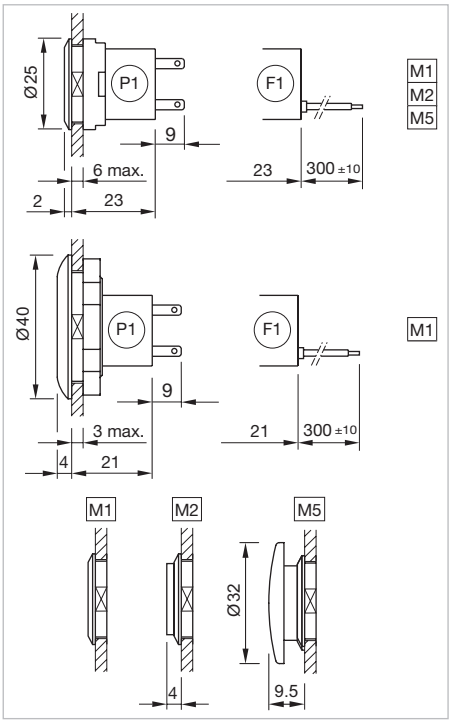
84 Flush design

Illuminated pushbutton standard

Product can differ from the current configuration.



Dimensions [mm]
F1 = Flat ribbon cable,
P1 = Plug-in terminal 2.8 x 0.8 mm,
M1 = Lens level with bezel,
M2 = Lens raised above bezel,
M5 = Mushroom-head cap

Equipment consisting of (schematic overview)

Lens *page 24*

Actuator

Fixing nut

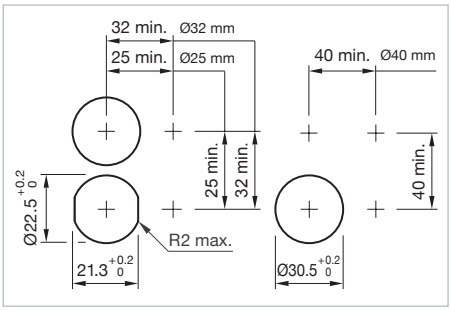
Switching element *page 33*

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

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

Additional Information

- Illuminated lens, non-illuminated bezel
- The colour of anodized aluminium parts can vary due to technical production reasons

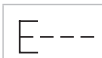


Mounting cut-outs [mm]

Front protection	Front ring	Switching action	Part No.	Wiring diagram	Weight
 **Illuminated pushbutton standard, Front dimension Ø 40 mm**					
IP 67	Aluminium natural anodized	B	**84-1221.7**	1	0.022 kg
 **Illuminated pushbutton standard, Front dimension Ø 25 mm**					
IP 40	Plastic black	B	**84-2101.0**	1	0.004 kg
IP 67	Plastic black	B	**84-1101.0**	1	0.003 kg
	Aluminium black anodized	B	**84-1201.0**	1	0.008 kg
	Aluminium red anodized	B	**84-1201.2**	1	0.008 kg

Front protection	Front ring	Switching action	Part No.	Wiring diagram	Weight
IP 67	Aluminium gold anodized	B	**84-1201.4**	1	0.008 kg
	Aluminium olive-green anodized	B	**84-1201.5**	1	0.008 kg
	Aluminium blue anodized	B	**84-1201.6**	1	0.008 kg
	Aluminium natural anodized	B	**84-1201.7**	1	0.008 kg

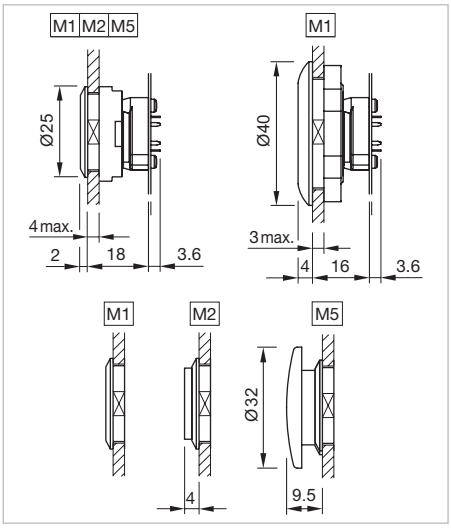
Switching action: B = Momentary



Wiring diagram 1

Illuminated pushbutton PCB standard

Product can differ from the current configuration.



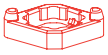
Dimensions [mm]
M1 = Lens level with bezel,
M2 = Lens raised above bezel,
M5 = Mushroom-head cap

Equipment consisting of (schematic overview)


Lens *page 24*


Actuator


Fixing nut


Mounting flange *page 37*


LED *page 39*

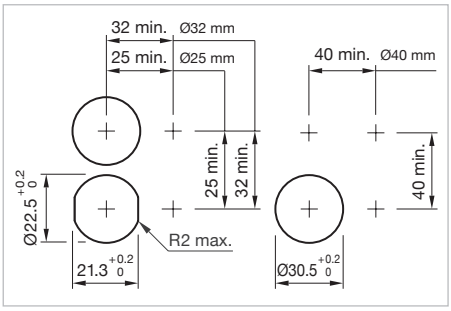

Switching element *page 34*

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

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

Additional Information

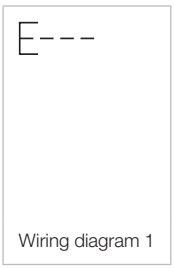
- Illuminated lens, non-illuminated bezel
- The colour of anodized aluminium parts can vary due to technical production reasons



Mounting cut-outs [mm]

Front protection	Front ring	Switching action	Part No.	Wiring diagram	Weight
 **Illuminated pushbutton actuator PCB standard, Front dimension Ø 40 mm**					
IP 67	Aluminium natural anodized	B	**84-1221.7**	1	0.022 kg
 **Illuminated pushbutton actuator PCB standard, Front dimension Ø 25 mm**					
IP 40	Plastic black	B	**84-2101.0**	1	0.004 kg
IP 67	Plastic black	B	**84-1101.0**	1	0.003 kg
	Aluminium black anodized	B	**84-1201.0**	1	0.008 kg
	Aluminium red anodized	B	**84-1201.2**	1	0.008 kg
	Aluminium gold anodized	B	**84-1201.4**	1	0.008 kg
	Aluminium olive-green anodized	B	**84-1201.5**	1	0.008 kg
	Aluminium blue anodized	B	**84-1201.6**	1	0.008 kg
	Aluminium natural anodized	B	**84-1201.7**	1	0.008 kg

Switching action: B = Momentary

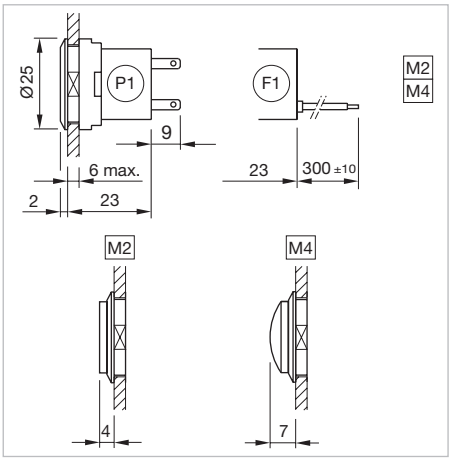


Wiring diagram 1

84 Flush design

Indicator with halo illumination standard, IP 67

Product can differ from the current configuration.



Dimensions [mm]
F1 = Flat ribbon cable,
P1 = Plug-in terminal 2.8 x 0.8 mm,
M2 = Lens raised above bezel,
M4 = Lens convexe raised above bezel

Equipment consisting of (schematic overview)


Lens *page 26*


Actuator


Fixing nut

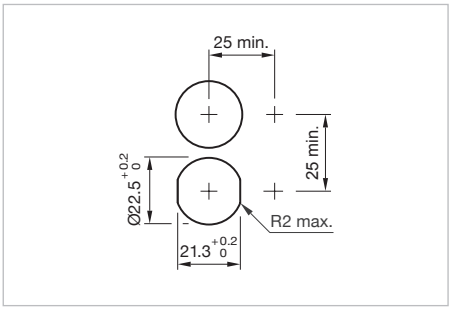

Illumination element *page 31*

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

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

Additional Information

- Front bezel illuminated
- Accessories for halo illumination: Essential lenses Part No. 84-7202.x00A and 84-7205.x00A



Mounting cut-outs [mm]

Front ring	Part No.	Weight
 **Indicator actuator with halo illumination standard, Front dimension Ø 25 mm**		
Plastic colourless translucent	**84-0090.7**	0.006 kg

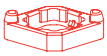
Indicator with halo illumination PCB standard, IP 67

Equipment consisting of (schematic overview)


Lens *page 26*


Actuator


Fixing nut

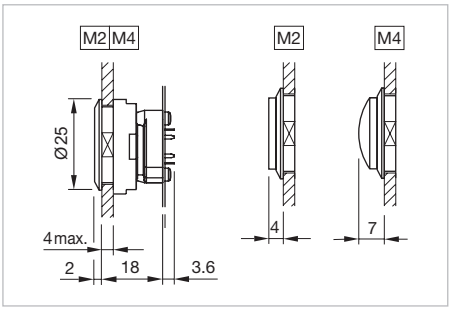

Mounting flange *page 37*


LED *page 39*


Illumination element *page 36*

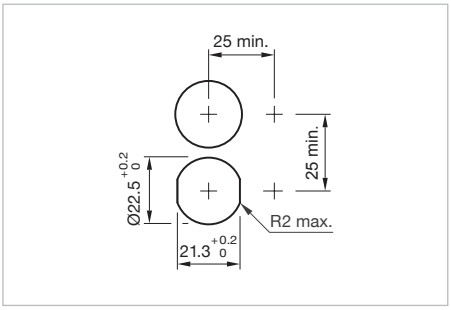
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]
M2 = Lens raised above bezel,
M4 = Lens convexe raised above bezel

Product can differ from the current configuration.



Mounting cut-outs [mm]

Additional Information

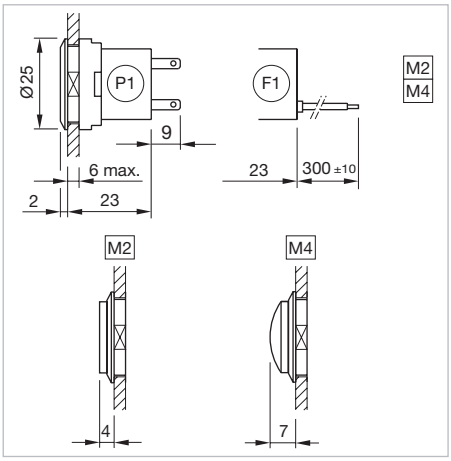
- Front bezel illuminated
- Accessories for halo illumination: Essential lenses Part No. 84-7202.x00A and 84-7205.x00A

Front ring	Part No.	Weight
 **Indicator actuator with halo illumination PCB standard, Front dimension Ø 25 mm**		
Plastic colourless translucent	**84-0090.7**	0.006 kg

84 Flush design

Pushbutton actuator with halo illumination standard, IP 67

Product can differ from the current configuration.



Dimensions [mm]
F1 = Flat ribbon cable,
P1 = Plug-in terminal 2.8 x 0.8 mm,
M2 = Lens raised above bezel,
M4 = Lens convexe raised above bezel

Equipment consisting of (schematic overview)


Lens *page 26*


Actuator


Fixing nut

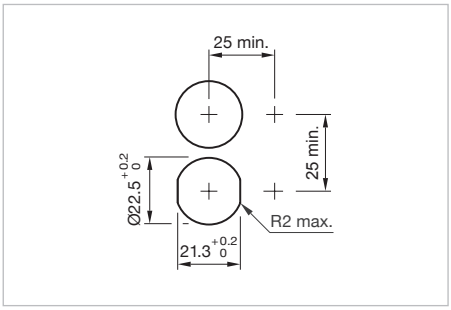

Switching element *page 33*

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

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

Additional Information

- Front bezel illuminated
- Accessories for halo illumination: Essential lenses Part No. 84-7202.x00A and 84-7205.x00A



Mounting cut-outs [mm]

Front ring	Switching action	Part No.	Wiring diagram	Weight
 **Pushbutton actuator with halo illumination standard, Front dimension Ø 25 mm**				
Plastic colourless translucent	B	**84-1091.7**	1	0.006 kg

Switching action: B = Momentary

Wiring diagram 1

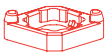
Pushbutton with halo illumination PCB standard, IP 67

Equipment consisting of (schematic overview)


Lens *page 26*


Actuator


Fixing nut

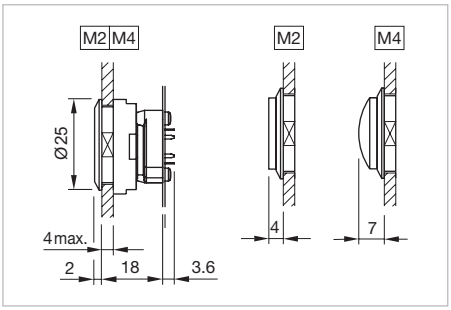

Mounting flange *page 37*


LED *page 39*


Switching element *page 34*

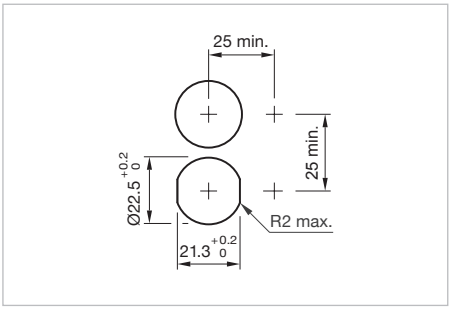
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]
M2 = Lens raised above bezel,
M4 = Lens convexe raised above bezel

Product can differ from the current configuration.



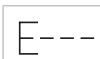
Mounting cut-outs [mm]

Additional Information

- Front bezel illuminated
- Accessories for halo illumination: Essential lenses Part No. 84-7202.x00A and 84-7205.x00A

Front ring	Switching action	Part No.	Wiring diagram	Weight
 **Pushbutton actuator with halo illumination PCB standard, Front dimension Ø 25 mm**				
Plastic colourless translucent	B	**84-1091.7**	1	0.006 kg

Switching action: B = Momentary

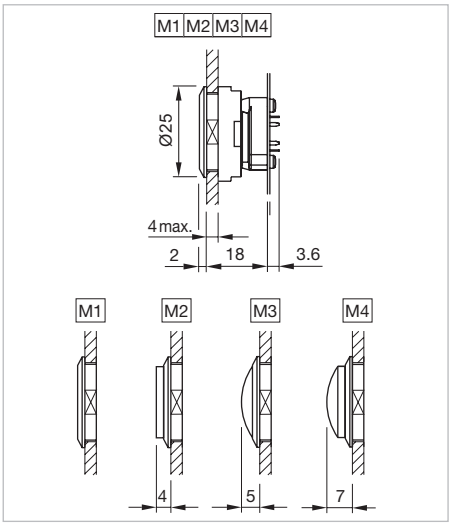


Wiring diagram 1

84 Flush design

Indicator for ring illumination (multicolor) PCB or Halo Compact, IP 67

Product can differ from the current configuration.



Dimensions [mm]
M1 = Lens level with bezel,
M2 = Lens raised above bezel,
M3 = Lens konvexe level with bezel,
M4 = Lens convexe raised above bezel

Equipment consisting of (schematic overview)


Lens *page 24*


Actuator


Befestigungs-mutter


Mounting flange *page 37*


Single-LED *page 39*

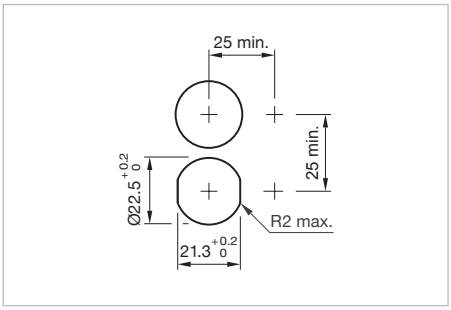

Illumination element *page 36*

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

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

Additional Information

- The LEDs are not part of delivery.
  Recommendation: Osram Hyper Mini TOPLED



Mounting cut-outs [mm]

Front ring	Part No.	Weight
 **Indicator actuator for ring illumination (multicolor) PCB or Halo Compact, Front dimension Ø 25 mm**		
Plastic colourless transparent	**84-0080.7**	0.006 kg

Pushbutton for ring illumination (multicolor) PCB or Halo Compact, IP 67

Equipment consisting of (schematic overview)


Lens *page 24*


Actuator


Fixing nut

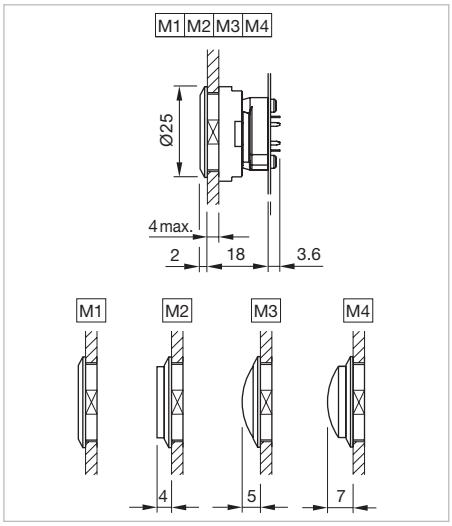

Mounting flange *page 37*


LED *page 39*


Switching element *page 34*

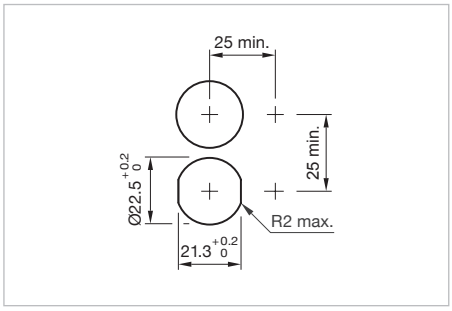
Each Part Number listed below includes all the black components shown in the 3D-drawing.

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



Dimensions [mm]
M1 = Lens level with bezel,
M2 = Lens raised above bezel,
M3 = Lens konvexe level with bezel,
M4 = Lens convexe raised above bezel

Product can differ from the current configuration.



Mounting cut-outs [mm]

Additional Information

- The LEDs are not part of delivery.
  Recommendation: Osram Hyper Mini TOPLED

Front ring	Switching action	Part No.	Wiring diagram	Weight
 **Pushbutton actuator for ring illumination (multicolor) PCB or Halo Compact, Front dimension Ø 25 mm**				
Plastic colourless transparent	B	**84-1081.7**	1	0.006 kg

Switching action: B = Momentary

Wiring diagram 1

84 Accessories

Front

Lens plastic

Additional Information

- Lens profile flat

Product attribute	Dimension	Lens	Mounting type	Part No.	Weight
 **Lens plastic**					
illuminative	Ø 19.7 mm	red transparent	level with bezel	**84-7111.200**	0.001 kg
		orange transparent	level with bezel	**84-7111.300**	0.001 kg
		yellow transparent	level with bezel	**84-7111.400**	0.001 kg
		green transparent	level with bezel	**84-7111.500**	0.001 kg
		blue transparent	level with bezel	**84-7111.600**	0.001 kg
		colourless transparent	level with bezel	**84-7111.700**	0.001 kg
non-illuminative	Ø 19.7 mm	black opaque	level with bezel	**84-7121.000**	0.001 kg
		grey opaque	level with bezel	**84-7121.800**	0.001 kg
illuminative	Ø 19.7 mm	red transparent	raised above bezel	**84-7115.200**	0.001 kg
		orange transparent	raised above bezel	**84-7115.300**	0.001 kg
		yellow transparent	raised above bezel	**84-7115.400**	0.001 kg
		green transparent	raised above bezel	**84-7115.500**	0.001 kg
		blue transparent	raised above bezel	**84-7115.600**	0.001 kg
		colourless transparent	raised above bezel	**84-7115.700**	0.001 kg
non-illuminative	Ø 19.7 mm	black opaque	raised above bezel	**84-7125.000**	0.001 kg
		grey opaque	raised above bezel	**84-7125.800**	0.001 kg

Marking plate

Additional Information

- Can be hot stamped

Marking plate	Part No.	Weight
 **Legend plate for lens plastic**		
Plastic colourless transparent	**61-9707.7**	0.001 kg

Lens metal with dot

Additional Information

- Lens profile flat
- The colour of anodized aluminium parts can vary due to technical production reasons

Product attribute	Dimension	Lens	Mounting type	Part No.	Weight
 **Lens metal with dot**					
illuminative	Ø 19.7 mm	Aluminium black anodized	level with bezel	**84-7211.000**	0.002 kg
		Aluminium red anodized	level with bezel	**84-7211.200**	0.002 kg
		Aluminium gold anodized	level with bezel	**84-7211.400**	0.002 kg
		Aluminium olive-green anodized	level with bezel	**84-7211.500**	0.002 kg
		Aluminium blue anodized	level with bezel	**84-7211.600**	0.002 kg
		Aluminium natural anodized	level with bezel	**84-7211.800**	0.002 kg
		Aluminium black anodized	raised above bezel	**84-7215.000**	0.002 kg
		Aluminium red anodized	raised above bezel	**84-7215.200**	0.002 kg
		Aluminium gold anodized	raised above bezel	**84-7215.400**	0.002 kg
		Aluminium olive-green anodized	raised above bezel	**84-7215.500**	0.002 kg
		Aluminium blue anodized	raised above bezel	**84-7215.600**	0.002 kg
		Aluminium natural anodized	raised above bezel	**84-7215.800**	0.002 kg

Mushroom-head cap

Product attribute	Mushroom-head cap	Part No.	Weight
 **Mushroom-head cap, Front dimension Ø 32 mm**			
illuminative	Plastic blue	**84-7114.600A**	0.004 kg
non-illuminative	Plastic black	**84-7124.000A**	0.004 kg
	Plastic red	**84-7124.200A**	0.004 kg
	Plastic yellow	**84-7124.400A**	0.004 kg
	Plastic green	**84-7124.500A**	0.004 kg

Front protective cap, IP 68

Additional Information

- For flat lense profil only
- When using the front protection cover the external sealing in the actuator has to be removed

Material	Colour	Optics	Part No.	Weight
Front protective cap				
Silicone	colourless	transparent	**84-9103.7**	0.001 kg

Legend frame

Additional Information

- For devices with front dimension Ø 25 mm, flush design
- The colour of anodized aluminium parts can vary due to technical production reasons

Dimension	Material	Colour	Mounting type	Part No.	Weight
 **Legend frame**					
30 x 50 x 0.75 mm	Aluminium	black anodized	adhesive	**61-9980.0**	0.001 kg

Legend plate

Additional Information

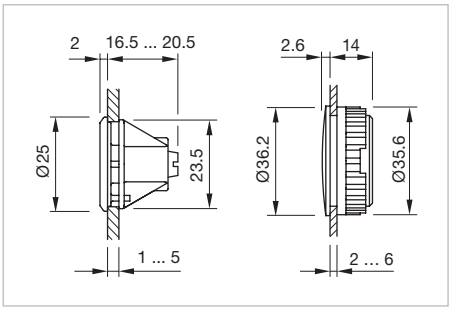
- For legend frame Part No. 61-9980.0
- The colour of anodized aluminium parts can vary due to technical production reasons

Dimension	Material	Colour	Mounting type	Part No.	Weight
 **Legend plate for legend frame**					
14.5 x 23.5 mm	Aluminium	natural anodized	adhesive	**704.968.0**	0.001 kg
		black anodized	adhesive	**704.968.1**	0.001 kg

Blind plug, IP 65

Additional Information

- The dimensions of the mounting cut-outs are shown in the product details
- Please note that bigger minimum distances are necessary



Dimensions [mm]

Product attribute	Dimension	Mounting cut-out	Material	Colour	Part No.	Weight
 **Blind plug**						
with this print version of the panel thickness is reduced to 2.5 mm max.	Ø 25 mm	Ø 22.5 mm	Plastic	black	**61-9453.0**	0.006 kg
 **Blind plug**						
	Ø 36 mm	Ø 30.5 mm	Plastic	black	**704.964.8**	0.007 kg

Rear side

Illumination element, IP 40

Additional Information

- LED and built-in resistor included
- Standard version: Cable length 300 mm with insulated ferrule, plug-in terminal 2.8 x 0.8 mm
- Other options on request: Customisation of cable and connectors, rear side fully sealed (IP 67)
- Protection degree (rear side): IP 40, upgrade to IP 67 with plug Part No. 84-900 possible. With applications where strong vibrations occure, the plugs may become loose
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

Protection degree	LED colour	Operating voltage	Operation current	Terminal	Part No.	Wiring diagram	Weight
 **Illumination element**							
IP 40	Single-LED red	12 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.2320**	1	0.005 kg
	Single-LED orange	12 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.3320**	1	0.005 kg
	Single-LED yellow	12 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.4320**	1	0.005 kg
	Single-LED green	12 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.5320**	1	0.005 kg
	Single-LED blue	12 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.6320**	1	0.005 kg
	Single-LED white	12 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.9320**	1	0.005 kg
	Single-LED red	24 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.2620**	1	0.005 kg
	Single-LED orange	24 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.3620**	1	0.005 kg
	Single-LED yellow	24 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.4620**	1	0.005 kg
	Single-LED green	24 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.5620**	1	0.005 kg
	Single-LED blue	24 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.6620**	1	0.005 kg
	Single-LED white	24 VDC ±10 %	10 mA	Plug 2.8 x 0.8 mm	**84-8001.9620**	1	0.005 kg
 **Illumination element**							
IP 40	Single-LED red	12 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.2340**	1	0.010 kg
	Single-LED orange	12 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.3340**	1	0.010 kg
	Single-LED yellow	12 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.4340**	1	0.010 kg
	Single-LED green	12 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.5340**	1	0.010 kg
	Single-LED blue	12 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.6340**	1	0.010 kg
	Single-LED white	12 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.9340**	1	0.010 kg
	Single-LED red	24 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.2640**	1	0.010 kg
	Single-LED orange	24 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.3640**	1	0.010 kg
	Single-LED yellow	24 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.4640**	1	0.010 kg
	Single-LED green	24 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.5640**	1	0.010 kg
	Single-LED blue	24 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.6640**	1	0.010 kg
	Single-LED white	24 VDC ±10 %	10 mA	Flat ribbon cable	**84-8001.9640**	1	0.010 kg

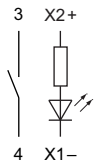
Switching element with illumination

Additional Information

- LED and built-in resistor included
- Standard version: Cable length 300 mm with insulated ferrule, plug-in terminal 2.8 x 0.8 mm
- Other options on request: Customisation of cable and connectors, rear side fully sealed (IP 67)
- Protection degree (rear side): IP 40, upgrade to IP 67 with plug Part No. 84-900 possible. With applications where strong vibrations occure, the plugs may become loose
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

Protection degree	LED colour	Operating voltage	Operation current	Contacts	Terminal	Part No.	Wiring diagram	Weight
 **Switching element with illumination**								
IP 40	Single-LED red	12 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.2320**	1	0.006 kg
	Single-LED orange	12 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.3320**	1	0.006 kg
	Single-LED yellow	12 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.4320**	1	0.006 kg
	Single-LED green	12 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.5320**	1	0.006 kg
	Single-LED blue	12 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.6320**	1	0.006 kg
	Single-LED white	12 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.9320**	1	0.006 kg
	Single-LED red	24 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.2620**	1	0.006 kg
	Single-LED orange	24 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.3620**	1	0.006 kg
	Single-LED yellow	24 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.4620**	1	0.006 kg
	Single-LED green	24 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.5620**	1	0.006 kg
	Single-LED blue	24 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.6620**	1	0.006 kg
	Single-LED white	24 VDC ±10 %	10 mA	1 NO	Plug 2.8 x 0.8 mm	**84-8511.9620**	1	0.006 kg
 **Switching element with illumination**								
IP 40	Single-LED red	12 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.2340**	1	0.015 kg
	Single-LED orange	12 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.3340**	1	0.015 kg
	Single-LED yellow	12 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.4340**	1	0.015 kg
	Single-LED green	12 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.5340**	1	0.015 kg
	Single-LED blue	12 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.6340**	1	0.015 kg
	Single-LED white	12 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.9340**	1	0.015 kg
	Single-LED red	24 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.2640**	1	0.015 kg
	Single-LED orange	24 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.3640**	1	0.015 kg
	Single-LED yellow	24 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.4640**	1	0.015 kg
	Single-LED green	24 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.5640**	1	0.015 kg
	Single-LED blue	24 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.6640**	1	0.015 kg
	Single-LED white	24 VDC ±10 %	10 mA	1 NO	Flat ribbon cable	**84-8511.9640**	1	0.015 kg

Contacts: NO = Normally open



Wiring diagram 1

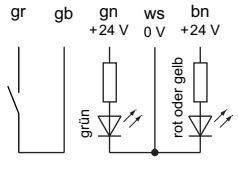
Switching element bi-colour

Additional Information

- LED and built-in resistor included
- Protection degree IP 67, rear side fully sealed. The switching element cannot be disconnected from the actuator any longer
- Best illumination level will be reached with aluminium lens with spot, Part No. 84-7215.x00 and 84-7211.x00
- Standard version: Cable length 300 mm with insulated ferrule
- Other options on request: Customisation of cable and connectors
- Luminosity and wave length variations caused by LED manufacturing processes may cause slight differences regarding the illumination

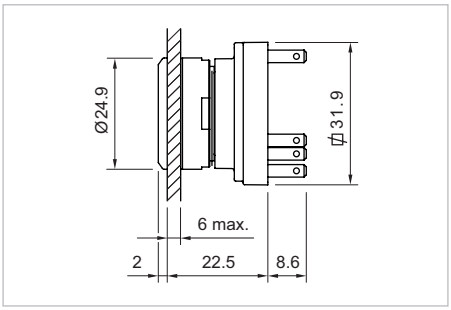
Protection degree	LED colour	Operating voltage	Operation current	Contacts	Terminal	Part No.	Wiring diagram	Weight
 **Switching element with bi-colour illumination**								
IP 67	Bi-colour LED red/green	24 VDC ±10 %	20 mA	1 NO	Flat ribbon cable	**84-8515.8640**	1	0.015 kg
	Bi-colour LED yellow/green	24 VDC ±10 %	20 mA	1 NO	Flat ribbon cable	**84-8515.7640**	1	0.015 kg

Contacts: NO = Normally open



Wiring diagram 1

Switching element Halo Compact



Dimensions [mm]

LED-Farbe	Contacts	Terminal	Part No.	Wiring diagram	Weight
 **Switching element Halo Compact**					
red	1 S	Solder/Plug-in 2.8 x 0.8 mm	**84-8716.2620**	6	0.013 kg
yellow	1 S	Solder/Plug-in 2.8 x 0.8 mm	**84-8716.4620**	6	0.013 kg
green	1 S	Solder/Plug-in 2.8 x 0.8 mm	**84-8716.5620**	6	0.013 kg
blue	1 S	Solder/Plug-in 2.8 x 0.8 mm	**84-8716.6620**	6	0.013 kg
white	1 S	Solder/Plug-in 2.8 x 0.8 mm	**84-8716.9620**	6	0.013 kg
Bi-colour LED red/green	1 S	Solder/Plug-in 2.8 x 0.8 mm	**84-8716.8620**	6	0.013 kg

Contacts: NO = Normally open
The component layouts you will find from page 49

Switching element without illumination

Additional Information

- Standard version: Cable length 300 mm with insulated ferrule, plug-in terminal 2.8 x 0.8 mm
- Other options on request: Customisation of cable and connectors, rear side fully sealed (IP 67)
- Protection degree (rear side): IP 40, upgrade to IP 67 with plug Part No. 84-900 possible. With applications where strong vibrations occure, the plugs may become loose

Protection degree	Contacts	Terminal	Part No.	Wiring diagram	Weight
 **Switching element without illumination**					
IP 40	1 NO	Plug 2.8 x 0.8 mm	**84-8510.0020**	1	0.005 kg
 **Switching element without illumination**					
IP 40	1 NO	Flat ribbon cable	**84-8510.0040**	1	0.010 kg

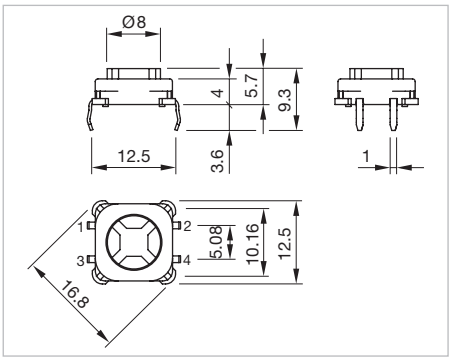
Contacts: NO = Normally open

Wiring diagram 1

Switching element PCB illuminative

Additional Information

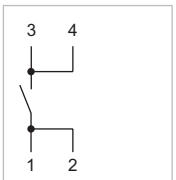
- The customer has to decide what series resistor shall be used to the LED
- LED and mounting flange to be ordered separately



Dimensions [mm]

Contacts	Terminal	Switching action	Part No.	Component layout	Wiring diagram	Weight
 **Switching element PCB mounting illuminative**						
1 NO	PCB	B	**92-851.342**	3	1	0.001 kg

Contacts: NO = Normally open
Switching action: B = Momentary
The component layouts you will find from page 49

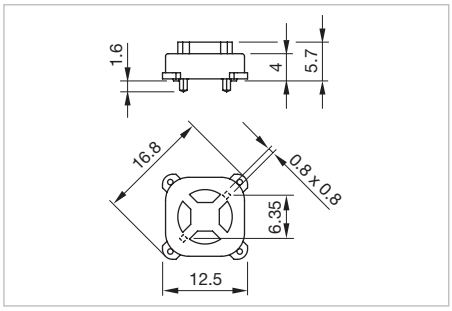


Wiring diagram 1

Illumination element PCB

Additional Information

- The customer has to decide what series resistor shall be used to the LED
- LED and mounting flange to be ordered separately

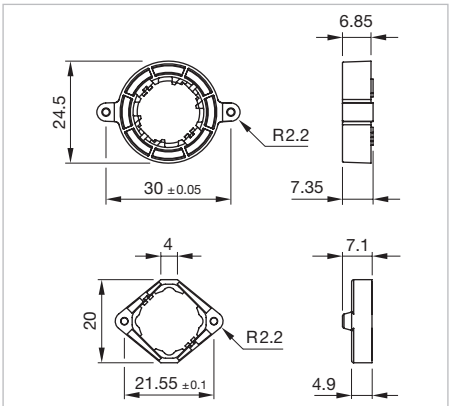


Dimensions [mm]

Terminal	Part No.	Component layout	Weight
 **Illumination element PCB mounting**			
PCB	**92-800.042**	4	0.001 kg

The component layouts you will find from page 49

Mounting flange



Dimensions [mm]

Product attribute	Part No.	Weight
 **Mounting flange**		
Halo illumination (illuminated multi-color bezel)	**84-960.0**	0.001 kg
 **Mounting flange**		
Standard version	**92-960.0**	0.001 kg

Illumination

Single-LED, T1 Bi-Pin

Additional Information

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

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

Bi-colour-LED, T1 Bi-Pin

Additional Information

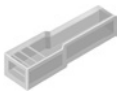
- The customer has to decide what series resistor shall be used to the LED
- Luminosity and wave length scattering caused by LED manufacturing processes may cause slight variations in the illumination

LED colour	Forward voltage typ.	Lumi. intensity	Dom. wavelength	Part No.	Weight
 **Bi-colour-LED**					
Bi-colour LED red/green	2.0/3.2 VDC @ 20 mA	380/650 mcd	628/525 nm	**10-2603.320AL**	0.001 kg
Bi-colour LED yellow/green	2.0/3.2 VDC @ 20 mA	480/380 mcd	588/525 nm	**10-2603.320CL**	0.001 kg

Flat receptacle

Product attribute	Part No.	Weight
 **Flat receptacle**		
2.8 x 0.5 mm plug-in terminal	**31-946**	0.001 kg

Insulation sleeve

Product attribute	Part No.	Weight
 **Insulation sleeve**		
for flat receptacle 2.8 mm	**31-929**	0.001 kg

Mounting

Mounting tool

Product attribute	Part No.	Weight
 **Mounting tool**		
for tightening or loosening the fixing nut, for emergency-stop and stop-switch	**84-996**	0.014 kg
 **Mounting tool**		
for tightening or loosening of fixing nut, for Indicator and Pushbutton	**84-997**	0.027 kg

Dismantling tool

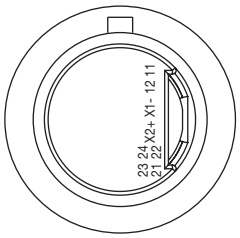
Additional Information

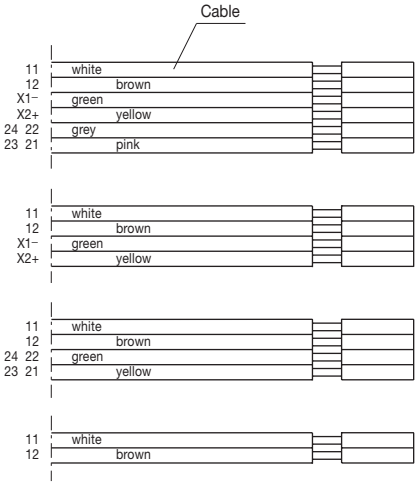
- For actuator dismantling of switching element, illumination element and mounting flange

Part No.	Weight
 **Combined dismantling tool**	
84-918	0.008 kg

84 Drawings

Drawings





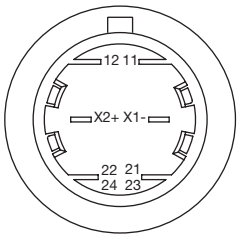
	Terminals
1 NC + 1 NO	11 / 12 + 23 / 24
2 NC	11 / 12 + 21 / 22
Illumination	X1– / X2+

	Terminals
1 NC	11 / 12
Illumination	X1– / X2+

	Terminals
1 NC + 1 NO	11 / 12 + 23 / 24
2 NC	11 / 12 + 21 / 22

	Terminals
1 NC	11 / 12

Component layout 1

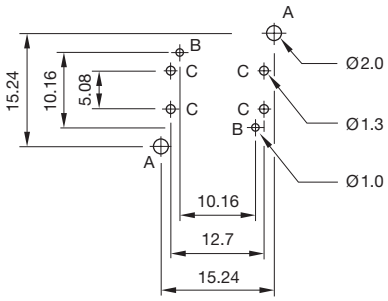


Component layout 2

Single-LED

Drilling plan (element side)

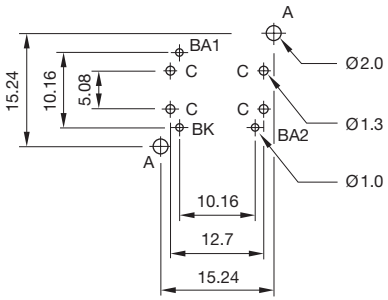
A Fixing holes for mounting flange (92-960.0)
B Holes for LED
C Holes for contact pins
Pad max. Ø 2.5 mm
Through-connection recommended



Bi-colour-LED

Drilling plan (element side)

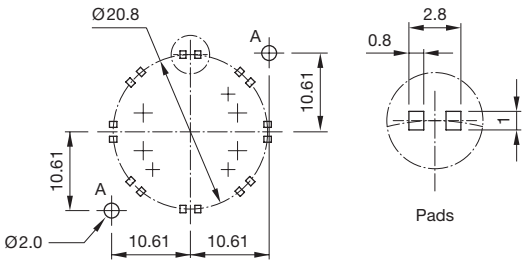
A Fixing holes for mounting flange (92-960.0)
B Holes for Bi-colour LED:
BA1 (green) + BA2 (yellow or red) = Anodes, BK = Cathode
C Holes for contact pins
Pad max. Ø 2.5 mm
Through-connection recommended



Hyper mini Top-LED

Drilling plan (element side)

A Fixing holes for mounting flange (84-960.0)

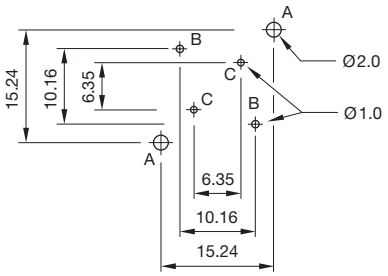


Component layout 3

Single-LED

Drilling plan (element side)

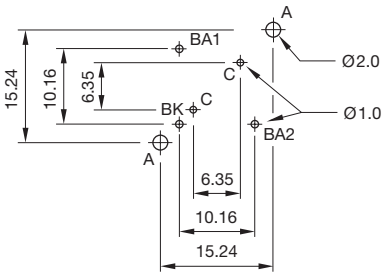
A Fixing holes for mounting flange (92-960.0)
B Holes for LED
C Holes for centering pins



Bi-colour-LED

Drilling plan (element side)

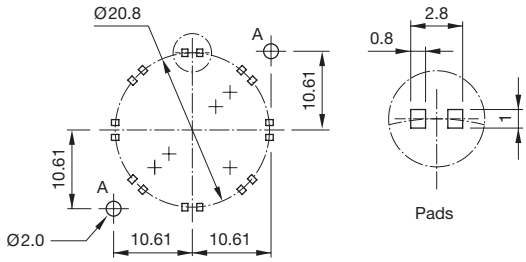
A Fixing holes for mounting flange (92-960.0)
B Holes for Bi-colour LED:
BA1 (green) + BA2 (yellow or red) = Anodes, BC = Cathode
C Holes for centering pins



Hyper mini Top-LED

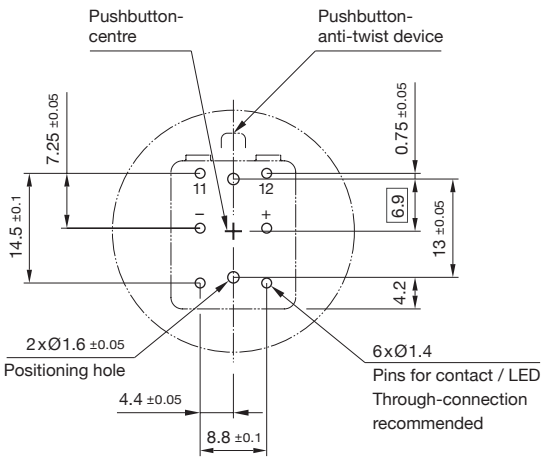
Drilling plan (element side)

A Fixing holes for mounting flange (84-960.0)

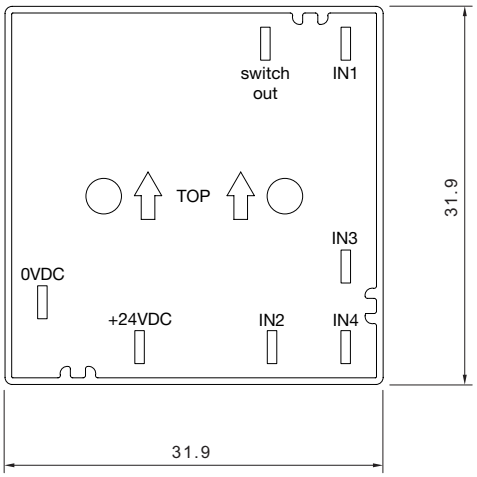


Component layout 4

Drilling plan (element side)



Component layout 5



Component layout 6

Overvoltage category
II, as per EN IEC 60947-1

Degree of pollution
3, as per EN IEC 60947-1

Environmental conditions

Storage temperature
-25 °C … +80 °C

Operating temperature
-25 °C … +65 °C

Front protection
IP 65, as per EN IEC 60529

Shock resistance
(semi-sinusoidal)
max. 150 m/s², pulse width 11 ms, 3-axis,
as per EN IEC 60068-2-27

Vibration resistance
(sinusoidal)
max. 50 m/s² at 10 Hz … 500 Hz, 10 cycles, 3-axis,
as per EN IEC 60068-2-6

Climate resistance
Damp heat, cyclic
96 hours, +25 °C/97 %, +55 °C/93 % relative humidity,
as per EN IEC 60068-2-30

Damp heat, steady
56 days, +40 °C/93 % relative humidity,
as per EN IEC 60068-2-78

Dry heat
96 hours, +70 °C, as per EN IEC 60068-2-2

Low temperature
96 hours, -40 °C, as per EN IEC 60068-2-1

Saline mist
96 Stunden, +35 °C in chemical solution NaCl,
as per EN IEC 60068-2-11

Approvals

Approbations
CB (IEC 60947)
UL
NFF

Declaration of conformity
CE

Switching element illuminated pushbutton

Switching system

Short-travel switching system with 2 independent contact points and tactile operation.
Guarantees reliable switching even of very light loads.
Fitted with 1 normally open contact.

Material

Connection cable
Polyvinylchloride (PVC), short-time heat-resistant up to 105 °C

Material of contact
Silver alloy gold plated

Switching element
Thermoplastic polyester (PET, PBT), as per UL 94 V0 and Polyacetale (POM), as per UL 94 HB

Mechanical characteristics

Terminals
Plug-in terminals 2.8 x 0.8 mm (solderable)
Flat ribbon cable 0.5 mm²
PCB terminal

Actuating force
4.0 N ±0.2 N (measured at the lens)

Actuating travel
~0.5 mm

Rebound time
≤ 1 ms

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

Mechanical lifetime
≥ 1 million cycles of operations

Electrical characteristics

Illumination
Single-Chip LED, green, orange, red, yellow, white and blue

Operation Voltage	12 VDC	24 VDC
Current consumption	10 mA	10 mA

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

Isolation resistance
≥ 1 GΩ between all terminals at 100 VDC,
as per DIN IEC 60512-3-1

Electrical life

Electrical life
as per EN IEC 60512-5

5 million cycles of operation	24 VAC, 50 mA at 480 Ω
5 million cycles of operation	24 VAC, 100 mA at 240 Ω
2 million cycles of operation	42 VAC, 50 mA at 840 Ω
2 million cycles of operation	42 VAC, 100 mA at 420 Ω
300 000 cycles of operation	42 VAC, 100 mA at cosφ 0.4
250 000 cycles of operation	42 VAC, 200 mA at cosφ 0.395
1 million cycles of operation	12 VDC, 250 mA at 48 Ω
1 million cycles of operation	24 VDC, 50 mA at 480 Ω
1 million cycles of operation	24 VDC, 100 mA at 240 Ω
5 million cycles of operation	42 VDC, 25 mA at 1680 Ω
1.5 million cycles of operation	42 VDC, 50 mA at 840 Ω
100 000 cycles of operation	42 VDC, 100 mA at 420 Ω
500 000 cycles of operation	24 VDC, 200 mA at L/R = 30 ms
300 000 cycles of operation	42 VDC, 100 mA at L/R = 30 ms
100 000 cycles of operation	42 VDC, 200 mA at L/R = 30 ms

Switch rating
Voltage 50 mVAC/DC … 42 VAC/DC
Current 10 uA … 100 mA
Power max. 2 W

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

Environmental conditions

Storage temperature
-40 °C … +85 °C

Operating temperature
-25 °C … +70 °C

Protection degree
Back protection:
IP 40, standard version
IP 67, fully sealed version, with mounted actuator only.

Shock resistance
(semi-sinusoidal)
max. 100 m/s², pulse width 11 ms, 3-axis,
as per EN IEC 60068-2-27

Vibration resistance
(sinusoidal)
max. 50 m/s² at 10 Hz … 500 Hz, 10 cycles, 3-axis,
as per EN IEC 60068-2-6

Switching element Halo Compact

Switch configuration

A complete switch requires a halo compact programmable switch actuator body (transparent) and a lens. If the switch needs lens illumination in addition then a translucent plastic lens or aluminium lens with a window is required.

Use Halo Compact with illuminated pushbutton actuator (Part No. 84-1081.7) or with the indicator actuator (Part No. 84-0080.7).

The illumination style is selected by the connection of 24V to the pins.

Material

Housing
Ixef 1521 nature (PA)
Hotmelt (sealing compound)

Material of contact
Silver alloy, gold-plated

The materials used comply with the high EAO standards relating to quality, functional safety, service life and design.

Mechanical characteristics

Terminals
Soldering / plug-in terminals
2.8 x 0.8 mm (solderable)

Actuating force
4.0 N ± 0.2 N
(measured at the lens)

Actuating distance
~ 0.5 mm

Mechanical lifetime
≥ 1 million cycles of operations

Electrical characteristics

Switching element
Short-travel snap-action switching system with two independent contact points and tactile operation.

Number of contacts: one normal open contact

Output
Electronic high-side switch

Pre-configured light sequences
- Full illumination
- Blinking (interval: 1 second)
- Rotating/chasing (one full rotation per second)
- Process (changeover a group of 4 LEDs per second)

Special feature
Integrated electronic switch for maintained action
(High-side switch)

Operating voltage
24 VDC ±10 %
Max. 100 mA

Current consumption
<80 mA

LED-colours
All versions available with eight SMD LEDs for halo illumination plus one single LED (3mm) for central illumination. The following variants are available:

8 x red LEDs + 1 white single LED
8 x green LEDs + 1 white single LED
8 x yellow LEDs + 1 white single LED
8 x white LEDs + 1 white single LED
8 x blue LEDs + 1 white single LED
8 x red/green bi-colour LEDs + 1 white single LED

Light sequences central LED		IN1	IN2	IN3
not illuminated	illuminated			
1	–	0 VDC	0 VDC	0 VDC
2	–	+24 VDC	0 VDC	0 VDC
3	–	0 VDC	+24 VDC	0 VDC
4	–	+24 VDC	+24 VDC	0 VDC
–	5	0 VDC	0 VDC	+24 VDC
–	6	+24 VDC	0 VDC	+24 VDC
–	7	0 VDC	+24 VDC	+24 VDC
–	8	+24 VDC	+24 VDC	+24 VDC

Shock resistance
(semi-sinusoidal)
max. 100 m/s², pulse width 6 ms, 3-axis,
as per EN IEC 60068-2-27

Vibration resistance
(sinusoidal)
max. 50 m/s² at 10 Hz … 500 Hz, 10 cycles, 3-axis,
as per EN IEC 60068-2-6

Ambient conditions

Storage temperature
–40 °C to +85 °C

Operating temperature
–25 °C to +70 °C

Degree of protection
IP67 front protection
(with actuator Part No. 84-1081.7 and 84-0080.7)

Approvals

Declaration of conformity
CE
ESD

Actuator

Material

Lens
Polycarbonate (PC), as per UL 94 V2 or Aluminium anodised

Actuator housing
Polyetherimid (PEI), as per UL 94 V0 or Aluminium anodised

Mechanical characteristics

Mounting cut-outs
Ø 22.5 mm and Ø 30.5 mm

Tightening torque
Fixing nut max. 80 Ncm

Actuating force
4.0 N ±0.2 N (measured at the lens)

Actuating travel
Total switching travel 1.2 mm

Mechanical lifetime
≥ 1 million cycles of operations

Electrical characteristics

Electrostatic breakdown value
Plastic case ≥ 15 kV
Aluminium case ≥ 5 kV
as per IEC 61000-4-2, mounted in plastic front panel

Environmental conditions

Storage temperature
–40 °C bis +85 °C

Operating temperature
–25 °C bis +70 °C

Front protection
IP 67 and IP40, as per EN IEC 60529

Climate resistance
Damp heat, cyclic
96 hours, +25 °C/97 %, +55 °C/93 % relative humidity,
as per EN IEC 60068-2-30

Damp heat, state
56 days, +40 °C/93 % relative humidity,
as per EN IEC 60068-2-78

Rapid change of temperature
100 cycles, -40 °C … +80 °C, as per EN IEC 60068-2-14

Approvals

Approbations
EBC
NFF

Declaration of conformity
CE
TSI/PRM

EAO reserves the right to alter specifications without further notice.

Suppressor circuits

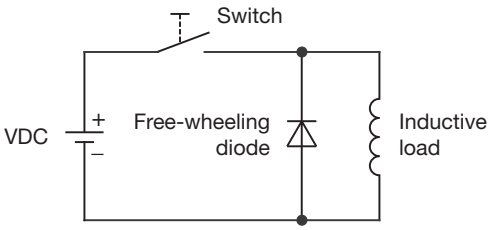
When switching inductive loads such as relays, DC motors, and DC solenoids, it is always important to absorb surges (e. g. with a diode) to protect the contacts. When these inductive loads are switched off, a counter emf can severely damage switch contacts and greatly shorten lifetime.

Fig. 1 shows an inductive load with a free-wheeling diode connected in parallel. This free-wheeling diode provides a path for the inductor current to flow when the current is interrupted by the switch. Without this free-wheeling diode, the voltage across the coil will be limited only by dielectric breakdown voltages of the circuit or parasitic elements of the coil. This voltage can be kilovolts in amplitude even when nominal circuit voltages are low (e. g. 12 VDC) see Fig. 2.

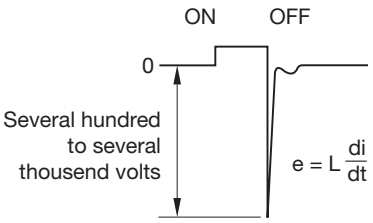
The free-wheeling diode should be chosen so that the reverse breakdown voltage is greater than the voltage driving the inductive load. The DC blocking voltage (VR) of the free-wheeling diode can be found in the datasheet of a diode. The forward current should be equal or greater than the maximum current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

To get an efficient protection, the free-wheeling diode must be connected as close as possible to the inductive load!

Switching with inductive load
Fig. 1



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

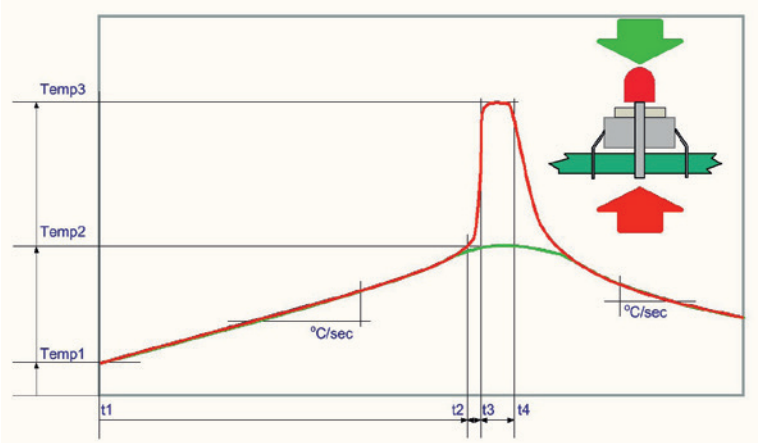


Note for soldering

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

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

Temperature curve wave soldering



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

Iron soldering

Basic specification for iron soldering IEC 60068-2-20

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

Cleaning/Lacquering

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

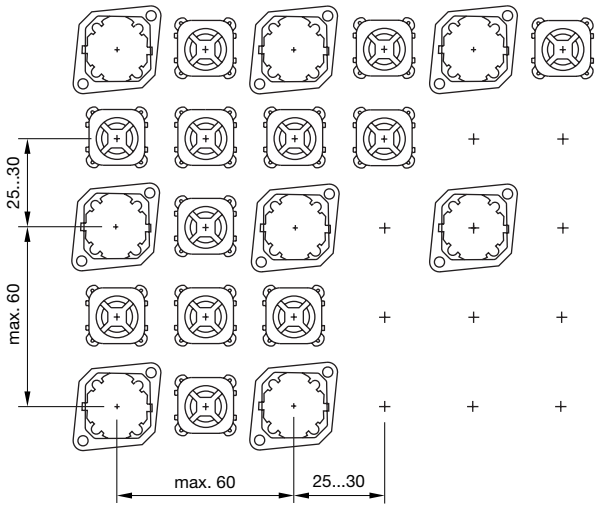
- When soldering make sure that the flux does not pass on the upper side of the PCB.
- When cleaning the PCB with detergents ensure that no dust or other debris may get inside of the switching elements.
- Ensure that no lacquer penetrates into the interior of the switching element when lacquering the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

Storage of components

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

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

Arrangement mounting flange for switching- and illumination element, PCB mounting



The arrangement of the mounting flanges and their number is determined by the size of the front panel or PCB. To ensure uniform, tactile switching, we recommend a layout of the flanges as per adjacent sketch.

For large PCBs with several switching elements we recommend the following procedure:

1. Fit the actuator to the front panel.
2. Clip the mounting flange to the rear of the intended actuator.
3. Screw the PCB with the components soldered to it to the assembled mounting flange.

This arrangement applies to PCBs 1.6 mm thick.

Dismantling mounting flange

The tool Part No. 84-998 must be used for removing the mounting flange from the actuator.
Before removing the flange, the PCB fixing srews must be loosened.