TecnelSystem SpA
equipaggiamenti elettrici industriali

Series 03

Characteristics
The robust and compact Series 03 is especially suited for:

- Flush design

The large rectangular design (24 x 48 mm) provides the option for dual illumination in addition to the “XL” illuminated surface.

Functions
The Series 03 incorporates the following functions:

- Indicator
- Pushbutton
- Illuminated pushbutton
- Keylock switch
- Buzzer

Market segments
The EAO Series 03 is especially suited for applications in the segments:

- Ship building
- Panel building

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Overview

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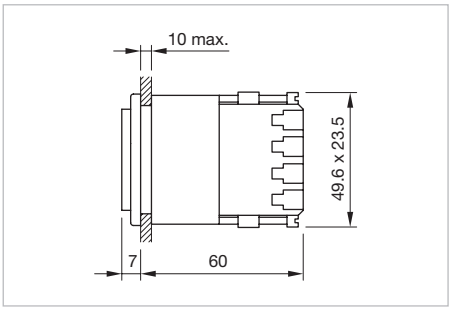
03 Flush design

Indicator, IP 40

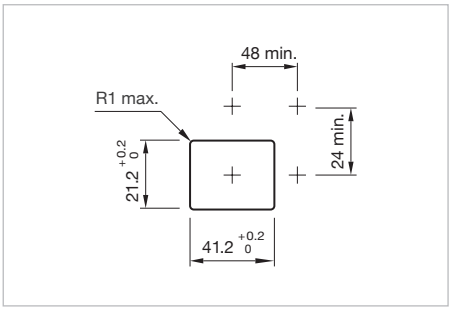
Product can differ from the current configuration.



Dimensions [mm]

Additional Information

- For front dimension 24 x 48 mm
- For LED element fitting information see «Application guidelines»
- Has two independent lamp bases
- Light barrier ordered separately



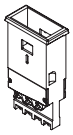
Mounting cut-outs [mm]

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Lens *Seite 13*

Single-LED *Seite 22*



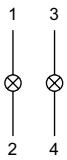
Actuator

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.

Terminal	Part No.	Wiring diagram	Weight
Indicator actuator			
Screw	**03-021.001**	1	0.045 kg

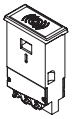


Wiring diagram 1

Buzzer, IP 40

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

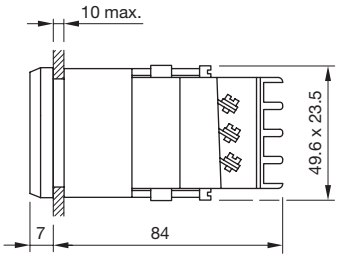


Buzzer

Fixing sleeve

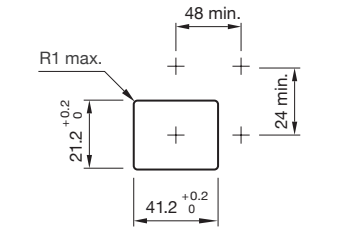
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]

Product can differ from the current configuration.

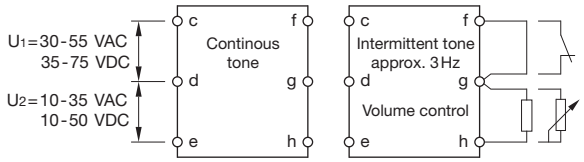


Mounting cut-outs [mm]

Additional Information

- For front dimension 24 x 48 mm
- Further information see «Technical data»

Operating voltage	Front cap	Terminal	Part No.	Wiring diagram	Weight
Buzzer					
10 ... 55 VAC, 10 ... 75 VDC	Plastic black	Screw	**03-810.001**	1	0.060 kg

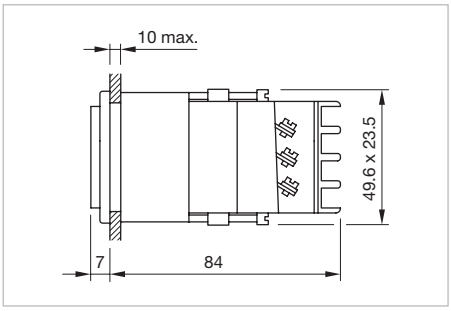


Wiring diagram 1

03 Flush design

Pushbutton single-headed, IP 40

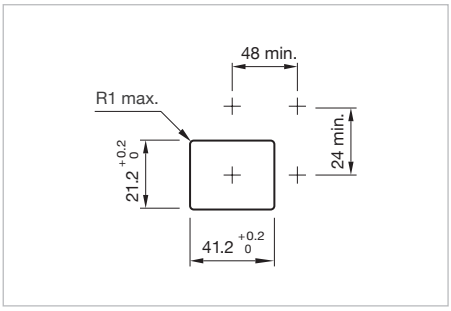
Product can differ from the current configuration.



Dimensions [mm]

Additional Information

- For front dimension 24 x 48 mm

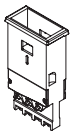


Mounting cut-outs [mm]

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Lens *Seite 13*



Actuator

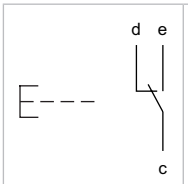
Fixing sleeve

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

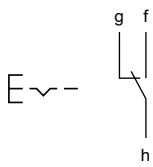
To obtain a complete unit, please select the red components from the pages shown.

Contacts	Switching action	Terminal	Part No.	Wiring diagram	Weight
Pushbutton actuator single-headed					
1 C	B	Screw	**03-611.011**	1	0.055 kg
	C	Screw	**03-613.011**	2	0.055 kg
2 C	B	Screw	**03-612.011**	3	0.065 kg
	C	Screw	**03-614.011**	4	0.065 kg
	B - C	Screw	**03-615.011**	5	0.065 kg

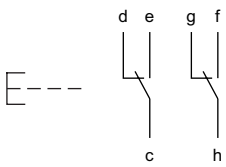
Contacts: C = Changeover
Switching action: B = Momentary, C = Maintained



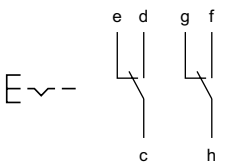
Wiring diagram 1



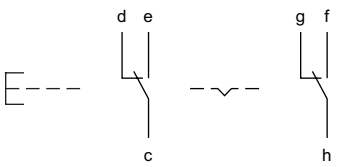
Wiring diagram 2



Wiring diagram 3



Wiring diagram 4



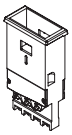
Wiring diagram 5

Pushbutton actuator double-headed, IP 40

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Lens *Seite 13*

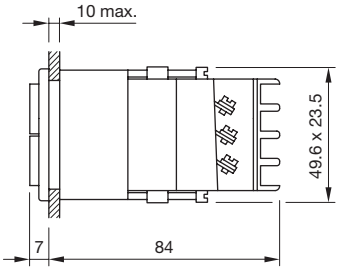


Actuator

Fixing sleeve

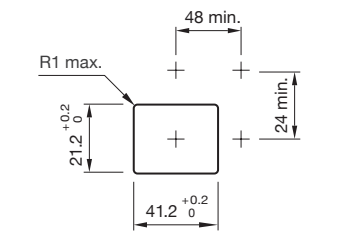
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]

Product can differ from the current configuration.



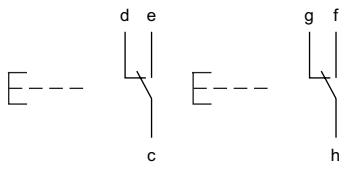
Mounting cut-outs [mm]

Additional Information

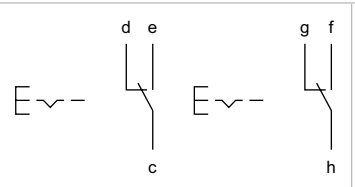
- For front dimension 24 x 48 mm
- Has independent changeover

Contacts	Switching action	Terminal	Part No.	Wiring diagram	Weight
2 C	B	Screw	**03-621.011**	1	0.065 kg
	C	Screw	**03-622.011**	2	0.065 kg
	B - C	Screw	**03-623.011**	3	0.065 kg

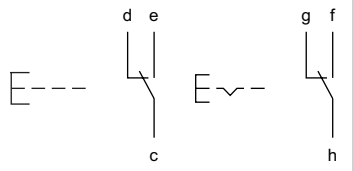
Contacts: C = Changeover
Switching action: B = Momentary, C = Maintained



Wiring diagram 1



Wiring diagram 2

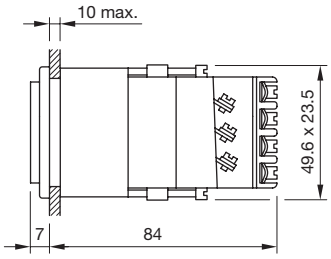


Wiring diagram 3

03 Flush design

Illuminated pushbutton single headed, IP 40

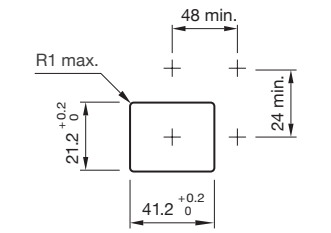
Product can differ from the current configuration.



Dimensions [mm]

Additional Information

- For front dimension 24 x 48 mm
- For LED element fitting information see «Application guidelines»
- Has two independent lamp bases
- Light barrier ordered separately



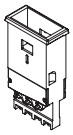
Mounting cut-outs [mm]

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Lens *Seite 13*

LED *Seite 22*



Actuator

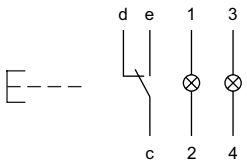
Fixing sleeve

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

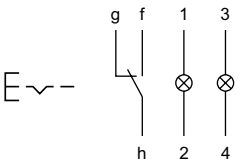
To obtain a complete unit, please select the red components from the pages shown.

Contacts	Switching action	Terminal	Part No.	Wiring diagram	Weight
Illuminated pushbutton actuator single-headed					
1 C	B	Screw	**03-616.011**	1	0.070 kg
	C	Screw	**03-618.011**	2	0.070 kg
2 C	B	Screw	**03-617.011**	3	0.075 kg
	C	Screw	**03-619.011**	4	0.075 kg
	B - C	Screw	**03-620.011**	5	0.075 kg

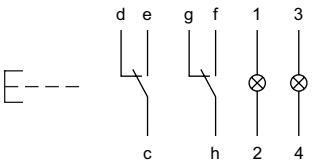
Contacts: C = Changeover
Switching action: B = Momentary, C = Maintained



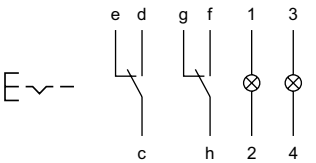
Wiring diagram 1



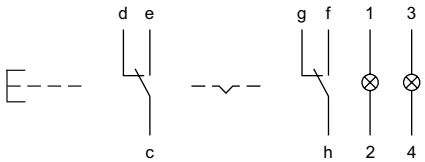
Wiring diagram 2



Wiring diagram 3



Wiring diagram 4



Wiring diagram 5

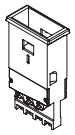
Illuminated pushbutton double-headed, IP 40

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Lens *Seite 13*

LED *Seite 22*

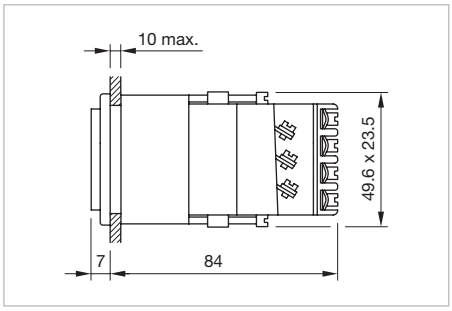


Actuator

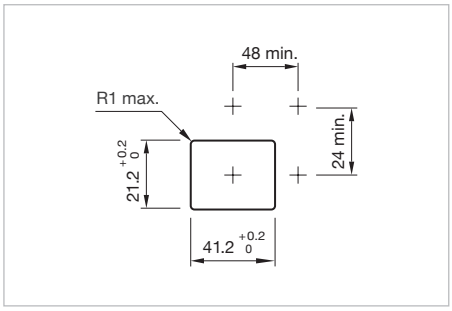
Fixing sleeve

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]



Mounting cut-outs [mm]

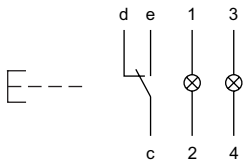
Product can differ from the current configuration.

Additional Information

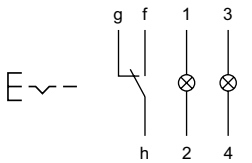
- For front dimension 24 x 48 mm
- For LED element fitting information see «Application guidelines»

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

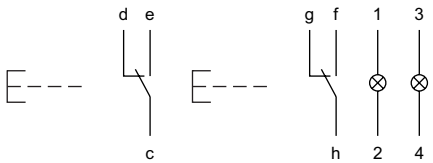
Contacts: C = Changeover
Switching action: B = Momentary, C = Maintained



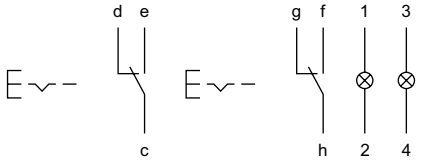
Wiring diagram 1



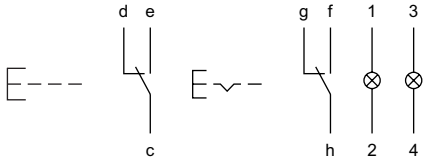
Wiring diagram 2



Wiring diagram 3



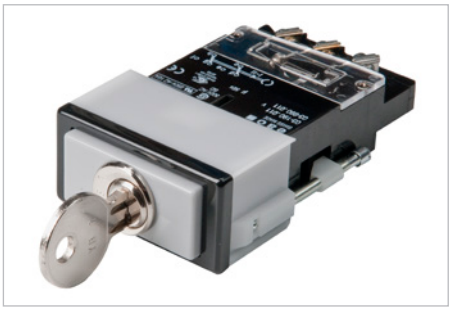
Wiring diagram 4



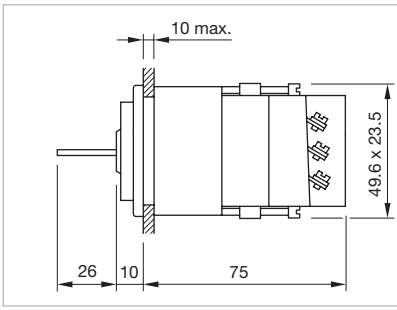
Wiring diagram 5

03 Flush design

Keylock switch 2 positions, IP 40



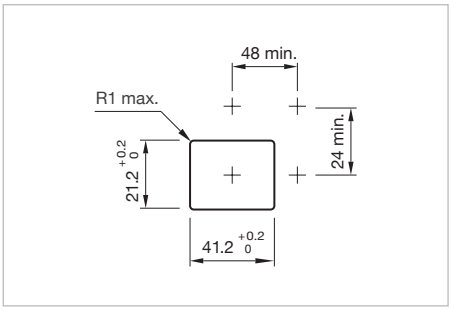
Product can differ from the current configuration.



Dimensions [mm]

Additional Information

- For front dimension 24 x 48 mm
- Front plastic grey
- After turning the key 90° clockwise, the switch can be operated
- In the unlocked switch positions always perform a momentary action
- Keylock number: Schulte YB1

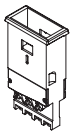


Mounting cut-outs [mm]

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Keylock front bezel *Seite 15*



Actuator

Fixing sleeve

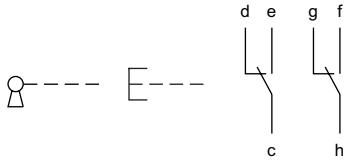
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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

Switching positions (A = Rest, B = Momentary)

Product attribute	Contacts	Switching angle	Key remove	Terminal	Part No.	Wiring diagram	Weight
A = lockable, actuated	2 C	B = 90°	A	Screw	**03-690.011**	1	0.065 kg
A = lockable, non-actuated	2 C	B = 90°	A	Screw	**03-691.011**	1	0.065 kg
A = lockable, non-actuated or actuated	2 C	B = 90°	A	Screw	**03-692.011**	1	0.065 kg

Contacts: C = Changeover



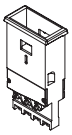
Wiring diagram 1

Keylock switch with keylock front bezel, 2 positions, IP 40

Equipment consisting of (schematic overview)

Front bezel *Seite 17*

Keylock front bezel

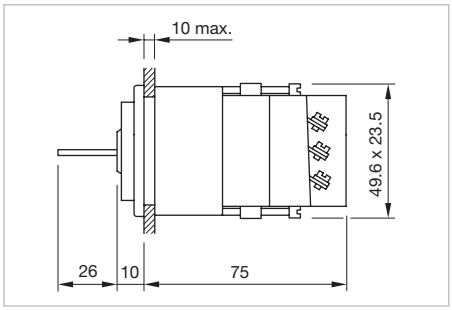


Actuator

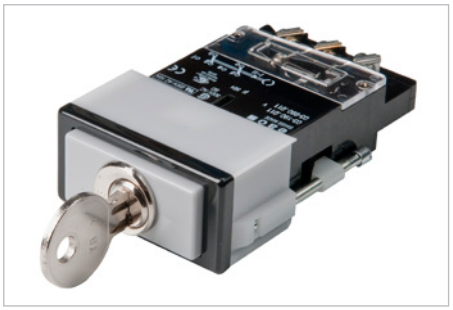
Fixing sleeve

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

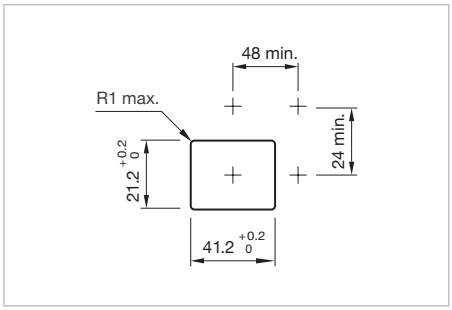
To obtain a complete unit, please select the red components from the pages shown.



Dimensions [mm]



Product can differ from the current configuration.



Mounting cut-outs [mm]

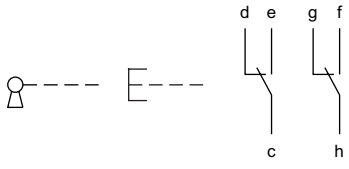
Additional Information

- For front dimension 24 x 48 mm
- Front plastic grey
- After turning the key 90° clockwise, the switch can be operated
- In the unlocked switch positions always perform a momentary action
- Keylock number: Schulte YB1

Switching positions (A = Rest, B = Momentary)

Product attribute	Contacts	Switching angle	Key remove	Terminal	Part No.	Wiring diagram	Weight
A = lockable, non-actuated, B = lockable, key not removable	2 C	B = 90°	A	Screw	**03-695.011**	1	0.065 kg
A = lockable, non-actuated or actuated; can be used with protective cover 03-925	2 C	B = 90°	A	Screw	**03-198.011**	1	0.065 kg

Contacts: C = Changeover



Wiring diagram 1

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

Lens single-headed uni-colour

Additional Information

- Material plastic, holder metal

Product attribute	Dimension	Lens	Part No.	Weight
Lens single-headed uni-colour for pushbutton single-headed				
illuminative, not suitable for film insert, ripped	18 x 38 mm	smoked translucent	**03-901.1**	0.009 kg
		red translucent	**03-901.2**	0.009 kg
		orange translucent	**03-901.3**	0.009 kg
		yellow translucent	**03-901.4**	0.009 kg
		green translucent	**03-901.5**	0.009 kg
		blue translucent	**03-901.6**	0.009 kg
		colourless translucent	**03-901.7**	0.009 kg
		white translucent	**03-901.9**	0.009 kg
illuminative, use holder for film insert	18 x 38 mm	colourless transparent	**03-941.7**	0.009 kg
illuminative, with black rim (prevents lateral light escape), use holder for film insert	18 x 38 mm	colourless transparent	**03-946.7**	0.009 kg
		smoked transparent	**03-947.1**	0.009 kg
non-illuminative, ripped	18 x 38 mm	black opaque	**03-901.0**	0.009 kg
		grey opaque	**03-901.8**	0.009 kg

Lens single-headed bi-colour

Additional Information

- Material plastic, holder metal

Product attribute	Dimension	Lens	Part No.	Weight
Lens single-headed bi-colour for pushbutton single-headed				
illuminative, with light barrier, not suitable for film insert, ripped	18 x 38 mm	black-red opaque-translucent	**03-902.0/2**	0.010 kg
		black-orange opaque-translucent	**03-902.0/3**	0.010 kg
		black-yellow opaque-translucent	**03-902.0/4**	0.010 kg
		black-green opaque-translucent	**03-902.0/5**	0.010 kg
		black-blue opaque-translucent	**03-902.0/6**	0.010 kg
		black-colourless opaque-translucent	**03-902.0/7**	0.010 kg
		anthracite-anthracite translucent	**03-902.1/1**	0.010 kg
		red-red translucent	**03-902.2/2**	0.010 kg
		red-orange translucent	**03-902.2/3**	0.010 kg
		red-yellow translucent	**03-902.2/4**	0.010 kg
		red-green translucent	**03-902.2/5**	0.010 kg
		red-blue translucent	**03-902.2/6**	0.010 kg
		red-colourless translucent	**03-902.2/7**	0.010 kg
		grey-red opaque-translucent	**03-902.2/8**	0.010 kg
		red-white translucent	**03-902.2/9**	0.010 kg

03 Accessories

Product attribute	Dimension	Lens	Part No.	Weight
illuminative, with light barrier, not suitable for film insert, ripped	18 x 38 mm	orange-orange translucent	**03-902.3/3**	0.010 kg
		orange-yellow translucent	**03-902.3/4**	0.010 kg
		orange-green translucent	**03-902.3/5**	0.010 kg
		orange-blue translucent	**03-902.3/6**	0.010 kg
		orange-colourless translucent	**03-902.3/7**	0.010 kg
		grey-orange opaque-translucent	**03-902.3/8**	0.010 kg
		orange-white translucent	**03-902.3/9**	0.010 kg
		yellow-yellow translucent	**03-902.4/4**	0.010 kg
		yellow-green translucent	**03-902.4/5**	0.010 kg
		yellow-blue translucent	**03-902.4/6**	0.010 kg
		yellow-colourless translucent	**03-902.4/7**	0.010 kg
		grey-yellow opaque-translucent	**03-902.4/8**	0.010 kg
		yellow-white translucent	**03-902.4/9**	0.010 kg
		green-green translucent	**03-902.5/5**	0.010 kg
		green-blue translucent	**03-902.5/6**	0.010 kg
		green-colourless translucent	**03-902.5/7**	0.010 kg
		grey-green opaque-translucent	**03-902.5/8**	0.010 kg
		green-white translucent	**03-902.5/9**	0.010 kg
		blue-blue translucent	**03-902.6/6**	0.010 kg
		blue-colourless translucent	**03-902.6/7**	0.010 kg
		grey-blue opaque-translucent	**03-902.6/8**	0.010 kg
		blue-white translucent	**03-902.6/9**	0.010 kg
		colourless-colourless translucent	**03-902.7/7**	0.010 kg
		grey-colourless opaque-translucent	**03-902.7/8**	0.010 kg
		colourless-white translucent	**03-902.7/9**	0.010 kg
		black-white opaque-translucent	**03-902.0/9**	0.010 kg
		grey-white opaque-translucent	**03-902.8/9**	0.010 kg
		white-white translucent	**03-902.9/9**	0.010 kg
		colourless-colourless transparent	**03-942.7/7**	0.010 kg
illuminative, with black rim (prevents lateral light escape), use holder for film insert	18 x 38 mm	colourless-colourless transparent	**03-951.7/7**	0.010 kg
non-illuminative, ripped	18 x 38 mm	black-black opaque	**03-902.0/0**	0.010 kg
		black-grey opaque	**03-902.0/8**	0.010 kg
		grey-grey opaque	**03-902.8/8**	0.010 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

03 Accessories

Holder single-headed

Additional Information

- For film insert
- For lens single-headed uni-colour: Part-No. 03-941.7, 03-946.7 and 03-947.1

Material	Colour	Optics	Part No.	Weight
Holder single-headed				
Plastic	red	translucent	**03-908.2**	0.001 kg
	orange	translucent	**03-908.3**	0.001 kg
	yellow	translucent	**03-908.4**	0.001 kg
	green	translucent	**03-908.5**	0.001 kg
	blue	translucent	**03-908.6**	0.001 kg
	colourless	transparent	**03-908.7**	0.001 kg
	white	translucent	**03-908.9**	0.001 kg

Diffuser plate halved

Additional Information

- For film insert, order two diffuser plates
- For lens halved and lens single-headed bi-colour, lettering only visible when illuminated

Part No.	Weight
Diffuser plate halved	
03-926	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

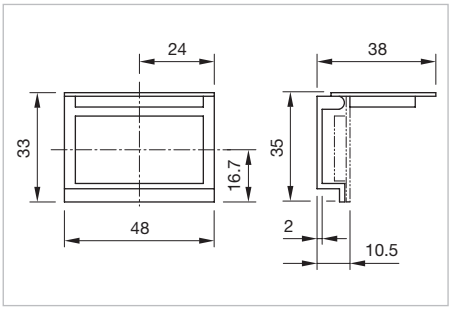
Light barrier

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



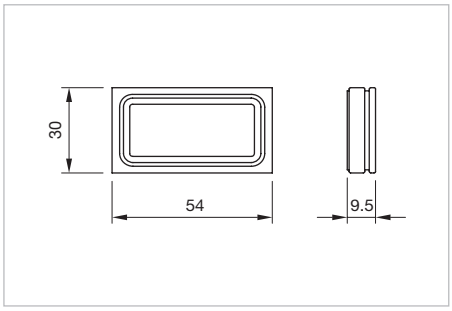
Dimensions [mm]

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

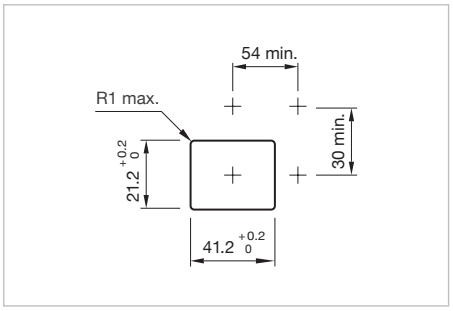
Front protective cap, IP 65

Additional Information

- Use only flush front bezel
- Three-part



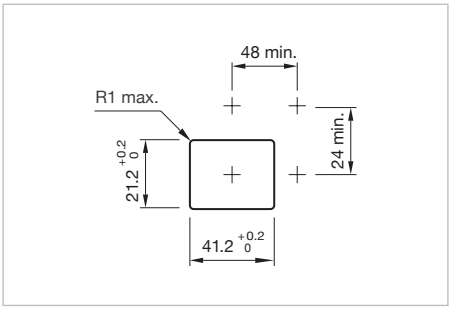
Dimensions [mm]



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

03 Accessories

Spare key

Additional Information

- Keylock number: Schulte YB1

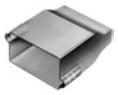
Part No.	Weight
Spare key	
02-989.001	0.001 kg

Rear side

Terminal cover

Additional Information

- For all connection methods

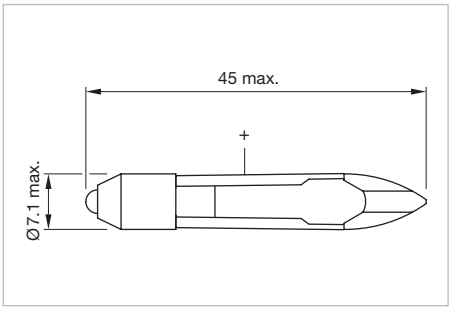
Part No.	Weight
 **Terminal cover**	
03-929	0.007 kg

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

Operating voltage	Operation current	Part No.	Weight
Filament lamp			
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)

Operating voltage	Resistance	Part No.	Weight
Series resistor			
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

Terminal plate empty

Additional Information

- For fitting with series resistors

Product attribute	Dimension	Part No.	Weight
Terminal plate empty			
5 spaces	62.5 x 60 x 15 mm	**02-912.1**	0.025 kg
10 spaces	125 x 60 x 15 mm	**02-912.2**	0.045 kg
15 spaces	187.6 x 60 x 15 mm	**02-912.3**	0.090 kg
20 spaces	250 x 60 x 15 mm	**02-912.4**	0.095 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 Technical data

Actuator with snap-action switching element

Switching system

1 or 2 self-cleaning, snap-action switching elements.
1 or 2 double-throw contacts.

Material

Material of contact
Standard version:
Silver (U > 20 V)
Special versions: (on request)
Gold/Silver 700 Au/300 Ag (U < 50 V)
Silver/Palladium 700 Ag/300 Pd (U > 20 V) for atmospheres containing sulphur

Switch housing
Thermosetting material, heat-resistant

Indicator housing
Polyamide

Mechanical characteristics

Terminals
Screw terminal (with self-lifting clip):
max. wire cross-section, 2 x 2.5 mm^2
max. wire cross-section of stranded cable, 2 x 1.5 mm^2

Tightening torque
For fixing sleeve max. 20 Ncm
For screw terminal max. 80 Ncm

Actuating force
6 N … 12 N

Actuating travel
5 mm

Mechanical lifetime
Momentary action 2 million operations
Maintained action 1 million operations

Electrical characteristics

Standards
The switches comply with the “Standards for low-voltage switching devices” EN IEC 60947-5-1

Rated insulation voltage
400 VAC/440 VDC, as per IEC 60947-5-1

Conventional free air thermal current
10 A
The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating
400 VAC, 10 A, cosφ 0.95, as per IEC 60947-5-1
250 VAC, 10 A, as per UL

Electric strength
2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60947-5-1

Environmental conditions

Storage temperature
-30 °C … +85 °C

Service temperature
-25 °C … +55 °C
For indicators and illuminated pushbuttons mounted as a block, make sure the heat can escape freely.

Protection degree
Front side IP 40, IP 65 with spray cover, as per IEC 60529

Vibration resistance
10 g at 10 … 2000 Hz, amplitude 1.0 mm, as per IEC 60068-2-6

Approvals

Approbations
CB (IEC 60947-5-1)
CSA
Germanischer Lloyd
UL

Declaration of conformity
CE

Buzzer

Buzzer system

System
Contactless electronic buzzer with IC oscillator

Material

Buzzer case
Duroplastic

Front cap
Polycarbonate (PC)

Front bezel
Polymethylacrylate

Mechanical characteristics

Terminals
Screw terminal

Tightening torque
For fixing sleeve max. 20 Ncm
For screw terminal max. 80 Ncm

Electrical characteristics

Frequency (tone)
Approx. 2.8 kHz

Sound pressure
85 dB (A) ±8 dB at a distance of 0.1 m
Volume variable with a 1 MΩ potentiometer or corresponding fixed resistor

Operation Voltage/Current
typical

10 … 55 VAC	10 … 75 VDC
25 mA	15 mA

Environmental conditions

Storage temperature
-40 °C … +85 °C

Service temperature
-25 °C … +55 °C

Protection degree
Front side IP 40, as per IEC 60529

Approvals

Approbations
CB (IEC 60947-5-1)

Declaration of conformity
CE

EAO reserves the right to alter specifications without further notice.

03 Marking

General notes

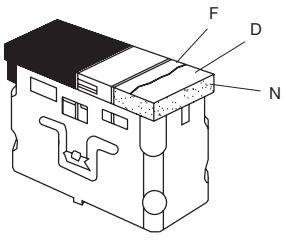
1. Engraving
In addition to the most commonly used world languages, in DIN1451-3 close spacing, other typefaces are available as Scandinavian, Slavic, Greek, Russian and Polish. Red, blue and black lenses are filled with white colour. Other colour lenses are filled in black. Standard height of letters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

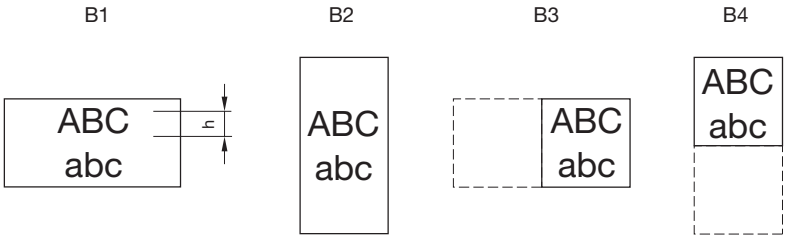
2. Hot stamping
For larger series it is worth considering markings by means of hot stamping. We will pleased to advise you. For letters and figures, typefaces with 2.5 mm, 3 mm and 4 mm are available.

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

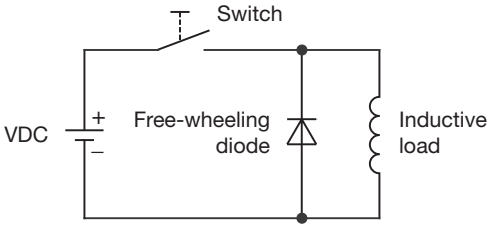
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e. g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

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.

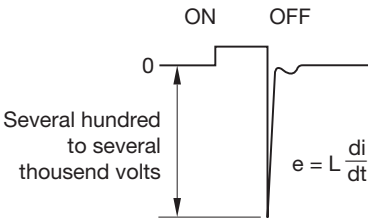
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage (VR) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum current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

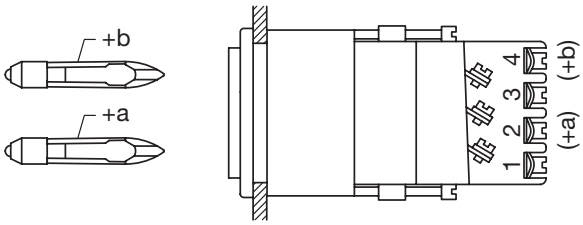


Counter EMF
over load without free-wheeling diode
Fig. 2



LED polarity

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



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