TecnelSystem S.p.A.

equipaggiamenti elettrici industriali

UNI EN ISO9001:2015
Nr. 9101.TNLS

Series 01

Compact and versatile.

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01 Information about the Series

Key advantages

- Compact 16 mm Series
- Excellent tactile feedback
- Chamfered bezel design
- Tactile snap action contacts
- Silent low signal level contact option

Typical application areas

- Machinery and Automation
- Panel building

Functions

- Pushbutton
- Illuminated pushbutton
- Indicator

Design

- Raised

IP front protection

- IP40
- IP67 (with front protective cap)

Raitings

- 42 VAC (100 mA)
- 250 VAC (5 A)

Mounting cut-outs

- Ø 16.2 mm

Terminal

- Soldering terminal
- Plug-in terminal
- PCB

Lens Material

- Plastic

Markings

- Engraving
- Hot stamping

Approvals

- CB (IEC 61058)
- CSA
- ENEC (EN61058)
- DNV GL (previously Germanischer Lloyd)
- UL

Conformities

- CE
- 2014/35/EU (LVD)
- 2011/65/EU (RoHS)

Content 01

Raised design	
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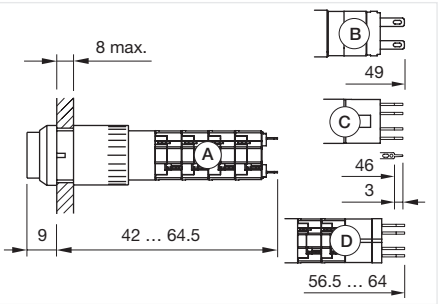
Illuminated pushbutton square, IP40

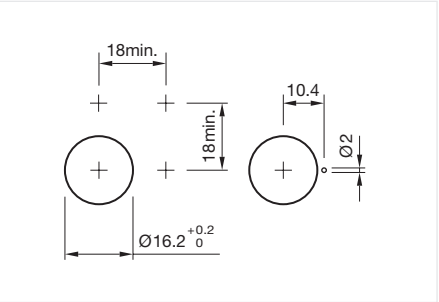
Product can differ from the current configuration.



Dimensions [mm]
A = Solder terminal
B = Solder terminal 2.8 mm x 0.5 mm
C = Universal terminal 2.0 mm x 0.5 mm
D = Universal-Solder terminal

General information

- Material of contact Gold

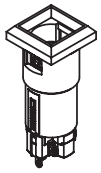


Mounting cut-outs [mm]

Equipment consisting of (schematic overview)

Lens — Page 19

LED — Page 22



Actuator

Fixing nut

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

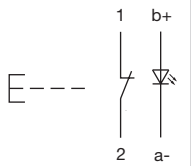
To obtain a complete unit, please select the red components from the pages shown.

Actuator, Front dimension 18 mm x 18 mm

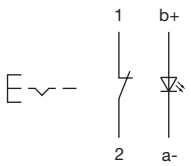
Switching action	Contacts	Terminal	Switching system	Diode 1N4007	Part No.	Wiring diagram	Component Layout
Momentary	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-151.022	18	
	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-151.0252	17	
	2 NC / 2 NO	Soldering terminal	Snap-action switching element		01-152.0252	24	
	3 NC / 3 NO	Soldering terminal	Snap-action switching element		01-153.0252	26	
	4 NC / 4 NO	Soldering terminal	Snap-action switching element		01-154.0252	28	
Maintained	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-281.022	20	
	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-281.0252	19	
	2 NC / 2 NO	Soldering terminal	Snap-action switching element		01-282.0252	25	
	3 NC / 3 NO	Soldering terminal	Snap-action switching element		01-283.0252	27	
	4 NC / 4 NO	Soldering terminal	Snap-action switching element		01-284.0252	29	
Momentary	2 NO	Universal terminal	Low-level element		01-451.036	11	1
	1 NC / 1 NO	Universal terminal	Low-level element		01-453.036	7	1
	1 NO	Universal terminal	Low-level element		01-455.036	9	1
	1 NC	Universal terminal	Low-level element		01-456.036	5	1
Maintained	2 NO	Universal terminal	Low-level element		01-481.036	12	1
	1 NC / 1 NO	Universal terminal	Low-level element		01-483.036	8	1
	1 NO	Universal terminal	Low-level element		01-485.036	10	1
	1 NC	Universal terminal	Low-level element		01-486.036	6	1
Momentary	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	1	01-709.0292	13	1
	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	2	01-710.0292	15	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	1	01-711.0292	21	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	2	01-712.0292	23	1
Maintained	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	1	01-717.0292	14	1
	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	2	01-718.0292	16	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	1	01-719.0292	22	1

Contacts: NC = Normally closed, NO = Normally open

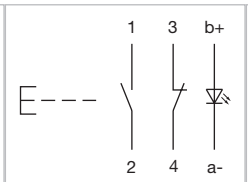
Wiring diagrams



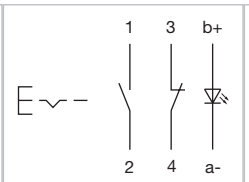
Wiring diagram 5



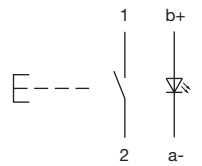
Wiring diagram 6



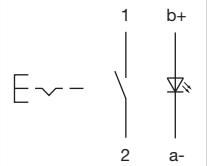
Wiring diagram 7



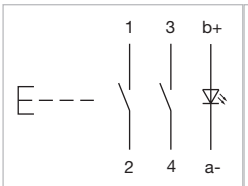
Wiring diagram 8



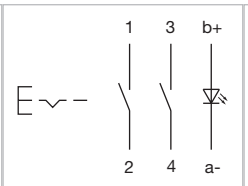
Wiring diagram 9



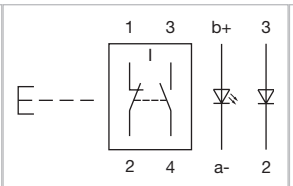
Wiring diagram 10



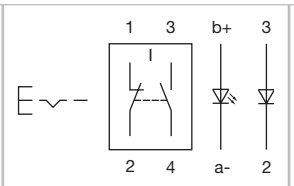
Wiring diagram 11



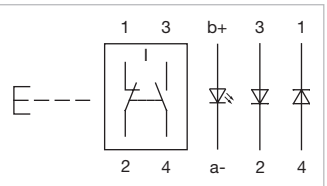
Wiring diagram 12



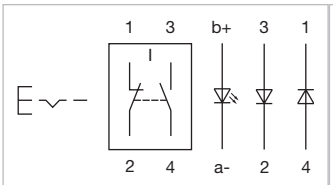
Wiring diagram 13



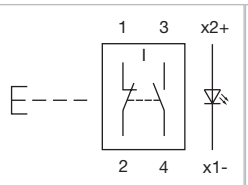
Wiring diagram 14



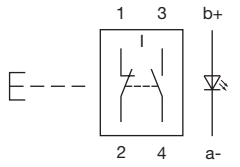
Wiring diagram 15



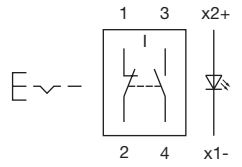
Wiring diagram 16



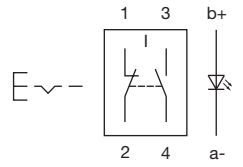
Wiring diagram 17



Wiring diagram 18



Wiring diagram 19



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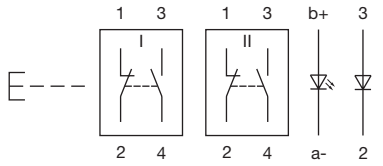

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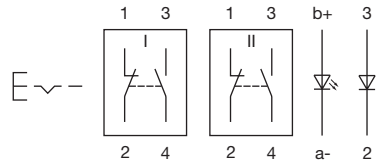
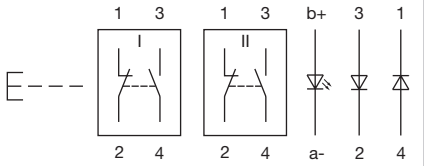
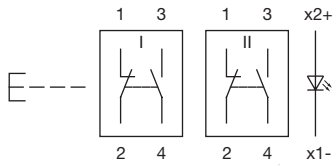


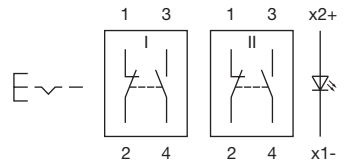
Wiring diagram 22



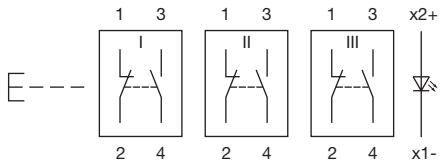
Wiring diagram 23



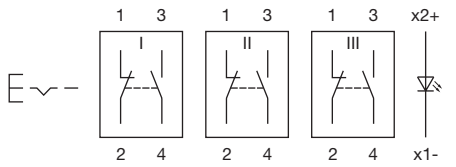
Wiring diagram 24



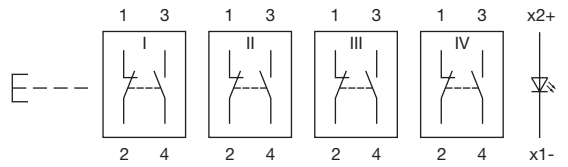
Wiring diagram 25



Wiring diagram 26



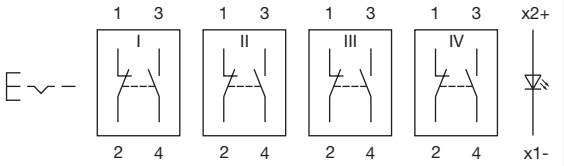
Wiring diagram 27



Wiring diagram 28

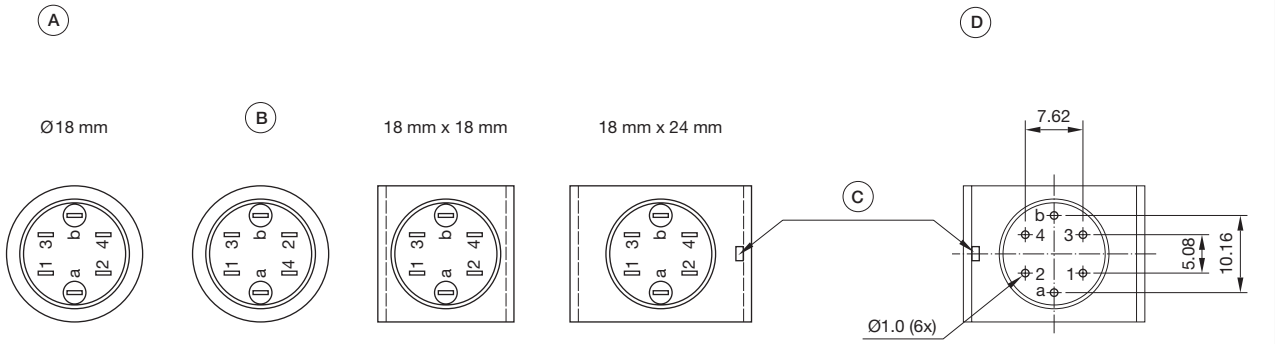
01 Raised design

Wiring diagrams



Wiring diagram 29

Component layouts



Component layout 1

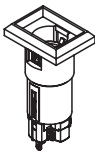
Dimensions [mm]
A = Terminals (rear side)
B = Diode block
C = Anti twist device only 18 mm x 24 mm
D = Drilling plan (component side)

Illuminated pushbutton rectangular, IP40

Equipment consisting of (schematic overview)

Lens Page 20

LED Page 22

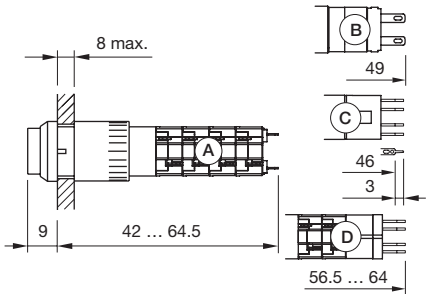


Actuator

Fixing nut

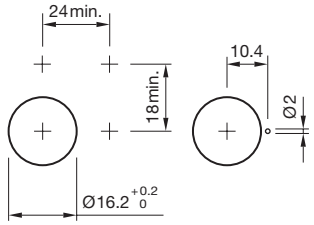
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]
A = Solder terminal
B = Solder terminal 2.8 mm x 0.5 mm
C = Universal terminal 2.0 mm x 0.5 mm
D = Universal-Solder terminal

Product can differ from the current configuration.



Mounting cut-outs [mm]

General information

- Material of contact Gold

Actuator, Front dimension 24 mm x 18 mm

Switching action	Contacts	Terminal	Switching system	Diode 1N4007	Part No.	Wiring diagram	Component Layout
Momentary	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-121.022	18	
	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-121.0252	17	
	2 NC / 2 NO	Soldering terminal	Snap-action switching element		01-122.0252	24	
	3 NC / 3 NO	Soldering terminal	Snap-action switching element		01-123.0252	26	
	4 NC / 4 NO	Soldering terminal	Snap-action switching element		01-124.0252	28	
Maintained	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-261.022	20	
	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-261.0252	19	
	2 NC / 2 NO	Soldering terminal	Snap-action switching element		01-262.0252	25	
	3 NC / 3 NO	Soldering terminal	Snap-action switching element		01-263.0252	27	
	4 NC / 4 NO	Soldering terminal	Snap-action switching element		01-264.0252	29	
Momentary	2 NO	Universal terminal	Low-level element		01-421.036	11	1
	2 NC	Universal terminal	Low-level element		01-422.036	30	1
	1 NC / 1 NO	Universal terminal	Low-level element		01-423.036	7	1
	1 NO	Universal terminal	Low-level element		01-425.036	9	1
Maintained	2 NO	Universal terminal	Low-level element		01-461.036	12	1
	2 NC	Universal terminal	Low-level element		01-462.036	31	1
	1 NC / 1 NO	Universal terminal	Low-level element		01-463.036	8	1
	1 NO	Universal terminal	Low-level element		01-465.036	10	1
Momentary	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	1	01-705.0292	13	1
	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	2	01-706.0292	15	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	1	01-707.0292	21	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	2	01-708.0292	23	1
Maintained	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	1	01-713.0292	14	1
	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	2	01-714.0292	16	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	1	01-715.0292	22	1

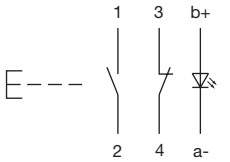
Contacts: NC = Normally closed, NO = Normally open

01 Raised design

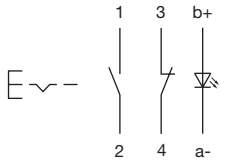
Switching action	Contacts	Terminal	Switching system	Diode 1N4007	Part No.	Wiring diagram	Compo-nent Layout
Maintained	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	2	01-716.0292	32	1

Contacts: NC = Normally closed, NO = Normally open

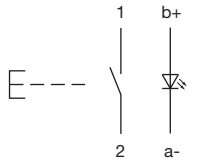
Wiring diagrams



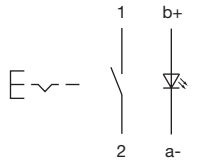
Wiring diagram 7



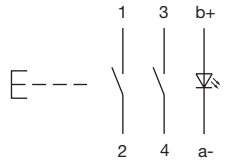
Wiring diagram 8



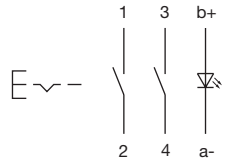
Wiring diagram 9



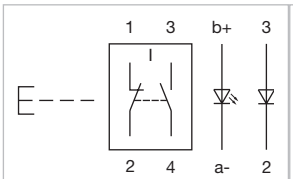
Wiring diagram 10



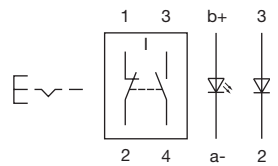
Wiring diagram 11



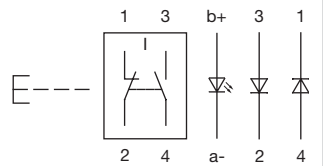
Wiring diagram 12



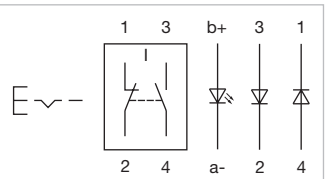
Wiring diagram 13



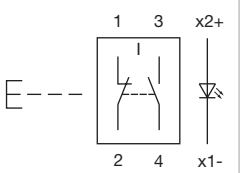
Wiring diagram 14



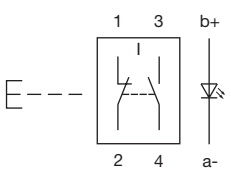
Wiring diagram 15



Wiring diagram 16



Wiring diagram 17



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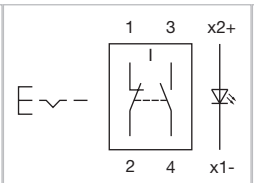

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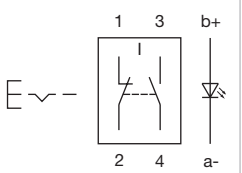
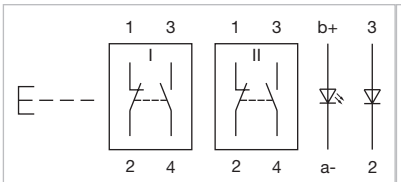
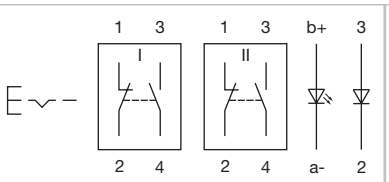


Wiring diagram 20



Wiring diagram 21



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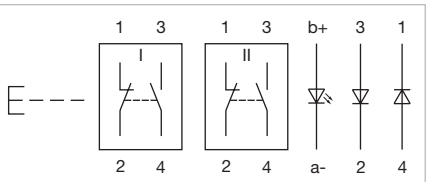
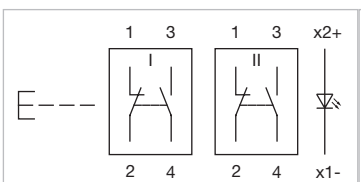
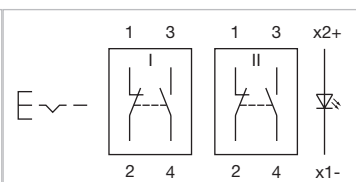


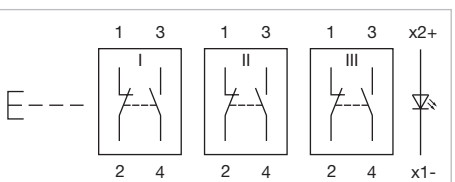
Wiring diagram 23



Wiring diagram 24

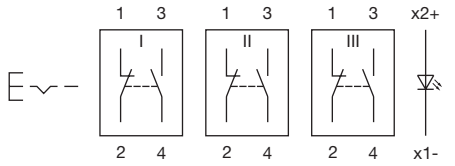


Wiring diagram 25

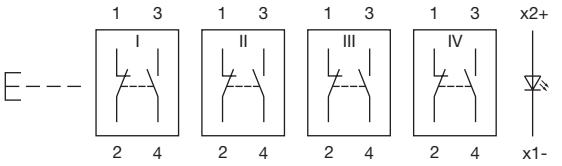


Wiring diagram 26

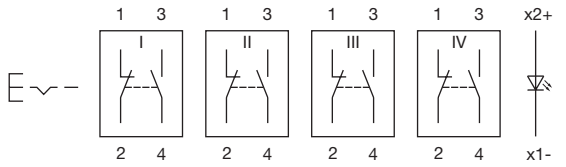
Wiring diagrams



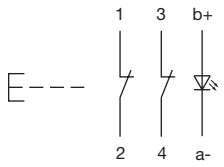
Wiring diagram 27



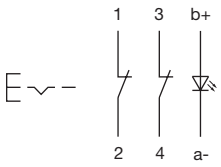
Wiring diagram 28



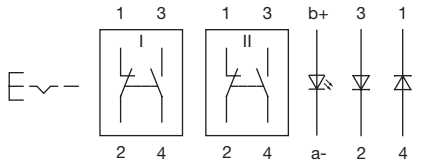
Wiring diagram 29



Wiring diagram 30

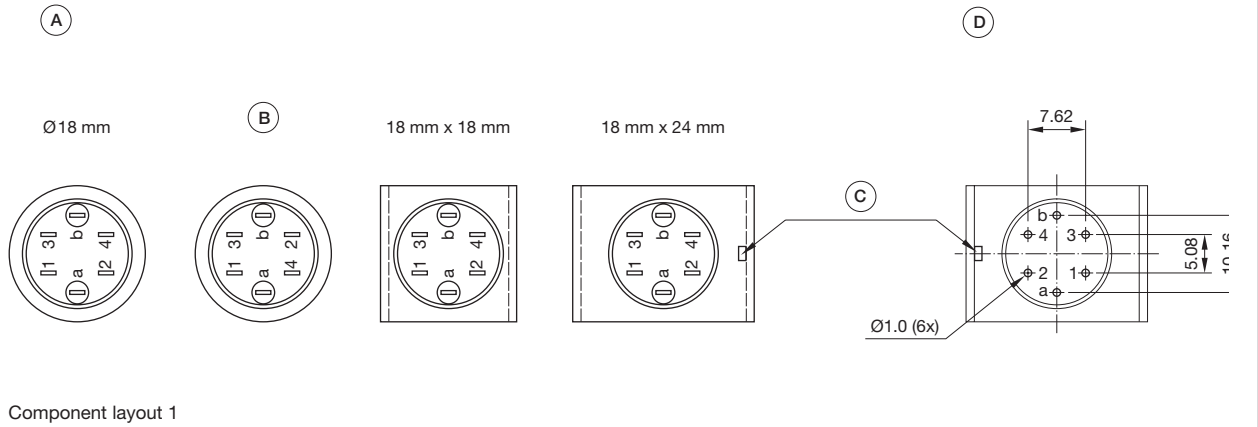


Wiring diagram 31



Wiring diagram 32

Component layouts

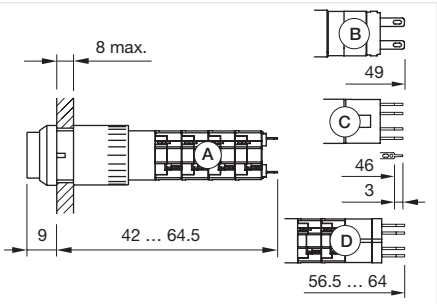


Component layout 1

Dimensions [mm]
A = Terminals (rear side)
B = Diode block
C = Anti twist device only 18 mm x 24 mm
D = Drilling plan (component side)

Illuminated pushbutton round, IP40

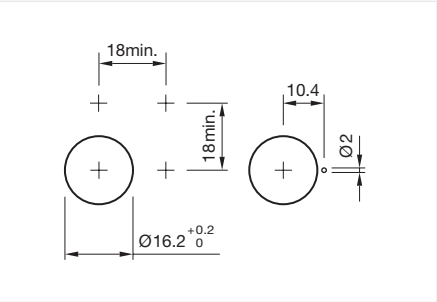
Product can differ from the current configuration.



Dimensions [mm]
A = Solder terminal
B = Solder terminal 2.8 mm x 0.5 mm
C = Universal terminal 2.0 mm x 0.5 mm
D = Universal-Solder terminal

General information

- Material of contact Gold



Mounting cut-outs [mm]

Equipment consisting of (schematic overview)

Lens — Page 21

LED — Page 22

Actuator

Fixing nut

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

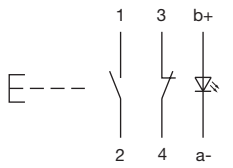
To obtain a complete unit, please select the red components from the pages shown.

Actuator, Front dimension Ø 18 mm

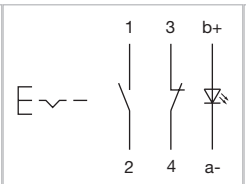
Switching action	Contacts	Terminal	Switching system	Diode 1N4007	Part No.	Wiring diagram	Component Layout
Momentary	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-131.022	18	
	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-131.0252	17	
	2 NC / 2 NO	Soldering terminal	Snap-action switching element		01-132.0252	24	
	3 NC / 3 NO	Soldering terminal	Snap-action switching element		01-133.0252	26	
	4 NC / 4 NO	Soldering terminal	Snap-action switching element		01-134.0252	28	
Maintained	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-271.022	20	
	1 NC / 1 NO	Soldering terminal	Snap-action switching element		01-271.0252	19	
	2 NC / 2 NO	Soldering terminal	Snap-action switching element		01-272.0252	25	
	3 NC / 3 NO	Soldering terminal	Snap-action switching element		01-273.0252	27	
	4 NC / 4 NO	Soldering terminal	Snap-action switching element		01-274.0252	29	
Momentary	2 NO	Universal terminal	Low-level element		01-431.036	11	1
	2 NC	Universal terminal	Low-level element		01-432.036	30	1
	1 NC / 1 NO	Universal terminal	Low-level element		01-433.036	7	1
	1 NO	Universal terminal	Low-level element		01-435.036	9	1
Maintained	2 NO	Universal terminal	Low-level element		01-471.036	12	1
	2 NC	Universal terminal	Low-level element		01-472.036	31	1
	1 NC / 1 NO	Universal terminal	Low-level element		01-473.036	8	1
	1 NO	Universal terminal	Low-level element		01-475.036	10	1
Momentary	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	1	01-743.0292	13	1
	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	2	01-744.0292	15	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	2	01-746.0292	23	1
Maintained	1 NC / 1 NO	Universal soldering terminal	Snap-action switching element	2	01-748.0292	16	1
	2 NC / 2 NO	Universal soldering terminal	Snap-action switching element	2	01-750.0292	32	1

Contacts: NC = Normally closed, NO = Normally open

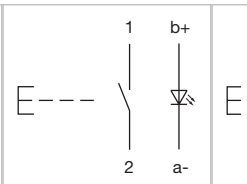
Wiring diagrams



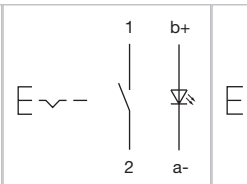
Wiring diagram 7



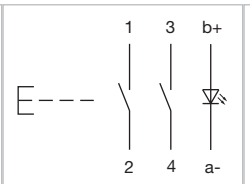
Wiring diagram 8



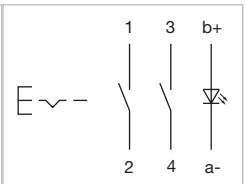
Wiring diagram 9



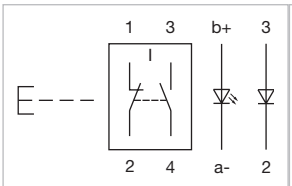
Wiring diagram 10



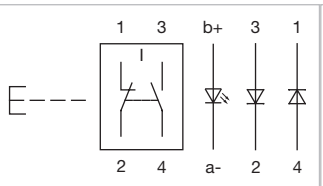
Wiring diagram 11



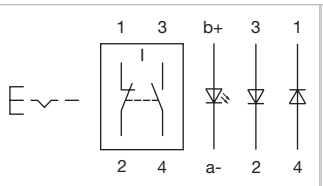
Wiring diagram 12



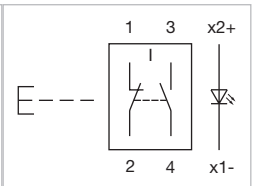
Wiring diagram 13



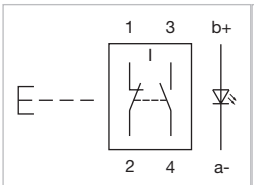
Wiring diagram 15



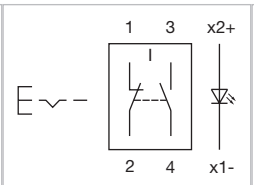
Wiring diagram 16



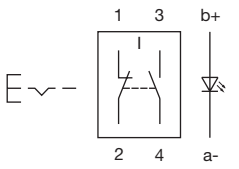
Wiring diagram 17



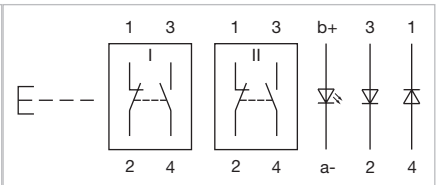
Wiring diagram 18



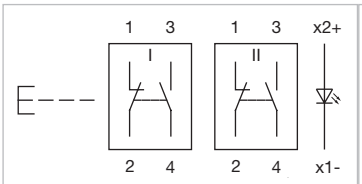
Wiring diagram 19



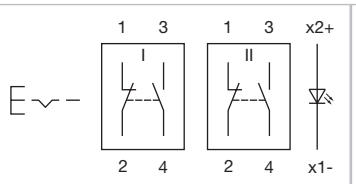
Wiring diagram 20



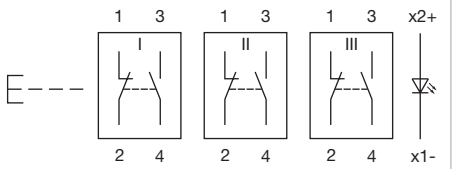
Wiring diagram 23



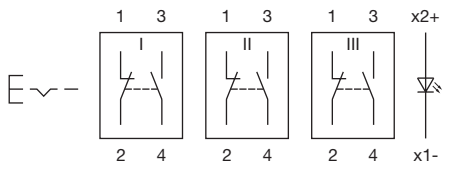
Wiring diagram 24



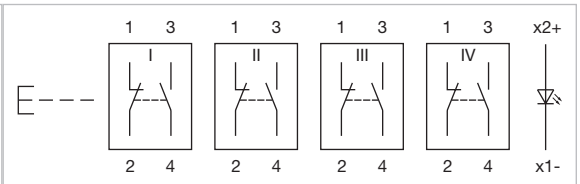
Wiring diagram 25



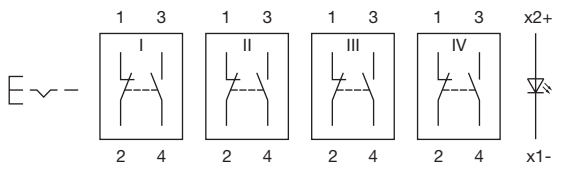
Wiring diagram 26



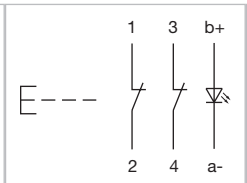
Wiring diagram 27



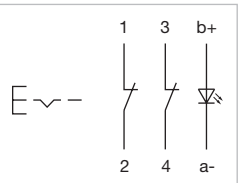
Wiring diagram 28



Wiring diagram 29



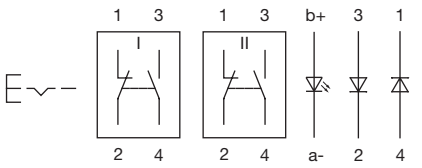
Wiring diagram 30



Wiring diagram 31

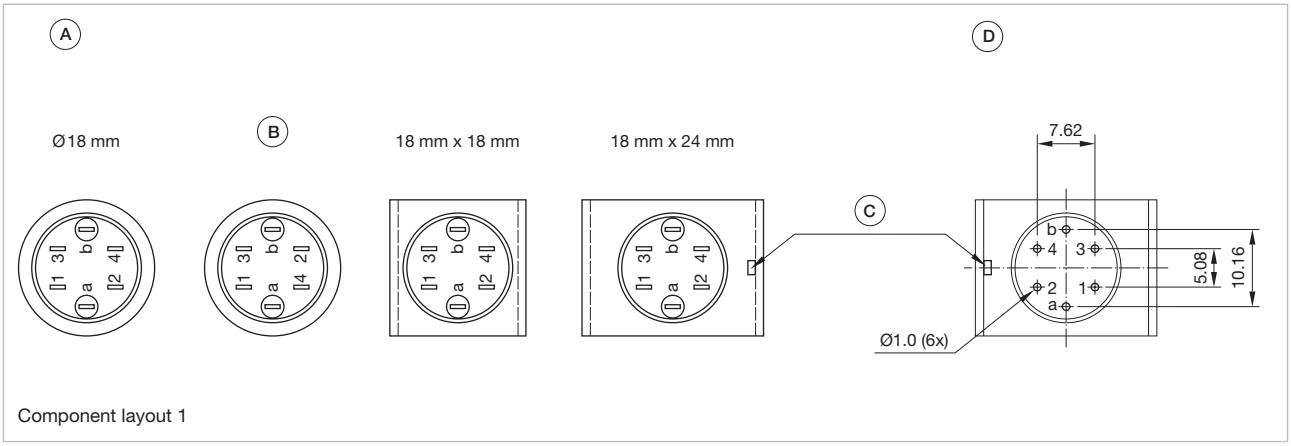
01 Raised design

Wiring diagrams



Wiring diagram 32

Component layouts



Component layout 1

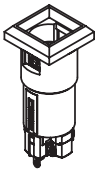
Dimensions [mm]
A = Terminals (rear side)
B = Diode block
C = Anti twist device only 18 mm x 24 mm
D = Drilling plan (component side)

Indicator square, IP40

Equipment consisting of (schematic overview)

Lens Page 19

LED Page 22

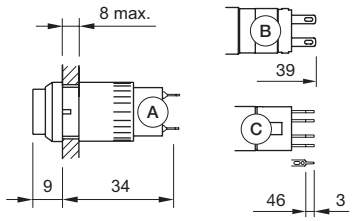


Actuator

Fixing nut

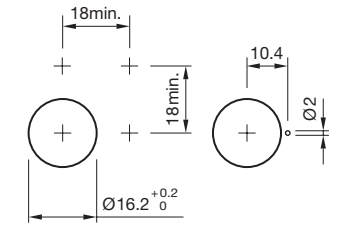
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]
A = Solder terminal
B = Solder terminal 2.8 mm x 0.5 mm
C = Universal terminal 2.0 mm x 0.5 mm

Product can differ from the current configuration.

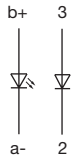


Mounting cut-outs [mm]

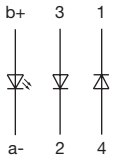
Actuator, Front dimension 18 mm x 18 mm

Terminal	Diode 1N4007	Part No.	Wiring diagram	Compo-nent Layout
Soldering terminal		01-050.002	3	
		01-050.005	4	
Universal terminal		01-051.006	3	1
	1	01-703.006	1	1
	2	01-704.006	2	1

Wiring diagrams



Wiring diagram 1

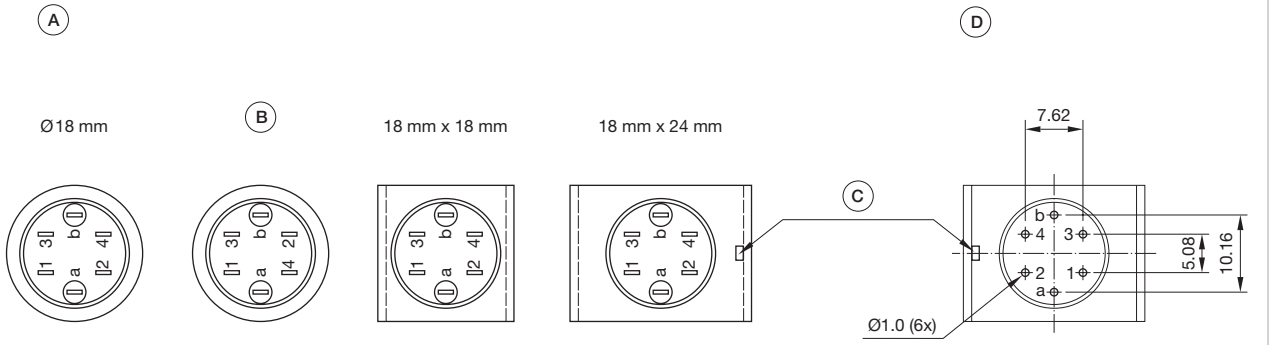


Wiring diagram 2

Wiring diagram 3

Wiring diagram 4

Component layouts



Component layout 1

Dimensions [mm]
A = Terminals (rear side)
B = Diode block
C = Anti twist device only 18 mm x 24 mm
D = Drilling plan (component side)

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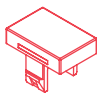
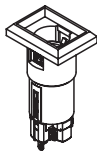
Indicator rectangular, IP40

Equipment consisting of (schematic overview)



Lens Page 20

LED Page 22

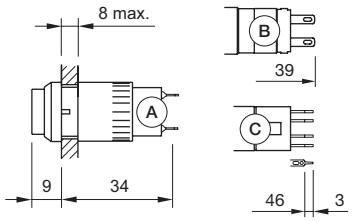


Actuator

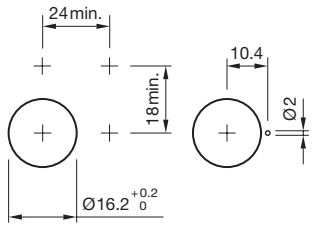
Fixing nut

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]
A = Solder terminal
B = Solder terminal 2.8 mm x 0.5 mm
C = Universal terminal 2.0 mm x 0.5 mm



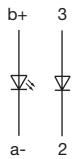
Mounting cut-outs [mm]

Product can differ from the current configuration.

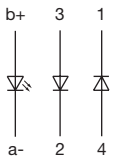
Actuator, Front dimension 24 mm x 18 mm

Terminal	Diode 1N4007	Part No.	Wiring diagram	Component Layout
Soldering terminal		01-040.002	3	
		01-040.005	4	
Universal terminal		01-041.006	3	1
	1	01-701.006	1	1
	2	01-702.006	2	1

Wiring diagrams



Wiring diagram 1



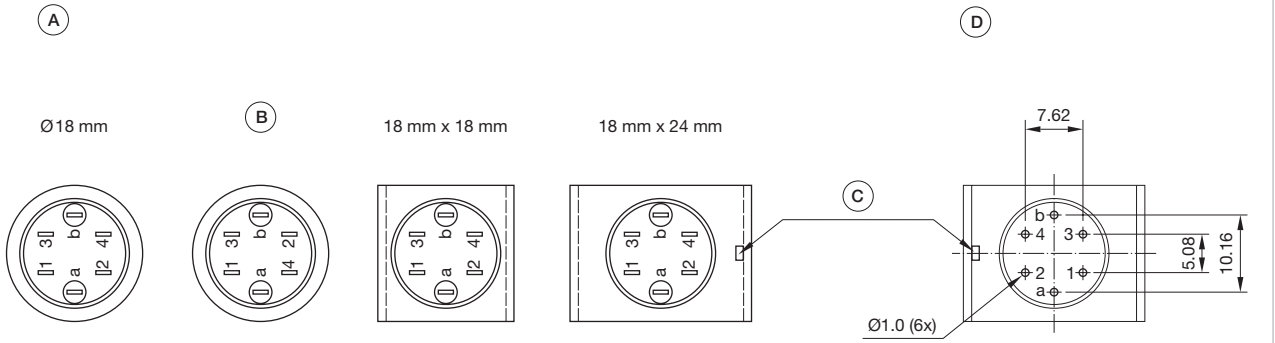
Wiring diagram 2

Wiring diagram 3

Wiring diagram 4

01 Raised design

Component layouts



Component layout 1

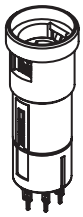
Dimensions [mm]
A = Terminals (rear side)
B = Diode block
C = Anti twist device only 18 mm x 24 mm
D = Drilling plan (component side)

Indicator round, IP40

Equipment consisting of (schematic overview)

Lens Page 21

LED Page 22

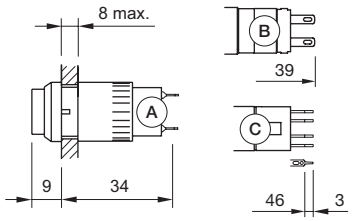


Actuator

Fixing nut

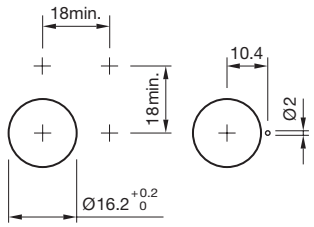
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]
A = Solder terminal
B = Solder terminal 2.8 mm x 0.5 mm
C = Universal terminal 2.0 mm x 0.5 mm

Product can differ from the current configuration.

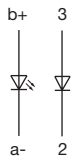


Mounting cut-outs [mm]

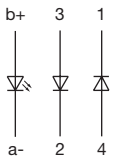
Actuator, Front dimension Ø 18 mm

Terminal	Diode 1N4007	Part No.	Wiring diagram	Component Layout
Soldering terminal		01-030.002	3	1
		01-030.005	3	
Universal terminal		01-031.006	3	1
	1	01-741.006	1	1
	2	01-742.006	2	1

Wiring diagrams



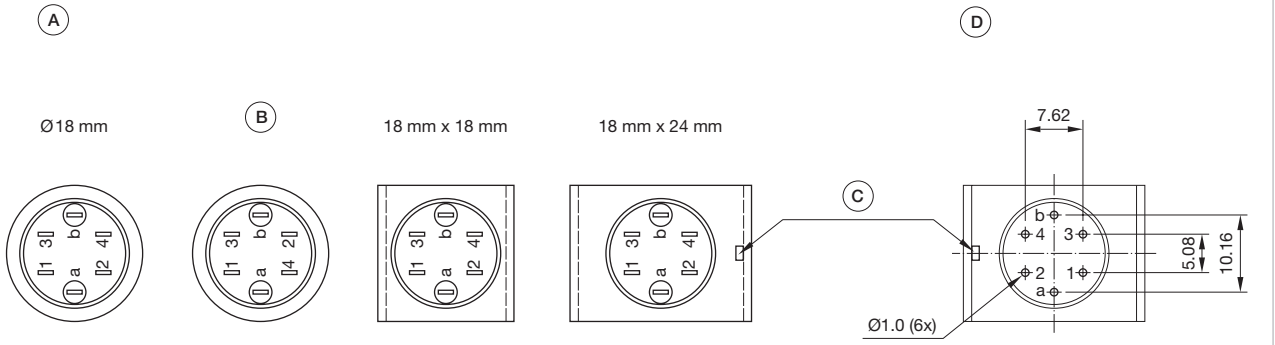
Wiring diagram 1



Wiring diagram 2

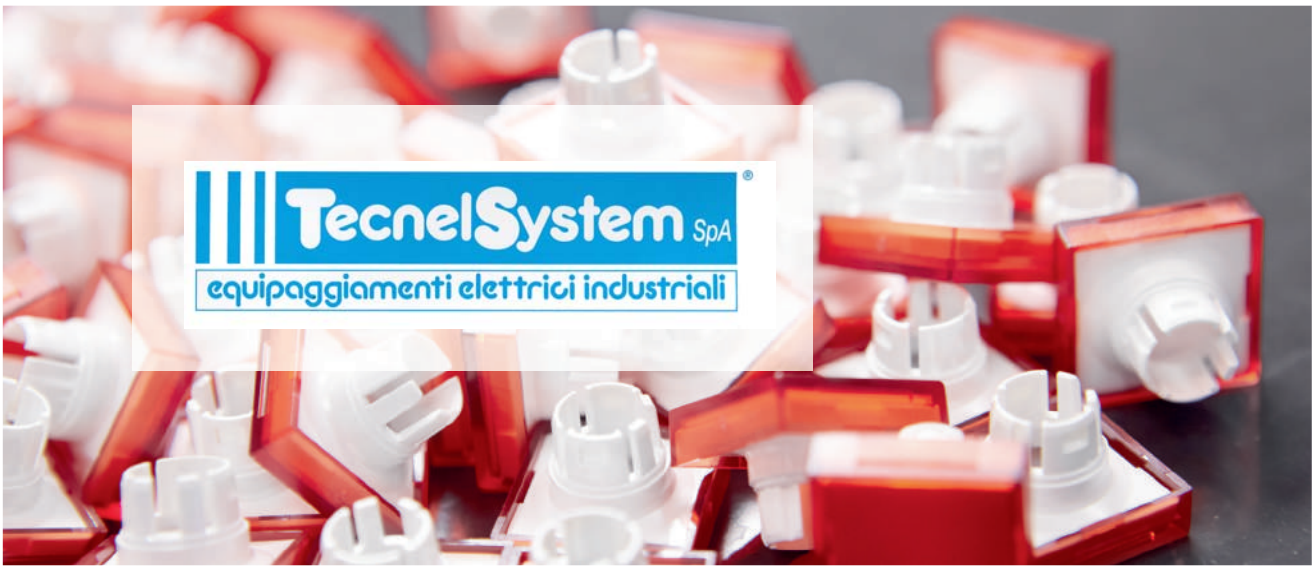
Wiring diagram 3

Component layouts



Component layout 1

Dimensions [mm]
A = Terminals (rear side)
B = Diode block
C = Anti twist device only 18 mm x 24 mm
D = Drilling plan (component side)



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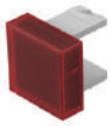


Lens square, raised design

Product attributes	Lens material	Lens colour	Lens optics	Lens shape	Lens illumination	Dimensions	Part No.
	Plastic	Red	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-985.2
	Plastic	Orange	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-985.3
	Plastic	Yellow	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-985.4
	Plastic	Green	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-985.5
	Plastic	Blue	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-985.6
	Plastic	Colourless	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-985.7
Not recommended for film insert	Plastic	Red	translucent	flush	illuminative	12.8 mm x 12.8 mm	01-951.2
	Plastic	Yellow	translucent	flush	illuminative	12.8 mm x 12.8 mm	01-951.4
	Plastic	Blue	translucent	flush	illuminative	12.8 mm x 12.8 mm	01-951.6
	Plastic	White	translucent	flush	illuminative	12.8 mm x 12.8 mm	01-951.9
	Plastic	Red	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-975.2
	Plastic	Yellow	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-975.4
	Plastic	Green	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-975.5
	Plastic	Colourless	transparent	flush	illuminative	12.8 mm x 12.8 mm	01-975.7
	Plastic	Black	opaque	flush	non illuminative	12.8 mm x 12.8 mm	01-951.0
	Plastic	Grey	opaque	flush	non illuminative	12.8 mm x 12.8 mm	01-951.8

Additional information

- Not recommended for film insert

Lens rectangular, raised design

Product attributes	Lens material	Lens colour	Lens optics	Lens shape	Lens illumination	Dimensions	Part No.
	Plastic	Red	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-982.2
	Plastic	Orange	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-982.3
	Plastic	Yellow	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-982.4
	Plastic	Green	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-982.5
	Plastic	Blue	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-982.6
	Plastic	Colourless	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-982.7
Not recommended for film insert	Plastic	Red	translucent	flush	illuminative	12.8 mm x 18.8 mm	01-901.2
	Plastic	Orange	translucent	flush	illuminative	12.8 mm x 18.8 mm	01-901.3
	Plastic	Yellow	translucent	flush	illuminative	12.8 mm x 18.8 mm	01-901.4
	Plastic	Blue	translucent	flush	illuminative	12.8 mm x 18.8 mm	01-901.6
	Plastic	White	translucent	flush	illuminative	12.8 mm x 18.8 mm	01-901.9
	Plastic	Red	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-972.2
	Plastic	Yellow	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-972.4
	Plastic	Green	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-972.5
	Plastic	Colourless	transparent	flush	illuminative	12.8 mm x 18.8 mm	01-972.7
	Plastic	Black	opaque	flush	non illuminative	12.8 mm x 18.8 mm	01-901.0
	Plastic	Grey	opaque	flush	non illuminative	12.8 mm x 18.8 mm	01-901.8

Additional information

- Not recommended for film insert

Lens round, raised design

Product attributes	Lens material	Lens colour	Lens optics	Lens shape	Lens illumination	Dimensions	Part No.
	Plastic	Red	transparent	flush	illuminative	Ø 15.8 mm	01-983.2
	Plastic	Orange	transparent	flush	illuminative	Ø 15.8 mm	01-983.3
	Plastic	Yellow	transparent	flush	illuminative	Ø 15.8 mm	01-983.4
	Plastic	Green	transparent	flush	illuminative	Ø 15.8 mm	01-983.5
	Plastic	Blue	transparent	flush	illuminative	Ø 15.8 mm	01-983.6
	Plastic	Colourless	transparent	flush	illuminative	Ø 15.8 mm	01-983.7
Not recommended for film insert	Plastic	Red	translucent	flush	illuminative	Ø 15.8 mm	01-931.2
	Plastic	Yellow	translucent	flush	illuminative	Ø 15.8 mm	01-931.4
	Plastic	Blue	translucent	flush	illuminative	Ø 15.8 mm	01-931.6
	Plastic	White	translucent	flush	illuminative	Ø 15.8 mm	01-931.9
	Plastic	Red	transparent	flush	illuminative	Ø 15.8 mm	01-973.2
	Plastic	Yellow	transparent	flush	illuminative	Ø 15.8 mm	01-973.4
	Plastic	Green	transparent	flush	illuminative	Ø 15.8 mm	01-973.5
	Plastic	Colourless	transparent	flush	illuminative	Ø 15.8 mm	01-973.7
	Plastic	Black	opaque	flush	non illuminative	Ø 15.8 mm	01-931.0
	Plastic	Grey	opaque	flush	non illuminative	Ø 15.8 mm	01-931.8

Additional information

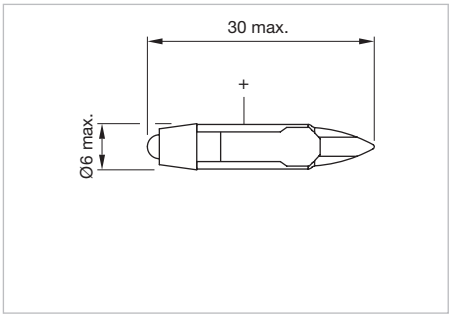
- Not recommended for film insert

Single-LED, T5.7

Illumination colour	Operating voltage	Operation current	Lumi. Intensity	Dom. Wavelength	Part No.	Wiring diagram
Red	6 V DC +10%	15 mA ±15 %	350 mcd	630 nm	10-2106.3142	33
	12 V AC/DC +10%	7 - 14 mA ±15 %	330 mcd	630 nm	10-2109.1062	33
	24 V AC/DC +10%	7 - 14 mA ±15 %	330 mcd	630 nm	10-2112.1062	33
	28 V AC/DC +10%	7 - 14 mA ±15 %	330 mcd	630 nm	10-2113.1062	33
	48 V AC/DC +10%	4 - 8 mA ±15 %	200 mcd	630 nm	10-2119.1042	33
Yellow	6 V DC +10%	15 mA ±15 %	300 mcd	587 nm	10-2106.3144	33
	12 V AC/DC +10%	7 - 14 mA ±15 %	280 mcd	587 nm	10-2109.1064	33
	24 V AC/DC +10%	7 - 14 mA ±15 %	280 mcd	587 nm	10-2112.1064	33
	28 V AC/DC +10%	7 - 14 mA ±15 %	280 mcd	587 nm	10-2113.1064	33
	48 V AC/DC +10%	4 - 8 mA ±15 %	180 mcd	587 nm	10-2119.1044	33
Green	6 V DC +10%	7 mA ±15 %	1050 mcd	525 nm	10-2106.3145	33
	12 V AC/DC +10%	4 - 7 mA ±15 %	1050 mcd	525 nm	10-2109.1065	33
	24 V AC/DC +10%	4 - 7 mA ±15 %	1050 mcd	525 nm	10-2112.1065	33
	28 V AC/DC +10%	4 - 7 mA ±15 %	1050 mcd	525 nm	10-2113.1065	33
	48 V AC/DC +10%	2 - 4 mA ±15 %	600 mcd	525 nm	10-2119.1045	33
Blue	6 V DC +10%	15 mA ±15 %	680 mcd	470 nm	10-2106.3146	33
	12 V AC/DC +10%	4 - 14 mA ±15 %	650 mcd	470 nm	10-2109.1066	33
	24 V AC/DC +10%	7 - 14 mA ±15 %	650 mcd	470 nm	10-2112.1066	33
	28 V AC/DC +10%	7 - 14 mA ±15 %	650 mcd	470 nm	10-2113.1066	33
	48 V AC/DC +10%	4 - 8 mA ±15 %	400 mcd	470 nm	10-2119.1046	33
White	6 V DC +10%	6 mA ±15 %	900 mcd	x: 0,31 / y: 0,32 nm	10-2106.3149	33
	12 V AC/DC +10%	3 - 6 mA ±15 %	900 mcd	x: 0,31 / y: 0,32 nm	10-2109.1069	33
	24 V AC/DC +10%	2,5 - 5 mA ±15 %	750 mcd	x: 0,31 / y: 0,32 nm	10-2112.1069	33
	28 V AC/DC +10%	2,5 - 5 mA ±15 %	750 mcd	x: 0,31 / y: 0,32 nm	10-2113.1069	33
	48 V AC/DC +10%	2 - 4 mA ±15 %	600 mcd	x: 0,31 / y: 0,32 nm	10-2119.1049	33

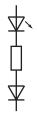
Additional information

- For LED element fitting information see Application guidelines, LED polarity
- 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 occur
- The luminous intensity stated is for when used with DC
- 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. The customer has to decide what resistor shall be used to the LED
- Where supply voltages are over 48 V, a voltage-reduction element (external protective series resistor) must be used.



Dimensions [mm]

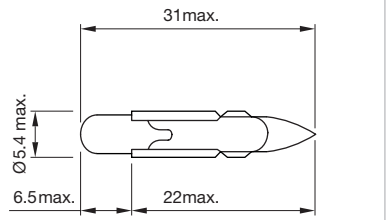
Wiring diagrams



Wiring diagram 33

Filament lamp

Operating voltage	Operation current	Part No.	Wiring diagram
6 V AC/DC	200 mA	10-1106.1369	34
12 V AC/DC	100 mA	10-1109.1329	34
24 V AC/DC	50 mA	10-1112.1279	34
28 V AC/DC	40 mA	10-1113.1249	34
30 V AC/DC	40 mA	10-1114.1249	34
36 V AC/DC	35 mA	10-1116.1229	34
48 V AC/DC	25 mA	10-1119.1199	34



Dimensions [mm]

Wiring diagrams

Wiring diagram 34

Front side

Blind plug

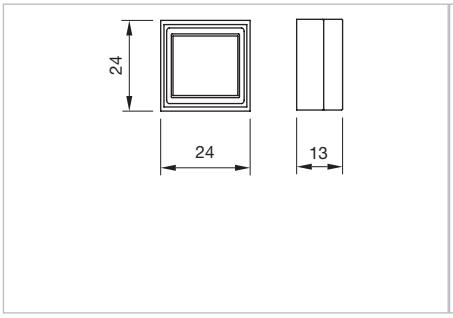
Dimensions	Material	Colour	Part No.
18 mm x 18 mm	Plastic	Black	01-948.0
18 mm x 24 mm	Plastic	Black	01-947.0
Ø 18 mm	Plastic	Black	01-949.0

Protective cap

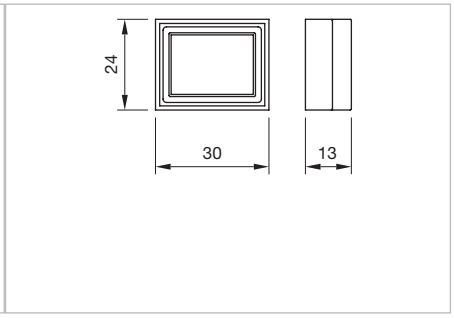
Product attributes	Dimensions	Colour	Optics	Part No.
Two-part	24 mm x 24 mm	Colourless	transparent	31-923
	24 mm x 30 mm	Colourless	transparent	31-924.2

Additional information

- Two-part



Dimensions [mm]
for Part No. 31-923



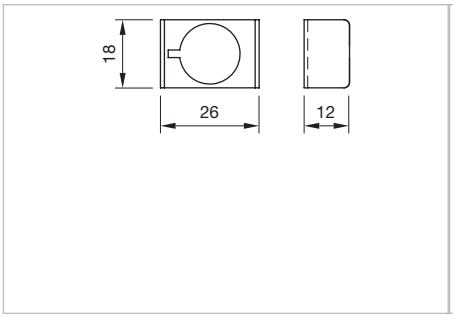
Dimensions [mm]
for Part No. 31-924.2

Protective guard

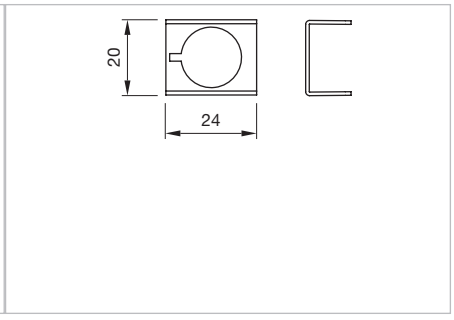
Product attributes	Dimensions	Material	Surface	Part No.
Narrow ends bent upwards, for buttons 18 x 24 mm with mounting cut-out Ø16 mm	18 mm x 26 mm	Brass	matt chrome	01-926
Broad sides bent upwards, for buttons 18 mm x 24 mm with mounting cut-out Ø16 mm	20 mm x 24 mm	Brass	matt chrome	01-927

Additional information

- Please note that bigger minimum distances are necessary



Dimensions [mm]
for Part No. 01-926



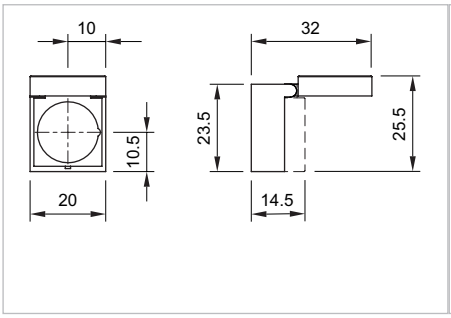
Dimensions [mm]
for Part No. 01-927

Protective cover

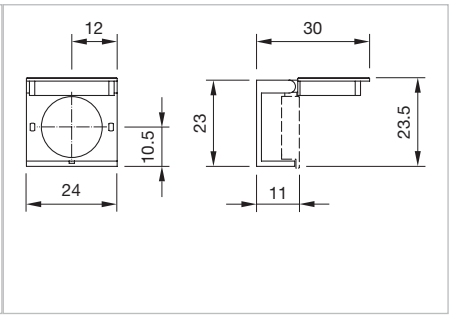
Product attributes	Dimensions	Material	Optics	Part No.
Hinged, with means for sealing	20 mm x 23.5 mm	Plastic	transparent	31-920
	24 mm x 23.5 mm	Plastic	transparent	01-925

Additional information

- Hinged, with means for sealing



Dimensions [mm]



Dimensions [mm]

eao

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Rear side

Flat receptacle

Product attributes	Material	Part No.
2.0 mm x 0.5 mm plug-in terminal	Metal	31-945
2.8 x 0.5 mm plug-in terminal	Metal	31-946

Insulation sleeve

Product attributes	Material	Part No.
For flat receptacle 2.0 mm	Plastic	31-928
For flat receptacle 2.8 mm	Plastic	31-929
Cover plug-in terminals for snap-action switching element 2.8 mm	Plastic	01-928

Terminal cover

Product attributes	Material	Part No.
For snap-action switching element	Plastic	01-929

Side terminal plate empty

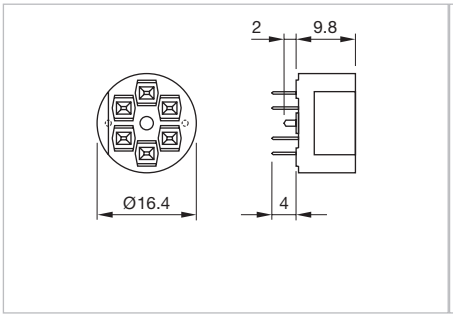
Product attributes	Dimensions	Part No.
5 spaces	62.5 mm x 15 mm x 60 mm	02-912.1
10 spaces	125 mm x 15 mm x 60 mm	02-912.2
15 spaces	187.6 mm x 15 mm x 60 mm	02-912.3
20 spaces	250 mm x 15 mm x 60 mm	02-912.4

PCB plug-in base

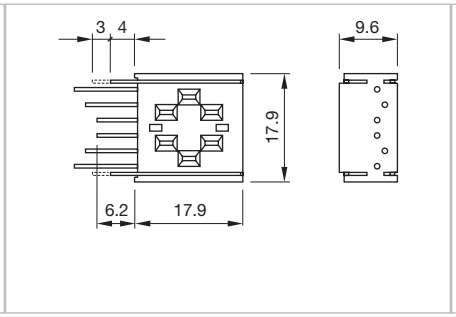
Product attributes	Terminal	Pins	Part No.	Component Layout
For low level switching element	PCB terminal	Axial	31-940	3
	PCB terminal	90° angled	31-941	2
For snap-action switching element 2.8 mm	PCB terminal	Axial	31-942	4

Additional information

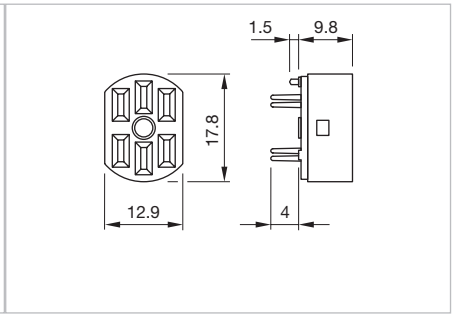
- PCB plug-in base pins right-angle: With the extendable mounting the distance between plug-in base and PCB can be varied up to 3 mm



Dimensions [mm]
for Part No. 31-940

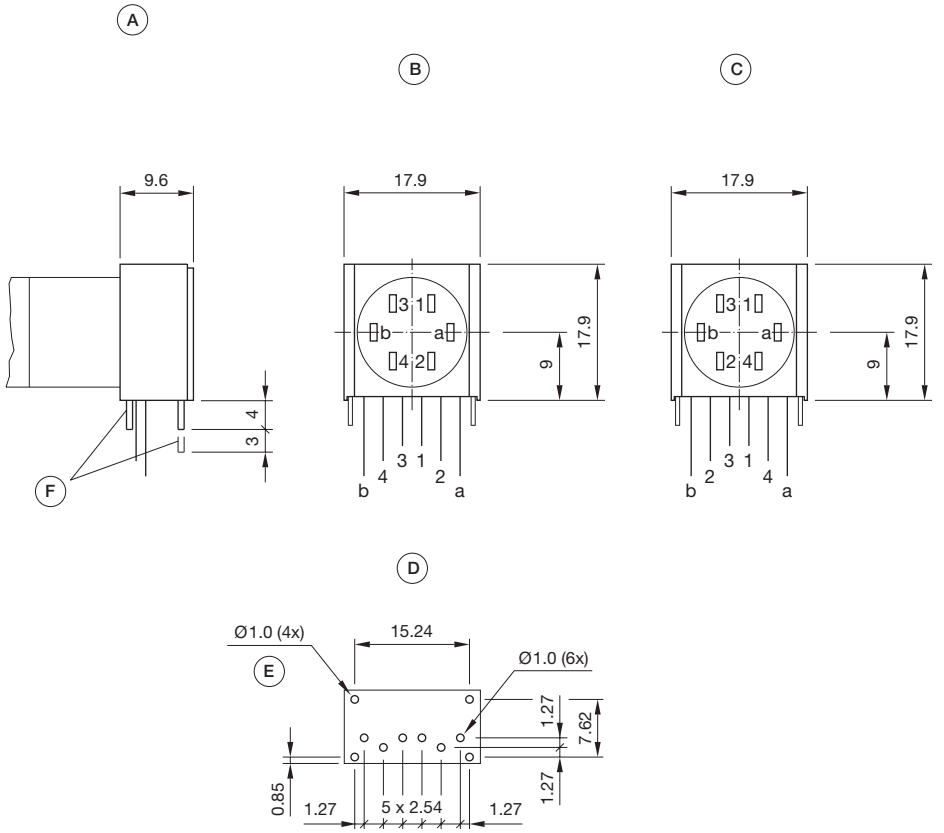


Dimensions [mm]
for Part No. 31-941



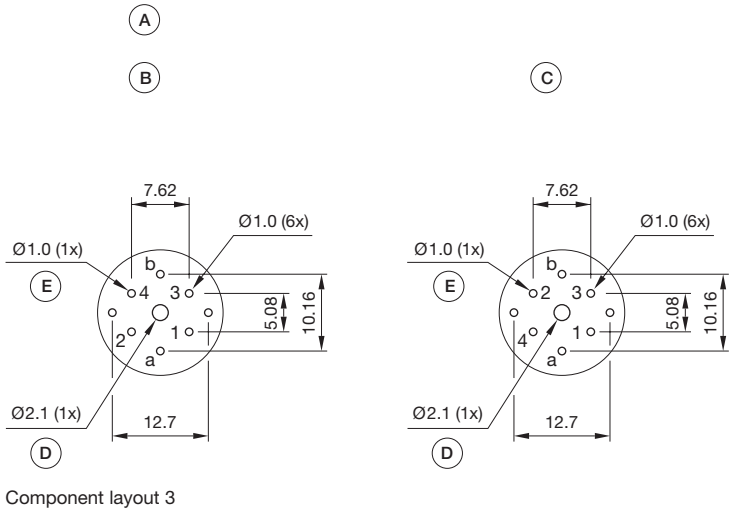
Dimensions [mm]
for Part No. 31-942

Component layouts



Component layout 2

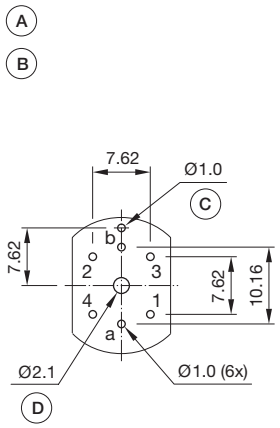
Dimensions [mm]
A = Socket 90° angled
B = Occupancy plan (component side)
C = Occupancy plan diode block
D = Drilling plan (component side)
E = non-metallic
F = Extendable mounting pins



Component layout 3

Dimensions [mm]
A = Axial socket
B = Drilling-/occupancy plan (component side)
C = Drilling-/occupancy plan diode block
D = for central mounting with M2 screw, if desired
E = non-metallic

Component layouts



Component layout 4

Dimensions [mm]
A = Axial socket
B = Drilling-/occupancy plan (component side)
C = non-metallic
D = for central mounting with M2 screw, if desired

Series resistor

Operating voltage	Resistance	Part No.
110 V AC	2.7 kΩ	02-904.0
125 V AC	3.3 kΩ	02-904.1
145 V AC	4.7 kΩ	02-904.3
240 V AC	10 kΩ	02-904.7

Additional information

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

Mounting

Lens remover

Product attributes	Material	Part No.
For raised design	Metal	02-905

Lamp remover

Product attributes	Material	Part No.
A switching action may occur when replacing the lamp	Plastic	02-906

Mounting tool

Product attributes	Dimensions	Material	Part No.
For tightening or loosening of the fixing nut Ø 16 mm	Ø 16 mm	Metal	01-907

Dressing tool

Product attributes	Material	Part No.
For aligning buttons	Metal	01-906

Actuator with snap-action switching element

Switching system

Self-cleaning, double-break, snap action switching system (with contact gap 2 mm x 0.5 mm).

1 Normally closed and 1 Normally open contact per element.

Snap-action switching elements with soldering terminals at the sides: Up to 4 switching element can be on a pushbutton (max. 4 Normally closed and 4 Normally open contacts).

Snap-action switching element with axial plug-in terminals 2.8 mm stachable, only 1 switching element can be on a pushbutton.

Material

Material of contact
Gold plated silver

Switch housing
Axial plug-in-/soldering terminal 2.8 mm: Plastic

Actuator housing
Plastic

Mechanical characteristics

Terminals
Snap-action switching element with tinned soldering terminals at the sides:
Max. wire diameter 2 wires à 1.2 mm
Max. wire cross-section of stranded cable 1 x 1 mm²
Snap-action switching element with axial plug-in terminals, which can also be used as soldering terminals: Plug-in terminal 2.8 mm x 0.5 mm

Soldering terminal:
Max. wire diameter 2 wire of 1 mm²
Max. wire cross-section of stranded cable 2 x 0.75 mm²
or 1 x 1 mm²

Tightening torque
For fixing nut max. 0.25 Nm

Actuating force
2 N ... 5.5 N, depending on the number of switching elements

Actuating travel
Approx. 3 mm

Mechanical lifetime
Momentary action 2 million cycles of operation
Maintained action 1 million cycles of operation

Electrical characteristics

Standards
EN IEC 61058-1

Rated voltage
250 VAC
220 VDC

Rated current
5 A

Thermal current I_{th}
5 A

Switching voltage and switching current
250 VAC, 5 A (ohmic)
250 VAC, 2 A (inductive, cos(phi) = 0.7)
220 VDC, 0.1 A (inductive, L:R = 30 ms)
110 VDC, 0.2 A (inductive, L:R = 30 ms)
60 VDC, 0.7 A (inductive, L:R = 30 ms)
24 VDC, 2 A (inductive, L:R = 30 ms)

Electric strength
2500 VAC, 50 Hz, 1 minute between all terminals and earth, as per IEC 61058-1, part 1

Protection class
II

Electrical lifetime
50 000 cycles of operation

Ambient conditions

Storage temperature
–40 °C ... +85 °C

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

Protection degree
IP40 front side
IP67 with front protective cap

Shock resistance
(Single impacts, semi-sinusoidal)
15 g for 11 ms, as per IEC 60512-4-3, IEC 60068-2-27

Vibration resistance
(sinusoidal)
10 g at 0-2000 Hz, amplitude 1.5 mm, as per IEC 60512-4-4, IEC 60068-2-6

Climate resistance
Standard condition, as per IEC 60068-2-3
Changing condition, as per IEC 60068-2-14

Approvals

Approbations
CB (IEC 61058)
CSA
ENEC (EN 61058)
DNV GL (Germanischer Lloyd)
UL

Conformities
CE

Actuator with low level switching element

Switching system

This low level switching element was designed for switching low powers in electronic circuits. The mechanism assures reliable switching of loads ranging from a few µA / µV up to 100 mA / 42 VAC/DC.

Single-break momentary contact, as normally open or normally closed with 4 independent points of contact. 2 momentary contacts per switching element; combination of normally open and normally closed is possible.

Special features are the long life, extremely short rebound time and stable contact resistance.

Material

Material of contact
Gold plated silver

Switch housing
Plastic

Actuator housing
Plastic

Mechanical characteristics

Terminals
The universal terminals permit these units to be mounted on printed circuit boards (PCB). These terminals can also be used as soldering or plug-in terminals.

For these terminals we can also supply a plug-in base which, when soldered on to the board, enables the switch to be plugged in.
Soldering terminal:

Solder terminal:
Max. wire diameter 2 wires à 0.8 mm
Max. wire cross-section of stranded cable 1 x 0.75 mm²

Plug-in terminal:
2.0 mm x 0.5 mm

Actuating force
3 ... 3.52 N

Actuating travel
Approx. 3 mm

Mechanical lifetime
Momentary action 5 million cycles of operation
Maintained action 1 million cycles of operation

Electrical characteristics

Standards
EN/IEC 61058-1

Switching voltage and switching current
100 mA at 42 VAC / VDC

Electric strength
2500 VAC, 50 Hz, 1 minute between all terminals and earth, as per IEC 60512-2-11

Protection class
II

01 Technical data

Ambient conditions

Storage temperature
–40 °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
IP40 front
IP67 with front protective cap

Shock resistance
(Single impacts, semi-sinusoidal)
15 g for 11 ms, as per IEC 60512-4-3, IEC 60068-2-27

Climate resistance
Standard condition, as per IEC 60068-2-3
Changing condition, as per IEC 60068-2-14

Approvals

Conformities
2011/65/EC (RoHS)

EAO reserves the right to alter specifications without further notice.

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 2 mm. If the height is not specified, we will supply 2 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.

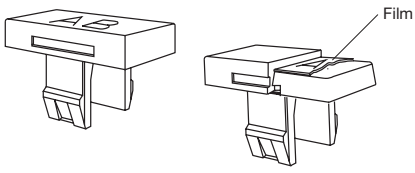
3. Film inserts

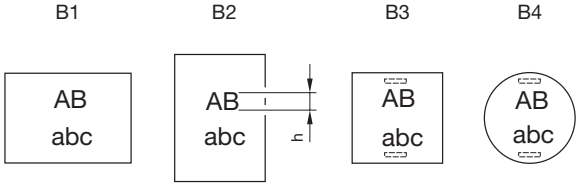
Instead of using engraving the lenses can be fitted with transparent film inserts, as an alternative. For this purpose, though, it is advisible to use transparent lenses. In the case of use of a smoke-black lens the fitted film becomes readable only if the lamp is on. To insert the film, the feet of the lens holder have to be pushed together far enough to enable the lens to be lift off easily. The film thickness is 0.2 mm.

Important: Consider pushbutton mounting orientation befor specifying engraving characters!

All dimensions in mm

Front size (Lens)	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 18 (12.8 x 12.8)	10.2 x 10.2	2.5	3	6–7	7	B3
		3.0	2	5–6	6	B3
		4.0	2	4	4	B3
		5.0	1	3	3–4	B3
		6.0	1	2–3	3	B3
		8.0	1	2	2	B3
18 x 24 (12.8 x 18.8)	10.2 x 16.2	2.5	3	10	10–11	B1
		2.5	4	6–7	7	B2
		3.0	2	8–9	9	B3
		3.0	4	5–6	6	B4
		4.0	2	6	6–7	B2
		4.0	3	4	4	B1
		5.0	1	5	5–6	B2
		5.0	2	3	3–4	B1
		6.0	1	4	4–5	B2
		6.0	1	2–3	3	B1
		8.0	1	3	3–4	B2
		8.0	1	2	2	B2
Ø 18 (Ø 15.8)	Ø 12.8	2.5	3	6	6	B4
		3.0	2	5	6	B4
		4.0	2	3	4	B4
		5.0	1	2	3	B4
		6.0	1	2	2	B4
		8.0	1	2	2	B4





01 Application guidelines

Suppressor circuits

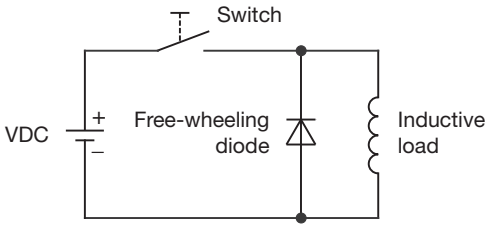
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e. g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

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.

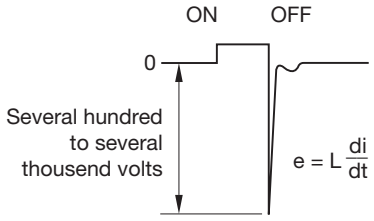
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage (VR) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum current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

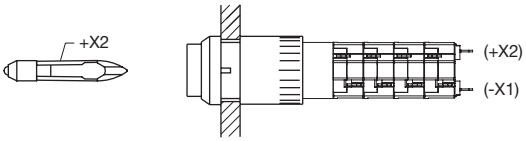


Counter EMF
over load without free-wheeling diode
Fig. 2



LED polarity

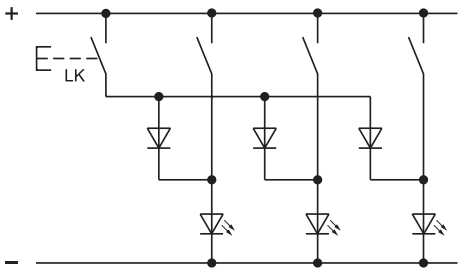
When fitting the LED element the polarity has to correspond with the respective terminal, (+) goes to +.



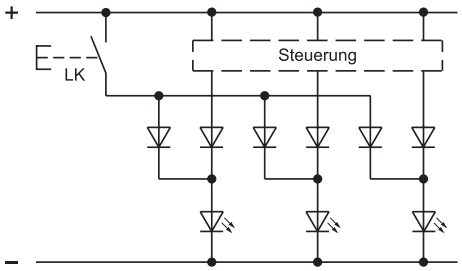
Diode element for lamp check

When indicators and illuminated pushbuttons equipped with diodes, the user is able to perform a lamp check or wire an alarm circuit simply with a considerable saving of space.

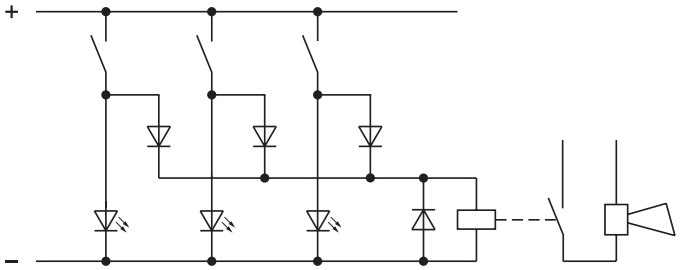
Lamp check



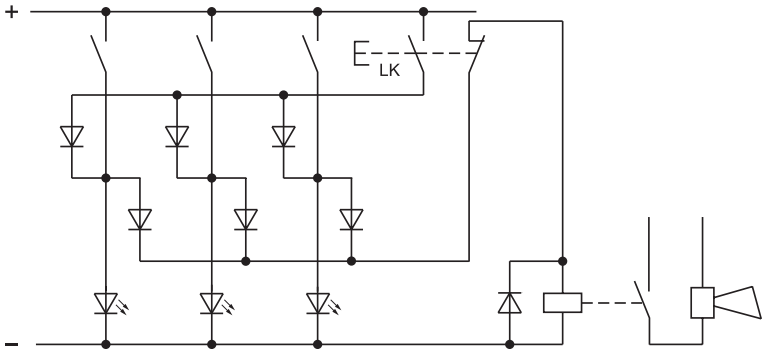
Lamp check with blocking diodes



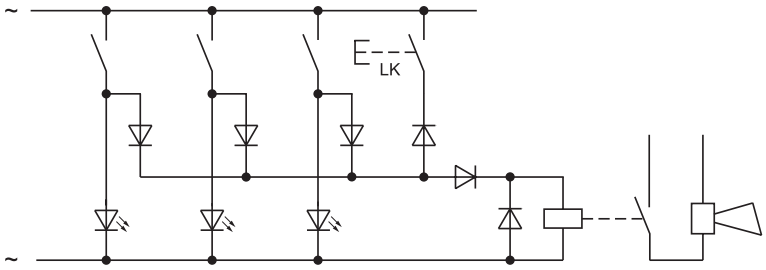
Alarm circuit from fault annunciation system



Lamp check and alarm circuit



Lamp check and alarm circuit with only one diode and AC voltage



LK = Lamp control

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