Index

Series 84

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 (see page 181)

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 order

Indicator	
- 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

We reserve the right to modify technical data

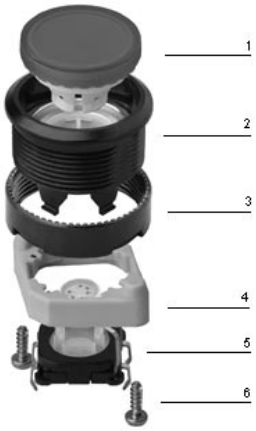
indicator, illuminated-/pushbutton 25 mm dia.

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

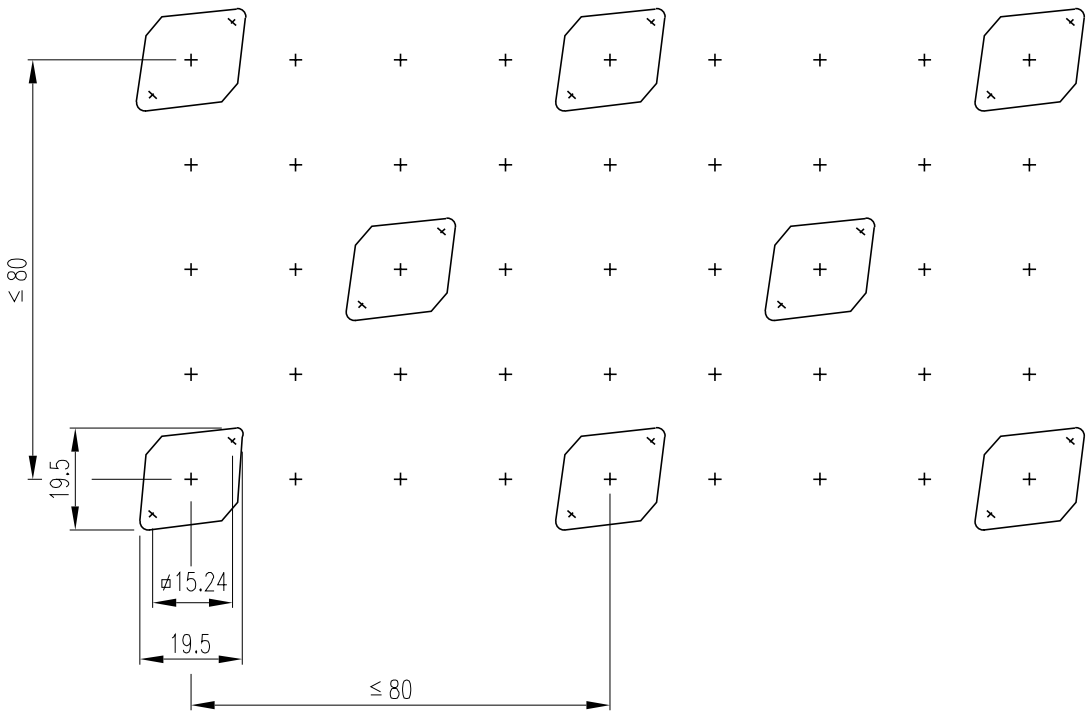
indicator, illuminated-/pushbutton 40 mm dia.

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



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.

indicator actuator

recommended accessories:

- lens plastic → 181; lens metal with window → 181
- indicator element → 182
- indicator element with PCB terminal → 183
- LED → 185
- mounting flange → 186

	degree of protection	front ring	25 mm dia. part no.	technical drawing	mounting dimension	e
indicator actuator	IP 40	plastic black	**84-3100.0**	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 drawing as of page 190, mounting dimensions as of page 192

illuminated-/pushbutton actuator

recommended accessories:

- lens plastic → 181; lens metal with window → 181; lens metal → 181
- switching element → 184
- switching element with PCB terminal → 185
- LED → 185
- mounting flange → 186

	switching action	degree of protection	front ring	40 mm dia. part no.	25 mm dia. part no.	circuit drawing	technical drawing	mounting dimension	e
illuminated-/pushbutton actuator	mom	IP 40	plastic black		**84-2101.0**	1	1	1	0,008
		IP 67	aluminium natural	**84-1221.7**		1	2	2	0,015
					84-1201.7	1	1	1	0,008
			plastic black		**84-1101.0**	1	1	1	0,008

switching action: mom = momentary action
technical drawing as of page 190, mounting dimensions as of page 192, circuit drawing as of page 194

at front

lens plastic

	shape	lens	colour	25 mm dia. part no.	e	
lens plastic	flat	opaque	black	**84-7121.000**	0,001	
			grey	**84-7121.800**	0,001	
		transparent	blue	**84-7111.600**	0,001	
			colourless, clear	**84-7111.700**	0,001	
			green	**84-7111.500**	0,001	
			orange	**84-7111.300**	0,001	
			red	**84-7111.200**	0,001	
			yellow	**84-7111.400**	0,001	

lens metal with window

	shape	lens	colour	25 mm dia. part no.	e	
lens metal with window	flat	aluminium anodized	natural	**84-7211.800**	0,002	

lens metal

	shape	lens	colour	25 mm dia. part no.	e	
lens metal	flat	aluminium anodized	black	**84-7201.000**	0,001	
			blue	**84-7201.600**	0,001	
			green	**84-7201.500**	0,001	
			natural	**84-7201.800**	0,001	
			red	**84-7201.200**	0,001	
			yellow	**84-7201.400**	0,001	

marking plate

for lens, plastic

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

blind plug

	colour	28 mm dia. part no.	e	
blind plug for mounting hole 22 mm dia.	black	**704.960.7**	0,004	

at back

indicator element

incl. illumination

	degree of protection	illumination	operation voltage	colour of LED	connection method	part no.	circuit drawing	technical drawing	e	
indicator element	IP 67	Multi-LED	12 VDC/40 mA	green	ST/PT	**84-8002.5320**	2	1	0,030	
					f	**84-8002.5340**	2	1	0,030	
				orange	ST/PT	**84-8002.3320**	2	1	0,030	
					f	**84-8002.3340**	2	1	0,030	
				red	ST/PT	**84-8002.2320**	2	1	0,030	
					f	**84-8002.2340**	2	1	0,030	
				yellow	ST/PT	**84-8002.4320**	2	1	0,030	
					f	**84-8002.4340**	2	1	0,030	
			24 VDC/20 mA	green	ST/PT	**84-8002.5620**	2	1	0,030	
					f	**84-8002.5640**	2	1	0,030	
				orange	ST/PT	**84-8002.3620**	2	1	0,030	
					f	**84-8002.3640**	2	1	0,030	
				red	ST/PT	**84-8002.2620**	2	1	0,030	
					f	**84-8002.2640**	2	1	0,030	
				yellow	ST/PT	**84-8002.4620**	2	1	0,030	
					f	**84-8002.4640**	2	1	0,030	
	IP40	Multi-LED	24 VDC/20 mA	green	ST/PT	**84-8102.5620**	2	1	0,030	
					f	**84-8102.5640**	2	1	0,030	
				orange	ST/PT	**84-8102.3620**	2	1	0,030	
					f	**84-8102.3640**	2	1	0,030	
				red	ST/PT	**84-8102.2620**	2	1	0,030	
					f	**84-8102.2640**	2	1	0,030	
				yellow	ST/PT	**84-8102.4620**	2	1	0,030	
					f	**84-8102.4640**	2	1	0,030	
		single-LED	24 VDC/20 mA	green	ST/PT	**84-8101.5620**	2	1	0,030	
					f	**84-8101.5640**	2	1	0,030	
				orange	ST/PT	**84-8101.3620**	2	1	0,030	
					f	**84-8101.3640**	2	1	0,030	
				red	ST/PT	**84-8101.2620**	2	1	0,030	
					f	**84-8101.2640**	2	1	0,030	
				yellow	ST/PT	**84-8101.4620**	2	1	0,030	
					f	**84-8101.4640**	2	1	0,030	

connection method: ST/PT = soldering-/plug-in terminal, f = flat ribbon cable 300 mm
technical drawing as of page 190, circuit drawing as of page 194

indicator element with PCB terminal

illumination and mounting flange to be ordered separately

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

technical drawing as of page 190, components layouts as of page 192

switching element

incl. illumination

	degree of protection	illumination	operation voltage	colour of LED	connection method	part no.	circuit drawing	technical drawing	e	
switching element momentary action 1 NO	IP 40	Multi-LED	24 VDC/20 mA	green	ST/PT	**84-8612.5620**	4	1	0,090	
					f	**84-8612.5640**	4	1	0,090	
				orange	ST/PT	**84-8612.3620**	4	1	0,090	
					f	**84-8612.3640**	4	1	0,090	
				red	ST/PT	**84-8612.2620**	4	1	0,090	
					f	**84-8612.2640**	4	1	0,090	
				yellow	ST/PT	**84-8612.4620**	4	1	0,090	
					f	**84-8612.4640**	4	1	0,090	
		single-LED	24 VDC/20 mA	green	ST/PT	**84-8611.5620**	4	1	0,090	
					f	**84-8611.5640**	4	1	0,090	
				orange	ST/PT	**84-8611.3620**	4	1	0,090	
					f	**84-8611.3640**	4	1	0,090	
				red	ST/PT	**84-8611.2620**	4	1	0,090	
					f	**84-8611.2640**	4	1	0,090	
				yellow	ST/PT	**84-8611.4620**	4	1	0,090	
					f	**84-8611.4640**	4	1	0,090	
		without	-	-	ST/PT	**84-8610.0020**	3	1	0,090	
					f	**84-8610.0040**	3	1	0,090	
	IP 67	Multi-LED	12 VDC/40 mA	green	ST/PT	**84-8512.5320**	4	1	0,090	
					f	**84-8512.5340**	4	1	0,090	
				orange	ST/PT	**84-8512.3320**	4	1	0,090	
					f	**84-8512.3340**	4	1	0,090	
				red	ST/PT	**84-8512.2320**	4	1	0,090	
					f	**84-8512.2340**	4	1	0,090	
				yellow	ST/PT	**84-8512.4320**	4	1	0,090	
					f	**84-8512.4340**	4	1	0,090	
			24 VDC/20 mA	blue	ST/PT	**84-8512.6620**	4	1	0,090	
					f	**84-8512.6640**	4	1	0,090	
				green	ST/PT	**84-8512.5620**	4	1	0,090	
					f	**84-8512.5640**	4	1	0,090	
				orange	ST/PT	**84-8512.3620**	4	1	0,090	
					f	**84-8512.3640**	4	1	0,090	
				red	ST/PT	**84-8512.2620**	4	1	0,090	
					f	**84-8512.2640**	4	1	0,090	
				yellow	ST/PT	**84-8512.4620**	4	1	0,090	
					f	**84-8512.4640**	4	1	0,090	
		without	-	-	ST/PT	**84-8510.0020**	3	1	0,090	
					f	**84-8510.0040**	3	1	0,090	

connection method: ST/PT = soldering-/plug-in terminal, f = flat ribbon cable 300 mm
technical drawing as of page 190, circuit drawing as of page 194

switching element with PCB terminal

illumination and mounting flange to be ordered separately

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

technical drawing as of page 190, components layouts as of page 192, circuit drawing as of page 194

cable shoe

	connection method	part no.	e	
cable shoe	plug-in terminal 2,8 x 0,8 mm	**84-9420**	0,001	

insulation socket

	part no.	e	
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.	e	
LED base T 1 Bi-Pin	1 chip	2,2 VDC/20 mA	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	
			yellow	**10-2602.3174D (92-948.4)**	0,001	
	6 chips	6.0 VDC/40 mA	orange	**10-5606.3243D (92-944.3)**	0,001	
			red	**10-5606.3242D (92-944.2)**	0,001	
			yellow	**10-5606.3244D (92-944.4)**	0,001	
		12.0 VDC/20 mA	orange	**10-5609.3173D (92-945.3)**	0,001	
			red	**10-5609.3172D (92-945.2)**	0,001	
			yellow	**10-5609.3174D (92-945.4)**	0,001	

assembling

mounting flange

for indicator/switching element with PCB terminal

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

technical drawing as of page 190

lens remover

	part no.	e	
lens remover	**61-9730.0**	0,011	

dismantling tool

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

mounting tool

	part no.	e	
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.	grey RAL 7016	**84-9500.8**	6	
	yellow RAL 1023	**84-9500.4**	6	

technical drawing as of page 190

adaptor round 35 - 25 mm

for housing for stop request pushbutton for poles of 35 - 25 mm dia.

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

technical drawing as of page 190

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.	grey RAL 7016	**84-9600.8**	-	
	yellow RAL 1023	**84-9600.4**	-	

technical drawing as of page 190

adaptor round 35 - 30 mm

for housing for stop request pushbutton for poles of 35 - 25 mm dia.

	colour	part no.	technical drawing	
adaptor round 35 - 30 mm	grey RAL 7016	**84-9700.8**	7	
	yellow RAL 1023	**84-9700.4**	7	

technical drawing as of page 190

housing for stop request pushbutton for wall mounting

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

technical drawing as of page 190

switching element

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 polyacetate POM

mechanical characteristics

actuating force
4,0 N ± 0.,2 (measured at the lens)

actuating travel
switching element 0.5 mm

ambient air temperature
-25°C to +70°C
(as per DIN IEC 68-)

connection method
plug-in/soldering terminals 2.8 x 0.8 mm
flat ribbon cable connectors
PCB terminals

mechanical life
>= 1 mio. operations as per IEC 512-5, test 9a

rebound time
<=1 ms

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)

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

storage temperature
-40°C to +85°C
(as per DIN IEC 68-)

electrical characteristics

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

electrical life
>= 500,000 operations at 42 VDC/50 mA as per IEC 512-5, test 9c

insulation resistance
>= 1,000,000,000 Ω 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

volume resistance
starting value (initial) <= 100 mΩ as per IEC 512-2, test 2b

actuator

material

actuator case
polyetherimide PEI or aluminium

lenses
polycarbonate PC or aluminium

mechanical characteristics

actuating force
4,0 N ± 0.,2 (measured at the lens)

actuating travel
total switching travel 1.2 mm

ambient air temperature
-25°C to +70°C
(as per DIN IEC 68-)

degree of protection
front as per IEC 529
IP 67, IP 65 and IP40

mechanical life
>= 1 mio. operations as per IEC 512-5, test 9a

storage temperature
-40°C to + 85°C
(as per DIN IEC 68-)

electrical characteristics

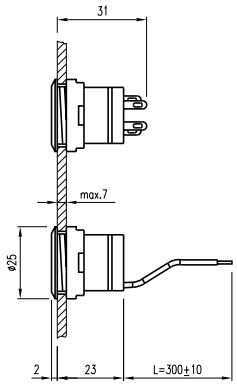
electrostatic breakdown value

plastic case	>=	15 kV as per IEC 801-2
aluminium case	>=	5 kV as per IEC 801-2

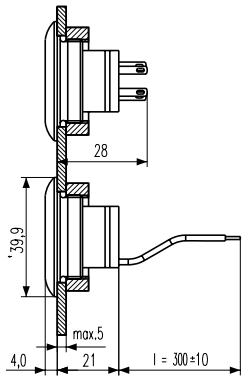
(mounted in plastic front panel)

technical drawing

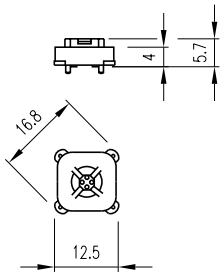
1 indicator actuator, illuminated-/pushbutton actuator, indicator element, switching element
page 180, 182, 184



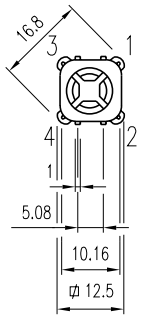
2 indicator actuator, illuminated-/pushbutton actuator
page 180

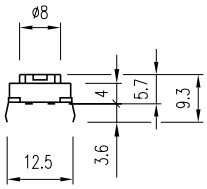


3 indicator element with PCB terminal
page 183

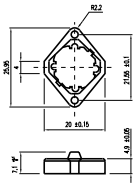


4 switching element with PCB terminal
page 185

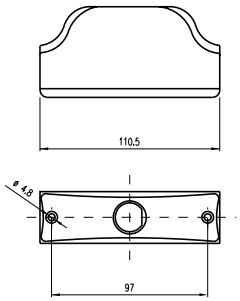


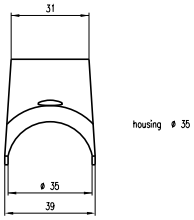


5 mounting flange
page 186

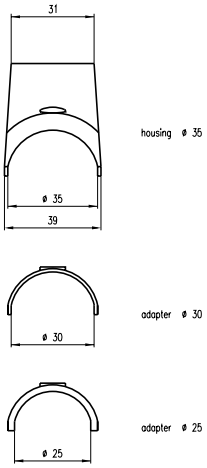


6 housing for stop request pushbutton for pole mounting 35 mm dia.
page 186





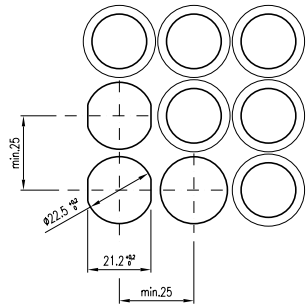
7 adaptor round 35 - 25 mm, adaptor round 35 - 30 mm
page 187



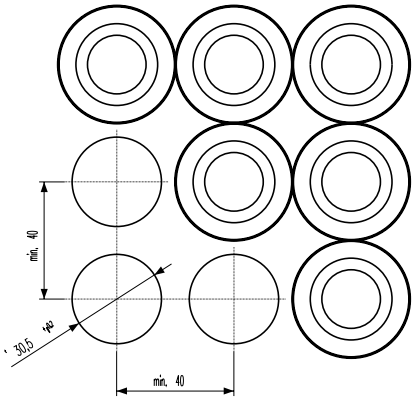
housing for stop request pushbutton for pole mounting 38 mm dia.

mounting dimension

1 indicator actuator, illuminated-/pushbutton actuator
page 180



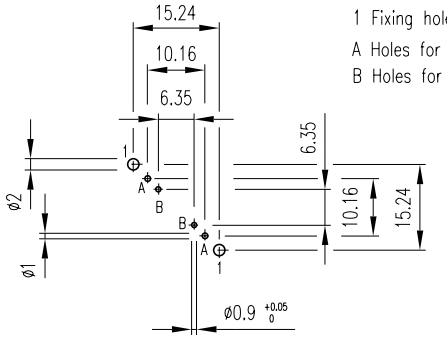
2 indicator actuator, illuminated-/pushbutton actuator
page 180



components layouts

1 indicator element with PCB terminal
page 183

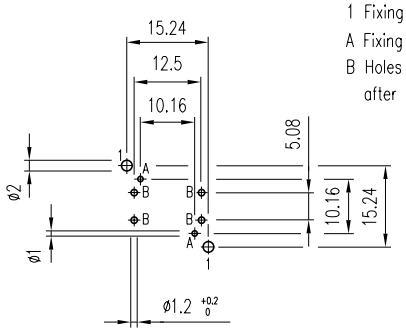
Drilling plan (conductor side of board)



1 Fixing holes for mounting flange
A Holes for LED
B Holes for centering pin

2 switching element with PCB terminal
page 185

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

	circuit drawing
1	
2	
3	
4	
5