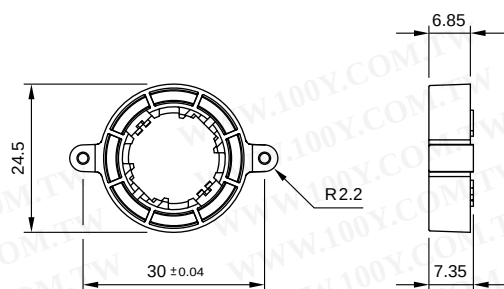


12 Emergency-stop protective shroud page 23

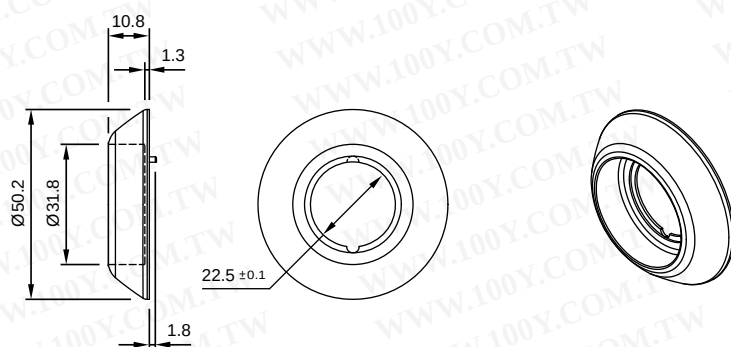


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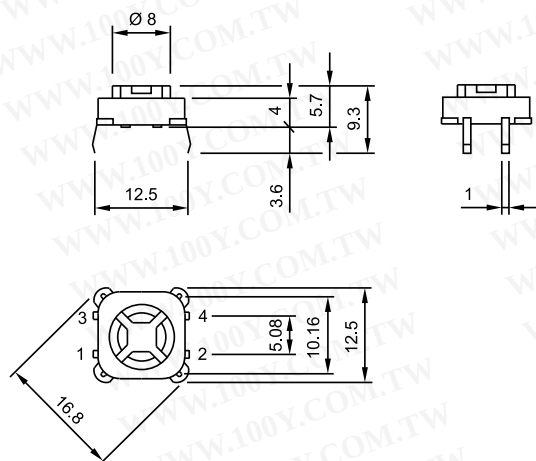
13 Mounting flange page 21



14 Emergency-stop protective shroud page 23

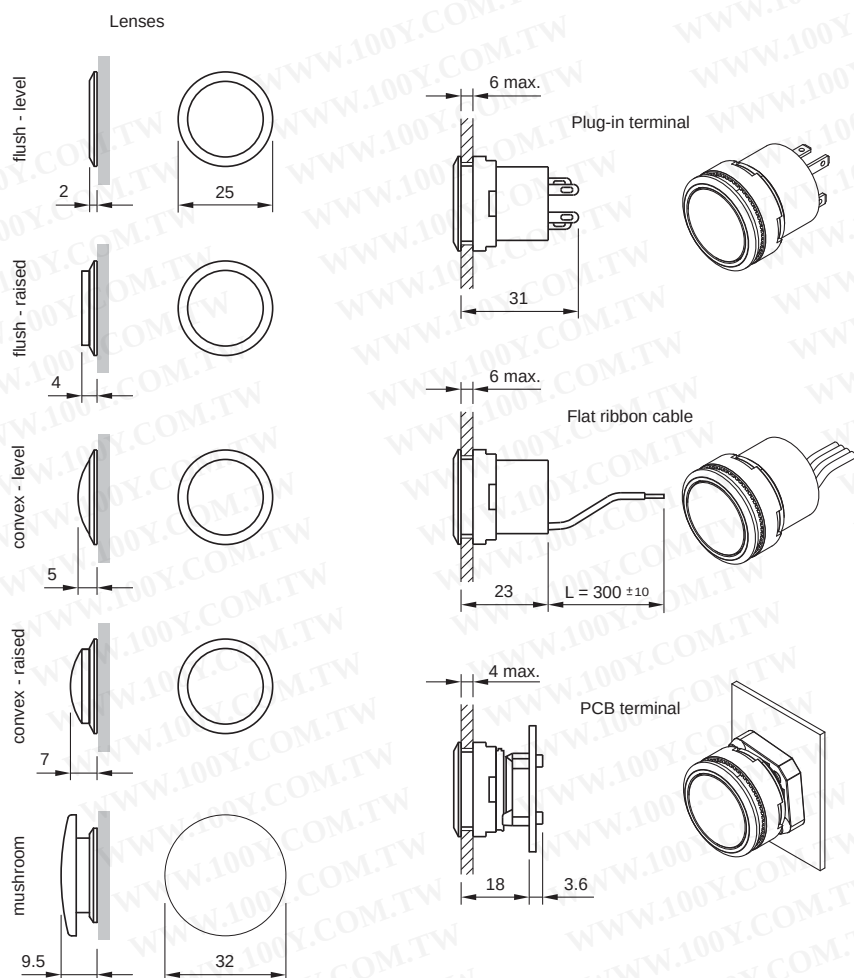


15 Switching element PCB mounting illuminative page 21



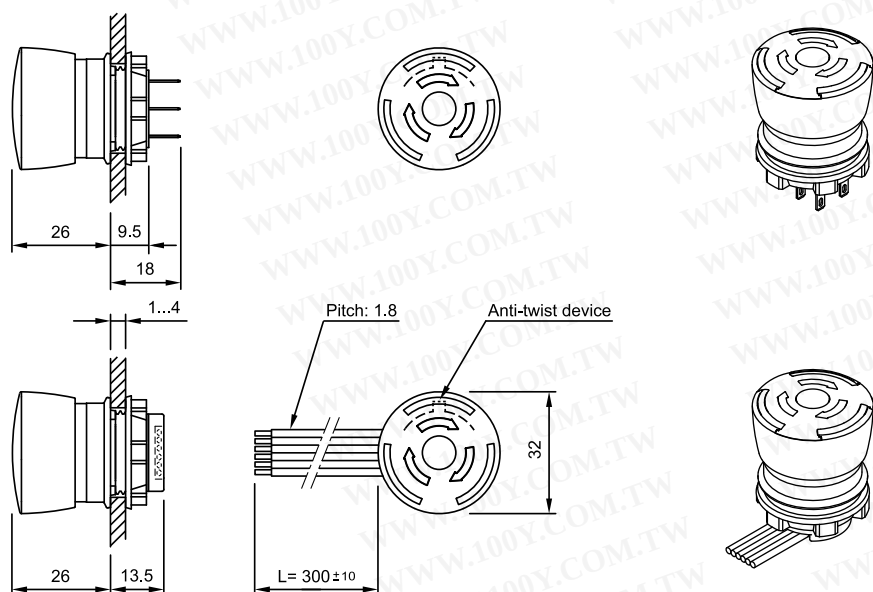
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16 Indicator actuator page 9 | Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10 | Indicator actuator with ring illumination (illuminated bezel) page 10 | Pushbutton actuator with ring illumination (illuminated bezel) page 11 | Indicator actuator with ring illumination (illuminated multi-colour bezel) page 11 | Pushbutton actuator with ring illumination (illuminated multi-colour bezel) page 12

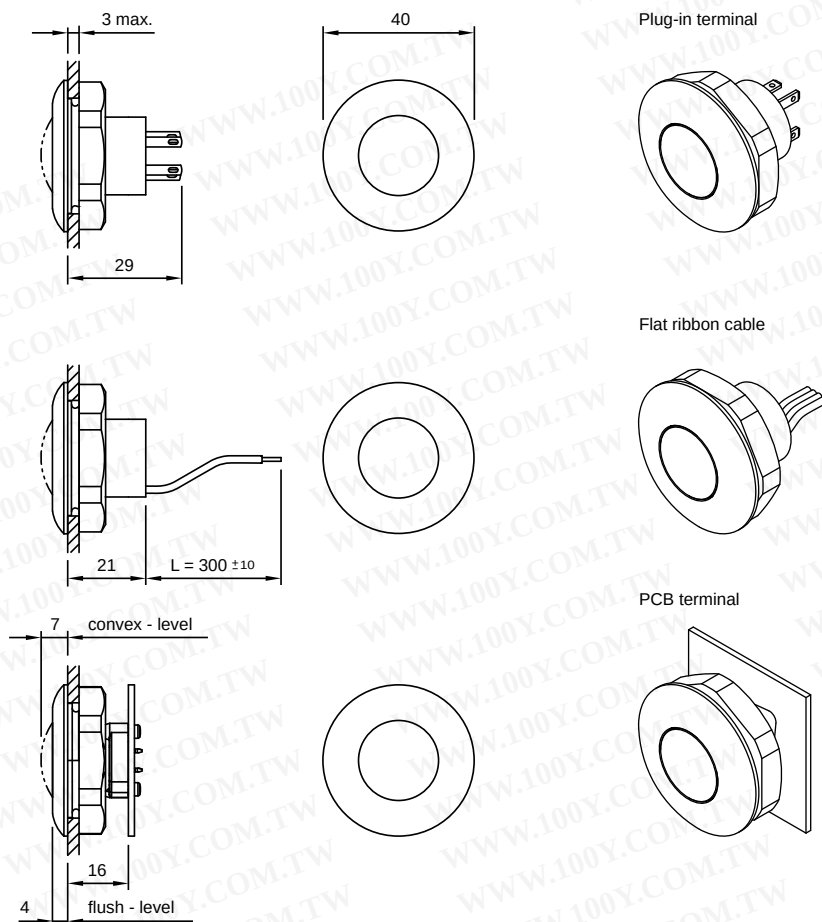


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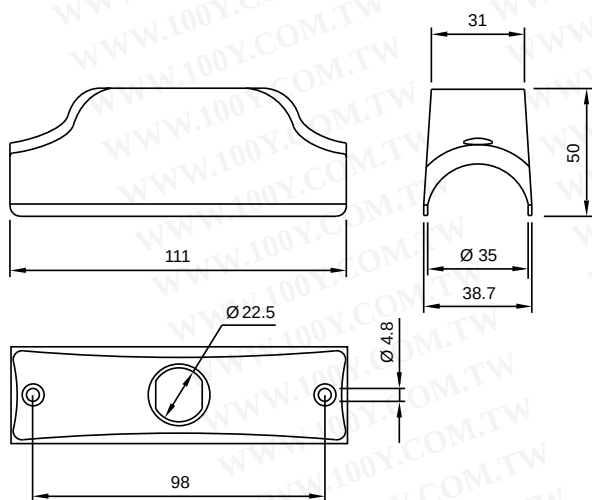
17 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



18 Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10



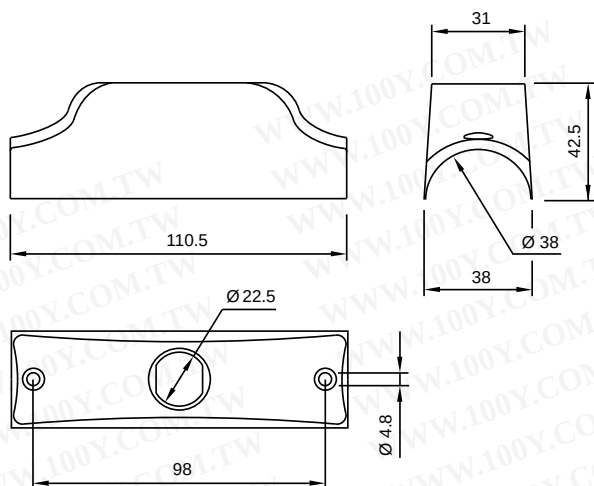
19 Housing, pole mounting 35 mm dia. page 25



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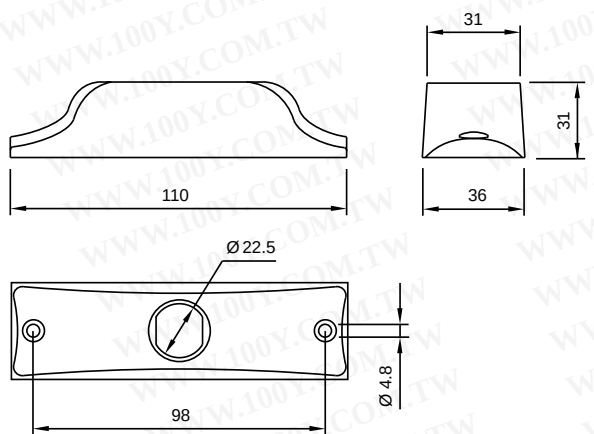
Please note: The cut-out of the pole must read min. 22 mm dia. and needs to be aligned with the switch!

20 Housing, pole mounting 38 mm dia. page 25



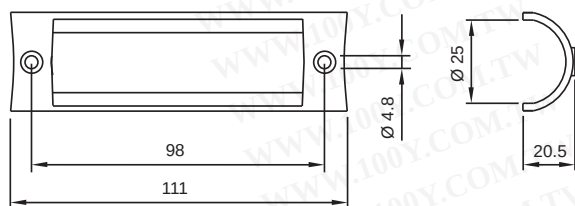
Please note: The cut-out of the pole must read min. 22 mm dia. and needs to be aligned with the switch!

21 Housing, wall mounting page 26

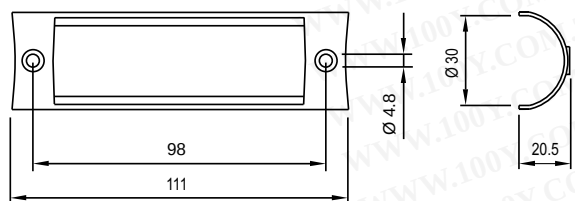


Please note: The cut-out of the wall must read min. 22 mm dia. and needs to be aligned with the switch!

22 Adaptor, reducing to 25 mm dia. page 26



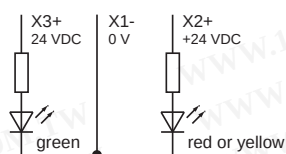
23 Adaptor, reducing to 30 mm dia. page 25



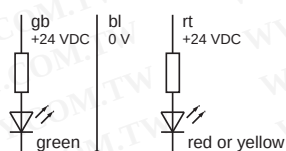
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Circuit drawing

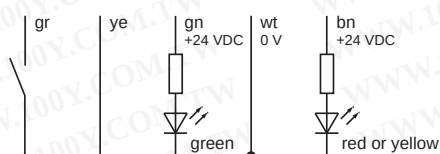
1 Illumination element with Bi-colour illumination page 18



2 Illumination element with Bi-colour illumination page 18



3 Switching element with Bi-colour illumination page 20



4 Illuminated pushbutton actuator page 9 | Pushbutton actuator page 10 | Pushbutton actuator with ring illumination (illuminated bezel) page 11 | Pushbutton actuator with ring illumination (illuminated multi-colour bezel) page 12



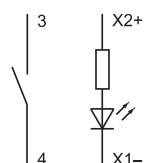
5 Illumination element page 17



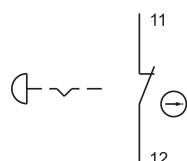
6 Switching element non-illuminated page 20



7 Switching element illuminated page 19

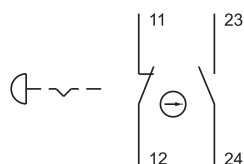


8 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8

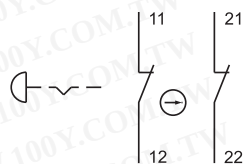


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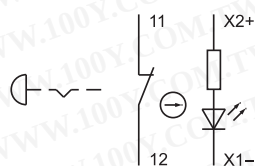
9 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



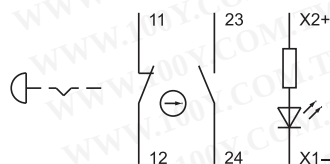
10 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



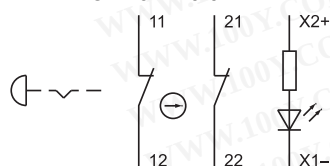
11 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



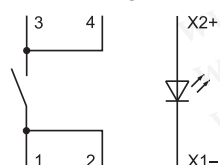
12 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



13 Emergency-stop pushbutton, foolproof EN IEC 60947-5-5, complete page 7 | Stop pushbutton grey, complete page 8



14 Switching element PCB mounting illuminative page 21



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Series 84

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Product Range	
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General information

The 84 series is a modular system of pushbuttons consisting of lenses, actuator elements, switching units and a variety of means of connection and mounting. The front protection IP 67 ensures that the illuminated pushbuttons are suited for industrial use. The IP 40 version is available for reduced protection.

Mounting

The actuators of the series 84 are inserted in the mounting hole 22.5 mm dia. and the switching units are clipped on to the rear of the actuators. The torque with which the fixing sleeve is tightened is max. 80 Ncm. The pushbutton system can be mounted as a complete unit (actuator and switching unit). Mounting from the front with the wiring already attached is also possible.

When mounted on printed circuit boards the actuators are inserted in the mounting hole 22.5 mm dia. and the switching elements are fixed on the board. The PCB is connected to the preassembled actuator by means of the mounting flange. There is no need for subsequent adjustment or spacing studs.

Lenses

The flat lenses are available in various colours and made either from plastic, or anodized aluminium.

Marking

The actuators of the series 84 can be marked by any of the following methods: engraving, hot pressing, laser, marking plate.

Please provide marking details.

Illumination

To ensure full illumination, the switching elements can be supplied with an integrated Multi-LED in any of the colours red, yellow, orange or green. LED load 20 mA (24 VDC) or 40 mA (12 VDC). Series resistor integrated.

Switching system

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

Specimen orderIndicator

- indicator actuator, IP40	84-2101.0
Recommended accessories:	
- lens plastic, yellow	84-7111.400
- indicator element, IP40, Multi-LED, yellow, soldering-/plug-in terminal	84-8102.4620

or

Indicator with PCB terminal

- indicator actuator, IP40	84-2101.0
Recommended accessories:	
- lens plastic yellow	84-7111.400
- indicator element with PCB terminal	92-800.042
- LED, 1 chip, yellow	10-2602.3174D
- mounting flange	92-960.0

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All dimensions in mm.

We reserve the right to modify technical data.

indicator, illuminated-/pushbutton 25 mm dia.



- 1 lens
- 2 actuator case
- 3 fixing nut
- 4 switching element with soldering-/plug-in terminal

indicator, illuminated-/pushbutton 40 mm dia.



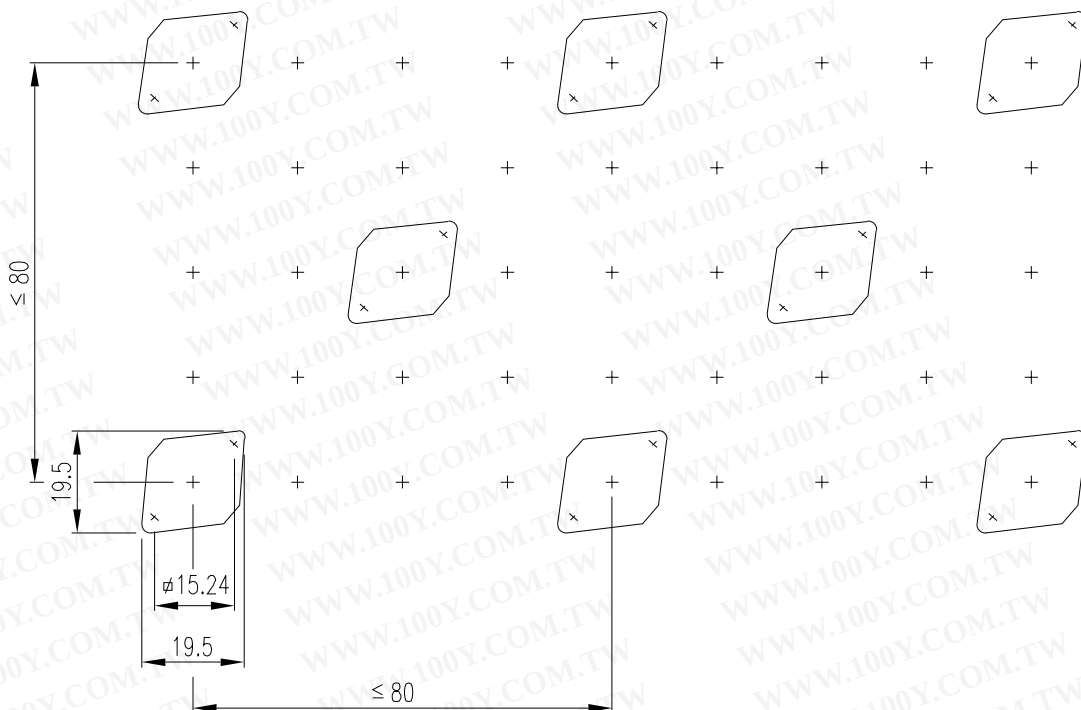
- 1 actuator
- 2 fixing nut
- 3 switching element with flat ribbon cable

indicator, illuminated-/pushbutton PCB version



- 1 lens
- 2 actuator case
- 3 fixing nut
- 4 mounting flange
- 5 switching element for PCB terminal
- 6 fixing screw

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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 mounting flanges as per the adjacent sketch. For large PCBs with several switching elements we recommend the following mounting 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.

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indicator actuator



- lens plastic page 544
- lens metal with window page 544
- indicator element page 545
- indicator element with PCB terminal page 546
- LED page 547
- mounting flange page 548

indicator actuator	degree of protection	front ring	25 mm dia. Typ-Nr.	technical drawing			mounting dimensions
	IP 40	plastic black	84-3100.1	1	1		0,008
	IP 67	aluminium natural	84-0200.7	1	1		0,008
		plastic black	84-0100.0	1	1		0,008

technical drawings from page 551, mounting dimensions from page 553

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illuminated-/pushbutton actuator



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- 🛒 lens metal with window page 544
- 🛒 lens metal page 544
- 🛒 switching element page 546
- 🛒 switching element with PCB terminal page 547
- 🛒 LED page 547
- 🛒 mounting flange page 548

	switching action	degree of protection	front ring	25 mm dia. Typ-Nr.	40 mm dia. Typ-Nr.	circuit drawing	technical drawing	mounting dimensions	
illuminated-/pushbutton actuator	M	IP 40	plastic black	84-2101.0		1	1	1	0,008
		IP 67	aluminium natural	84-1201.7		1	1	1	0,008
					84-1221.7	1	2	2	0,015
			plastic black	84-1101.0		1	1	1	0,008

switching action : momentary action = M

circuit drawings from page 554, technical drawings from page 551, mounting dimensions from page 553

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at front

lens plastic

	shape	lens	colour	25 mm dia. Typ-Nr.	
lens plastic	flat	opaque	grey	84-7121.800	0,001
			black	84-7121.000	0,001
		transparent	blue	84-7111.600	0,001
			colourless, clear	84-7111.700	0,001
			yellow	84-7111.400	0,001
			green	84-7111.500	0,001
			orange	84-7111.300	0,001
			red	84-7111.200	0,001



marking plate

for lens, plastic

	front shape	marking plate	colour	part no.	
marking plate can be hot pressed	round	transparent	clear	61-9707.7	0,001



lens metal with window

	shape	lens	colour	25 mm dia. Typ-Nr.	
lens metal with window	flat	aluminium anodized	natural	84-7211.800	0,002



lens metal

	shape	lens	colour	25 mm dia. Typ-Nr.	
lens metal	flat	aluminium anodized	blue	84-7201.600	0,001
			yellow	84-7201.400	0,001
			green	84-7201.500	0,001
			natural	84-7201.800	0,001
			red	84-7201.200	0,001
			black	84-7201.000	0,001



blind plug

	colour	28 mm dia. Typ-Nr.	
blind plug for mounting hole 22 mm dia.	black	704.960.7	0,004



protective front membrane cap

	material	colour	part no.	
protective front membrane cap	silicone natural	transparent	84-9103.7	0,001



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at back

indicator element

incl. illumination

indicator element	degree of protection	illumination	operation voltage	colour of LED	connection method	part no.	circuit drawing	technical drawing	kg
indicator element	IP 40	Multi-LED	24 VDC/20 mA	yellow	F 300 mm	84-8102.4640	2	1	0,030
				-	-	84-8102.4620	2	1	0,030
				green	F 300 mm	84-8102.5640	2	1	0,030
				-	-	84-8102.5620	2	1	0,030
				orange	F 300 mm	84-8102.3640	2	1	0,030
				-	-	84-8102.3620	2	1	0,030
				red	F 300 mm	84-8102.2640	2	1	0,030
				-	-	84-8102.2620	2	1	0,030
		single-LED	24 VDC/20 mA	yellow	F 300 mm	84-8101.4640	2	1	0,030
				-	-	84-8101.4620	2	1	0,030
				green	F 300 mm	84-8101.5640	2	1	0,030
				-	-	84-8101.5620	2	1	0,030
				orange	F 300 mm	84-8101.3640	2	1	0,030
				-	-	84-8101.3620	2	1	0,030
				red	F 300 mm	84-8101.2640	2	1	0,030
				-	-	84-8101.2620	2	1	0,030
				white	F 300 mm	84-8101.9640	2	1	0,030
				-	-	84-8101.9620	2	1	0,030
		Multi-LED	12 VDC/40 mA	yellow	F 300 mm	84-8002.4340	2	1	0,030
				-	-	84-8002.4320	2	1	0,030
				green	F 300 mm	84-8002.5340	2	1	0,030
				-	-	84-8002.5320	2	1	0,030
				orange	F 300 mm	84-8002.3340	2	1	0,030
				-	-	84-8002.3320	2	1	0,030
				red	F 300 mm	84-8002.2340	2	1	0,030
				-	-	84-8002.2320	2	1	0,030
		single-LED	12 VDC/20 mA	white	F 300 mm	84-8001.9340	2	1	0,030
				-	-	84-8001.9320	2	1	0,030
			24 VDC/20 mA	white	F 300 mm	84-8001.9640	2	1	0,030
				-	-	84-8001.9620	2	1	0,030



circuit drawings from page 554, technical drawings from page 551

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indicator element with PCB terminal

illumination and mounting flange to be ordered separately

	part no.	technical drawing	component layout	
indicator element with PCB terminal	92-800.042	3	1	0,001



technical drawings from page 551, component layouts from page 553

switching element incl. illumination

	degree of protection	illumination	operation voltage	colour of LED	connection method	part no.	circuit drawing	technical drawing	
switching element incl. illumination momentary action 1 NO	IP 40	Multi-LED	24 VDC/20 mA	yellow	F 300 mm	84-8612.4640	3	1	0,090
				-	-	84-8612.4620	3	1	0,090
				green	F 300 mm	84-8612.5640	3	1	0,090
				-	-	84-8612.5620	3	1	0,090
				orange	F 300 mm	84-8612.3640	3	1	0,090
				-	-	84-8612.3620	3	1	0,090
				red	F 300 mm	84-8612.2640	3	1	0,090
				-	-	84-8612.2620	3	1	0,090
				yellow	F 300 mm	84-8611.4640	3	1	0,090
				-	-	84-8611.4620	3	1	0,090
		single-LED	24 VDC/20 mA	green	F 300 mm	84-8611.5640	3	1	0,090
				-	-	84-8611.5620	3	1	0,090
				orange	F 300 mm	84-8611.3640	3	1	0,090
				-	-	84-8611.3620	3	1	0,090
				red	F 300 mm	84-8611.2640	3	1	0,090
				-	-	84-8611.2620	3	1	0,090
				white	F 300 mm	84-8611.9640	3	1	0,090
				-	-	84-8611.9620	3	1	0,090
		Multi-LED	12 VDC/40 mA	yellow	F 300 mm	84-8512.4340	3	1	0,090
				-	-	84-8512.4320	3	1	0,090
				green	F 300 mm	84-8512.5340	3	1	0,090
				-	-	84-8512.5320	3	1	0,090
				orange	F 300 mm	84-8512.3340	3	1	0,090
				-	-	84-8512.3320	3	1	0,090
				red	F 300 mm	84-8512.2340	3	1	0,090
				-	-	84-8512.2320	3	1	0,090
		single-LED	24 VDC/20 mA	blue	F 300 mm	84-8512.6640	3	1	0,090
				-	-	84-8512.6620	3	1	0,090
				yellow	F 300 mm	84-8512.4640	3	1	0,090
				-	-	84-8512.4620	3	1	0,090
				green	F 300 mm	84-8512.5640	3	1	0,090
				-	-	84-8512.5620	3	1	0,090
				orange	F 300 mm	84-8512.3640	3	1	0,090
				-	-	84-8512.3620	3	1	0,090
				red	F 300 mm	84-8512.2640	3	1	0,090
				-	-	84-8512.2620	3	1	0,090
		single-LED	12 VDC/20 mA	white	F 300 mm	84-8511.9340	3	1	0,090
			-	-	-	84-8511.9320	3	1	0,090
			24 VDC/20 mA	white	F 300 mm	84-8511.9640	3	1	0,090
			-	-	-	84-8511.9620	3	1	0,090



circuit drawings from page 554, technical drawings from page 551

switching element without illumination

	degree of protection	connection method	photo	part no.	circuit drawing	technical drawing	kg
switching element without illumination momentary action 1 NO	IP 40	F 300 mm		84-8610.0040	4	1	0,090
		-		84-8610.0020	4	1	0,090
		F 300 mm		84-8510.0040	4	1	0,090
		-		84-8510.0020	4	1	0,090

circuit drawings from page 554, technical drawings from page 551

switching element with PCB terminal

illumination and mounting flange to be ordered separately

	part no.	circuit drawing	technical drawing	component layout	kg
switching element with PCB terminal momentary action, 1 NO, front protection IP 40	92-851.342	5	4	2	0,001



circuit drawings from page 554, technical drawings from page 551, component layouts from page 553

cable shoe

	connection method	part no.	kg
cable shoe	plug-in terminal 2.8 x 0.8 mm	84-9420	0,001



insulation socket

	part no.	kg
insulation socket for connector 84-9420	31-929	0,001



for illumination

LED

for indicator/switching element with PCB terminal

	number of chips	voltage/current	colour	part no.	kg
LED base T 1 Bi-Pin	1 chip	2.2 VDC/20 mA	yellow	10-2602.3174D (92-948.4)	0,001
			green	10-2602.3175D (92-948.5)	0,001
			orange	10-2602.3173D (92-948.3)	0,001
			red	10-2602.3172D (92-948.2)	0,001
	6 chips	3.6 VDC/20 mA	white	10-2603.3179D	0,001
		12.0 VDC/20 mA	yellow	10-5609.3174D (92-945.4)	0,001
			orange	10-5609.3173D (92-945.3)	0,001
			red	10-5609.3172D (92-945.2)	0,001
		6.0 VDC/40 mA	yellow	10-5606.3244D (92-944.4)	0,001
			orange	10-5606.3243D (92-944.3)	0,001
			red	10-5606.3242D (92-944.2)	0,001



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assembling

mounting flange

for indicator/switching element with PCB terminal

	part no.	technical drawing	
mounting flange	92-960.0	5	0,001

technical drawings from page 551



lens remover

	part no.		
lens remover	61-9730.0		0,011



dismantling tool

	part no.		
dismantling tool for dismantling of actuator/switching element/mounting flange	84-998		0,002



mounting tool

	part no.		
mounting tool for tightening (or loosening) fixing nut starting torque fixing nut max. 80 Ncm	84-997		0,027



for stop request pushbutton

housing for stop request pushbutton for pole mounting 35 mm dia.

	colour	part no.	technical drawing
housing for stop request pushbutton for pole mounting 35 mm dia.	yellow RAL 1023	84-9500.4	6
	grey RAL 7016	84-9500.8	6



technical drawings from page 551

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adaptor round 35 - 25 mm

for housing for stop request pushbutton for pole mounting 35 mm dia.

	colour	part no.	technical drawing
adaptor round 35 - 25 mm	yellow RAL 1023	84-9300.4	7
	grey RAL 7016	84-9300.8	7



technical drawings from page 551

housing for stop request pushbutton for pole mounting 38 mm dia.

	colour	part no.	technical drawing
housing for stop request pushbutton for pole mounting 38 mm dia.	yellow RAL 1023	84-9600.4	
	grey RAL 7016	84-9600.8	



adaptor round 38 - 35 mm

for housing for stop request pushbutton for pole mounting 38 mm dia.

	colour	part no.	technical drawing
adaptor round 38 - 35 mm	yellow RAL 1023	84-9700.4	7
	grey RAL 7016	84-9700.8	7



technical drawings from page 551

housing for stop request pushbutton for wall mounting

	colour	part no.	technical drawing
housing for stop request pushbutton for wall mounting	yellow RAL 1023	84-9800.4	
	grey RAL 7016	84-9800.8	



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switching element

switching system

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

material of contacts

gold

switching element

thermoplastic polyester PET, PBT and polyacetale POM

mechanical characteristics

connection method

plug-in/soldering terminals 2.8 x 0.8 mm

flat ribbon cable connectors

PCB terminals

actuating force

4.0 N $\pm$ 0.2 (measured at the lens)

actuating travel

switching element 0.5 mm

storage temperature

-40°C to + 85°C

(as per DIN IEC 68-)

resistance to heat of soldering

260°C/5 s as per IEC 68-2-20 (PCB assembly)

350°C/10 s as per IEC 68-2-20 (when using a soldering iron)

mechanical life

$\geq$ 1 million operations as per IEC 512-5, test 9a

rebound time

$\leq$ 1 ms

resistance to shock

50 g for 11 ms as per IEC 68-2-29 and 27

resistance to vibration

10 g at 10-2000 Hz, amplitude 0.75 mm as per IEC 68-2-6

ambient air temperature

-25°C to + 70°C

(as per DIN IEC 68-)

electrical characteristics

contact resistance

starting value (initial) $\leq$ 100 m Ω as per IEC 512-2, test 2b

electrical life

$\geq$ 500.000 operations at 42 VDC/50 mA as per IEC 512-5, test 9c

insulation resistance

$\geq$ 1.000.000.000 ohm between all terminals at 100 VDC, as per IEC 512-2, test 3a

switch rating

switching voltage VDC/VAC

min. 50 mV, max. 42 V

switching current VDC/VAC

min. 10 mA, max. 100 mA

power rating

max. 2 W

electric strength

500 VAC, 50 Hz, 1 min, as per IEC 512-2, test 3a

actuator with snap-action switching element

material

lenses

polycarbonate PC or aluminium

actuator case

polyetherimide PEI or aluminium

mechanical characteristics

actuating force

4.0 N $\pm$ 0.2 (measured at the lens)

actuating travel

total switching travel 1.2 mm

storage temperature

-40°C to + 85°C

(as per DIN IEC 68-)

mechanical life

$\geq$ 1 million operations as per IEC 512-5, test 9a

degree of protection

front as per IEC 529

IP 67, IP 65 and IP40

ambient air temperature

-25°C to + 70°C

(as per DIN IEC 68-)

electrical characteristics

electrostatic breakdown value

plastic case

$\geq$ 15 kV as per IEC 801-2

aluminium case

$\geq$ 5 kV as per IEC 801-2

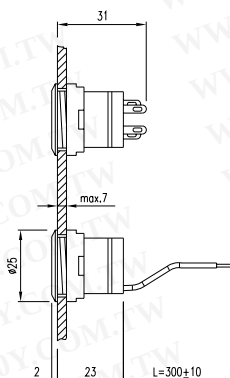
(mounted in plastic front panel)

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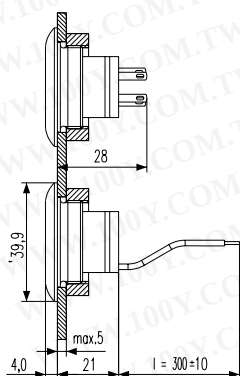
technical drawings

1 indicator actuator, illuminated-/pushbutton actuator, indicator element, switching element incl. illumination, switching element without illumination

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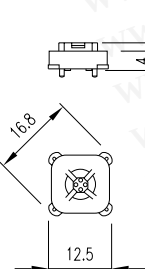


2 illuminated-/pushbutton actuator
page 543

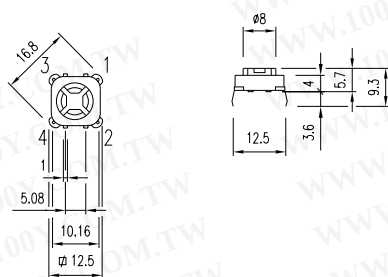


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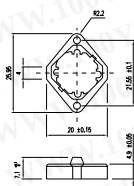
3 indicator element with PCB terminal
page 546



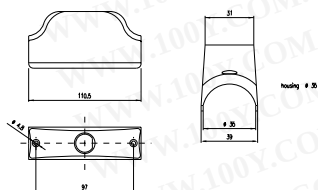
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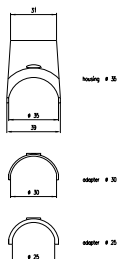
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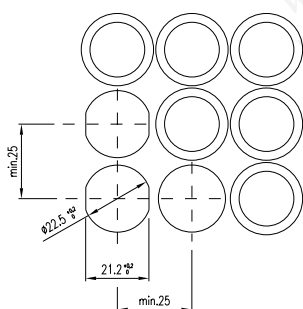
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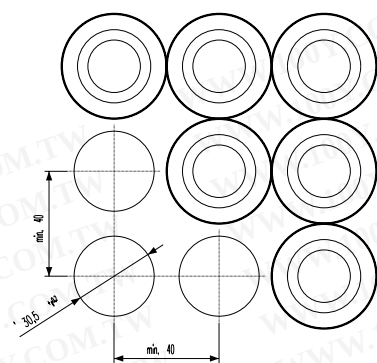


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2 illuminated-/pushbutton actuator

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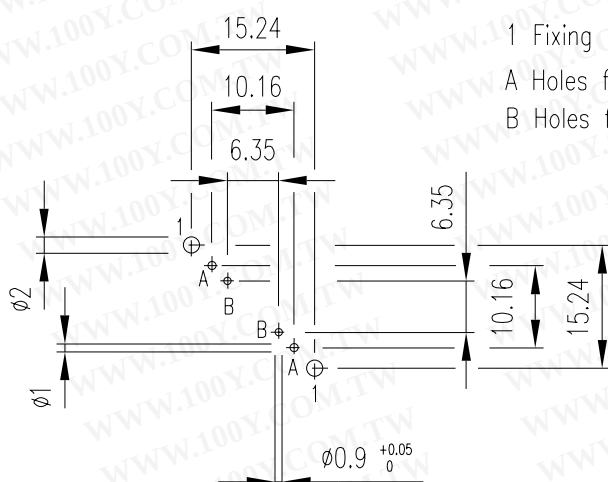


component layouts

1 indicator element with PCB terminal

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Drilling plan (conductor side of board)



1 Fixing holes for mounting flange

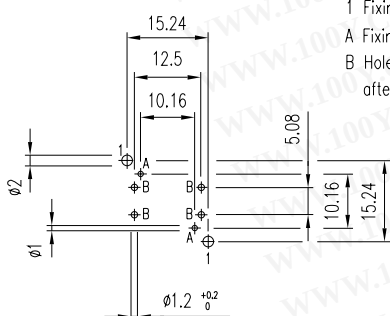
A Holes for LED

B Holes for centering pin

2 switching element with PCB terminal

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Drilling plan(conductor side of board)



1 Fixing holes for mounting flange

A Fixing holes for LED

B Holes for centering pins, diameter after tinning max. 2mm

* Final diameter after tinning

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circuit drawings

1 illuminated-/pushbutton actuator

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2 indicator element

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x1-



x2+

3 switching element incl. illumination

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3



4

4 switching element without illumination

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3



4

5 switching element with PCB terminal

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3 4



1 2

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