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Series 84

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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 (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
<u>Recommended accessories:</u>	
- 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.



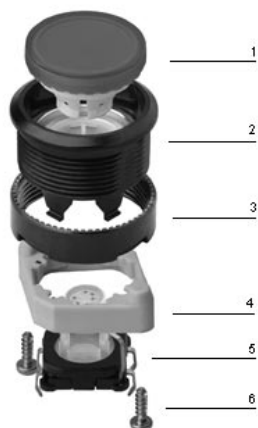
- 1 lens
- 2 actuator case
- 3 fixing nut
- 4 switching element with soldering-/plug-in terminal

indicator, illuminated-/pushbutton 40 mm dia.

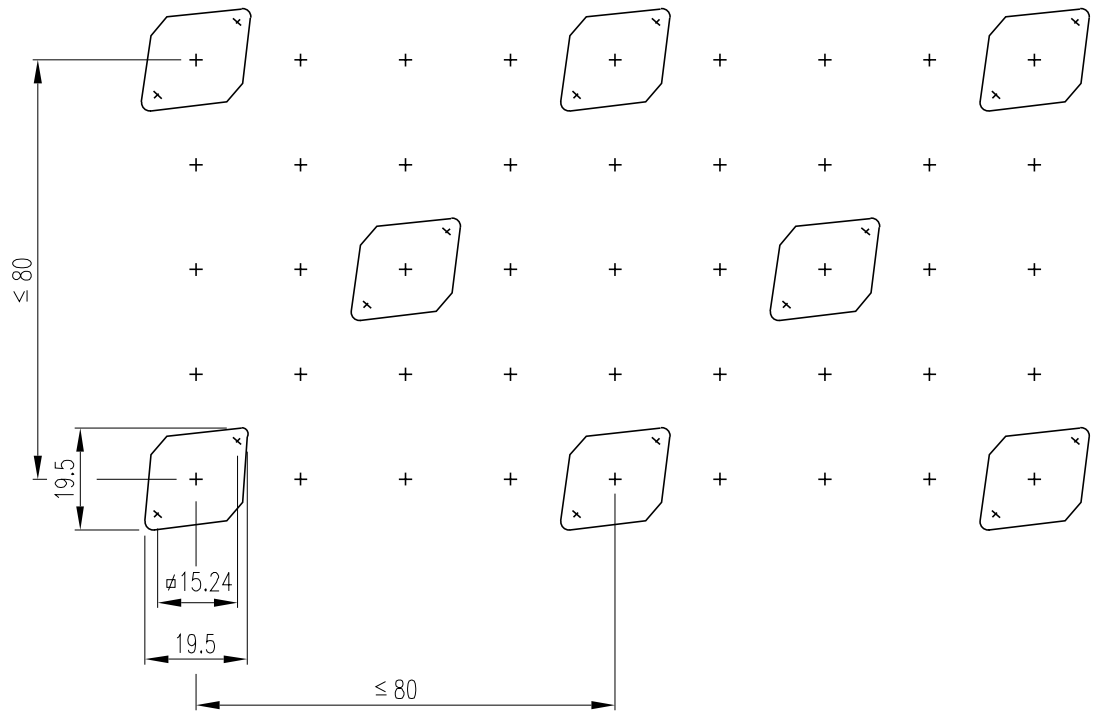


- 1 actuator
- 2 fixing nut
- 3 switching element with flat ribbon cable

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


indicator element	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	
			24 VDC/20 mA	green	ST/PT	84-8002.4320	2	1	0,030	
					f	84-8002.4340	2	1	0,030	
				orange	ST/PT	84-8002.5620	2	1	0,030	
					f	84-8002.5640	2	1	0,030	
				red	ST/PT	84-8002.3620	2	1	0,030	
					f	84-8002.3640	2	1	0,030	
	yellow	ST/PT	84-8002.2620	2	1	0,030				
		f	84-8002.2640	2	1	0,030				
	IP40	Multi-LED	24 VDC/20 mA	green	ST/PT	84-8102.4620	2	1	0,030	
					f	84-8102.4640	2	1	0,030	
				orange	ST/PT	84-8102.5620	2	1	0,030	
					f	84-8102.5640	2	1	0,030	
				red	ST/PT	84-8102.3620	2	1	0,030	
					f	84-8102.3640	2	1	0,030	
			single-LED	green	24 VDC/20 mA	ST/PT	84-8102.2620	2	1	0,030
						f	84-8102.2640	2	1	0,030
				orange	ST/PT	84-8101.5620	2	1	0,030	
					f	84-8101.5640	2	1	0,030	
red				ST/PT	84-8101.3620	2	1	0,030		
				f	84-8101.3640	2	1	0,030		
yellow	ST/PT	84-8101.2620	2	1	0,030					
	f	84-8101.2640	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	
			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 \pm 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

\geq 1 mio. operations as per IEC 512-5, test 9a

rebound time

\leq 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

\geq 500,000 operations at 42 VDC/50 mA as per IEC 512-5, test 9c

insulation resistance

\geq 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) \leq 100 m Ω 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 \pm 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

\geq 1 mio. operations as per IEC 512-5, test 9a

storage temperature

-40°C to +85°C
(as per DIN IEC 68-)

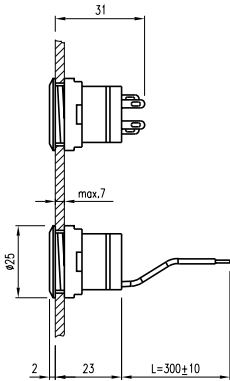
electrical characteristics

electrostatic breakdown value

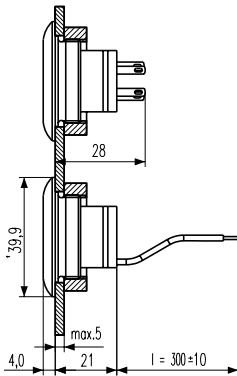
plastic case \geq 15 kV as per IEC 801-2
aluminium case \geq 5 kV as per IEC 801-2
(mounted in plastic front panel)

technical drawing

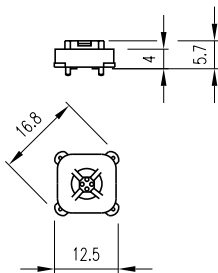
1 indicator actuator, illuminated-/pushbutton actuator, indicator element, switching element
 page 180, 182, 184



2 indicator actuator, illuminated-/pushbutton actuator
 page 180

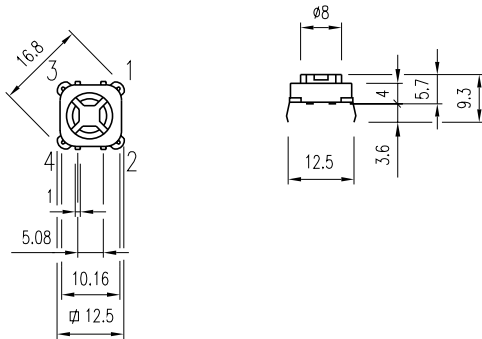


3 indicator element with PCB terminal
 page 183



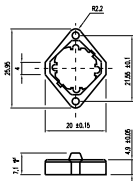
4 switching element with PCB terminal

page 185



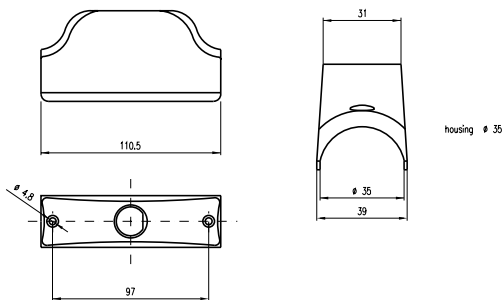
5 mounting flange

page 186



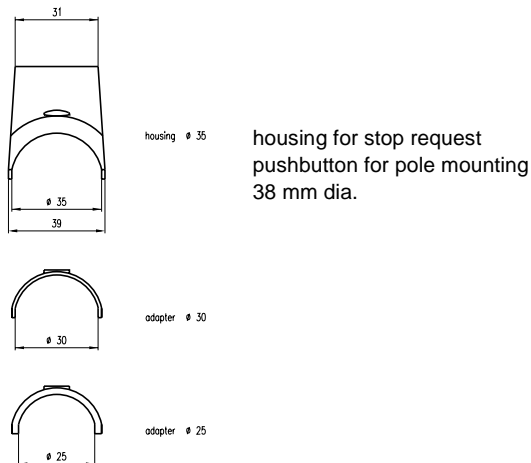
6 housing for stop request pushbutton for pole mounting 35 mm dia.

page 186



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

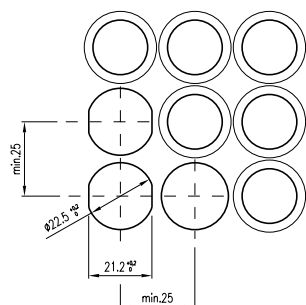
page 187



mounting dimension

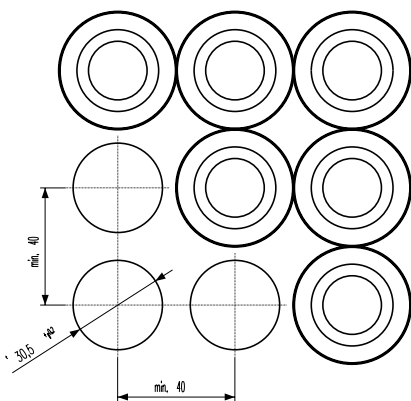
1 indicator actuator, illuminated-/pushbutton actuator

page 180



2 indicator actuator, illuminated-/pushbutton actuator

page 180

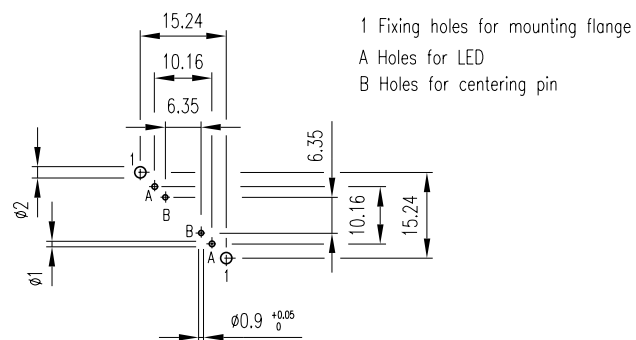


components layouts

1 indicator element with PCB terminal

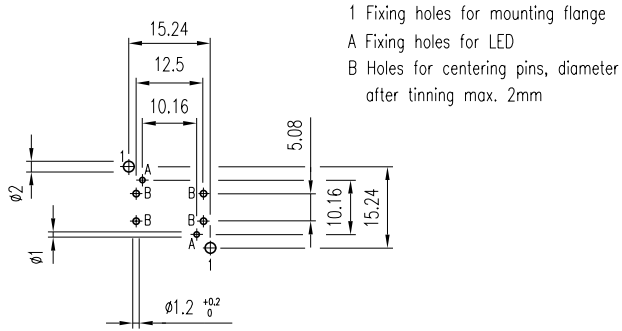
page 183

Drilling plan (conductor side of board)







2 switching element with PCB terminal
page 185

Drilling plan(conductor side of board)



* Final diameter after tinning

	circuit drawing
1	
2	
3	
4	
5	