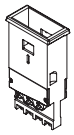
Illuminated pushbutton double-headed, IP 40

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Lens *Seite 13*

LED *Seite 22*

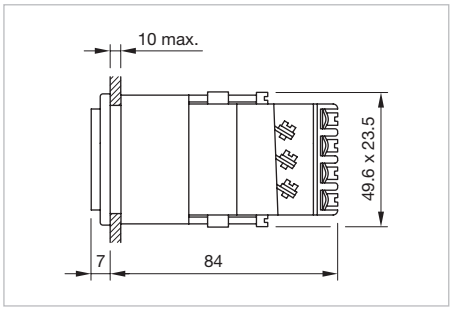


Actuator

Fixing sleeve

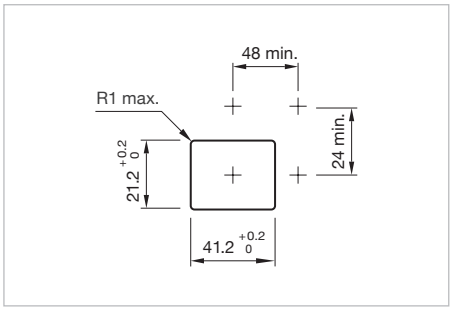
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]

Product can differ from the current configuration.



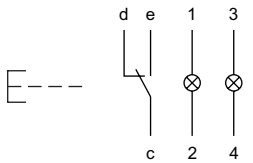
Mounting cut-outs [mm]

Additional Information

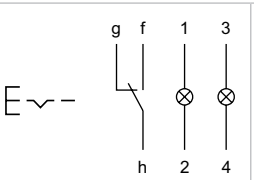
- For front dimension 24 x 48 mm
- For LED element fitting information see «Application guidelines»

Product attribute	Contacts	Switching action	Terminal	Part No.	Wiring diagram	Weight
 **Illuminated pushbutton actuator double-headed**						
has two independent lamp bases	1 C	B	Screw	**03-627.011**	1	0.075 kg
		C	Screw	**03-628.011**	2	0.075 kg
has two independent lamp bases, has independent changeover	2 C	B	Screw	**03-624.011**	3	0.080 kg
		C	Screw	**03-625.011**	4	0.080 kg
		B - C	Screw	**03-626.011**	5	0.080 kg

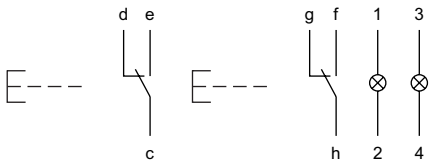
Contacts: C = Changeover
Switching action: B = Momentary, C = Maintained



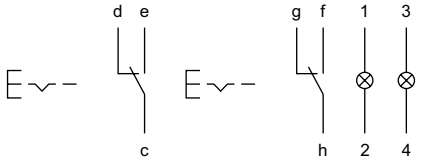
Wiring diagram 1



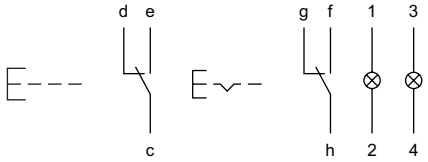
Wiring diagram 2



Wiring diagram 3



Wiring diagram 4



Wiring diagram 5

03 Flush design

Front

Lens halved

Additional Information

- Material plastic, holder metal
- Order two lenses

Product attribute	Dimension	Lens	Part No.	Weight
 **Lens halved for pushbutton double-headed**				
illuminative, not suitable for film insert, ripped	18 x 19 mm	smoked translucent	**03-921.1**	0.005 kg
		red translucent	**03-921.2**	0.005 kg
		orange translucent	**03-921.3**	0.005 kg
		yellow translucent	**03-921.4**	0.005 kg
		green translucent	**03-921.5**	0.005 kg
		blue translucent	**03-921.6**	0.005 kg
		colourless translucent	**03-921.7**	0.005 kg
		white translucent	**03-921.9**	0.005 kg
illuminative, use holder for film insert	18 x 19 mm	colourless transparent	**03-943.7**	0.005 kg
non-illuminative, ripped	18 x 19 mm	black opaque	**03-921.0**	0.005 kg
		grey opaque	**03-921.8**	0.005 kg
illuminative, with black rim (prevents lateral light escape), use holder for film insert	18 x 19 mm	colourless transparent	**03-953.7**	0.005 kg

Keylock front bezel

Additional Information

- Standard lock: Schulte YB1

Product attribute	Dimension	Material	Colour	Part No.	Weight
 **Keylock front bezel**					
for keylock switch Part No. 03-690, 03-691, 03-692	17.5 x 37.5 mm	Plastic	grey	**03-980.1**	0.010 kg

Holder halved

Additional Information

- For use with film insert, order two holders
- For lens halved: Part No. 03-943.7; for lens single-headed bi-colour: Part No. 03-951.7/7

Material	Colour	Optics	Part No.	Weight
 **Holder halved**				
Plastic	red	translucent	**03-922.2**	0.001 kg
	orange	translucent	**03-922.3**	0.001 kg
	yellow	translucent	**03-922.4**	0.001 kg
	green	translucent	**03-922.5**	0.001 kg
	blue	translucent	**03-922.6**	0.001 kg
	colourless	transparent	**03-922.7**	0.001 kg
	white	translucent	**03-922.9**	0.001 kg

Diffuser plate single-headed

Additional Information

- For film insert
- For lens single-headed uni-colour, lettering only visible when illuminated

Part No.	Weight
 **Diffuser plate single-headed**	
03-909	0.001 kg

Front bezel flush

Additional Information

- Lens only removable with lens remover Part No. 02-905

Front bezel	Part No.	Weight
 **Front bezel flush, Front dimension 24 x 48 mm**		
Plastic black	**03-965.0**	0.001 kg

Front bezel raised

Additional Information

- Lens only removable with lens remover Part No. 98-969

Front bezel	Part No.	Weight
 **Front bezel raised, Front dimension 24 x 48 mm**		
Plastic black	**03-967.0**	0.001 kg

03 Accessories

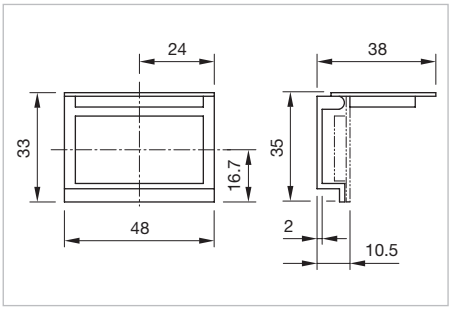
Light barrier

Part No.	Weight
 **Light barrier**	
03-907	0.002 kg

Protective cover, IP 40

Additional Information

- Use only flush front bezel
- Hinged, with means for sealing
- Please note that bigger minimum distances are necessary



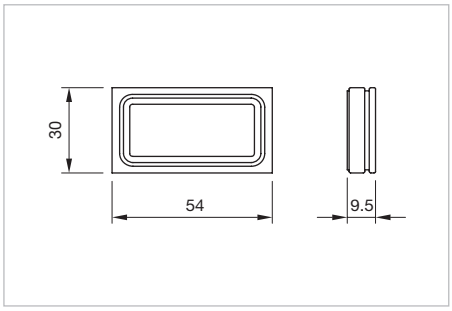
Dimensions [mm]

Product attribute	Material	Optics	Dimension	Part No.	Weight
 **Protective cover**					
for button with mounting cut-out 21.2 x 41.2 mm	Plastic	transparent	48 x 33 mm	**03-925**	0.001 kg

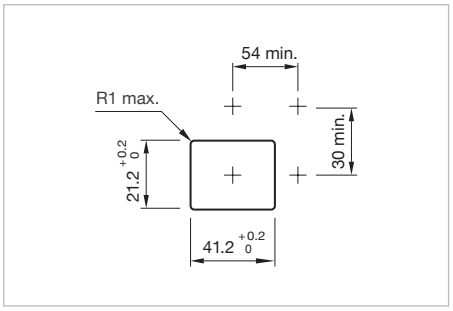
Front protective cap, IP 65

Additional Information

- Use only flush front bezel
- Three-part



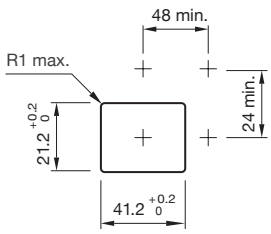
Dimensions [mm]



Mounting cut-outs [mm]

Dimension	Material	Colour	Optics	Temperature	Part No.	Weight
 **Front protective cap**						
30 x 54 mm	PVC	colourless	transparent	-20 ... +60 °C	**03-924**	0.005 kg

Blind plug



Mounting cut-outs [mm]

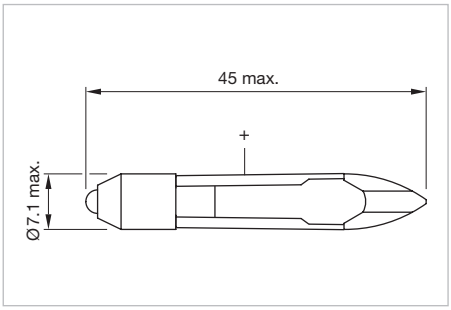
Dimension	Mounting cut-out	Material	Colour	Part No.	Weight
 **Blind plug**					
24 x 48 mm	21.2 x 41.2 mm	Plastic	black	**03-949.0**	0.005 kg
			grey	**03-949.8**	0.005 kg

Illumination

Single-LED, T6.8

Additional Information

- Order two LEDs
- For LED element fitting information see «Application guidelines»
- Due to high surface temperatures, the series resistor must not be soldered directly to the terminals of the equipment (use a terminal plate)
- When using AC/DC types with AC operation, slight flickering can occure
- Luminous intensity data of the LEDs on direct voltage
- Electrical and optical data are measured at 25 °C
- The specified versions are built with a protection diode (halve wave rectifier) in series and the LED
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination
- For supply voltages above 48 V, it is necessary to use a voltage reduction element (external series resistor or transformer)



Dimensions [mm]

LED colour	Operating voltage	Operation current	Lumi. intensity	Dom. wavelength	Part No.	Weight
 **Single-LED**						
Single-LED red	6 VDC +10 %	17 mA ±15 %	400 mcd	630 nm	**10-2K06.3152**	0.002 kg
	12 VAC/DC +10 %	9/17 mA ±15 %	400 mcd	630 nm	**10-2K09.1072**	0.002 kg
	24 VAC/DC +10 %	9/17 mA ±15 %	400 mcd	630 nm	**10-2K12.1072**	0.002 kg
	28 VAC/DC +10 %	9/17 mA ±15 %	400 mcd	630 nm	**10-2K13.1072**	0.002 kg
	48 VAC/DC +10 %	4/8 mA ±15 %	200 mcd	630 nm	**10-2K19.1052**	0.002 kg
Single-LED yellow	6 VDC +10 %	17 mA ±15 %	340 mcd	340 nm	**10-2K06.3154**	0.002 kg
	12 VAC/DC +10 %	9/17 mA ±15 %	340 mcd	340 nm	**10-2K09.1074**	0.002 kg
	24 VAC/DC +10 %	9/17 mA ±15 %	340 mcd	340 nm	**10-2K12.1074**	0.002 kg
	28 VAC/DC +10 %	9/17 mA ±15 %	340 mcd	340 nm	**10-2K13.1074**	0.002 kg
	48 VAC/DC +10 %	4/8 mA ±15 %	180 mcd	340 nm	**10-2K19.1054**	0.002 kg
Single-LED green	6 VDC +10 %	7 mA ±15 %	1050 mcd	525 nm	**10-2K06.3155**	0.002 kg
	12 VAC/DC +10 %	4/7 mA ±15 %	1050 mcd	525 nm	**10-2K09.1075**	0.002 kg
	24 VAC/DC +10 %	4/7 mA ±15 %	1050 mcd	525 nm	**10-2K12.1075**	0.002 kg
	28 VAC/DC +10 %	4/7 mA ±15 %	1050 mcd	525 nm	**10-2K13.1075**	0.002 kg
	48 VAC/DC +10 %	2/4 mA ±15 %	600 mcd	525 nm	**10-2K19.1055**	0.002 kg
Single-LED blue	6 VDC +10 %	17 mA ±15 %	780 mcd	470 nm	**10-2K06.3156**	0.002 kg
	12 VAC/DC +10 %	9/17 mA ±15 %	780 mcd	470 nm	**10-2K09.1076**	0.002 kg
	24 VAC/DC +10 %	9/17 mA ±15 %	780 mcd	470 nm	**10-2K12.1076**	0.002 kg
	28 VAC/DC +10 %	9/17 mA ±15 %	780 mcd	470 nm	**10-2K13.1076**	0.002 kg
	48 VAC/DC +10 %	4/8 mA ±15 %	400 mcd	470 nm	**10-2K19.1056**	0.002 kg

LED colour	Operating voltage	Operation current	Lumi. intensity	Dom. wavelength	Part No.	Weight
Single-LED white	6 VDC +10 %	6 mA±15 %	900 mcd	x0.31/y0.32 nm	**10-2K06.3159**	0.002 kg
	12 VAC/DC +10 %	3/6 mA±15 %	900 mcd	x0.31/y0.32 nm	**10-2K09.1079**	0.002 kg
	24 VAC/DC +10 %	3/6 mA±15 %	900 mcd	x0.31/y0.32 nm	**10-2K12.1079**	0.002 kg
	28 VAC/DC +10 %	2.5/5 mA±15 %	750 mcd	x0.31/y0.32 nm	**10-2K13.1079**	0.002 kg
	48 VAC/DC +10 %	2/4 mA±15 %	600 mcd	x0.31/y0.32 nm	**10-2K19.1059**	0.002 kg

Filament lamp, T6.8

Additional Information

- Order two filament lamps

Filament lamp

Operating voltage	Operation current	Part No.	Weight
12 VAC/DC	50 mA ±10 %	**10-1209.1279**	0.001 kg
12 VAC/DC	100 mA ±10 %	**10-1209.1329**	0.001 kg
24 VAC/DC	25 mA ±10 %	**10-1212.1199**	0.001 kg
24 VAC/DC	50 mA ±10 %	**10-1212.1279**	0.001 kg
28 VAC/DC	40 mA ±10 %	**10-1213.1249**	0.001 kg
30 VAC/DC	40 mA ±10 %	**10-1214.1249**	0.001 kg
36 VAC/DC	35 mA ±10 %	**10-1216.1229**	0.001 kg

Series resistor

Additional Information

- Only for filament lamp 48 VAC, 25 mA
- For lamp voltage reduction
- Keep to the country specific safety instructions
- Due to high surface temperatures, the series resistor must not be soldered directly to the terminals of the equipment (use a terminal plate)

Series resistor

Operating voltage	Resistance	Part No.	Weight
110 VAC	2.7 kOhm	**02-904.0**	0.003 kg
125 VAC	3.3 kOhm	**02-904.1**	0.003 kg
145 VAC	4.7 kOhm	**02-904.3**	0.003 kg
240 VAC	10 kOhm	**02-904.7**	0.003 kg

Mounting

Lens remover

Product attribute	Part No.	Weight
 **Lens remover**		
for flush front bezel	**02-905**	0.011 kg
 **Lens remover**		
for raised front bezel	**98-968**	0.004 kg

Lamp remover

Additional Information

▲ **Caution:** A switching process might be released when replacing the lamp

Product attribute	Part No.	Weight
 **Lamp remover**		
for LED	**03-996**	0.027 kg
 **Lamp remover**		
for filament lamp	**61-9740.0**	0.003 kg

03 Marking

General notes

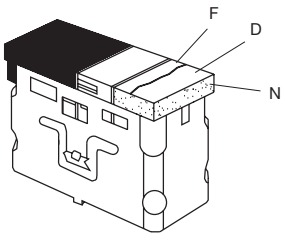
1. Engraving
In addition to the most commonly used world languages, in DIN1451-3 close spacing, other typefaces are available as Scandinavian, Slavic, Greek, Russian and Polish. Red, blue and black lenses are filled with white colour. Other colour lenses are filled in black. Standard height of letters is 3 mm. If the height is not specified, we will supply 3 mm engraved letters.

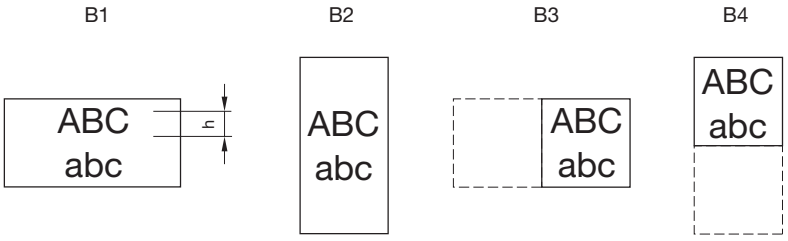
2. Hot stamping
For larger series it is worth considering markings by means of hot stamping. We will pleased to advise you. For letters and figures, typefaces with 2.5 mm, 3 mm and 4 mm are available.

3. Film inserts
Instead of using engraving the lenses can be fitted with transparent film inserts, as an alternative. For this purpose, though, it is advisible to use lenses without ripped pattern. In the case of use of a smoke-black lens the fitted film becomes readable only if the lamp is on. The film (F) is inserted in the cap. To ensure even illumination a diffusor (D) is recommended, which is inserted beneath the film. If, on the other hand, the diffusor is inserted above the film, the lettering only becomes legible when the lamp is alight. To hold the film and diffusor in position, the use of a holder (N) is advised. The film thickness is 0.2 mm.

All dimensions in mm

Lens size	Film insert max. size	Height of letters h	Number of lines	Number of capital letters per line (target value)	Number of small letters per line (target value)	Image
18 x 19	14.3 x 15.6	3	4	7–8	9 - 10	B3
						B4
		4	2	5	6	B3
						B4
		5	2	4	4	B3
						B4
		6	1	3	4	B3
						B4
		8	1	2	2	B3
						B4
18 x 38	14.3 x 34.3	3	4	16	18	B1
			8	6	8	B2
		4	2	11	13	B1
			4	4	5	B2
		5	2	8	10	B1
			4	3	4	B2
		6	1	7	9	B1
			3	3	3	B2
		8	1	5	6	B1
			2	2	2	B2





Suppressor circuits

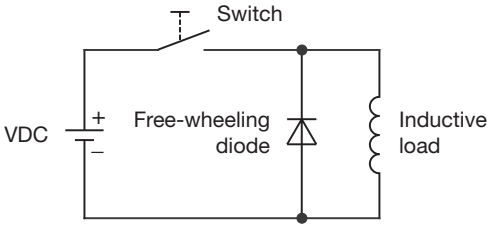
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e. g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

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.

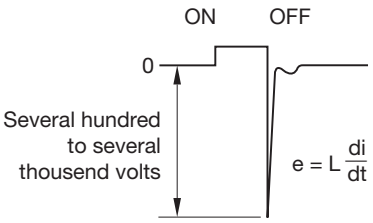
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage (VR) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum current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



LED polarity

When fitting the LED elements the polarity has to correspond with the respective terminals, (+) goes to +.