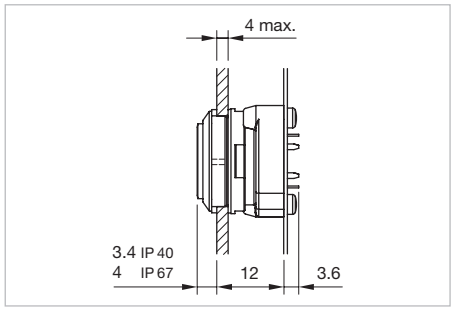
92 PCB pushbuttons

Pushbutton

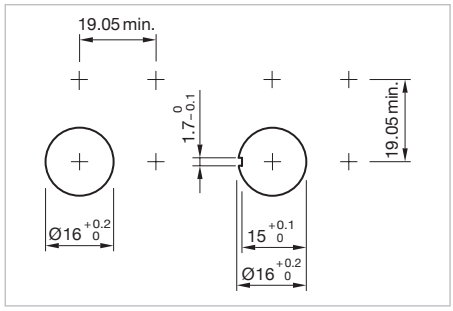
Product can differ from the current configuration.



Dimensions

Additional Information

- Lens opaque
- IP 67 version without bezel



Mounting cut-outs

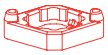
Equipment consisting of (schematic overview)

Lens

Actuator

Bezel

Fixing nut



Mounting flange *page 19*

Switching element *page 16*

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.

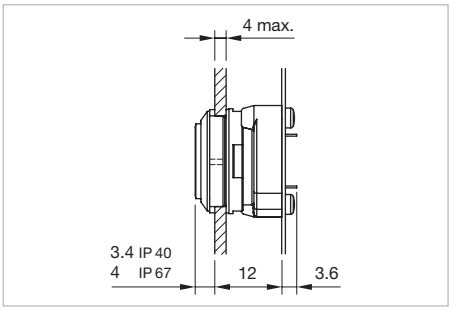
Front protection	Front	Pressure plate	Lens	Switching action	Part No.	Wiring diagram	Weight
 **Pushbutton actuator, Front dimension 18.8 x 18.8 mm**							
IP 67	Plastic white	Plastic black		B	**92-341.000**	1	0.002 kg
		Plastic grey		B	**92-341.800**	1	0.002 kg
	Plastic black	Plastic black		B	**92-441.000**	1	0.002 kg
		Plastic grey		B	**92-441.800**	1	0.002 kg
 **Pushbutton actuator, Front dimension 18.4 x 18.4 mm**							
IP 40	Plastic white		Plastic black	B	**92-356.000**	1	0.002 kg
			Plastic grey	B	**92-356.800**	1	0.002 kg
			Plastic white	B	**92-356.900**	1	0.002 kg
	Plastic black		Plastic black	B	**92-456.000**	1	0.002 kg
			Plastic grey	B	**92-456.800**	1	0.002 kg
			Plastic white	B	**92-456.900**	1	0.002 kg

Switching action: B = Momentary

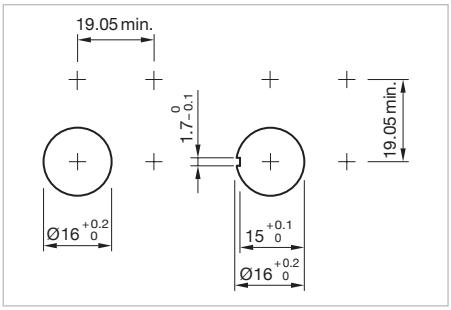
Wiring diagram 1

Pushbutton actuator IP 40

Product can differ from the current configuration.



Dimensions



Mounting cut-outs

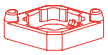
Equipment consisting of (schematic overview)


Lens *page 14*


Actuator


Bezel *page 15*


Fixing nut


Mounting flange *page 19*


Switching element *page 16*

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.

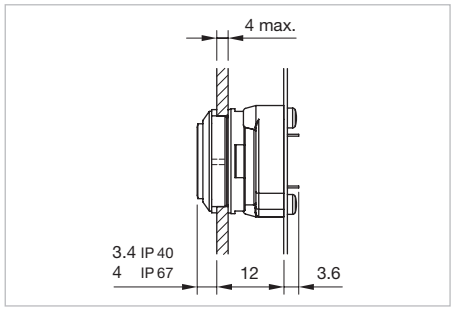
Front	Switching action	Part No.	Wiring diagram	Weight
 **Pushbutton actuator IP 40, Front dimension 18.4 x 18.4 mm**				
Plastic white	B	**92-350.000**	1	0.003 kg
Plastic black	B	**92-450.000**	1	0.003 kg

Switching action: B = Momentary

Wiring diagram 1

Indicator

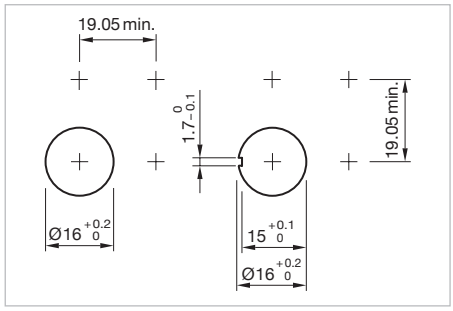
Product can differ from the current configuration.



Dimensions

Additional Information

- Transparent lens and pressure plate
- IP 67 version without bezel



Mounting cut-outs

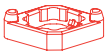
Equipment consisting of (schematic overview)


Lens


Actuator


Bezel


Fixing nut


Mounting flange *page 19*


LED *page 18*


Illumination element *page 16*

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.

Front protection	Front	Pressure plate	Lens	Part No.	Weight
 **Indicator actuator, Front dimension 18.8 x 18.8 mm**					
IP 67	Plastic white	Plastic red		**92-043.200**	0.003 kg
		Plastic orange		**92-043.300**	0.003 kg
		Plastic yellow		**92-043.400**	0.003 kg
		Plastic green		**92-043.500**	0.003 kg
		Plastic blue		**92-043.600**	0.003 kg
		Plastic colourless		**92-043.700**	0.003 kg
	Plastic black	Plastic red		**92-143.200**	0.003 kg
		Plastic orange		**92-143.300**	0.003 kg
		Plastic yellow		**92-143.400**	0.003 kg
		Plastic green		**92-143.500**	0.003 kg
		Plastic blue		**92-143.600**	0.003 kg
		Plastic colourless		**92-143.700**	0.003 kg
 **Indicator actuator, Front dimension 18.4 x 18.4 mm**					
IP 40	Plastic white		Plastic smoked	**92-058.100**	0.003 kg
			Plastic red	**92-058.200**	0.003 kg
			Plastic orange	**92-058.300**	0.003 kg
			Plastic yellow	**92-058.400**	0.003 kg
			Plastic green	**92-058.500**	0.003 kg
			Plastic blue	**92-058.600**	0.003 kg
			Plastic colourless	**92-058.700**	0.003 kg

Front

Lens plate IP 67

Additional Information

- Material plastic

Product attribute	Dimension	Pressure plate	Part No.	Weight
 **Lens plate for pushbutton and indicator IP 67**				
non-illuminative	12 x 12 mm	black opaque	**92-941.000**	0.001 kg
		grey opaque	**92-941.800**	0.001 kg
illuminative	12 x 12 mm	red transparent	**92-941.200**	0.001 kg
		orange transparent	**92-941.300**	0.001 kg
		yellow transparent	**92-941.400**	0.001 kg
		green transparent	**92-941.500**	0.001 kg
		blue transparent	**92-941.600**	0.001 kg
		colourless transparent	**92-941.700**	0.001 kg

Lens IP 40

Additional Information

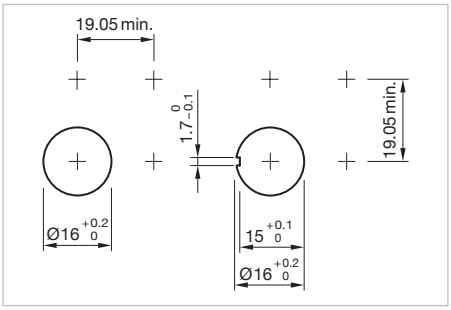
- Material plastic
- With white marking plate

Product attribute	Dimension	Lens	Part No.	Weight
 **Lens for pushbutton and indicator IP 40**				
non-illuminative	13.2 x 13.2 mm	black opaque	**92-956.000**	0.001 kg
		grey opaque	**92-956.800**	0.001 kg
		white opaque	**92-956.900**	0.001 kg
illuminative	13.2 x 13.2 mm	red translucent	**92-956.200**	0.001 kg
		orange translucent	**92-956.300**	0.001 kg
		yellow translucent	**92-956.400**	0.001 kg
		green translucent	**92-956.500**	0.001 kg
		blue translucent	**92-956.600**	0.001 kg
		smoked transparent	**92-958.100**	0.001 kg
		red transparent	**92-958.200**	0.001 kg
		orange transparent	**92-958.300**	0.001 kg
		yellow transparent	**92-958.400**	0.001 kg
		green transparent	**92-958.500**	0.001 kg
		blue transparent	**92-958.600**	0.001 kg
		colourless transparent	**92-958.700**	0.001 kg

Bezel IP 40

Material	Colour	Part No.	Weight
 **Front bezel for pushbutton and indicator IP 40**			
Plastic	black	**92-912.0**	0.001 kg
	white	**92-912.9**	0.001 kg

Blind plug



Mounting cut-outs

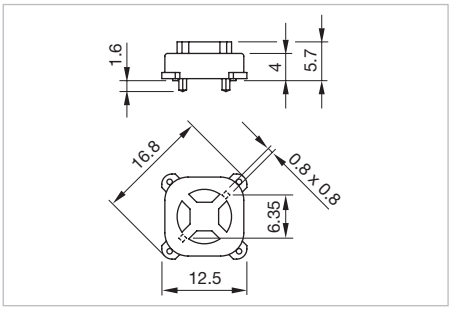
Dimension	Material	Colour	Part No.	Weight
 **Blind plug**				
18 x 18 mm	Plastic	black	**51-948.0**	0.003 kg

Rear side

Illumination element PCB

Additional Information

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



Dimensions

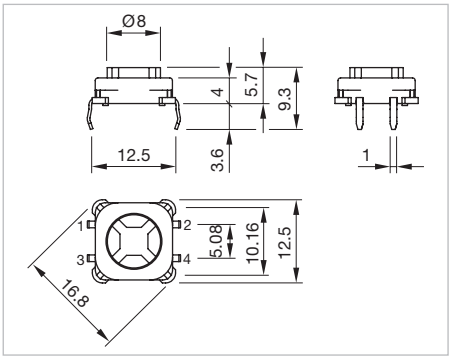
Terminal	Part No.	Compo-nent layout	Weight
 **Illumination element PCB mounting**			
PCB	**92-800.042**	1	0.001 kg

The component layouts you will find from page {$l=BR92_KAZE_Zeichnung}

Switching element PCB illuminative

Additional Information

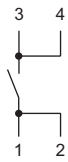
- The customer has to decide what series resistor shall be used to the LED



Dimensions

Contacts	Terminal	Part No.	Compo-nent layout	Wiring diagram	Weight
 **Switching element PCB mounting illuminative**					
1 NO	PCB	**92-851.342**	2	1	0.001 kg

The component layouts you will find from page {$l=BR92_KAZE_Zeichnung}



Wiring diagram 1

Spacer

Additional Information

- Adjustable for front plate thickness of 2/2.5/3/3.5/4 mm
- When fitting, ensure that back of panel is free of grease and dirt

Part No.	Weight
 **Spacer**	
92-965.0	0.003 kg

PCB assembled

Additional Information

- For discrete switching applications including switching element and mounting flange, soldering terminal (assembled PCB incl. series resistor and LED on request)

Part No.	Weight
 **PCB assembled**	
92-981.0	0.003 kg

Mounting

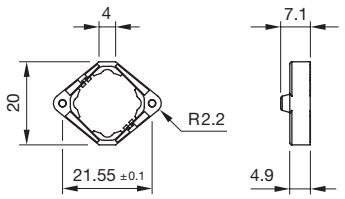
Anti-twist ring

Additional Information

- For front panel thickness max. 2 mm

Mounting cut-out	Part No.	Weight
 **Anti-twist ring**		
Ø 16 mm	**51-910**	0.001 kg

Mounting flange



Dimensions

Part No.	Weight
 **Mounting flange**	
92-960.0	0.001 kg

Lens remover

Additional Information

- For lens IP 40 only

Part No.	Weight
 **Lens remover**	
18-910	0.002 kg

92 Accessories

Mounting tool

Additional Information

- For tightening or loosening of the fixing nut

Part No.	Weight
 **Mounting tool**	
01-907	0.020 kg

Dismantling tool

Additional Information

- For actuator dismantling of switching element, illumination element and mounting flange

Part No.	Weight
 **Dismantling tool**	
92-971.0	0.002 kg

92 Technical data

Pushbutton and 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

Lens
Polycarbonate (PC)

Front bezel
Thermoplastic Elastomer (TPE)

Frame
Thermoplastic Polyester (PBT)

Material of contact
Gold (Au)

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

Actuator housing
Thermoplastic Polyester (PBT)

Mechanical characteristics

Tightening torque
Fixing screw 40 Ncm recommended
Fixing nut max. 50 Ncm

Actuating force
2.7 N ±1 N measured at the switching element
5 N measured at the lens

Actuating travel
Switching element 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
≥ 1 Million operations as per IEC 60512-5-9a

Electrical characteristics

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

Isolation resistance
≥ 10^9 Ω between all terminals at 100 VDC, as per IEC 60512-2-3a

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.

Electrostatic discharge (ESD)
15 kV

Switch rating

Switching voltage	min. 50 mV AC/DC
	max. 42 V AC/DC
Switching current	min. 10 µA AC/DC
	max. 100 mA AC/DC
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 … +80 °C

Operating temperature
-25 °C … +70 °C

Front protection
Switching element IP 40 (fluxproof to DIN 41640 Part 84)
front IP 67 or IP 40

Shock resistance
(semi-sinusoidal)
max. 500 m/s², pulse width 11 ms, 3-axis,
as per EN IEC 60068-2-27

Vibration resistance
(sinusoidal)
max. 100 m/s² at 10 Hz … 500 Hz, 10 cycles, 3-axis,
as per EN IEC 60068-2-6

Approvals

Declaration of conformity
CE

EAO reserves the right to alter specifications without further notice.

Suppressor circuits

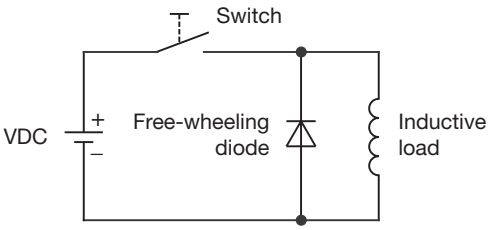
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e. g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

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.

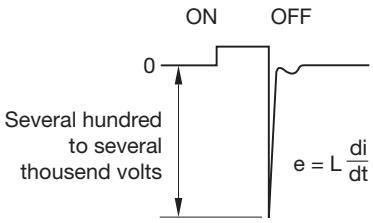
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage (VR) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum current 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

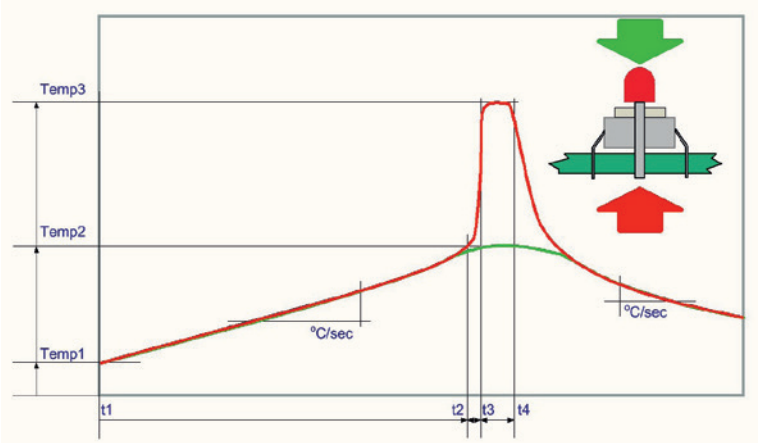


Note for soldering

Process parameter for wave soldering
Basic specification for wave soldering J-STD 75 W4C

Maximum temperature on the component side of the pcb (Temperature must not exceed during the entire processing)	120 °C
Preheating phase (t1 … t2)	70 … 120 sec
Ramp up	typ. + 1°C/sec
Ramp up to maximum temperature (t2 … t3)	not defined
Maximum temperature on the soldering side (Temp 3)	250 °C
Maximum time of soldering process (t3 … t4)	3 sec
Ramp down at 170 °C:	typ. –2 °C/sec

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.