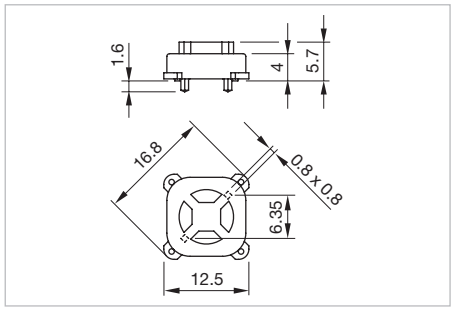
Illumination element

Product can differ from the current configuration.



Dimensions

Equipment consisting of (schematic overview)

Lens *page 7*

LED

Illumination element

Each Part Number listed below includes all the black components shown in the 3D-drawing.

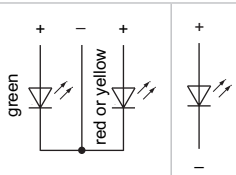
To obtain a complete unit, please select the red components from the pages shown.

Additional Information

- The customer has to decide what series resistor shall be used to the LED
- Dimensions with fitted lens see details «Lens»
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

LED colour	Forward voltage typ.	Lumi. intensity	Dom. wavelength	Terminal	Part No.	Component layout	Wiring diagram	Weight
 **Illumination element**								
Single-LED red	2.1 VDC @ 20 mA	200 mcd	625 nm	PCB	**70-820.2**	3	2	0.001 kg
Single-LED orange	2.1 VDC @ 20 mA	220 mcd	590 nm	PCB	**70-820.3**	3	2	0.001 kg
Single-LED yellow	3.3 VDC @ 30 mA	500 mcd	570 nm	PCB	**70-820.4**	3	2	0.001 kg
Single-LED green	3.5 VDC @ 20 mA	250 mcd	525 nm	PCB	**70-820.5**	3	2	0.001 kg
Single-LED blue	3.5 VDC @ 20 mA	450 mcd	470 nm	PCB	**70-820.6**	3	2	0.001 kg
Single-LED white	3.3 VDC @ 20 mA	600 mcd	x=0.29/y=0.31 nm	PCB	**70-820.9**	3	2	0.001 kg
 **Illumination element**								
				PCB	**92-800.042**	1		0.001 kg

The component layouts you will find from page 10

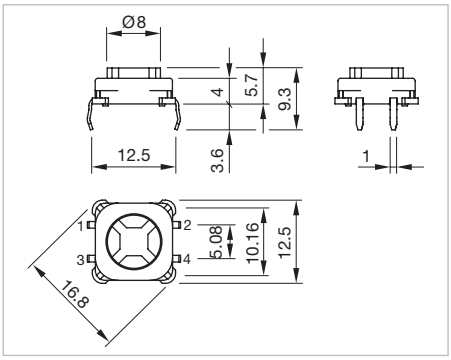


Wiring diagram 1

Wiring diagram 2

Switching element with illumination

Product can differ from the current configuration.



Dimensions

Equipment consisting of (schematic overview)

Lens *page 7*

LED

Switching element

Each Part Number listed below includes all the black components shown in the 3D-drawing.

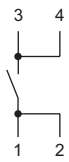
To obtain a complete unit, please select the red components from the pages shown.

Additional Information

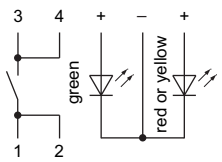
- Contact normally open
- Switching action momentary
- The customer has to decide what series resistor shall be used to the LED
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination
- Dimensions with fitted lens see details «Lens»

LED colour	Forward voltage typ.	Contact material	Lumi. intensity	Dom. wavelength	Terminal	Part No.	Component layout	Wiring diagram	Weight
 **Switching element with illumination**									
Single-LED red	2.1 VDC @ 20 mA	Gold	200 mcd	625 nm	PCB	**70-220.2**	4	3	0.001 kg
Single-LED orange	2.1 VDC @ 20 mA	Gold	220 mcd	590 nm	PCB	**70-220.3**	4	3	0.001 kg
Single-LED yellow	3.3 VDC @ 20 mA	Gold	500 mcd	570 nm	PCB	**70-220.4**	4	3	0.001 kg
Single-LED green	3.5 VDC @ 20 mA	Gold	250 mcd	525 nm	PCB	**70-220.5**	4	3	0.001 kg
Single-LED blue	3.5 VDC @ 20 mA	Gold	450 mcd	470 nm	PCB	**70-220.6**	4	3	0.001 kg
Single-LED white	3.3 VDC @ 20 mA	Gold	600 mcd	x=0.29/y=0.31 nm	PCB	**70-220.9**	4	3	0.001 kg
 **Switching element with illumination**									
		Gold			PCB	**92-851.342**	4	1	0.001 kg

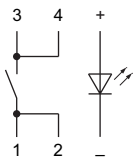
The component layouts you will find from page 10



Wiring diagram 1



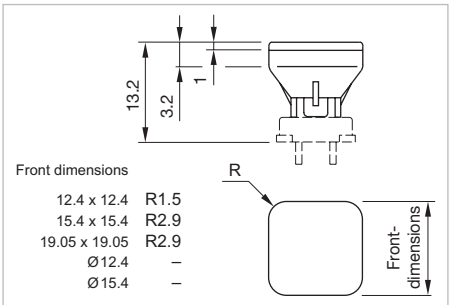
Wiring diagram 2



Wiring diagram 3

Front

Lens



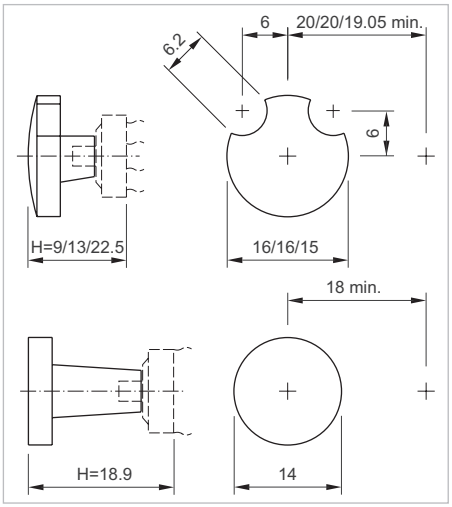
Dimensions

Lens	Part No.	Weight
 **Lens, Front dimension 19.05 x 19.05 mm**		
Plastic white translucent	**70-920.9**	0.001 kg
 **Lens, Front dimension 15.4 x 15.4 mm**		
Plastic red translucent	**70-921.2**	0.001 kg
Plastic orange translucent	**70-921.3**	0.001 kg
Plastic yellow translucent	**70-921.4**	0.001 kg
Plastic green translucent	**70-921.5**	0.001 kg
Plastic blue translucent	**70-921.6**	0.001 kg
Plastic white translucent	**70-921.9**	0.001 kg
 **Lens, Front dimension 12.4 x 12.4 mm**		
Plastic red translucent	**70-922.2**	0.001 kg
Plastic orange translucent	**70-922.3**	0.001 kg
Plastic yellow translucent	**70-922.4**	0.001 kg
Plastic green translucent	**70-922.5**	0.001 kg
Plastic blue translucent	**70-922.6**	0.001 kg
Plastic white translucent	**70-922.9**	0.001 kg
 **Lens, Front dimension Ø 15.4 mm**		
Plastic red translucent	**70-911.2**	0.001 kg
Plastic orange translucent	**70-911.3**	0.001 kg
Plastic yellow translucent	**70-911.4**	0.001 kg
Plastic green translucent	**70-911.5**	0.001 kg
Kunststoff weiss transluzent	**70-911.9**	0.001 kg

70 Accessories

Lens	Part No.	Weight
 **Lens, Front dimension Ø 12.4 mm**		
Plastic red translucent	**70-912.2**	0.001 kg
Plastic orange translucent	**70-912.3**	0.001 kg
Plastic yellow translucent	**70-912.4**	0.001 kg
Plastic green translucent	**70-912.5**	0.001 kg
Plastic white translucent	**70-912.9**	0.001 kg

Spacing cap



Dimensions

Product attribute	Part No.	Weight
 **Spacing cap**		
without recesses for LED, H = 18.9 mm	**70-901.0**	0.001 kg
2 recesses for LED, H = 9 mm	**70-910.0**	0.001 kg
2 recesses for LED, H = 13 mm	**70-911.0**	0.001 kg
2 recesses for LED, H = 22.5 mm	**70-912.0**	0.001 kg

Illumination

Single-LED, T1 Bi-Pin

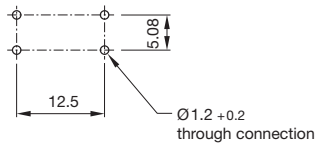
Additional Information

- The customer has to decide what series resistor shall be used to the LED
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

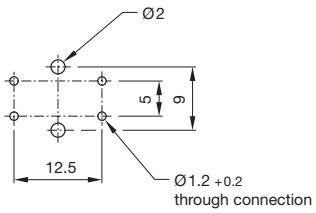
LED colour	Forward voltage typ.	Lumi. intensity	Dom. wavelength	Part No.	Weight
 **Single-LED**					
Single-LED red	2.1 VDC @ 20 mA	200 mcd	625 nm	**10-2602.3202L**	0.001 kg
Single-LED orange	2.1 VDC @ 20 mA	220 mcd	590 nm	**10-2602.3203L**	0.001 kg
Single-LED yellow	3.3 VDC @ 20 mA	500 mcd	570 nm	**10-2602.3204L**	0.001 kg
Single-LED green	3.5 VDC @ 20 mA	250 mcd	525 nm	**10-2602.3205L**	0.001 kg
Single-LED blue	3.5 VDC @ 20 mA	450 mcd	470 nm	**10-2602.3206L**	0.001 kg
Single-LED white	3.3 VDC @ 20 mA	600 mcd	x=0.29/y=0.31 nm	**10-2602.3209L**	0.001 kg

70 Drawings

Drawings



Component layout 1

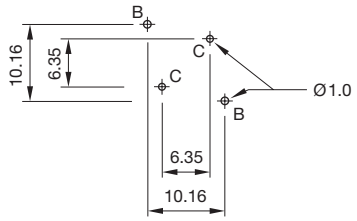


Component layout 2

Single-LED

Drilling plan (element side)

B Holes for LED
C Holes for centering pins

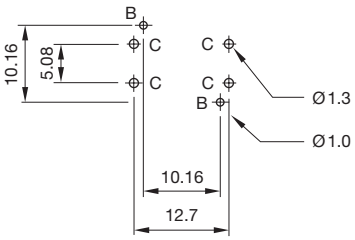


Component layout 3

Single-LED

Drilling plan (element side)

B Holes for LED
C Holes for contact pins
Pad max. Ø 2.5 mm
Through-connection recommended



Component layout 4

Switching element illuminated

Switching system

Short-travel switching system with two independent contact points and tactile operation. Guarantees reliable switching even of very light loads.
1 normally open contact

Material

Material of contact
Gold (Au)

Switching element
Thermoplastic Polyester (PET, PBT) and Polyacetale (POM)

Mechanical characteristics

Actuating force
with overlay foil 4 N ±1,5 N
Max. actuating force > 50 N, as per DIN 42115

Actuating travel
0.4 mm

Rebound time
≤ 1 ms

Resistance to heat of soldering
250 °C, 3 s (PCB assembly)
320 °C, 3 s (when using a soldering iron)

Mechanical lifetime
> 5 million operations

Electrical characteristics

Contact resistance
Starting value (initial) ≤ 100 mΩ, as per IEC 60512-2-2b

Isolation resistance
≥ 1000 MΩ

Contact resistance
≤ 100 mΩ
as per 500 000 cycles of operation at 12 VDC, 5 mA resistive load ≤ 200 mΩ

Electrical life
≥ 500 000 operations at 42 VDC, 50 mA, as per IEC 60512-5-9c
When attention is paid to the direction of current flow from terminal 3/4 to 1/2 the electrical life can be prolonged.

Switch rating
max. 2 VA (resistive load)

Switch rating

Switching voltage VDC/VAC	min. 50 mV	max. 42 V
Switching current VDC/VAC	min. 10 µA	max. 100 mA
Power rating	max. 2 W	

Electric strength
500 VAC, 50 Hz, 1 min, as per IEC 60512-2-4a

Environmental conditions

Storage temperature
-40 °C … +85 °C

Operating temperature
-25 °C … +70 °C

Switching element non-illuminated Part No. 70-100.0 and 70-101.0

Switching system

Short-travel switching system with two independent contact points and tactile operation. Guarantees reliable switching even of very light loads.
1 normally open contact

Material

Material of contact
Silver (Ag)

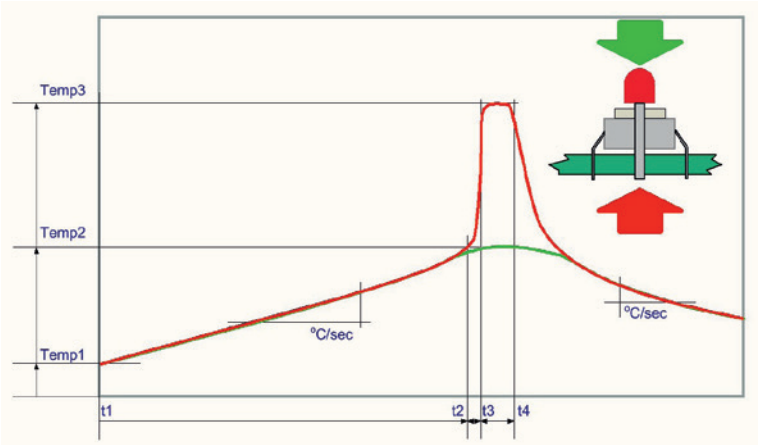
Mechanical characteristics

Actuating force
with overlay foil 5 N ±2 N
Max. actuating force >50 N, as per DIN 42115
Actuating travel
0.3 mm

Rebound time
≤ 5ms

Mechanical lifetime
> 1 million operations

Temperature curve wave soldering



Green curve:	Temperature on the component side of the pcb
Red curve:	Temperature on the soldering side of the pcb
Room temperature:	Temp 1
Preheating:	Temperature process = Temp 1 … Temp 2 Process time = t1 … t2
Ramp up to soldering temperature:	Process time = t2 … t3
Soldering phase:	Temperature process = Temp 3 Process time = t3 … t4

Iron soldering

Basic specification for iron soldering IEC 60068-2-20

Maximum temperature at tip of iron:	320 °C
Maximum soldering time:	3 sec

Cleaning/Lacquering

The switching elements are not sealed. Cleaning up the PCB may damage the contacts in the switching elements. For this reason, the following points should be noted:

- When soldering make sure that the flux does not pass on the upper side of the PCB.
- When cleaning the PCB with detergents ensure that no dust or other debris may get inside of the switching elements.
- Ensure that no lacquer penetrates into the interior of the switching element when lacquering the PCB.

Storage of components

To obtain the optimum solderability of the components, the following points should be noted during storage:

- Do not store components in locations with high temperature or humidity.
- Do not expose components to corrosive gases.
- Avoid direct sunlight for a long period.