

EAO – Your Expert Partner for
Human Machine Interfaces



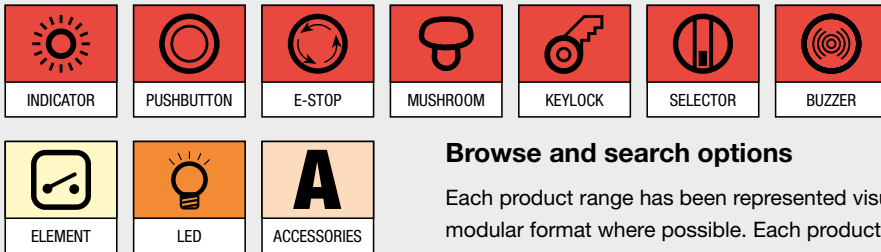
QuickSelector

Actuators and Indicators for:

Machinery and Equipment
Transportation
Telecommunication and Audio/Video
Process Automation and Panel building
Lifting and Moving

How to use this catalogue

The objective of this catalogue is to provide users and purchasers with a quick and easy search facility for the selection and purchase of EAO's most popular product ranges. Included within this catalogue are details of EAO's latest state of the art, ergonomically designed ranges of keyboards, keypads, switches and pushbuttons that have been stringently tested to meet international standards.



Browse and search options

Each product range has been represented visually and in a modular format where possible. Each product series has been colour coded to indicate the function and the additional elements that need to be purchased to complete an order. Additional elements may be actuators, illumination, switching elements, accessories, and so on.

On the page opposite is located a simple index, sorted by product type. Additionally, at the rear of the catalogue the reader will find a product selector, that enables search criteria to be defined by:

- Mounting hole sizes
- Contact terminals
- Number of keys
- Illumination
- Front protection (IP Rating)
- Lens caps
- Mounting styles
- Markings
- Switch ratings
- Applications
- Product functions
- Approvals

For further information about EAO's complete product range either contact your local sales office, distributor, or alternatively visit our website at www.eao.com

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Type	Mounting Style	Mounting Hole Size (MM)	Page
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Series 03	Raised	21.2x41.2	6
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Panel Mount, Sealed, IP65 Switches & Indicators			
Series 04	Raised/Flush	22.5∅, 30.5∅, 30x30	14
Series 14	Raised/Flush	22.5∅, 30.5∅	36
Series 22	Raised	22x30	52
Series 44	Raised/Flush	22.5∅, 30.5∅	64
Series 51	Raised	16∅	76
Series 56	Raised/Flush	42∅, 43.1∅	84
Series 61	Raised/Flush	16∅, 21x21, 21x27, 22.5∅	96
Series 71	Flush	21x21, 21x27, 22.5∅	110
Series 84	Flush	22.5∅	118
Keylock & Selector Switches			
Series 03	Raised	21.2x41.2	6
Series 04	Raised/Flush	22.5∅, 30.5∅, 30x30	14
Series 14	Raised/Flush	22.5∅, 30.5∅	36
Series 22	Raised	22x30	52
Series 44	Raised/Flush	22.5∅, 30.5∅	64
Series 51	Raised	16∅	76
Series 61	Raised/Flush	16∅, 21x21, 21x27, 22.5∅	96
Series 71	Flush	21x21, 21x27, 22.5∅	110
Emergency-Stop Switches			
Series 04	Raised	22.5∅	14
Series 44	Raised	22.5∅	64
Series 61	Raised	16∅	96
Series 84	Raised	22.5∅	118
Buzzers			
Series 03	Raised	21.2x41.2	6
Series 04	Raised/Flush	22.5∅, 30.5∅	14
Series 14	Raised/Flush	22.5∅, 30.5∅	36
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Company Overview

The Company

EAO is a global manufacturer of high-quality Human Machine Interface products, from switches, keypads and keyboards to complete, custom-built control panels. Founded in 1947, EAO has established a global reputation for being an expert partner for Human Machine Interfaces across a range of target industries – transportation, machinery, process control, lifting and moving, and instrumentation.

EAO products have been developed by world-class industrial specialists and tested to international standards. They are synonymous with creativity, innovation and excellence – the hallmarks of EAO.

Our 12 specialised Sales and Customer Service Centres around the world and a network of trained specialist agents and representatives in more than 50 countries bring experience, skill and dedication to customer's projects.

The Approved Partner

EAO is certified and managed according to ISO 9001, ISO 9002, ISO 14001 and VDA6.1 (Automotive) standards.

It is an approved A-supplier to leading automotive manufacturers and guarantees worldwide approvals by ENEC, CB, UL/UR, CSA, VDE, SEV and Germanischer Lloyd.



Global EAO Argentina Australia Austria Belarus Belgium Brazil Bulgaria Canada Chile China Croatia Czech Republic Denmark Finland France Germany Great Britain Greece Hungary Iceland India Iran Ireland Israel Italy Japan Korea Latvia Luxembourg Malaysia Mexico Netherlands New Zealand Norway Oman Peru Poland Portugal Romania Russia Saudi Arabia Singapore Slovakia South Africa Spain Sri Lanka Sweden Switzerland Taiwan Thailand Turkey U.A.E Ukraine USA

Key Markets

Transportation

Stringent regulations within the public transportation industry requires a special range of Human Machine Interface components that meet the highest standards of safety, durability and functionality. EAO products meet these standards, including the latest regulations on access for the disabled.





Solutions

EAO is the expert partner for Human Machine Interfaces with a reputation built on developing innovative, ready-to-use solutions for customers and users which add significant value to their end products.

Our customers value EAO's skill in selecting the best components and services in terms of cost-effectiveness, quality and reliability. In the search for solutions, we make use of a

network of plastics specialists, toolmakers, electrical and electronics engineers, industrial designers and ergonomics experts.

EAO trims development times with rapid prototyping using modern technologies including stereolithography and urethane casting. We also plan the production sequence while developing the solution to help bring customer's products to market faster.

Machinery

EAO manufactures a broad range of industrial switches including foolproof emergency-stops and high-illumination pushbuttons. They offer unparalleled reliability with the benefit of EAO's unique, tactile 'click' that is reassuring for the user.



Instrumentation

Instrument controls require precision and sophistication, both in function and design. EAO has a range of specialised Human Machine Interface components for every instrument application, whether it is medical electronics, measuring instruments or test equipment.



Lifting and Moving

Lifting and moving controls must be highly responsive and tactile to answer the operator's every touch, yet tough enough to survive the harshest of environments. EAO's range of controls are ideal for these applications, whether it's industrial, hydraulic lifting equipment or a personal stair-lift in the home.

EAO – Your Expert Partner for
Human Machine Interfaces

Series 03

21.2mm x 41.2mm IP40/IP65 10A 400VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

The Series 03 is a high quality switch range that includes pushbuttons, indicators, mushroom headed switches and key switches.

Options include self cleaning snap-action switching elements.

Technical data see page 9

- IP40 or IP65 Protection (with cover)
- Switch Rating, 10A, 400VAC
- Mounting into 21.2x41.2 mm cut out
- Illumination using T6.8 Lamps or LED's
- The standard lenses are available in many different versions, transparent, opaque or translucent
- Screw terminal or plug-in connections

Indicator



Indicator body single with two independent lamp bases, raised, rectangular, black plastic, screw terminals, without bezel

Part No.
03-021.001

Illuminated pushbutton



Illuminated single pushbutton actuator, raised, rectangular, black plastic, screw terminals, without bezel

Part No.	Function	Contact type
03-616.011	Momentary	1 changeover
03-617.011	Momentary	2 changeover
03-618.011	Maintained	1 changeover
03-619.011	Maintained	2 changeover
03-620.011	Momentary/Maintained	2 changeover

For complete switch also order **A**

For complete switch also order **A**

Illuminated pushbutton



Illuminated double pushbutton actuator with independent contacts, raised, rectangular, black plastic, screw terminals, without bezel

Part No.	Function	Contact type
03-624.011	Momentary	2 changeover
03-625.011	Maintained	2 changeover
03-626.011	Momentary/Maintained	2 changeover
03-627.011	Momentary	1 changeover
03-628.011	Maintained	1 changeover

Buzzer



Buzzer, black plastic bezel, raised, rectangular, screw terminals, 10-50VAC/10-75VDC, 85dB ±10 at a distance of 0.1 m, without bezel

Part No.	Contact type
03-810.001	

LED

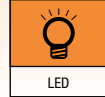


LED, T6.8, single chip, 12 Volt and 28 Volt.
(Also available in 6 Volt, 24 Volt and 48 Volt)

Colour	Part No.	Voltage
Red	10-2K09.1072	12VAC/DC, 9/17mA
Yellow	10-2K09.1074	12VAC/DC, 9/17mA
Green	10-2K09.1075	12VAC/DC, 9/17mA
Blue	10-2K09.1076	12VAC/DC, 9/17mA
White	10-2K09.1079	12VAC/DC, 9/17mA
Red	10-2K13.1072	28VAC/DC, 9/17mA
Yellow	10-2K13.1074	28VAC/DC, 9/17mA
Green	10-2K13.1075	28VAC/DC, 9/17mA
Blue	10-2K13.1076	28VAC/DC, 9/17mA
White	10-2K13.1079	28VAC/DC, 9/17mA

For complete switch also order **A**

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Lens, translucent or opaque/ribbed, one colour for single indicator and pushbutton actuators

Colour	Part No.	Lens
● Red	03-901.2	Translucent
● Yellow	03-901.4	Translucent
● Green	03-901.5	Translucent
● Blue	03-901.6	Translucent
○ White	03-901.9	Opaque/ribbed
● Black	03-901.0	Opaque/ribbed



Lens, translucent/ribbed, two colours for single indicator and pushbutton actuators

Colour	Part No.
● Red/Green	03-902.2/5
● Red/Red	03-902.2/2
○ White/White	03-902.9/9



Lens, translucent or opaque/ribbed, halved for double pushbutton actuators

Colour	Part No.	Lens
● Red	03-921.2	Translucent
● Yellow	03-921.4	Translucent
● Green	03-921.5	Translucent
● Blue	03-921.6	Translucent
○ White	03-921.9	Opaque/ribbed
● Black	03-921.0	Opaque/ribbed

A Accessories



Lens, translucent or opaque/ribbed, halved for mechanically interlocked double pushbutton actuators

Colour	Part No.	Lens
● Red	03-923.2	Translucent
● Yellow	03-923.4	Translucent
● Green	03-923.5	Translucent
● Blue	03-923.6	Translucent
○ White	03-923.9	Opaque/ribbed
● Black	03-923.0	Opaque/ribbed



Front bezel flat and raised, black plastic

Image	Part No.	Product description
1	03-965.0	Front bezel flat
2	03-967.0	Front bezel raised



Sprayproof cover for IP65 sealing and flap guard for pushbutton switch

Image	Part No.	Product description
1	03-924	Sprayproof cover
2	03-925	Flap guard

Series 03

21.2mm x 41.2mm IP40/IP65 10A 400VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

A Accessories



Blanking plate



Lens remover for flat bezel, lens remover for raised bezel and LED remover

Image	Part No.	Image	Part No.	Product description
	03-949.0	1	02-905	Lens remover for flat bezel
		2	98-968	Lens remover for raised bezel
		3	03-996	LED remover

Actuator with snap-action switching element

Switching system

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

Material

Material of contact

Standard version:

Silver (U >20V)

Special versions: (on request)

Gold/Silver 700 Au/300 Ag (U <50V)

Silver/Palladium 700 Ag/300 Pd (U >20V) for atmospheres containing sulphur

Switch housing

Thermosetting material, heat-resistant

Indicator housing

Polyamide

Mechanical characteristics

Terminals

Screw terminal (with self-lifting clip):

max. wire cross-section, 2x2.5mm²

max. wire cross-section of stranded cable, 2x1.5mm²

Plug-in terminal 4.8x0.8mm:

max. wire cross-section of stranded cable, 1mm² can also be used as soldering terminal

max. wire cross-section, 2x1mm²

max. wire cross-section of stranded cable: 2x0.75mm²

Plug-in terminal 4.8x0.8mm:

max. wire cross-section of stranded cable, 2.5mm² can also be used as soldering terminal

max. wire cross-section: 2x1mm²

max. wire cross-section of stranded cable, 2x0.75mm²

Actuating force

6N ... 12N

Actuating travel

5mm

Mechanical lifetime

Momentary action 2 million operations

Maintained action 1 million operations

Storage temperature

-30°C ... +85°C

Electrical characteristics

Standards

The switches comply with the "Standards for low-voltage switching devices" EN IEC 61058-1

Rated insulation voltage

400VAC/440VDC, as per IEC 61058-1

Conventional free air thermal current

10A.

The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating

400VAC, 10A, cosφ 0.95, as per IEC 61058-1

250VAC, 10A, as per UL

Electric strength

2500VAC, 50Hz, 1min. between all terminals and earth, as per IEC 61058-1

Environmental conditions

Storage temperature

-30°C ... +85°C

Service temperature

-25°C ... +55°C

For indicators and illuminated pushbuttons mounted as a block, make sure the heat can escape freely.

Protection degree

Front side IP40, IP65 with spray cover, as per IEC 60529

Vibration resistance

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

Approvals

Approbations

CB (IEC 61058-1/92)

CSA

ENEC (EN 61058-1/92)

Germanischer Lloyd

UL

Declaration of conformity

CE

Buzzer

Buzzer system

System

Contactless electronic buzzer with IC oscillator

Material

Alarm buzzer case

Duroplastic

Front cap

Polycarbonate (PC)

Front bezel

Polymethylacrylate

Mechanical characteristics

Terminals

Screw terminal

Operating temperature

-25 °C ... +55 °C

Storage temperature

-40 °C ... +85 °C

Front protection

IP40

Electrical characteristics

Frequency (tone)

Approx. 2.8 kHz

Sound pressure

85 dB (A) ±8 dB at a distance of 0.1 m

Volume variable with a 1 M Ω potentiometer or corresponding fixed resistor

Operation Voltage/Current

typical

10 ... 55 VAC 10 ... 75 VDC

25 mA 15 mA

Approvals

Approbations

CB (IEC 61058-1/92)

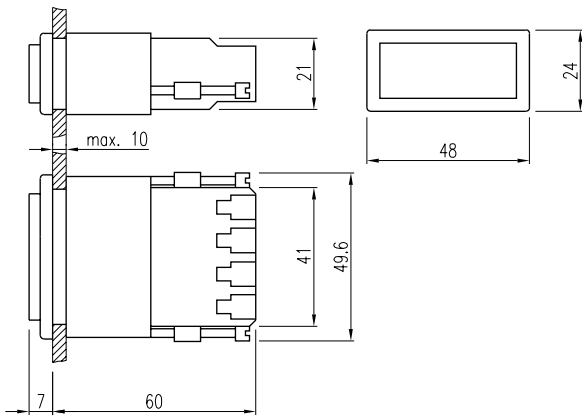
ENEC (EN 61058-1/92)

Declaration of conformity

CE

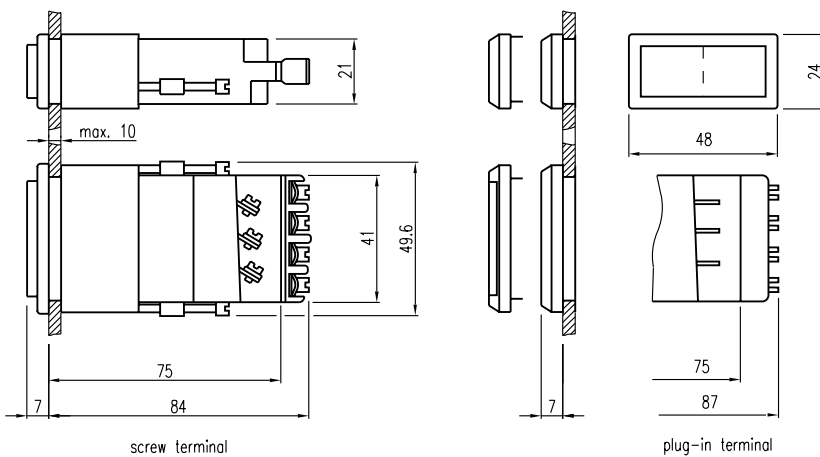
03 Indicator

Single



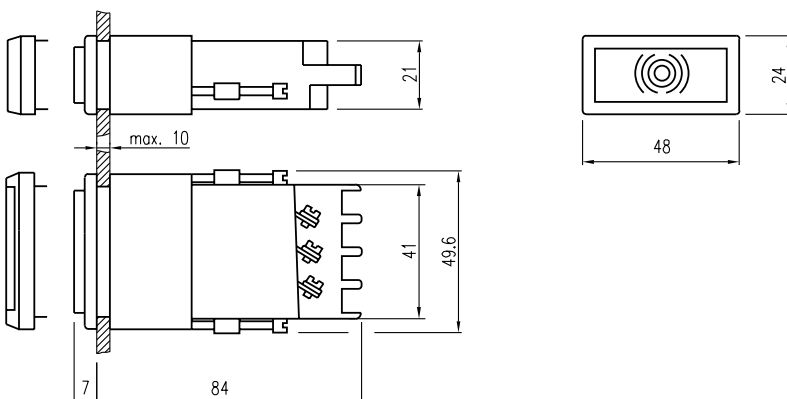
03 Pushbutton

Illuminated, Raised, Single

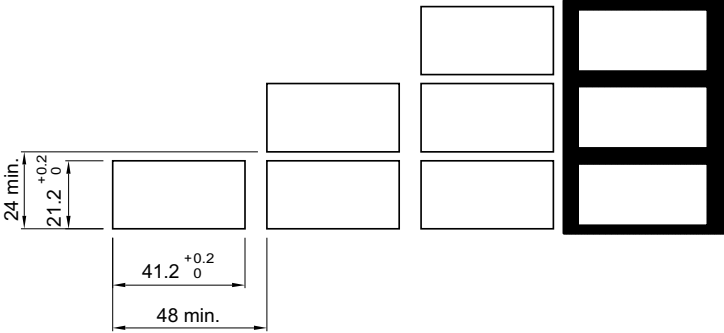


03 Buzzer

Raised



03 Cut-outs, Raised Mounting



The Halo Illumination



The Series 84 PCB range of pushbuttons and indicators opens up new and previously unimagined possibilities for illuminated control panels.

A wide spectrum of different colours can be generated from a single switch by utilizing the possibility to combine up to nine different coloured LEDs in one unit: eight within the bezel and one bi-colour LED in the lens.

When connected to a PCB, they can be programmed to change colour, pulse, flash, illuminate the edge and create a variety of other disco-style effects.

They not only add the WOW factor, they enable the status of more than one function to be displayed on a single switch. This makes it possible to create a feature-packed display or control panel in even the smallest areas.

The actuator, which is transparent, is mounted on the PCB by means of a newly developed flange with snap-on connector. It fits into a $\varnothing 22.5$ mm mounting hole.

More details on how to purchase these switches are available on pages 122–125.



Series 04

22.5mm 30.5mm IP65 10A 500VAC



Choose one component from each of the coloured sections to assemble a complete switch.

Product Profile

The Series 04 is a high quality switch range that includes pushbuttons, indicators, selectors, mushroom headed switches, key switches, and Emergency-stops.

Options include self cleaning, slow-make and snap-action switching elements.

Technical data see page 25

- IP65 Protection
- Switch Rating:
Maximum Voltage, 500VAC
Maximum Thermal Current, I_{th} = 10A
230VAC/6A, 24VDC/10A
- Raised Mounting into 22.5 mm cut out
- Flush Mounting into 30.5 mm cut out
- Illumination using Ba9s Lamps or LED's
- All standard lenses are transparent with translucent diffuser
- Screw terminal or plug-in connections

Indicator



Indicator, round, full face, 22.5mm mounting

Colour	Part No.
● Red	704.000.2
● Yellow	704.000.4
● Green	704.000.5
● Blue	704.000.6
○ Clear	704.000.7



Indicator, flush mount, aluminium bezel, 30.5mm mounting

Colour	Part No.
● Red	704.006.218
● Yellow	704.006.418
● Green	704.006.518
● Blue	704.006.618
○ Clear	704.006.718

For complete switch also order

For complete switch also order

Indicator



Indicator, flush mount, silver plastic bezel, 30x30mm mounting

Colour	Part No.
● Red	704.202.208
● Yellow	704.202.408
● Green	704.202.508
● Blue	704.202.608
○ Clear	704.202.708

Non-Illuminated pushbutton



Non-Illuminated raised pushbutton, grey plastic bezel, 22.5mm mounting

Colour	Part No., Momentary	Part No., Maintained
● Red	704.010.2	704.040.2
● Yellow	704.010.4	704.040.4
● Green	704.010.5	704.040.5
● Blue	704.010.6	704.040.6
○ Clear	704.010.7	704.040.7
● Black	704.010.0	704.040.0



Non-Illuminated raised pushbutton, aluminium bezel, 22.5mm mounting

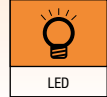
Colour	Part No., Momentary	Part No., Maintained
● Red	704.012.2	704.042.2
● Yellow	704.012.4	704.042.4
● Green	704.012.5	704.042.5
● Blue	704.012.6	704.042.6
○ Clear	704.012.7	704.042.7
● Black	704.012.0	704.042.0

For complete switch also order

For complete switch also order A

For complete switch also order A

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Non-Illuminated pushbutton **Illuminated pushbutton**



Non-Illuminated flush mount pushbutton, aluminium bezel, 30.5 mm mounting



Non-Illuminated flush mount pushbutton, silver plastic bezel, 30x30 mm mounting



Illuminated raised pushbutton, grey plastic bezel, 22.5 mm mounting

Colour	Part No., Momentary	Part No., Maintained	Colour	Part No., Momentary	Part No., Maintained	Colour	Part No., Momentary	Part No., Maintained
Red	704.012.218	704.042.218	Red	704.210.208	704.240.208	Red	704.030.2	704.060.2
Yellow	704.012.418	704.042.418	Yellow	704.210.408	704.240.408	Yellow	704.030.4	704.060.4
Green	704.012.518	704.042.518	Green	704.210.508	704.240.508	Green	704.030.5	704.060.5
Blue	704.012.618	704.042.618	Blue	704.210.608	704.240.608	Blue	704.030.6	704.060.6
Clear	704.012.718	704.042.718	Clear	704.210.708	704.240.708	Clear	704.030.7	704.060.7
Black	704.012.018	704.042.018	Black	704.210.008	704.240.008			

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

Illuminated pushbutton



Illuminated raised pushbutton, aluminium bezel, 22.5 mm mounting



Illuminated flush mount pushbutton, aluminium bezel, 30.5 mm mounting



Illuminated flush mount pushbutton, silver plastic bezel, 30x30 mm mounting

Colour	Part No., Momentary	Part No., Maintained	Colour	Part No., Momentary	Part No., Maintained	Colour	Part No., Momentary	Part No., Maintained
Red	704.032.2	704.062.2	Red	704.032.218	704.062.218	Red	704.230.208	704.260.208
Yellow	704.032.4	704.062.4	Yellow	704.032.418	704.062.418	Yellow	704.230.408	704.260.408
Green	704.032.5	704.062.5	Green	704.032.518	704.062.518	Green	704.230.508	704.260.508
Blue	704.032.6	704.062.6	Blue	704.032.618	704.062.618	Blue	704.230.608	704.260.608
Clear	704.032.7	704.062.7	Clear	704.032.718	704.062.718	Clear	704.230.708	704.260.708




For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**






Choose one component from each of the coloured sections to assemble a complete switch.

Emergency-stop switch		Mushroom head pushbutton					
 <p>Emergency-stop, twist release, 37 mm diameter, foolproof to EN 60947-5-1 and DIN EN ISO 13850</p>		 <p>Emergency-stop, key release, 37 mm diameter, foolproof to EN 60947-5-1 and DIN EN ISO 13850</p>			 <p>Mushroom head pushbutton, plastic bezel and aluminium bezel, 22.5 mm mounting, function momentary</p>		
Part No.	Part No.	Colour	Part No., Plastic	Part No., Aluminium			
704.064.2	704.066.2	Red	704.070.2	704.071.2			
		Yellow	704.070.4	704.071.4			
		Green	704.070.5	704.071.5			
		Black	704.070.0	704.071.0			
Please use slow make switch element only		Please use slow make switch element only					
Part No. 704.91X		Part No. 704.91X					

For complete switch also order **A**

For complete switch also order **A**

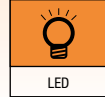
For complete switch also order **A**

Mushroom head stop switch			Keylock switch							
 <p>Stop switch, twist release, mushroom head, 40 mm diameter, 22.5 mm mounting</p>			 <p>Keylock switch 2 position, raised, 22.5 mm mounting</p>				 <p>Keylock switch 2 position, flush mount, 30.5 mm mounting</p>			
Part.No	Front Ring	Markings	Graphic	Part No.	Function	Key out	Graphic	Part No.	Function	Key out
704.074.2	Gray plastic	Directional arrows	1	704.123.0	Momentary	A	3	704.123.018	Momentary	A
704.075.2	Anodized aluminium	Directional arrows	2	704.121.0	Maintained	C	4	704.121.018	Maintained	C
			2	704.122.0	Maintained	C + B	4	704.122.018	Maintained	C + B

For complete switch also order **A**

For complete switch also order **A**

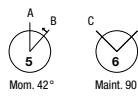
Choose one component from each of the coloured sections to assemble a complete switch.
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Keylock switch



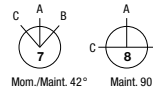
Keylock switch 2 position, flush mount, 30x30 mm mounting



Graphic	Part No.	Function	Key out
5	704.343.008	Momentary	A
6	704.341.008	Maintained	C
6	704.342.008	Maintained	C + B



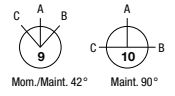
Keylock switch 3 position, raised, 22.5 mm mounting



Graphic	Part No.	Function	Key out
7	704.115.0	Momentary	A
7	704.114.0	Maintained	A
7	704.116.0	Maintained	C + B
8	704.113.0	Maintained	C + A + B



Keylock switch 3 position, flush mount, 30.5 mm mounting



Graphic	Part No.	Function	Key out
10	704.113.018	Maintained	C + A + B
9	704.115.018	Momentary	A
9	704.114.018	Maintained	A
9	704.116.018	Maintained	C + B

For complete switch also order **A**

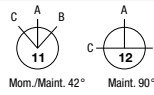
For complete switch also order **A**

For complete switch also order **A**

Keylock switch



Keylock switch 3 position, flush mount, 30x30 mm mounting

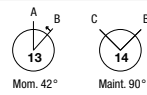


Graphic	Part No.	Function	Key out
11	704.335.008	Momentary	A
11	704.334.008	Maintained	A
11	704.336.008	Maintained	C + B
12	704.333.008	Maintained	C + A + B

Selector switch



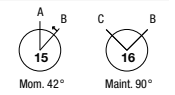
Selector switch short lever 2 position, raised, 22.5 mm mounting



Graphic	Part No.	Function	Bezel
13	704.412.0	Momentary	Grey plastic
13	704.413.0	Momentary	Aluminium
14	704.410.0	Maintained	Grey plastic
14	704.411.0	Maintained	Aluminium



Selector switch short lever 2 position, flush mount, 30.5 mm mounting



Graphic	Part No.	Function	Bezel
15	704.413.018	Momentary	Aluminium
16	704.411.018	Maintained	Aluminium

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**



Choose one component from each of the coloured sections to assemble a complete switch.

Selector switch

<p>Selector switch short lever 2 position, flush mount, 30 x 30 mm mounting</p>				<p>Selector switch short lever 3 position, raised, 22.5 mm mounting</p>				<p>Selector switch short lever 3 position, flush mount, 30.5 mm mounting</p>							
Graphic	Part No.	Function	Bezel	Graphic	Part No.	Function	Bezel	Graphic	Part No.	Function	Bezel	Graphic	Part No.	Function	Bezel
17	704.512.008	Momentary	Silver plastic	19	704.404.0	Momentary	Grey plastic	20	704.405.018	Momentary	Aluminium				
18	704.510.008	Maintained	Silver plastic	19	704.405.0	Momentary	Aluminium	20	704.403.018	Maintained	Aluminium				
				19	704.402.0	Maintained	Grey plastic								
				19	704.403.0	Maintained	Aluminium								

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

Selector switch

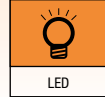
<p>Selector switch short lever 3 position, flush mount, 30 x 30 mm mounting</p>				<p>Selector switch long lever 2 position, raised, 22.5 mm mounting</p>				<p>Selector switch long lever 2 position, flush mount, 30.5 mm mounting</p>									
Graphic	Part No.	Function	Bezel	Graphic	Part No.	Function	Bezel	Graphic	Part No.	Function	Bezel	Graphic	Part No.	Function	Bezel		
21	704.504.008	Momentary	Silver plastic	22	704.102.0	Momentary	Grey plastic	24	704.103.018	Momentary	Aluminium						
21	704.502.008	Maintained	Silver plastic	22	704.103.0	Momentary	Aluminium	25	704.101.018	Maintained	Aluminium						
				23	704.100.0	Maintained	Grey plastic										
				23	704.101.0	Maintained	Aluminium										

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

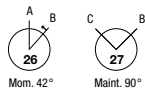
Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Selector switch



Selector switch long lever
2 position, flush mount,
30x30mm mounting



Graphic	Part No.	Function	Bezel
26	704.302.008	Momentary	Silver plastic
27	704.300.008	Maintained	Silver plastic



Selector switch long lever
3 position, raised,
22.5mm mounting



Graphic	Part No.	Function	Bezel
28	704.094.0	Momentary	Grey plastic
28	704.095.0	Momentary	Aluminium
28	704.092.0	Maintained	Grey plastic
28	704.093.0	Maintained	Aluminium



Selector switch long lever
3 position, flush mount,
30.5mm mounting



Graphic	Part No.	Function	Bezel
29	704.095.018	Momentary	Aluminium
29	704.093.018	Maintained	Aluminium

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

Selector switch



Selector switch long lever
3 position, flush mount,
30x30mm mounting



Graphic	Part No.	Function	Bezel
30	704.294.008	Momentary	Black plastic
30	704.292.008	Maintained	Black plastic

Buzzer



Buzzer, raised, 22.5mm mounting, IP65, 24VDC, 95dB ±8
at a distance of 0.1m

Part No.	Front finish
14-810.002	Black plastic
14-810.902	Nickel-plated brass



Buzzer, flush mount, 30.5mm mounting, IP40,
24VDC, 95dB ±8 at a distance of 0.1m

Part No.	Front finish
14-810.910	Black aluminium
14-810.918	Natural aluminium

For complete switch also order **A**

Series 04

22.5mm 30.5mm IP65 10A 500VAC



Choose one component from each of the coloured sections to assemble a complete switch.

Switching element



Switching element, screw terminal, snap-action with silver self-cleaning contacts

Part No.	Contact type
704.900.1	1NO
704.900.2	1NC
704.900.3	2NO
704.900.4	2NC
704.900.5	1NO/1NC
Other contact materials and terminals available.	
Please contact us.	



Switching element, plug-in terminal, 6.3 mm, snap-action with self-cleaning silver contacts

Part No.	Contact type
704.905.1	1NO
704.905.2	1NC
704.905.3	2NO
704.905.4	2NC
704.905.5	1NO/1NC
Other contact materials and terminals available.	
Please contact us.	



Switching element, screw terminal, snap-action with silver self-cleaning contacts

Part No.	Contact type
704.910.1	1NO
704.910.2	1NC
704.910.3	2NO
704.910.4	2NC
704.910.5	1NO/1NC
Other contact materials and terminals available.	
Please contact us.	

Switching element



Switching element, plug-in terminal, 6.3 mm, slow-make with forced opening silver contacts

Part No.	Contact type
704.915.1	1NO
704.915.2	1NC
704.915.3	2NO
704.915.4	2NC
704.915.5	1NO/1NC
Other contact materials and terminals available.	
Please contact us.	

LED



LED, Ba9s, single chip, 6 Volt and 12 Volt

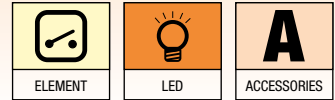
Colour	Part No.	Voltage
Red	10-2506.1082	6VDC, 10/17mA
Yellow	10-2506.1084	6VDC, 10/17mA
Green	10-2506.1085	6VDC, 10/17mA
Blue	10-2506.1086	6VDC, 10/17mA
White	10-2506.1089	6VDC, 10/17mA
Red	10-2509.1142	12VAC/DC, 15mA
Yellow	10-2509.1144	12VAC/DC, 15mA
Green	10-2509.1145	12VAC/DC, 15mA
Blue	10-2509.1146	12VAC/DC, 15mA
White	10-2509.1149	12VAC/DC, 15mA



LED, Ba9s, single chip, 24 Volt and 28 Volt

Colour	Part No.	Voltage
Red	10-2512.1142	24VAC/DC, 15mA
Yellow	10-2512.1144	24VAC/DC, 15mA
Green	10-2512.1145	24VAC/DC, 15mA
Blue	10-2512.1146	24VAC/DC, 15mA
White	10-2512.1149	24VAC/DC, 15mA
Red	10-2513.1142	28VAC/DC, 15mA
Yellow	10-2513.1144	28VAC/DC, 15mA
Green	10-2513.1145	28VAC/DC, 15mA
Blue	10-2513.1146	28VAC/DC, 15mA
White	10-2513.1149	28VAC/DC, 15mA

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



LED **A Accessories**



LED, Ba9s, single chip, 48 Volt

Colour	Part No.	Voltage
● Red	10-2519.1052	48VAC/DC, 6mA
● Yellow	10-2519.1054	48VAC/DC, 6mA
● Green	10-2519.1055	48VAC/DC, 6mA
● Blue	10-2519.1056	48VAC/DC, 6mA
○ White	10-2519.1059	48VAC/DC, 6mA



LED, Ba9s, single chip, 130 Volt and 230 Volt

Colour	Part No.	Voltage
● Red	10-2H24.2052	130VAC / 5mA
● Yellow	10-2H24.2054	130VAC / 5mA
● Green	10-2H24.2055	130VAC / 5mA
● Blue	10-2H24.2056	130VAC / 5mA
○ White	10-2H24.2059	130VAC / 5mA
● Red	10-2H24.2042	230VAC / 3mA
● Yellow	10-2H24.2044	230VAC / 3mA
● Green	10-2H24.2045	230VAC / 3mA
● Blue	10-2H24.2046	230VAC / 3mA
○ White	10-2H24.2049	230VAC / 3mA



Lamp/LED block, screw terminal

Part No.
704.950.0*

* Other terminals available. Please contact us.

A Accessories



Lamp/LED block, plug-in terminal, 6.3 mm

Part No.
704.950.1*

* Other terminals available. Please contact us.



Lens cap, round, transparent, plastic for raised and flush indicators with bezel and pushbutton actuators

Colour	Part No.
● Red	704.602.2
● Yellow	704.602.4
● Green	704.602.5
● Blue	704.602.6
○ Clear	704.602.7

For complete lens also order diffuser
704.609.9 (see page 24)



Lens cap raised, round, transparent, plastic for raised and flush mount pushbutton actuators

Colour	Part No.
● Red	704.611.2
● Yellow	704.611.4
● Green	704.611.5
● Blue	704.611.6
○ Clear	704.611.7

For complete lens also order diffuser
704.610.9 (see page 24)



Choose one component from each of the coloured sections to assemble a complete switch.

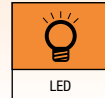
A Accessories

<p>Lens cap, round, aluminium anodised for raised and flush mount pushbutton actuators</p>			<p>Protective cover, raised pushbutton</p>			<p>Protective front ring with silicon membrane for raised or flush mount pushbutton</p>		
Colour	Part No.	Comment	Part No.		Part No.	Size		
● Red	704.601.2		704.925.0	1	704.600.3	29 mm Ø for raised pushbutton		
● Yellow	704.601.4			2	704.955.3	35 mm Ø for flush mount pushbutton		
● Blue	704.601.6							
● Silver	704.601.8							
● Silver	704.601.81	Illuminated central dot						
● Black	704.601.0							
● Black	704.601.01	Illuminated central dot						
● Silver	704.601.9	Stainless steel						

A Accessories

<p>Emergency-stop protective shroud, yellow painted aluminium with 22.5 mm mounting hole</p>			<p>Emergency-stop switch label, 60 mm Ø</p>			<p>Emergency-stop switch enclosure 94 mm (w) x 94 mm (h) x 81 mm (d), anti twist hole. Cable gland M20, IP66</p>		
Part No.	Part No.	Markings	Part No.		Part No.			
704.927.4	704.963.5	NOT-AUS	1	704.945.0				
	704.963.6	EMERGENCY-STOP	2	704.945.6				
	704.963.7	ARRET D'URGENCE						
	704.963.8	NOT-HALT						

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Emergency-stop switch enclosure with 22.5 mm Ø mounting hole, 65 mm (w) x 65 mm (h) x 81 mm (d), anti twist hole. Cable gland M20, IP66

	Part No.
1	704.945.7
2	704.945.6



Emergency-stop switch enclosure, with 22.5 mm Ø mounting hole, 94 mm (w) x 65 mm (h) x 81 mm (d), anti twist hole. Cable gland M20, IP66

	Part No.
1	704.945.8
2	704.945.6



Blanking plate

Part No.	Mounting hole
704.960.7	22.5 mm Ø
704.964.8	30.5 mm Ø
704.964.9	30x30 mm

A Accessories



Flush mount bezel for 30.5 Ø mounting

	Part No.	Product description
1	704.955.0	Aluminium, black anodised
2	704.955.1	Aluminium, natural anodised
3	704.955.9	Stainless steel
4	704.955.3	Alu, natural anodised with seal



Lens remover for round pushbuttons and indicators. LED and lamp remover for round and square pushbuttons and indicators

	Part No.
	700.006.0



Lens remover for square pushbuttons and indicators

	Part No.
	98-968



Choose one component from each of the coloured sections to assemble a complete switch.

A Accessories

																																
<p>Mounting flange</p>	<p>Diffuser for raised indicator, diffuser for flat lens indicator and pushbutton, diffuser for raised pushbutton</p>	<p>Marking plate selfadhesive, aluminium finish or black, for raised and flush mount push buttons</p>																														
<table border="1"> <thead> <tr> <th>Part No.</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>704.960.5</td> <td>Metal</td> </tr> <tr> <td>704.950.5</td> <td>Plastic</td> </tr> </tbody> </table>	Part No.	Material	704.960.5	Metal	704.950.5	Plastic	<table border="1"> <thead> <tr> <th>Image</th> <th>Part No.</th> <th>Product description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>704.608.9</td> <td>Diffuser for raised indicator</td> </tr> <tr> <td>2</td> <td>704.609.9</td> <td>Diffuser for flat lens</td> </tr> <tr> <td>3</td> <td>704.610.9</td> <td>Diffuser for raised illum. pushbutton</td> </tr> </tbody> </table>	Image	Part No.	Product description	1	704.608.9	Diffuser for raised indicator	2	704.609.9	Diffuser for flat lens	3	704.610.9	Diffuser for raised illum. pushbutton	<table border="1"> <thead> <tr> <th>Image</th> <th>Part No.</th> <th>Size</th> <th>Colour</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>704.968.2</td> <td>22.5mm Ø</td> <td>Black</td> </tr> <tr> <td>2</td> <td>704.968.3</td> <td>30.5mm Ø</td> <td>Black</td> </tr> </tbody> </table>	Image	Part No.	Size	Colour	1	704.968.2	22.5mm Ø	Black	2	704.968.3	30.5mm Ø	Black
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2	704.968.3	30.5mm Ø	Black																													

A Accessories

																									
<p>Engraving Label for Marking plate, selfadhesive, natural anodised or black aluminium</p>	<p>Engraving Label for flat square products, selfadhesive natural anodised or black aluminium</p>																								
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Image	Part No.	Size	Colour																						
1	704.968.0	23.5x14.5mm	Aluminium																						
2	704.968.1	23.5x14.5mm	Black																						
Image	Part No.	Size	Colour																						
1	704.968.4	35x18mm	Aluminium																						
2	704.968.5	35x18mm	Black																						

Snap-action switching element

Switching system

The double-break, snap-action switching element is equipped with one or two independent contact systems, acting as normally open or normally closed contact. The snap-action switching element is fitted with self-cleaning contacts.

Up to 3 switching elements can be snapped to each actuator.

Snap-action switching elements are not permissible for emergency-stop pushbuttons!

Material

Material of contact

Hard Silver, Gold/Silver, Silver/Palladium (for aggressive atmospheres)

Switch housing

Polycarbonate (PC)

Mechanical characteristics

Terminals

Screw terminals

Plug-in terminals 6.3x0.8mm

max. wire cross-section 2x2.5mm²

max. wire cross-section of stranded cable 2x1.5mm²

For switches with plug-in terminals it is necessary to provide insulation sleeves and to maintain a spacing of 65 mm between rows (mounting dimensions)

Tightening torque

Screws at the mounting flange max. 25Ncm

Screws at switching element max. 50Ncm

Actuating force

1 Normally closed 1.9N

1 Normally open 2N

Actuating travel

5.8mm ±0.2mm

Rebound time

≤3ms

Mechanical lifetime

(with 1 switching element)

Pushbutton, maintained action 1.5 million Cycles of operation

Pushbutton momentary action 3 million Cycles of operation

Selector switch maintained action 1.25 million Cycles of operation

Selector switch momentary action 2.5 million Cycles of operation

Keylock switch maintained action 25 000 Cycles of operation

Keylock switch momentary action 50 000 Cycles of operation

Electrical characteristics

Standards

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

Rated Insulation Voltage Ui

500 VAC/600VDC, as per EN IEC 60947-5-1

Contact resistance

New state ≤50mΩ as per DIN IEC 60512-2-4

Conventional free air thermal current Ith

10A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

Isolation resistance

≥10MΩ between open contacts at 500VDC, as per DIN IEC 60512-2-10

Switch rating

At switch rating AC for Gold/Silver, Silver/Palladium and Hard Silver contacts service category AC-15, as per EN IEC 60947-5-1 (cosφ 0.3)

Voltage	230VAC	400VAC	500VAC
Current	6A	4A	2.5A

At switch rating DC for Gold-, Silver- and Hard Silver contacts service category DC-13, as per EN IEC 60947-5-1

Voltage	24VDC	60VDC	110VDC
Current	10A	3A	1A

Recommended minimum operational data

Gold/Silver contacts:

Voltage	5VDC	24VDC	110VDC
Current	15mA	5mA	2mA

Hard Silver contacts:

Voltage	24VDC	110VDC
Current	50mA	10mA

Protection class

Indicators and switches, fit for mounting into devices with protection class II

Environmental conditions

Storage temperature

-40°C ... +85°C

Operating temperature

-25°C ... +55°C

Shock resistance

(single impacts, semi-sinusoidal)

300m/s²puls width 11ms, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

100m/s² at 10Hz ... 500Hz, amplitude 0.75mm, as per EN IEC 60068-2-6

Approvals

Approbations

CB (IEC 60947)

CCC

CSA

Germanischer Lloyd

GOST

SEV

UL

Declaration of conformity

CE

NF F16-102

Slow-make switching element

Switching system

The double-break, slow-make switching element is equipped with one or two independent contact systems, acting as normally open or normally closed contact. The normally closed contact has forced opening.

Slow-make contacts with forced action are ideal for high switch ratings.

Up to 3 switching elements can be snapped to each actuator.

For the emergency-stop pushbutton use the slow-make switching element (max. 2).

Material

Material of contact

Hard Silver, Gold/Silver, Silver/Palladium (for aggressive atmospheres)

Switch housing

Polycarbonate (PC)

Mechanical characteristics

Terminals

Screw terminals

Plug-in terminals 6.3x0.8mm

max. wire cross-section 2x2.5mm²

max. wire cross-section of stranded cable 2x1.5mm²

For switches with plug-in terminals it is necessary to provide insulation sleeves and to maintain a spacing of 65mm between rows (mounting dimensions)

Tightening torque

Screws at the mounting flange max. 25Ncm

Screws at switching element max. 50Ncm

Actuating force

1 Normally closed 2N

1 Normally open 3.1N

Actuating travel

5.8mm ±0.2mm

Rebound time

≤1ms

Mechanical lifetime

(with 1 switching element)

Pushbutton, maintained action	1.5 million	Cycles of operation
Pushbutton momentary action	3 million	Cycles of operation
Selector switch maintained action	1.25 million	Cycles of operation
Selector switch momentary action	2.5 million	Cycles of operation
Emergency-stop switch	50 000	Cycles of operation
Keylock switch maintained action	25 000	Cycles of operation
Keylock switch momentary action	50 000	Cycles of operation

Electrical characteristics

Standards

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

Rated Insulation Voltage Ui

500VAC/600VDC, as per EN IEC 60947-5-1

Contact resistance

New state ≤50mΩ as per DIN IEC 60512-2-4

Isolation resistance

≥10MΩ between open contacts at 500VDC, as per DIN IEC 60512-2-10

Conventional free air thermal current Ith

10A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

Switch rating

At switch rating AC for Gold/Silver, Silver/Palladium and Hard Silver contacts service category AC-15, as per EN IEC 60947-5-1 (cosφ 0.3)

Voltage	230VAC	400VAC	500VAC
Current	7A	5A	4A

At switch rating DC for Gold-, Silver- and Hard Silver contacts service category DC-13, as per EN IEC 60947-5-1

Voltage	24VDC	60VDC	110VDC	250VDC
Current	10A	5A	2.5A	0.6A

Recommended minimum operational data

Gold/Silver contacts:

Voltage	24VDC	110VDC
Current	10mA	2mA

Hard Silver contacts:

Voltage	24VDC	110VDC
Current	50mA	10mA

Protection class

Indicators and switches, fit for mounting into devices with protection class II

Environmental conditions

Storage temperature

-40°C ... +85°C

Operating temperature

-40°C ... +55°C

Shock resistance

(single impacts, semi-sinusoidal)

300m/s² puls width 11ms, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

100m/s² at 10Hz ... 500Hz, amplitude 0.75mm, as per EN IEC 60068-2-6

Approvals

Approbations

CB (IEC 60947)

CCC

CSA

Germanischer Lloyd

GOST

SEV

UL

Declaration of conformity

CE

NF F16-102

Buzzer

Buzzer system

System

Piezo disc

Material

Alarm buzzer case

Polyamide

Front cap

Plastic Polyamide

Metal Nickel-plated brass (sea-water proof)

Mechanical characteristics

Terminals

Plug-in terminal 2.8x0.5mm

Electrical characteristics

Frequency (tone)

approx. 2.8kHz continuous tone only

Sound pressure

95 db (A) ±8 dB at a distance of 0.1 m

Operation Voltage/Current

Operation Voltage 24VDC ±10%

Operation Current ≤25mA

Environmental conditions

Storage temperature

-35 °C ... +85 °C

Operating temperature

-25 °C ... +55 °C

Protection degree

as per EN IEC 60529, frontside

IP40, devices flush mounting

IP65, devices raised mounting

Approvals

Declaration of conformity

CE

NF F16-102

Actuator

Material

Front ring

Polyamide, Aluminium or Stainless steel

Mounting flange

Polyethylene terephthalate

Actuator housing

Polycarbonate, Polyamide

Mechanical characteristics

Actuating force

Mounting style square flush 6.2N

other Mounting styles 8N

Actuating travel

5.8mm ±0.2mm

Mechanical lifetime

Pushbutton	≤3 million	Cycles of operation
------------	------------	---------------------

Selector switch	≤2.5 million	Cycles of operation
-----------------	--------------	---------------------

Stop pushbutton	≤50 000	Cycles of operation
-----------------	---------	---------------------

Fool proofed E-stop	≥6050	Cycles of operation
---------------------	-------	---------------------

Keylock switch	≤50 000	Cycles of operation
----------------	---------	---------------------

Electrical characteristics

Standards

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

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +55 °C

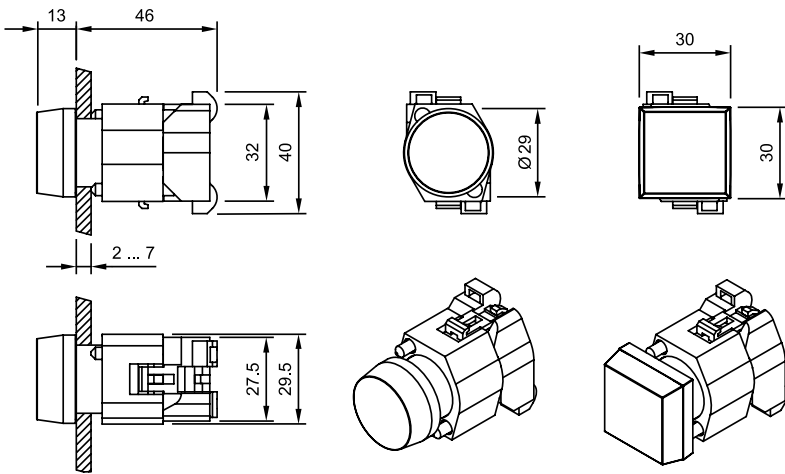
Protection degree

as per EN IEC 60529

Frontside IP65

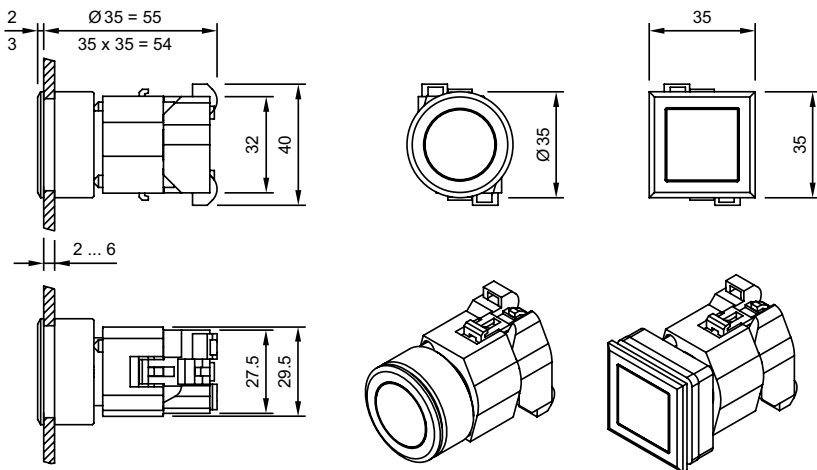
04 Indicator

Raised



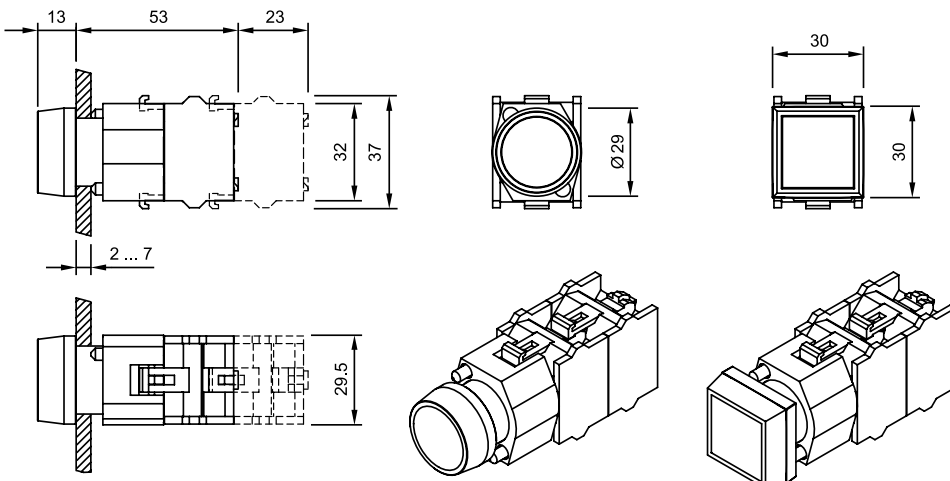
04 Indicator

Flush



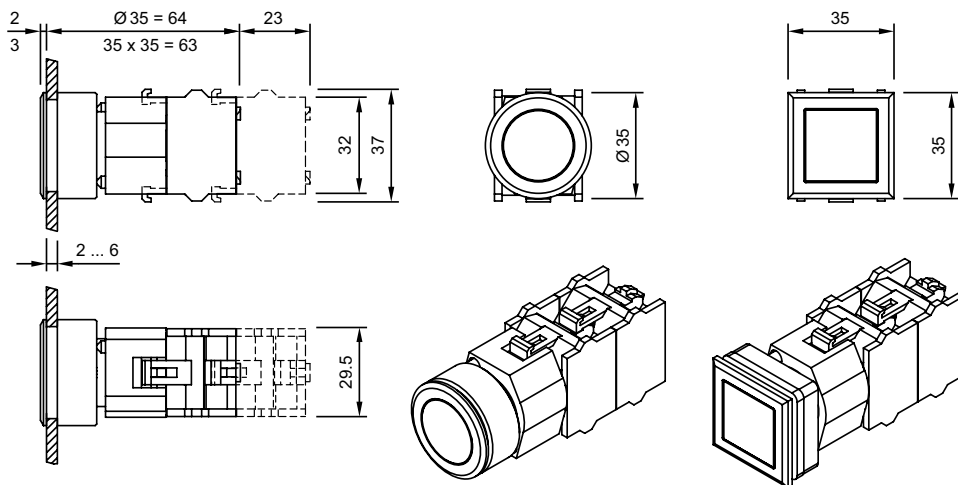
04 Non-Illuminated Pushbutton

Raised



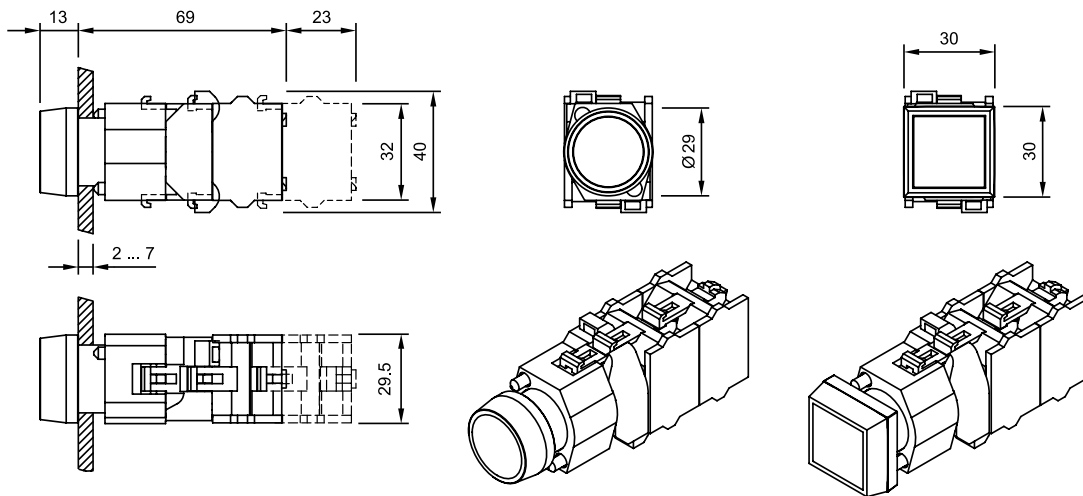
04 Non-Illuminated Pushbutton

Flush



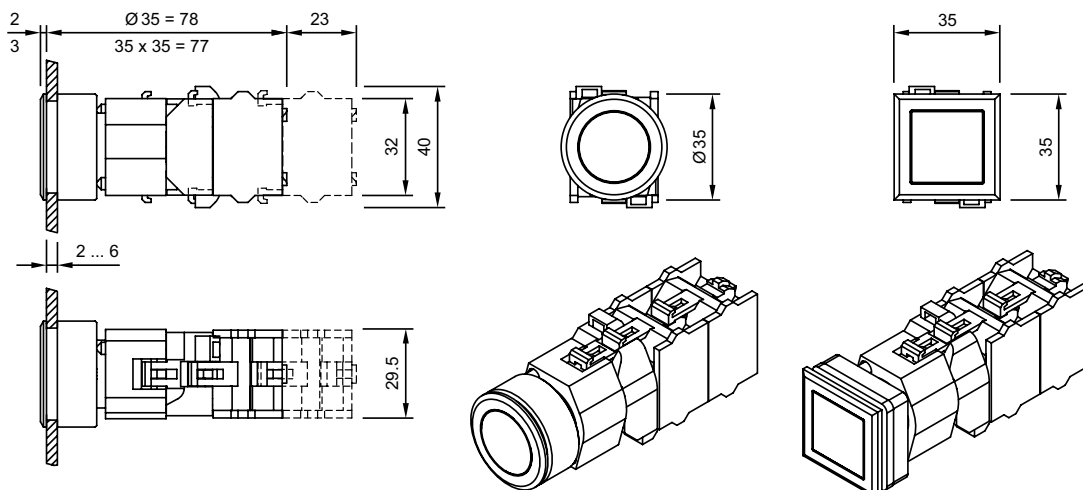
04 Illuminated Pushbutton

Raised



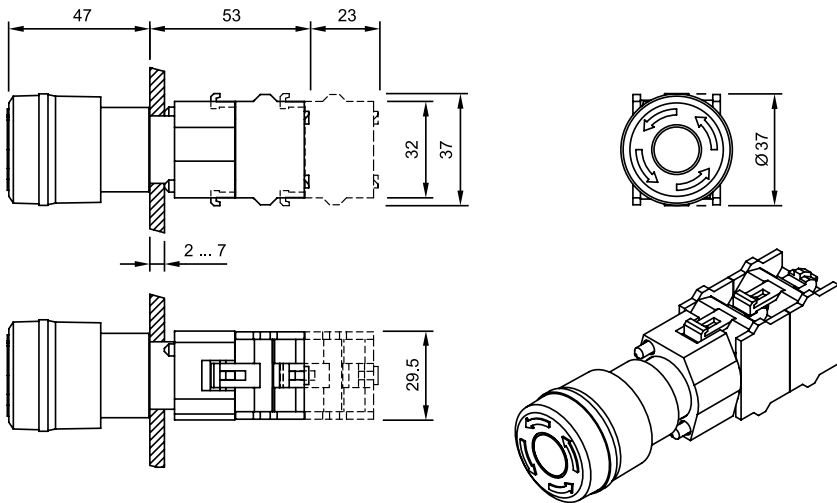
04 Illuminated Pushbutton

Flush



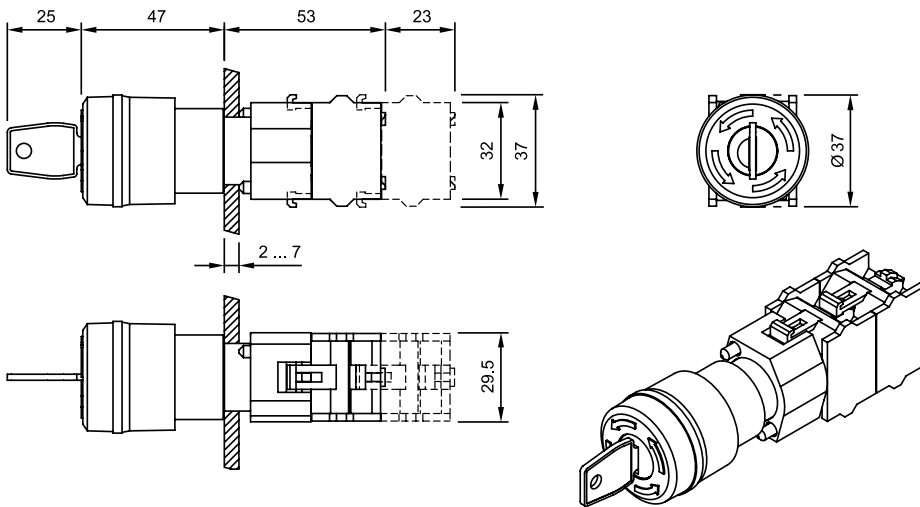
04 Emergency-stop switch

ISO 13850, Twist to release

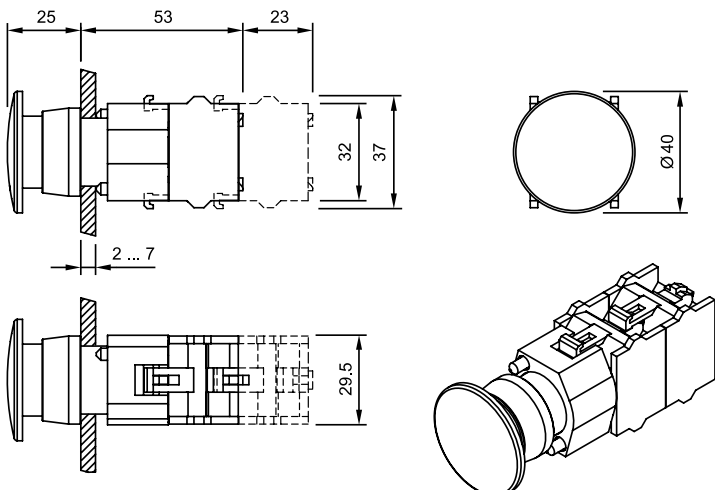


04 Emergency-stop switch

ISO 13850, Key to release

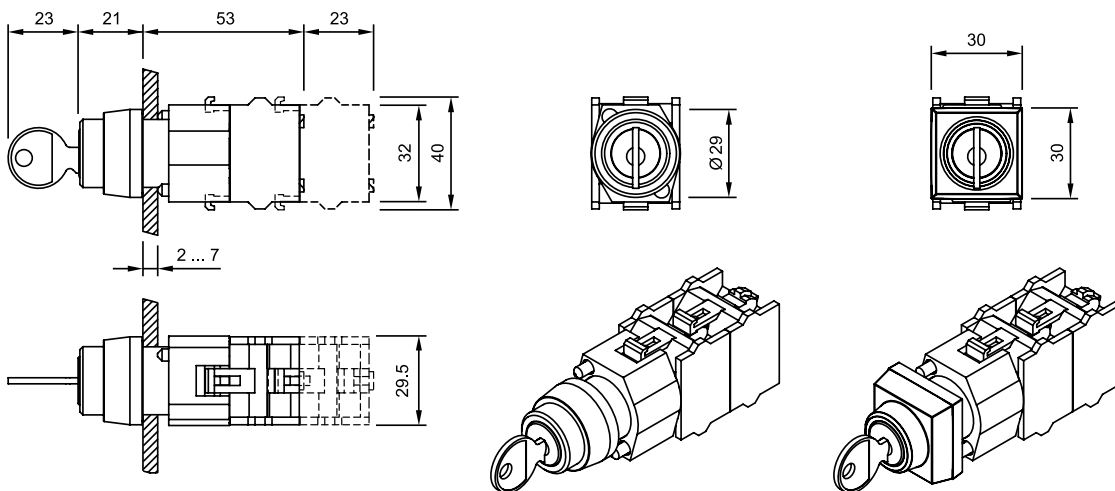


04 Head Pushbutton Mushroom



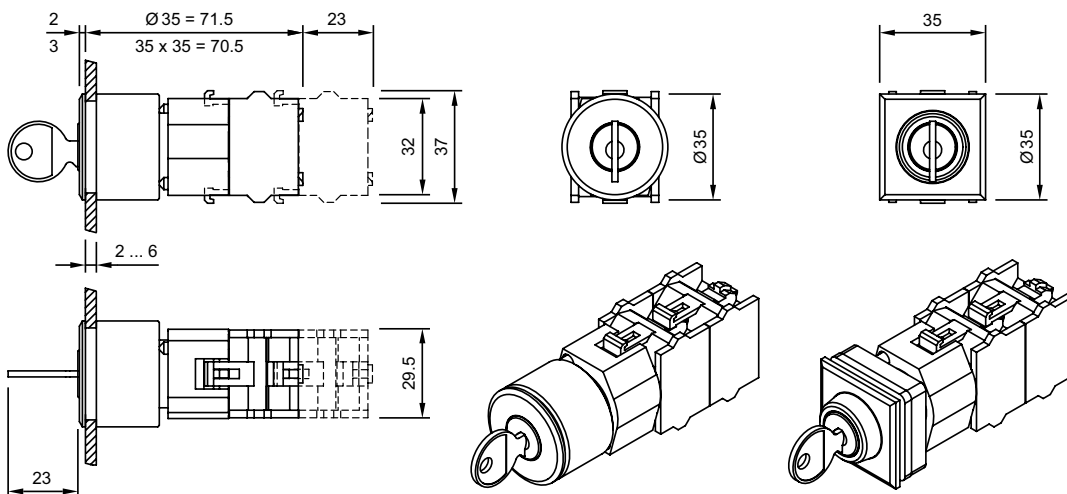
04 Keylock switch

2-Position, 3-Position, Raised



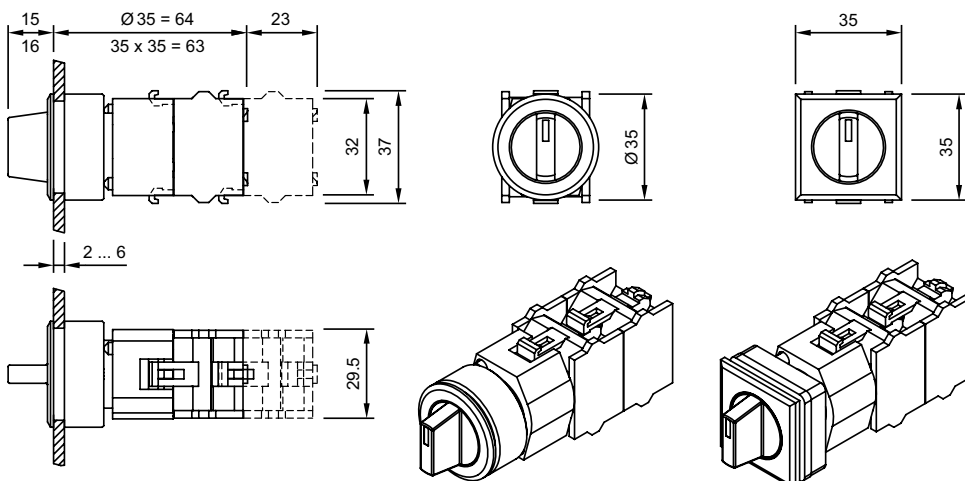
04 Keylock switch

2-Position, 3-Position, Flush



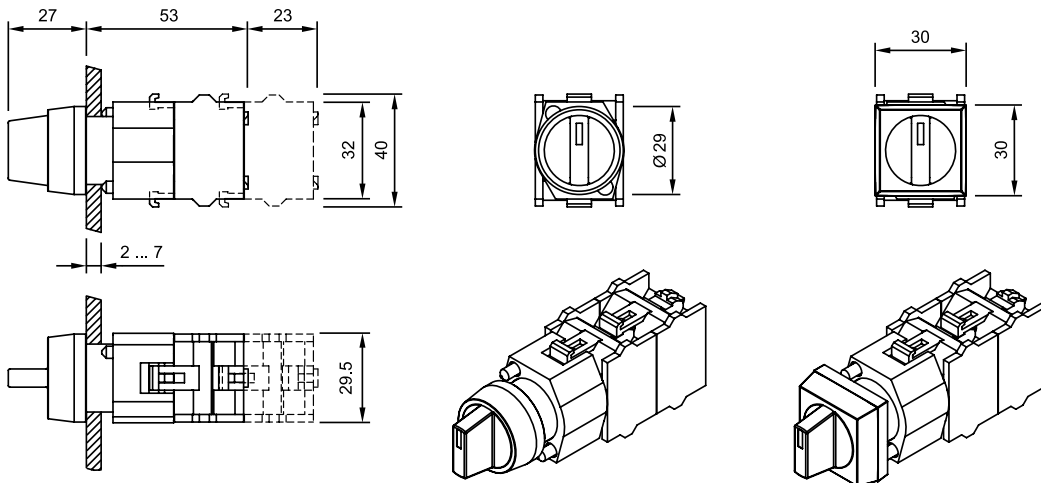
04 Selector switch

2-Position, 3-Position, Short lever, Flush



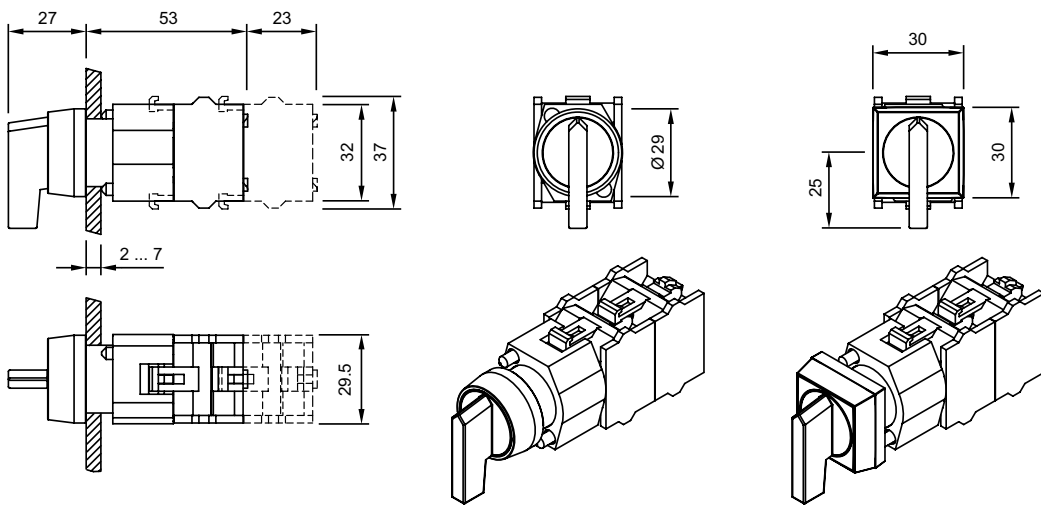
04 Selector switch

2-Position, 3-Position, Short lever, Raised



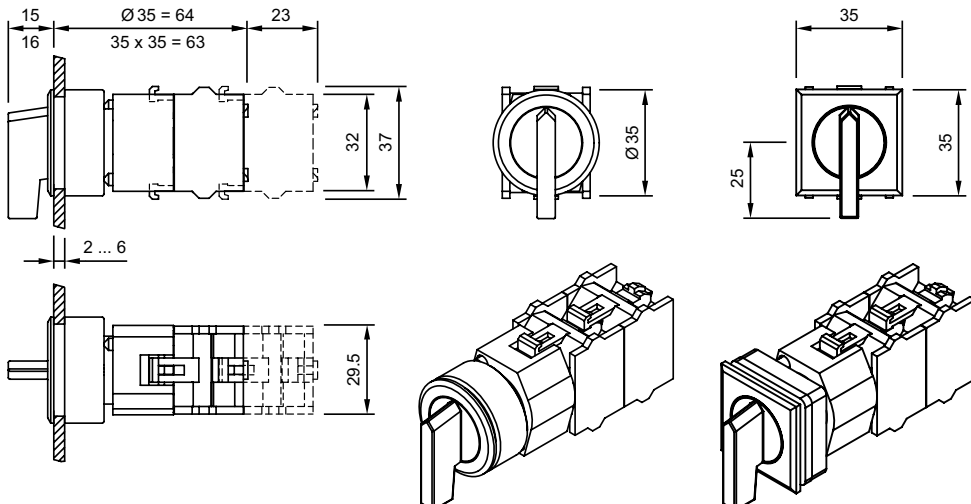
04 Selector switch

2-Position, 3-Position, Long lever, Raised



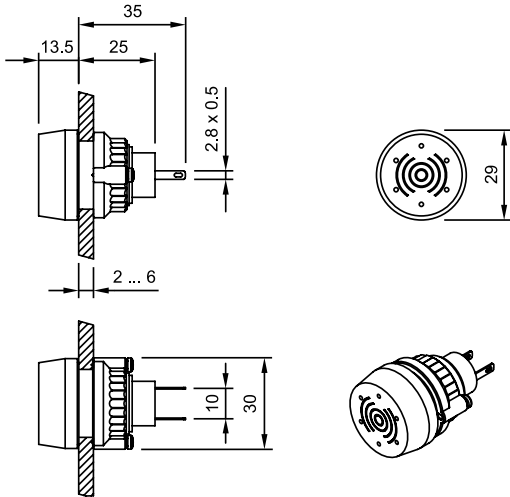
04 Selector switch

2-Position, 3-Position, Long lever, Flush



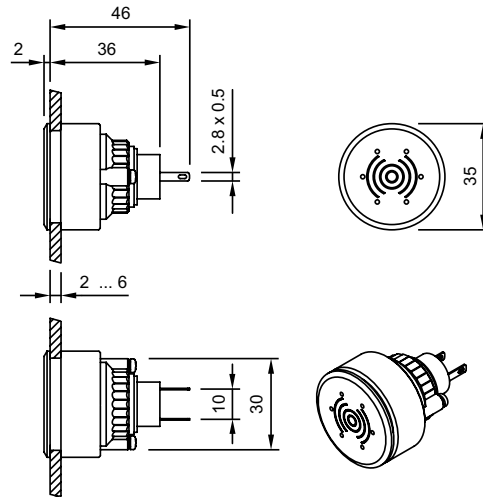
04 Buzzer

Raised



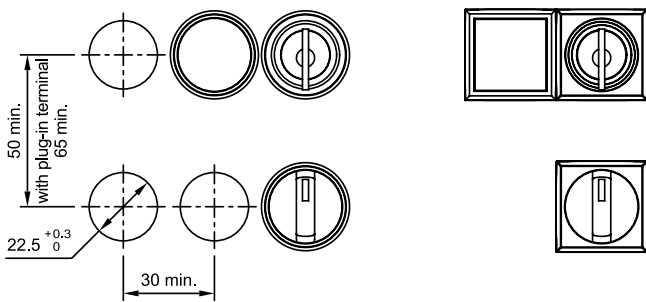
04 Buzzer

Flush



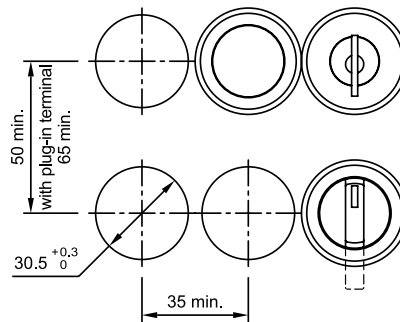
04 Cut-outs, Raised Mounting

(All but long lever)



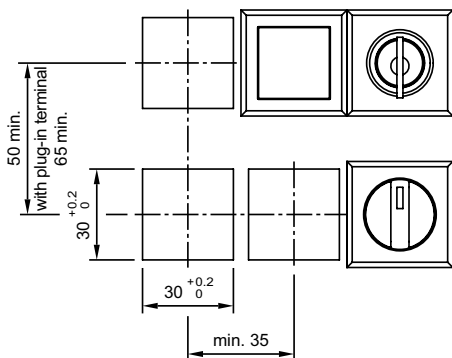
04 Cut-outs, Flush Mounting

(All but long lever)



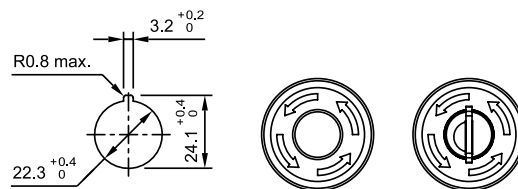
04 Cut-outs, Flush Mounting

(All but long lever)

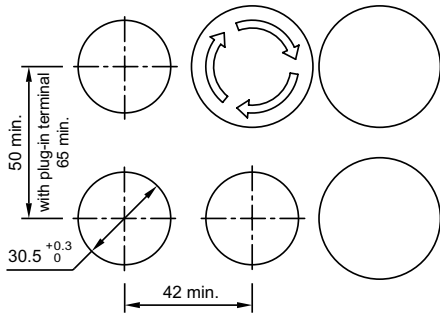


04 Cut-outs, Emergency-Stop

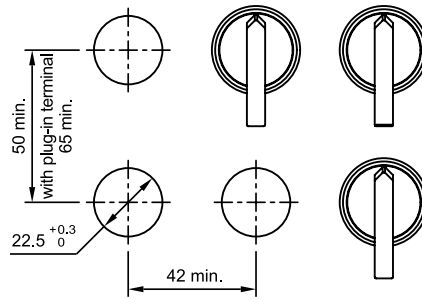
ISO 13850, Twist release, Key release



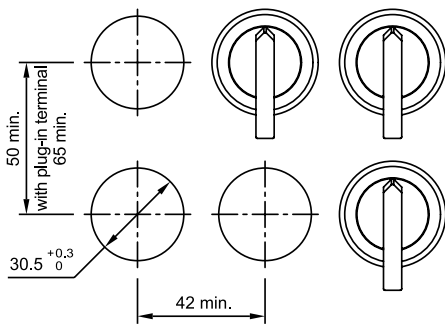
04 Cut-outs, Mushroom head



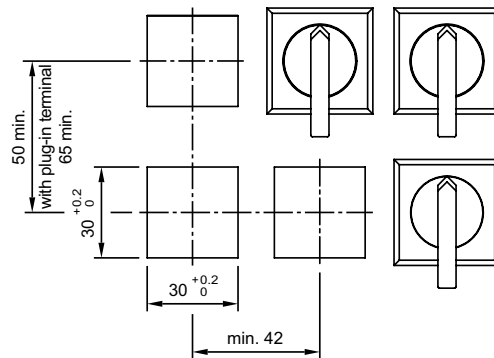
04 Cut-outs, Long Lever, Raised Mounting



04 Cut-outs, Long Lever, Flush Mounting



04 Cut-outs, Long Lever, Flush Mounting



Emergency-Stop Switches

Stop! Think EAO for emergency switches



EAO's comprehensive range of Emergency-stop switches provides a totally reliable solution for rapid shutdown of all types of machinery.

These products are foolproof – guaranteed! One push of the actuator instantly releases normally closed contacts, immediately terminating power. They are re-activated either by hand twisting, or by unlocking the actuator with a key when additional security is required.

The robust design ensures the device will survive in demanding industrial environments and being struck hard during a panic situation.

Continuous product development ensures that EAO products offer the most useful safety features plus benefits in terms of easy assembly, mounting and operation. Manufacturing is to the strictest regulations to satisfy the latest international standards.

EAO offers products for every environment, from the most compact hand-held controls to the largest of plant machinery.

- Illuminated E-stops for compact equipment. See page 118
- Smaller E-stops for mounting in 16mm holes. See page 97
- Larger E-stops for mounting in 22.5mm holes. See page 16 and 65

Protective shrouds, enclosures and labels are listed per Series. See the section 'Accessories' at the end of each product range.



Series 14

22.5mm 30.5mm IP67 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch. For other options or further information please contact your local sales office.

Product Profile

The Series 14 is a high quality switch range that includes pushbuttons, indicators, mushroom headed switches, selector switches and 2 position key switches.

Options include self cleaning, snap-action or low level switching elements.

Technical data see page 41

- IP67 Protection
- Switch Rating:
Maximum Voltage, 250VAC
Maximum Thermal Current, I_{th} = 5A
24VDC/2A, 250VAC/2A
- Raised Mounting into 22.5 mm cut out
- Flush Mounting into 30.5 mm cut out
- Illumination using T5.5 Lamps or LED's
- All standard lenses are transparent with translucent diffuser
- Solder, plug-in or PCB connections

Indicator



Indicator body round for raised full face, black plastic, 22.5 mm mounting

Part No.
14-030.005



Indicator body for raised and flush mount, black plastic

Part No.
14-040.005

For flush mount order bezel 704.955.1

For complete switch also order **A**

For complete switch also order **A**

Illuminated pushbutton



Illuminated pushbutton actuator for raised and flush mount, black plastic, solder terminal, snap-action

Part No.	Function	Contact type
14-131.0252	Momentary	1NO/1NC
14-132.0252	Momentary	2NO/2NC
14-271.0252	Maintained	1NO/1NC
14-272.0252	Maintained	2NO/2NC

For flush mount order bezel 704.955.1

For complete switch also order **A**



Illuminated pushbutton actuator for raised and flush mount, black plastic, solder or plug-in terminal, snap-action

Part No.	Function	Contact type
14-131.022	Momentary	1NO/1NC
14-271.022	Maintained	1NO/1NC

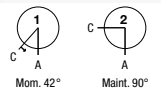
For flush mount order bezel 704.955.1

For complete switch also order **A**

Keylock switch



Keylock switch, 2 position, raised

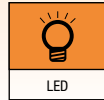


Graphic	Part No.	Function	Key out.
1	14-141.025K2	Momentary	A
2	14-235.025K2	Maintained	A

For flush mount order bezel 704.955.1

For complete switch also order **A**

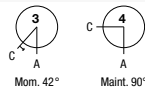
Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



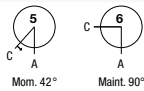
Selector switch **Buzzer**



Selector switch short lever 2 position, raised, snap-action



Selector switch long lever 2 position, raised, snap-action



Buzzer, raised, 22.5 mm mounting, IP65, 24VDC, 95dB ±8 at a distance of 0.1m

Graphic	Part No.	Function	Contact type	Graphic	Part No.	Function	Contact type	Part No.	Front finish
3	14-501.0252	Momentary	1NC/1NO	4	14-551.0252	Momentary	1NO/1NC	14-810.002	Black plastic
4	14-506.0252	Maintained	1NC/1NO	5	14-556.0252	Maintained	1NO/1NC	14-810.902	Nickel-plated brass
For flush mount order bezel 704.955.1									

For complete switch also order **A**

For complete switch also order **A**

Buzzer **LED**



Buzzer, flush mount, 30.5 mm mounting, IP40, 24VDC, 95dB ±8 at a distance of 0.1m

LED, T5.5, single chip, 6 Volt and 12 Volt

LED, T5.5, single chip, 24 Volt and 28 Volt

Part No.	Front finish	Colour	Part No.	Voltage	Colour	Part No.	Voltage
14-810.910	Black aluminium	Red	10-2106.3142	6VDC/15mA	Red	10-2112.1062	24VAC/DC, 7/14mA
14-810.918	Natur aluminium	Yellow	10-2106.3144	6VDC/15mA	Yellow	10-2112.1064	24VAC/DC, 7/14mA
		Green	10-2106.3145	6VDC/15mA	Green	10-2112.1065	24VAC/DC, 7/14mA
		Blue	10-2106.3146	6VDC/15mA	Blue	10-2112.1066	24VAC/DC, 7/14mA
		White	10-2106.3149	6VDC/15mA	White	10-2112.1069	24VAC/DC, 7/14mA
		Red	10-2109.1062	12VAC/DC, 7/14mA	Red	10-2113.1062	28VAC/DC, 7/14mA
		Yellow	10-2109.1064	12VAC/DC, 7/14mA	Yellow	10-2113.1064	28VAC/DC, 7/14mA
		Green	10-2109.1065	12VAC/DC, 7/14mA	Green	10-2113.1065	28VAC/DC, 7/14mA
		Blue	10-2109.1066	12VAC/DC, 7/14mA	Blue	10-2113.1066	28VAC/DC, 7/14mA
		White	10-2109.1069	12VAC/DC, 7/14mA	White	10-2113.1069	28VAC/DC, 7/14mA



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

LED



LED, T5.5, single chip, 48 Volt

Colour	Part No.	Voltage
● Red	10-2119.1042	48VAC/DC, 4/8mA
● Yellow	10-2119.1044	48VAC/DC, 4/8mA
● Green	10-2119.1045	48VAC/DC, 4/8mA
● Blue	10-2119.1046	48VAC/DC, 4/8mA
○ White	10-2119.1049	48VAC/DC, 4/8mA
For complete lens also order diffuser 704.608.9 (see page 39)		

A Accessories



Lens, plastic for raised, round indicator body, full face

Colour	Part No.
● Red	704.603.2
● Yellow	704.603.4
● Green	704.603.5
● Blue	704.603.6
○ Clear	704.603.7
For complete lens also order diffuser 704.608.9 (see page 39)	



Lens cap, round, transparent, plastic for raised and flush indicators with bezel and pushbutton actuators

Colour	Part No.
● Red	704.602.2
● Yellow	704.602.4
● Green	704.602.5
● Blue	704.602.6
○ Clear	704.602.7
● Black	704.602.0
For complete lens also order diffuser 704.609.9 (see page 39)	

A Accessories



Lens cap raised, transparent, plastic for raised and flush mount pushbutton actuators

Colour	Part No.
● Red	704.611.2
● Yellow	704.611.4
● Green	704.611.5
● Blue	704.611.6
○ Clear	704.611.7
For complete lens also order diffuser 704.610.9 (see page 39)	



Lens cap, aluminium anodised for raised and flush mount pushbutton actuators

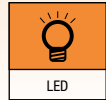
Colour	Part No.	Comment
● Red	704.601.2	
● Yellow	704.601.5	
● Blue	704.601.6	
○ Silver	704.601.8	
○ Silver	704.601.81	Illuminated central dot
● Black	704.601.0	
● Black	704.601.01	Illuminated central dot
	704.601.9	Stainless steel
For complete lens also order diffuser 704.610.9 (see page 39)		



Bezel, raised and flush mount

Image	Part No.	Product description
1	704.600.1	Aluminium natural, raised
2	704.600.0	Plastic black, raised
2	704.600.6	Plastic grey raised
3	704.955.0	Aluminium black flush
3	704.955.1	Aluminium natural flush
3	704.955.9	Stainless steel, flush

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories

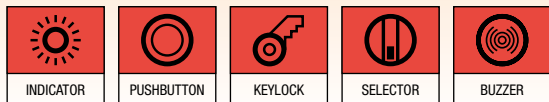
Protective cover, raised pushbutton		Protective front ring with silicon membrane for raised or flush mount pushbutton		Blanking plate	
Part No.	Image	Part No.	Size	Part No.	Size
704.925.0	1	704.600.3	29 mm Ø for raised pushbutton	704.960.7	22.5 mm Ø
	2	704.955.3	35 mm Ø for flush mount pushbutton	704.964.8	30.5 mm Ø

A Accessories

LED and lens remover			Diffuser for raised indicator, diffuser for flat lens indicator and pushbutton, diffuser for raised pushbutton			Marking plate selfadhesive, aluminium black, for raised and flush mount push buttons			
Image	Part No.	Product description	Image	Part No.	Product description	Image	Part No.	Size	Colour
1	61-9740.0	LED remover	1	704.608.9	Diffuser for raised indicator	1	704.968.2	22.5 mm Ø	Black
2	700.006.0	Lens remover	2	704.609.9	Diffuser for flat lens	2	704.968.3	30.5 mm Ø	Black
			3	704.610.9	Diffuser for raised illum. pushbutton				

Series 14

22.5mm 30.5mm IP67 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

A Accessories



Engraving Label for Marking plate, selfadhesive, natural anodised or black aluminium

Image	Part No.	Size	Colour
1	704.968.0	23.5x14.5mm	Aluminium
2	704.968.1	23.5x14.5mm	Black

Actuator with snap-action switching element

Switching system

Self-cleaning, double-break, snap action switching system (with contact gap 2x0.5mm).

1 normally closed or 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 2.8mm stackable, only 1 switching element can be on a pushbutton.

Material

Material of contact

Gold plated silver

Switch housing

Plug-in-/soldering terminal

Diallylphthalate DAP, Polyamide 66, Polysulfone, heat-resistant and self-extinguishing

Soldering terminal: PA 6.6 Ultramide

Actuator housing

Polyamide

Mechanical characteristics

Terminals

Snap-action switching element with tinned soldering terminals at the sides:

Max. wire diameter 2 wires à 1.2mm

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 2.8x0.5mm

Soldering terminal:

Max. wire diameter 2 wires of 1mm

Max. wire cross-section of stranded cable 2x0.75mm² or 1x1.0mm²

Actuating torque

Measured at the key or lever of the keylock- or selector switch 2.5Ncm ... 5.5Ncm, depending on the number of switching elements

Actuating force

Maintain 5 ... 7.8N, depending on the number of switching elements

Momentary 3.2 ... 6N, depending on the number of switching elements

Actuating travel

Illuminated pushbutton: 3mm

Switch actuator 2 positions:

Momentary action 1 x ca. 42° deflection momentary action

Maintained action 1 x ca. 90° deflection maintained action

Rebound time

≤5ms

Mechanical lifetime

Momentary action 2 million Cycles of operation

Maintained action 1 million Cycles of operation

Electrical characteristics

Standards

The devices comply with: EN IEC 61058-1

Rated voltage

250VAC/DC as per EN IEC 61058-15

Contact resistance

New state ≤50mΩ as per DIN IEC 60512-2-4

Electrostatic discharge

Keylock switch 15kV

Rated current

5A

Conventional free air thermal current I_{th}

5A

The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating

250VAC, 5A (cosφ 1)

250VAC, 3A (cosφ 0.3)

Switch rating AC (cosφ 0.7)

Voltage	125VAC	250VAC
---------	--------	--------

Current	3A	2A
---------	----	----

Switch rating DC (inductive) L:R = 30ms

Voltage	24VDC	60VDC	110VDC	220VDC
---------	-------	-------	--------	--------

Current	2A	0.7A	0.2A	0.1A
---------	----	------	------	------

Electric strength

3000VAC, 50Hz, 1min. between all terminals and earth, as per EN IEC 61058-1-15

Isolation resistance

>7MΩ between the open contacts at 500VDC, as per EN IEC 61058-1-15 (reinforced insulation)

Protection class

Class II

Environmental 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

as per EN IEC 60529

front side IP67

Shock resistance

(semi-sinusoidal)

max. 150m/s², pulse width 11ms, 3-axis, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

max. 100m/s² at 10Hz ... 500Hz, as per EN IEC 60068-2-6

Climate resistance

Damp heat state as per EN IEC 60068-2-30

Damp heat cyclic as per EN IEC 60068-2-78

Approvals

Approbations

CB (IEC 61058)
CSA
ENEC (EN 61058)
Germanischer Lloyd
UL

Declaration of conformity

CE

Buzzer

Buzzer system

System

Piezo disc

Material

Alarm buzzer case

Polyamide

Front cap

Plastic Polyamide

Metal Nickel-plated brass (sea-water proof)

Mechanical characteristics

Terminals

Plug-in terminal 2.8x0.5mm

Electrical characteristics

Frequency (tone)

approx. 2.8kHz continuous tone only

Sound pressure

95 db (A) ± 8 dB at a distance of 0.1 m

Operation Voltage/Current

Operation Voltage	24VDC $\pm 10\%$
Operation Current	≤ 25 mA

Environmental conditions

Storage temperature

-35°C ... $+85^{\circ}\text{C}$

Operating temperature

-25°C ... $+55^{\circ}\text{C}$

Protection degree

as per EN IEC 60529, frontside

IP40, devices flush mounting

IP65, devices raised mounting

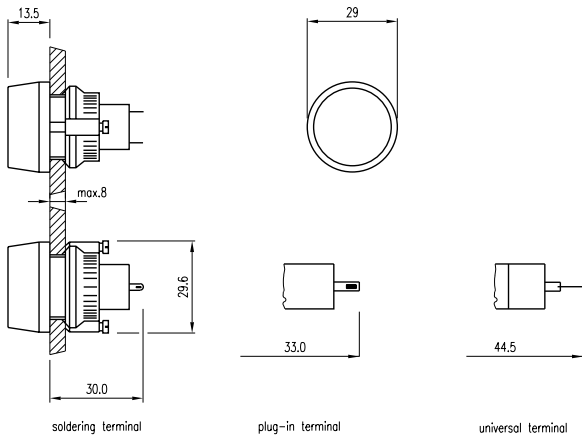
Approvals

Declaration of conformity

CE

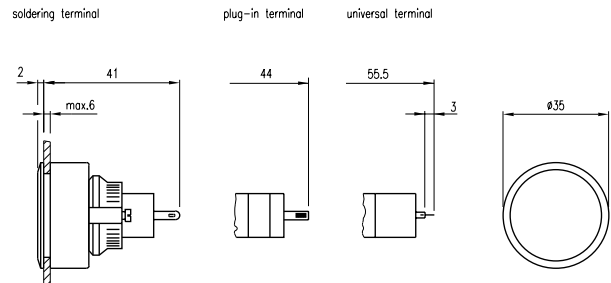
14 Indicator

Raised



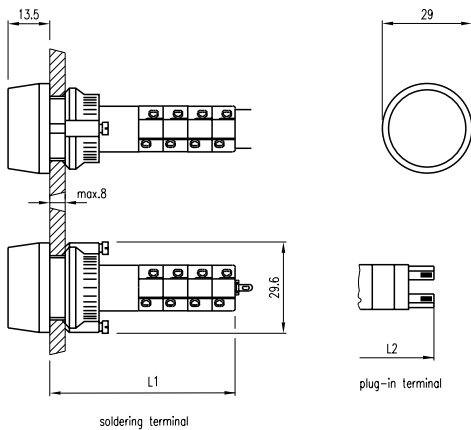
14 Indicator

Flush



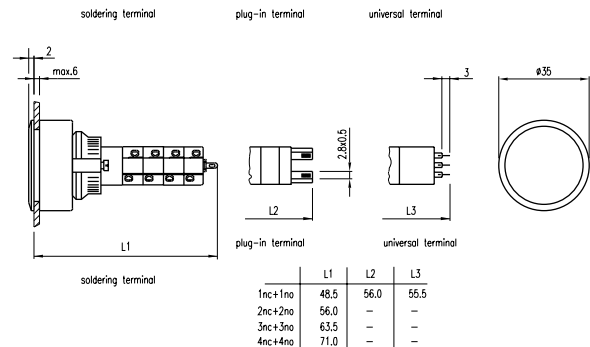
14 Illuminated pushbutton

Raised



14 Illuminated pushbutton

Flush Solder

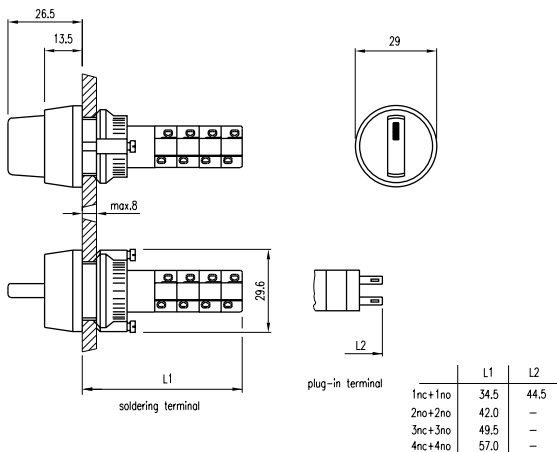


	L1	L2
1nc+1no	37.5	44.5
2nc+2no	45.0	-
3nc+3no	42.5	-
4nc+4no	60.0	-

	L1	L2	L3
1nc+1no	48.5	56.0	55.5
2nc+2no	56.0	-	-
3nc+3no	63.5	-	-
4nc+4no	71.0	-	-

14 Selector switch

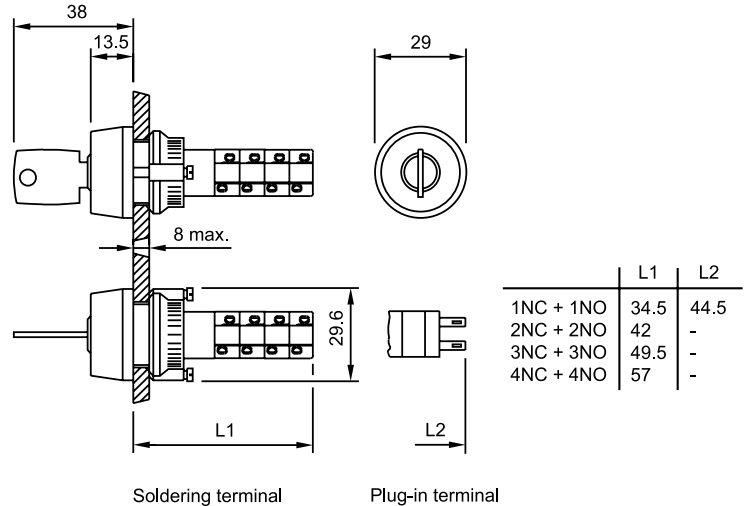
2-Position, Short Lever



	L1	L2
1nc+1no	34.5	44.5
2no+2no	42.0	-
3nc+3no	49.5	-
4nc+4no	57.0	-

14 Keylock switch

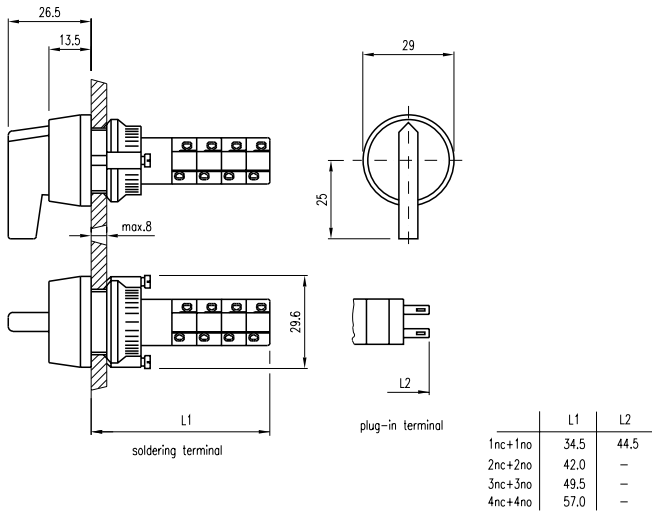
2-Position



	L1	L2
1NC + 1NO	34.5	44.5
2NC + 2NO	42	-
3NC + 3NO	49.5	-
4NC + 4NO	57	-

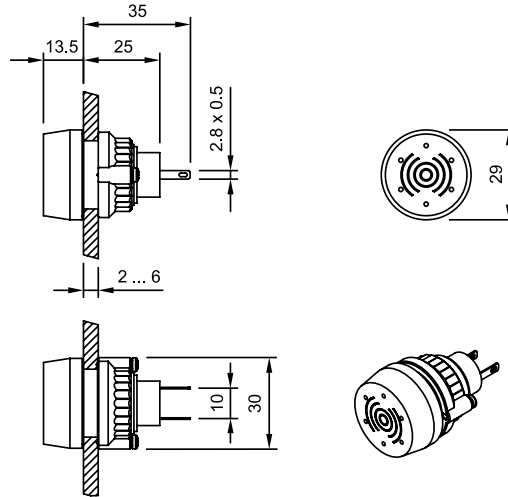
14 Selector switch

2-Position, Long Lever



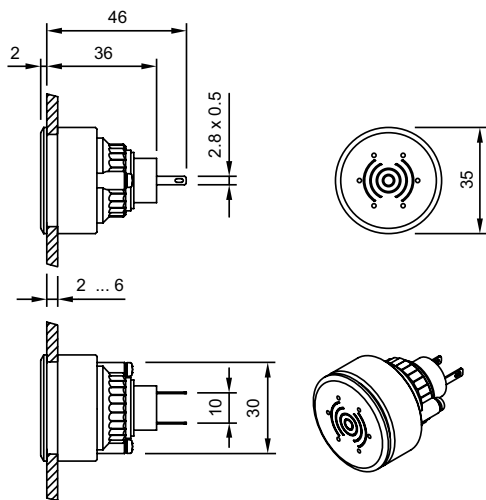
14 Buzzer

Raised



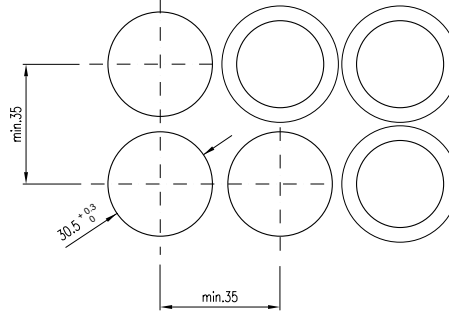
14 Buzzer

Flush



14 Cut-outs

Flush, Buzzer, Pushbutton, Indicator



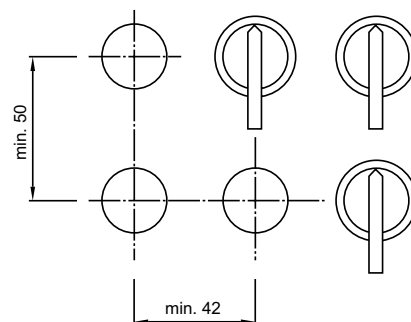
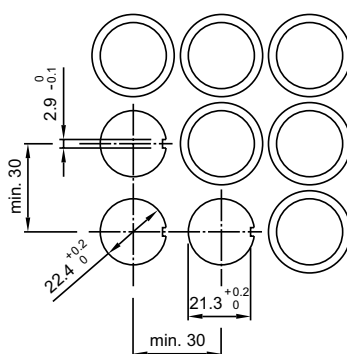
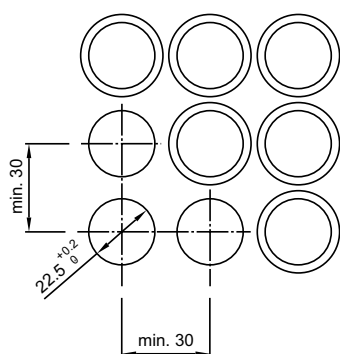
14 Cut-outs

Raised, Pushbuttons, Indicators, Keylocks, Selector

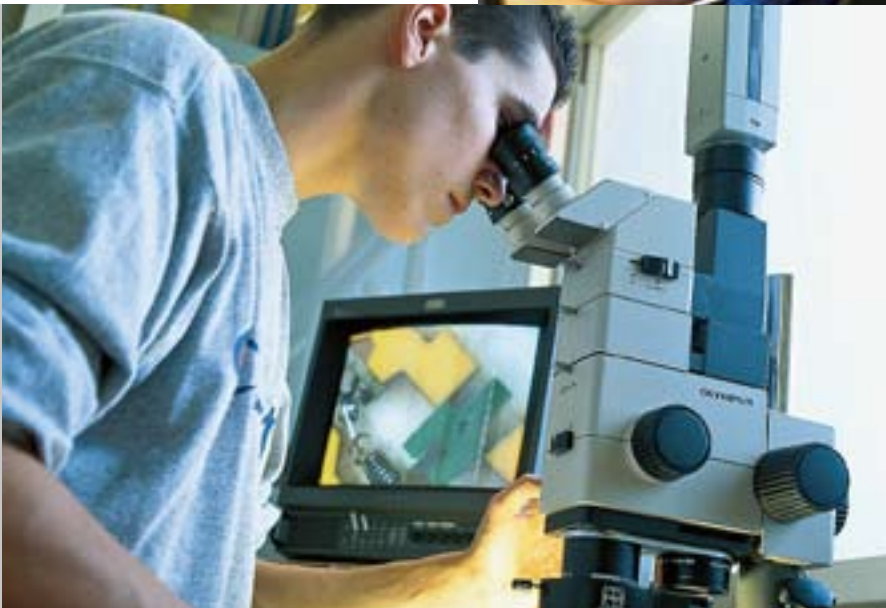
for devices
without anti-twist device

for devices
with anti-twist device (rotary)
(recommended for keylock switch)

for devices
Selector switch long lever



EAO has developed teams of Human Machine Interface application specialists with an in-depth knowledge of various industry sectors.



By understanding the requirements of our customers' projects, we are able to add value from concept (providing advice and ergonomic design) through to production.

EAO operates a 6 step project development process. The benefit to you, our customers, is the ability for you to focus on core business, save costs and achieve maximum efficiency in the implementation of product development without having to worry about creating concepts for complex Human Machine Interface systems.

- T0 Partnership**
EAO adds expert knowledge, creativity and innovative flair to its customers' projects.
- T1 Challenge**
EAO analyses the task with its customers and works out possible solutions.
- T2 Concept**
EAO examines all the technical, ergonomic and commercial specifications involved in the solution. Re-engineering using CAD, circuit diagrams and prototypes based on application-oriented tests.
- T3 Development**
EAO takes care of the detailed development of the solution while at the same time exchanging information with its customers.
- T4 Production**
Reliable processes and results – EAO co-ordinates implementation of the solution to suit its customer's end product.
- T5 Customer service**
EAO has a global presence and can always be contacted. Wherever our customers and their customers are, EAO stays in touch.

Series 17

6 mm 8 mm 14 mm IP40 24VDC 230VAC



For other options or further information please contact your local sales office.

Product Profile

The Series 17 panel mount indicators are available in red, yellow, green or multi colour illumination options. They can be mounted in 6, 8 or 14 mm diameter holes. The integral series resistor allows direct connection to 24VDC or up to 230VAC.

Technical data see page 49

- IP40 Protection
- Plug-in terminals 2.0x0.5 mm or 2.8x0.8 mm
- Internal or external reflector
- Front available in chromium-plated, silver or black

Indicator



Indicator, flat reflector, 3 mm LED, 24VDC, 6mm mounting

Colour	Part No.
● Red	17-000350
● Yellow	17-000352
● Green	17-000351



Indicator, external reflector, 3 mm LED, 24VDC, 6mm mounting

Colour	Part No.
● Red	17-020350
● Yellow	17-020352
● Green	17-020351

Indicator



Indicator, internal reflector, 3 mm LED, 24VDC, 6mm mounting

Colour	Part No.
● Red	17-030350
● Yellow	17-030352
● Green	17-030351
● Green/Yellow	17-030356



Indicator, flat, internal reflector, 5 mm LED, 24VDC, 8mm mounting

Colour	Part No.
● Red	17-010350
● Yellow	17-010352
● Green	17-010351



Indicator, external reflector, 5 mm LED, 24VDC, 8mm mounting




Colour	Part No.
● Red	17-040350
● Yellow	17-040352
● Green	17-040351

For other options or further information
please contact your local sales office.

 **Indicator**






Indicator, external reflector, 5 mm LED, 24VDC, 8 mm mounting

Colour	Part No.
 Red	17-041350
 Yellow	17-041352
 Green	17-041351




Indicator, internal reflector, 5 mm LED, 24VDC, 8 mm mounting

Colour	Part No.
 Red	17-050350
 Yellow	17-050352
 Green	17-050351




Indicator, flat reflector, 5 mm LED, 24VDC, 8 mm mounting, tri-colour

Colour	Part No.
 Red/Yellow/Green	17-100354

 **Indicator**




Indicator, external reflector, 5 mm LED, 24VDC, 8 mm mounting, bi-colour

Colour	Part No.
 Green/Red	17-120354






Indicator, internal reflector, 5 mm LED, 24VDC, 8 mm mounting, bi-colour

Colour	Part No.
 Green/Red	17-130354



Indicator, internal reflector, 5 mm LED, 230VAC, 8 mm mounting

Colour	Part No.
 Red	17-500430
 Yellow	17-500432
 Green	17-500431

Series 17

6 mm 8 mm 14 mm IP40 24VDC 230VAC



For other options or further information
please contact your local sales office.

Indicator



Indicator, external reflector, 5 mm LED, 230VAC,
8 mm mounting



Indicator, internal/external reflector, 10 mm LED,
24VDC, 14 mm mounting



Indicator, internal/external reflector, 10 mm LED,
230VAC, 14 mm mounting

Colour	Part No.	Colour	Part No.	Colour	Part No.
● Red	17-510430	● Red	17-210350	● Red	17-350230
● Yellow	17-510432	● Yellow	17-210352	● Yellow	17-350232
● Green	17-510431	● Green	17-210351	● Green	17-350231
		● Red/Yellow/Green	17-240354		

Technical Data

Material

Indicator

Reflector: Brass satin chrome/black chrome for indicator 16 mm dia. in black plastic

The plastic (polycarbonate) is limited resistant against chemicals

Mechanical characteristics

Terminals

Plug-in terminal 2.0x0.5 mm or 2.8x0.8 mm

The indicators with tab-connection are not qualified for soldering

Tightening torque

20 Ncm

Electrical characteristics

Polarity

Anode (+) Brass plug-in connector

Cathode (-) Brass tinned plug-in connector

Voltage tolerance

+10%

Optical characteristics

Wave length

red 660 nm

super red 625 nm

hyper red 660 nm

orange 625 nm / for execution 230V: 610 nm

green 565 nm

yellow/green 570 / for execution 230V: 575 nm

yellow 590 nm

blue 475 nm

red/green 660/565 nm

red/yellow 660/ 590 nm

Environmental conditions

Storage temperature

-25 °C ... +80 °C

Service temperature

-20 °C ... +60 °C

Protection degree

front IP40

IP67 as per DIN EN 60529 – Gap between LED and reflector and gap between reflector and frontplate sealed to IP67 when using the supplied gasket

Approvals

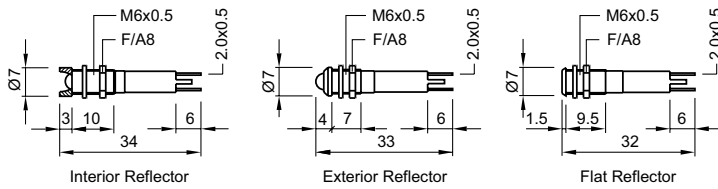
Approbations

UL

VDE

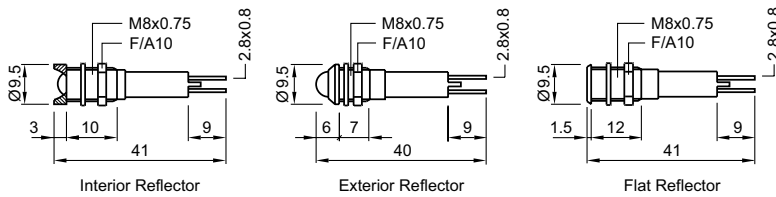
17 Indicator

6mm mounting



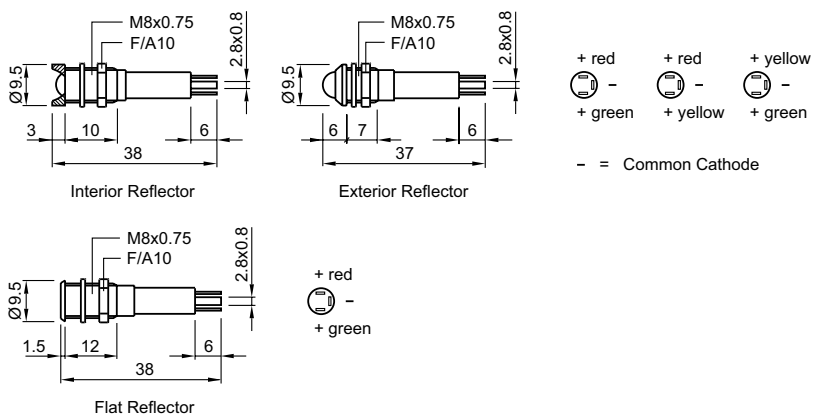
17 Indicator

8mm mounting



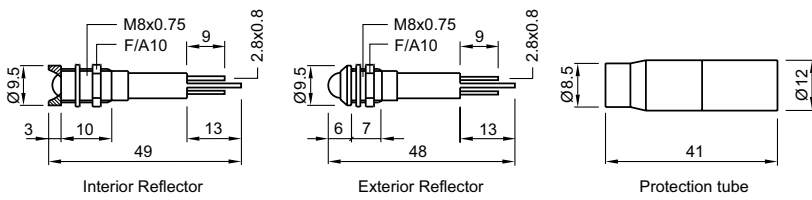
17 Indicator

8mm mounting, Bi-colour, Tri-colour



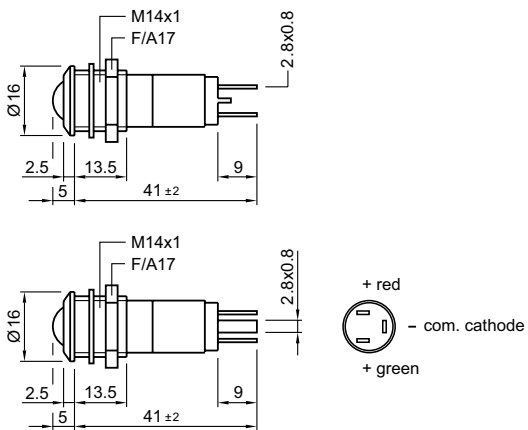
17 Indicator

8mm mounting, 230VAC



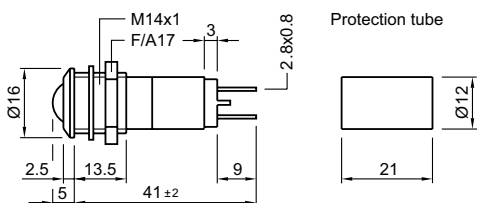
17 Indicator

14 mm mounting



17 Indicator

14 mm mounting, 230VAC





Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

The Series 22 is a high quality switch range that includes pushbuttons, indicators, mushroom headed switches and key switches.

Technical data see page 55

- IP65 Protection
- Switch Rating, 10A, 400VAC
- Self cleaning snap-action switching elements.
- Mounting into 22 x 30 mm cut out
- Illumination using T1¼ Lamps or LED's
- The standard lenses are available in many different versions, transparent, opaque or translucent
- Screw terminal or plug-in connections

Indicator



Indicator body raised, rectangular, black plastic, screw terminals

Part No.
22-040.001

Illuminated pushbutton



Illuminated pushbutton actuator, raised, rectangular, black plastic, screw terminals

Part No.	Function	Contact type
22-211.011	Momentary	1NO
22-212.011	Momentary	1NC
22-213.011	Momentary	2NO
22-214.011	Momentary	2NC
22-215.011	Momentary	1NO/1NC
22-221.011	Maintained	1NO
22-222.011	Maintained	1NC
22-223.011	Maintained	2NO
22-224.011	Maintained	2NC
22-225.011	Maintained	1NO/1NC

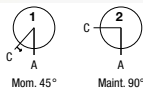
For complete switch also order **A**

For complete switch also order **A**

Keylock switch



Keylock switch actuator, 2 position raised, rectangular, screw terminals



Graphic	Part No.	Function	Contact	Key rem.
2	22-331.111D	Maint.	1NO	A
2	22-331.311D	Maint.	1NO	C
2	22-331.511D	Maint.	1NO	A + C
2	22-333.111D	Maint.	2NO	A
2	22-333.311D	Maint.	2NO	C
2	22-333.511D	Maint.	2NO	A + C
2	22-335.111D	Maint.	1NC/1NO	A
2	22-335.311D	Maint.	1NC/1NO	C
2	22-335.511D	Maint.	1NC/1NO	A + C
1	22-351.111D	Mom.	1NO	A
1	22-353.111D	Mom.	2NO	A
1	22-355.111D	Mom.	1NC/1NO	A

LED



LED, T1¼ MG, single chip, 12 Volt and 28 Volt. Also available in 6 Volt, 24 Volt and 48 Volt

Colour	Part No.	Voltage
● Red	10-2J09.1062	12 VAC/DC, 15 mA
● Yellow	10-2J09.1064	12 VAC/DC, 15 mA
● Green	10-2J09.1065	12 VAC/DC, 15 mA
● Blue	10-2J09.1066	12 VAC/DC, 15 mA
○ White	10-2J09.1069	12 VAC/DC, 15 mA
● Red	10-2J13.1062	28 VAC/DC, 15 mA
● Yellow	10-2J13.1064	28 VAC/DC, 15 mA
● Green	10-2J13.1065	28 VAC/DC, 15 mA
● Blue	10-2J13.1066	28 VAC/DC, 15 mA
○ White	10-2J13.1069	28 VAC/DC, 15 mA

Accessories

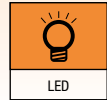


Lens, front translucent/rear translucent for rectangular indicator and illuminated pushbutton actuators

Colour	Part No.
● Red	22-901.2
● Yellow	22-901.4
● Green	22-901.5
● Blue	22-901.6
○ White	22-901.9

For complete switch also order **A**

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Lens, opaque for rectangular pushbutton actuators, not for illumination

Colour	Part No.
● Grey	22-901.8



Lens, front transparent/rear translucent for rectangular indicator and illuminated pushbutton actuators

Colour	Part No.
● Red	22-903.2
● Yellow	22-903.4
● Green	22-903.5
● Blue	22-903.6
○ Clear	22-903.7



Lens, front transparent/rear transparent for rectangular indicator and illuminated pushbutton actuators

Colour	Part No.
● Red	22-905.2
● Yellow	22-905.4
● Green	22-905.5
○ Clear	22-905.7

A Accessories



Mushroom head cap, not for illumination, opaque, red

Part No.
22-930.2



Front bezel flat and raised, black plastic

Image	Part No.	Product description
1	02-965.0	Front bezel flat
2	02-967.0	Front bezel raised



Flap guard, raised, rectangular

Part No.
22-925

Series 22

22 mm x 30 mm IP65 10 A 400 VAC

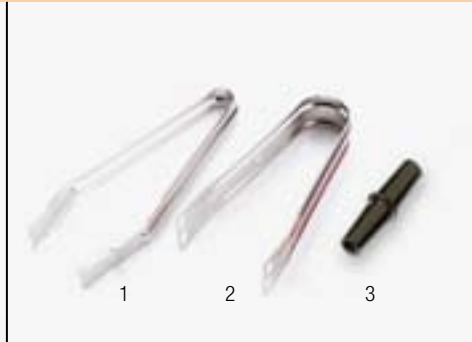


Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

A Accessories



Blanking plate



Lens remover for flat bezel, lens remover for raised bezel and LED remover

Part No.	Image	Part No.	Product description
22-949.0	1	02-905	Lens remover for flat bezel
	2	98-968	Lens remover for raised bezel
	3	61-9740.0	LED remover

Actuator with snap-action switching element

Switching system

Self-cleaning, double-break, snap-action switching system (with contact gap 2 x 1.5 mm)
 Max. 2 normally closed or 2 normally open contacts, or one of each.

Material

Lens

Polymethylmethacrylate PMMA, as per UL 94 HB, Polycarbonate (PC), as per UL 94V0

Front bezel

Polyphenylenoxide (PPO)

Material of contact

Hard silver

Actuator housing

Polyamide (PA), Polytherimide (PEI)

Mechanical characteristics

Terminals

Screw terminal (with self-lifting clip):
 Max. wire cross-section 2 x 2.5 mm²
 Max. wire cross-section of stranded cable 2 x 1.5 mm²

Plug-in terminal 6.3 x 0.8 mm

Actuating force

with 1 switching element 3.6 N ± 0.3 N
 with 2 switching elements 6.8 N ± 0.3 N

Actuating travel

5.5 mm ± 0.2 mm

Travel

3 mm

Rebound time

≤ 3 ms

Mechanical lifetime

Illuminated pushbutton 1 million operations
 Keylock switch 40 000 operations

Electrical characteristics

Contact resistance

Starting value ≤ 50 mΩ, as per IEC 60512-2-4

Isolation resistance

≥ 100 MΩ between all contacts at 100 VDC, as per IEC 60512-2-10

Switch rating

Power rating
 min. 12 VAC, 50 mA
 max. 400 VAC, 10 A

Switch rating AC (cosφ 0.7), service category AC-11

Voltage	125 VAC	250 VAC	380 VAC
Current	8 A	5 A	3 A
Operations	≤ 100 000		

Switch rating DC (inductive) L:R = 30 ms, service categorie DC-11

Voltage	24 V	60 V	110 V	220 V
Current	6 A	1.5 A	0.4 A	0.2 A
Operations	≤ 100 000			

Electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60512-2-11.

Environmental conditions

Storage temperature

-40 °C ... +95 °C

Service temperature

-25 °C ... +85 °C

Protection degree

Terminal/case IP20
 Front IP65 as per IEC 60529

Shock resistance

50 g for 11 ms, as per IEC 60512-4-3

Vibration resistance

(sinusoidal)
 10 g at 10 Hz ... 2000 Hz, amplitude 0.75 mm, as per IEC 60512-4-4

Approvals

Approbations

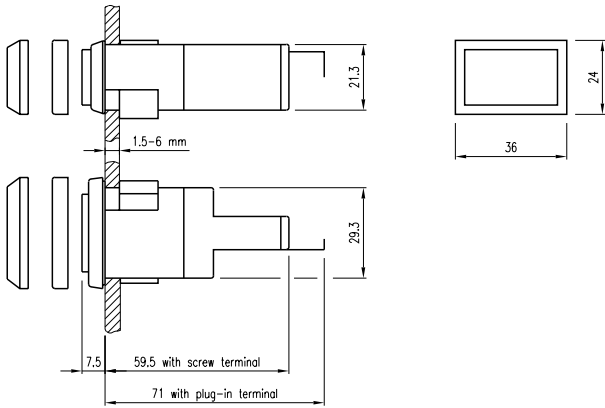
CB (IEC 61058)
 CSA
 ENEC (EN 61058)
 UL
 VDE

Declaration of conformity

NF F16-102

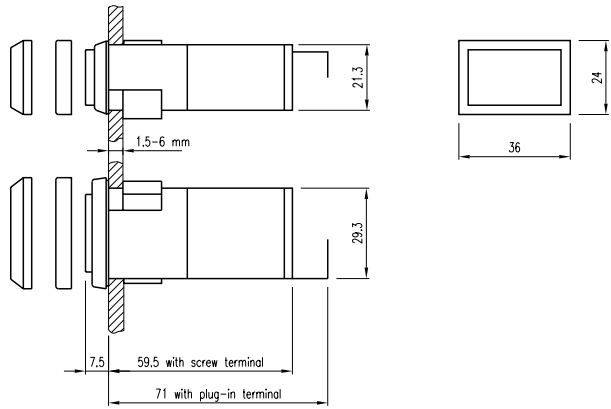
22 Indicator

Raised



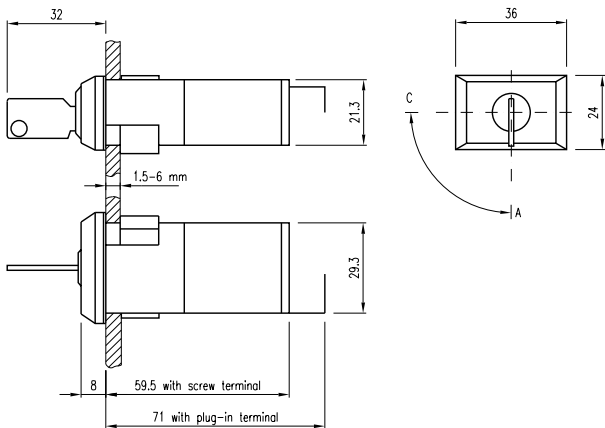
22 Illuminated Pushbutton

Raised



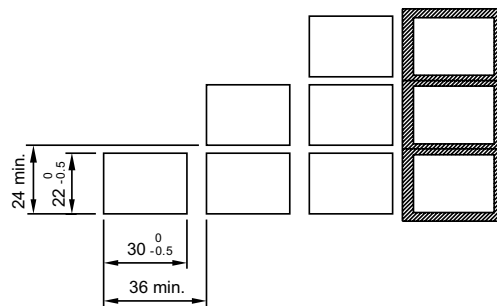
22 Keylock switch

2-Position, Raised



22 Cut-outs

For all Series 22



Keyboards & Keypads



EAO has manufactured the finest range of industrial keyboards and keypads for more than 30 years. With this experience, and with an uncompromising commitment to quality and craftsmanship, EAO products are designed to be different.

EAO believes in the “perfect fit”. Keypads and keyboards are made to be highly adaptable as standard. This includes options for key layout, illumination, colour, key sizes and connectors among others. For this reason, a keypad or keyboard is offered to suit every industrial application.

M.series This keypad takes adaptability and design flexibility to a new level. The modular construction and truly innovative technology allows for rapid customization – generally without any additional engineering or tooling costs. See page 142 for more information.



S.series Sealed to IP67 and resistant to IK10, this is the keypad for the most demanding security environments. See page 148 for more information.



W.series Fitted to some of the world’s best kiosks and information terminals, these vandal resistant keyboards will provide high levels of protection combined with excellent tactile feedback. Now available with a six-row version and an optical trackball. See page 160 for more information.



High security keypads

EAO can develop a secure keypad solution with a specialised interface and encryption modules for banking and payment terminals, biometric access controls and similar applications. It will also manage the integration of this keypad solution within the overall design.



Series 31

16 mm IP40 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

The Series 31 is a high quality switch range that includes pushbuttons, indicators and buzzers. It is possible to choose up to 4NO/4NC snap-action switching elements per switch. Low level switching elements are also available.

Technical data see page 61

- IP40 Protection
- Switch Rating, 5A, 250VAC
- Raised Mounting into 16 mm cut out
- Illumination using midjet-grooved T1¼ lamps or single chip LED's
- All standard lenses are transparent with translucent diffuser available in different colours
- Buzzers voltage from 10 to 75VDC

Indicator



Indicator bodies, raised in round, square and rectangular, black plastic, 16 mm mounting, solder terminals

Image	Part No.	Size
1	31-040.005	18x24 mm
2	31-050.005	18x18 mm
3	31-030.005	18 mm Ø

For complete switch also order **A**

Illuminated pushbutton



Illuminated pushbutton actuator, snap-action, raised, rectangular, black plastic, 16 mm mounting, solder terminals, gold contacts

Part No.	Function	Contact type	Size
31-121.0252	Momentary	1NO/1NC	18x24 mm
31-122.0252	Momentary	2NO/2NC	18x24 mm
31-261.0252	Maintained	1NO/1NC	18x24 mm
31-262.0252	Maintained	2NO/2NC	18x24 mm

For complete switch also order **A**

Illuminated pushbutton



Illuminated pushbutton actuator, snap-action, raised, square, black plastic, 16 mm mounting, solder terminals, gold over silver contacts

Part No.	Function	Contact type	Size
31-151.0252	Momentary	1NO/1NC	18x18 mm
31-152.0252	Momentary	2NO/2NC	18x18 mm
31-281.0252	Maintained	1NO/1NC	18x18 mm
31-282.0252	Maintained	2NO/2NC	18x18 mm

For complete switch also order **A**

Buzzer

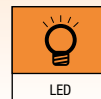


Buzzer, plastic bezel, raised, rectangular, 16 mm mounting, continuous or intermittent tone, 88 dB ±8 at a distance of 0.1 m

Image	Part No.	Voltage	Connection
1	31-810.005	10 - 55VAC/10 - 75VDC	Solder terminal
2	31-801.002	10 - 26VDC	Solder-/plug-in terminal

For complete switch also order **A**

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



LED



LED, T1¼ MG, single chip, 12 Volt and 28 Volt.
Also available in 6 Volt, 24 Volt and 48 Volt

Colour	Part No.	Contact type
● Red	10-2J09.1062	12VAC/DC, 15 mA
● Yellow	10-2J09.1064	12VAC/DC, 15 mA
● Green	10-2J09.1065	12VAC/DC, 15 mA
● Blue	10-2J09.1066	12VAC/DC, 15 mA
○ White	10-2J09.1069	12VAC/DC, 15 mA
● Red	10-2J13.1062	28VAC/DC, 14 mA
● Yellow	10-2J13.1064	28VAC/DC, 14 mA
● Green	10-2J13.1065	28VAC/DC, 14 mA
● Blue	10-2J13.1066	28VAC/DC, 14 mA
○ White	10-2J13.1069	28VAC/DC, 14 mA

A Accessories



Lens, opaque for rectangular pushbutton bodies, not for illumination

Colour	Part No.	Size
● Black	31-901.0	18x24 mm



Lens, front transparent/rear translucent for rectangular indicator and pushbutton actuators

Colour	Part No.	Size
● Red	31-903.2	18x24 mm
● Yellow	31-903.4	18x24 mm
● Green	31-903.5	18x24 mm
● Blue	31-903.6	18x24 mm
○ Clear	31-903.7	18x24 mm

A Accessories



Lens, opaque for square pushbutton actuators, not for illumination

Colour	Part No.	Size
● Black	31-951.0	18x18 mm



Lens, front transparent/rear translucent for square indicator and pushbutton actuators

Colour	Part No.	Size
● Red	31-953.2	18x18 mm
● Yellow	31-953.4	18x18 mm
● Green	31-953.5	18x18 mm
● Blue	31-953.6	18x18 mm
○ Clear	31-953.7	18x18 mm



Lens, opaque for round pushbutton actuators, not for illumination

Colour	Part No.	Size
● Black	31-931.0	18 mm Ø

Series 31

16mm IP40 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

A Accessories



Lens, front transparent with white diffuser for round indicator and pushbutton actuators



Flap guard, raised, square and rectangular



Sprayproof cover, square and rectangular, IP65

Colour	Part No.	Size	Image	Part No.	Size	Image	Part No.	Comment
● Red	31-933.2	18 mm Ø	1	31-925	18x24 mm	1	31-924.2	PVC rear, silicon front
● Yellow	31-933.4	18 mm Ø	2	31-920	18x18 mm	2	31-923	Both PVC
● Green	31-933.5	18 mm Ø						
● Blue	31-933.6	18 mm Ø						
○ Clear	31-933.7	18 mm Ø						

A Accessories



Blanking plate



Mounting tool, lens and LED remover

Image	Part No.	Size	Image	Part No.	Product description
1	01-947.0	18x24 mm	1	01-907	Mounting tool
2	01-948.0	18x18 mm	2	02-905	Lens remover
3	01-949.0	18 mm Ø	3	61-9740.0	LED remover

Actuator with snap-action switching element

Switching system

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

1 Normally closed or 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 stackable, 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:

Diallylphthalate (DAP), Polyamide (PA66), Polysulfone,

heat-resistant and self-extinguishing

Soldering terminal: PA 6.6 Ultramide

Actuator housing

Polyetherimide, self-extinguishing

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 x 0.5 mm

Soldering terminal:

Max. wire diameter 1 wire of 1.5 mm²

Max. wire cross-section of stranded cable 2 x 0.75 mm² or 1 x 1.0 mm²

Actuating force

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

Actuating travel

3 mm

Rebound time

≤ 5 ms

Mechanical lifetime

Momentary action 2 million cycles of operation

Maintained action 1 million cycles of operation

Electrical characteristics

Standards

IEC 61058, EN 61058

Rated voltage

250 VAC/VDC

Rated current

5 A

Contact resistance

Starting value (initial) ≤ 50 mΩ

Conventional free air thermal current

5 A

The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating

250 VAC, 5 A (cosφ 1)

250 VAC, 3 A (cosφ 0.3)

Switch rating AC (cosφ 0.7)

Voltage	125 VAC	250 VAC
---------	---------	---------

Current	3 A	2 A
---------	-----	-----

Switch rating DC (inductive) L:R = 30 ms

Voltage	24 VDC	60 VDC	110 VDC	220 VDC
---------	--------	--------	---------	---------

Current	2 A	0.7 A	0.2 A	0.1 A
---------	-----	-------	-------	-------

Electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60512-2-11

Protection class

Class II

Environmental 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

Front as per:

IP40

IP65 with spray cover

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 and 2-30

Changing condition, as per IEC 60068-2-14 and 2-33

Approvals

Approbations

CB (IEC 61058)

CSA

ENEC (EN 61058)

Germanischer Lloyd

UL

Declaration of conformity

CE

Buzzer Typ-Nr. 31-810.005

Switching system

Buzzer system

Electronic non-contacting buzzer
with IC oscillator

Material

Alarm buzzer case

Polyetherimide

Front bezel

Polyamide

Mechanical characteristics

Terminals

Soldering terminal

Electrical characteristics

Frequency (tone)

Approx. 2.8 kHz

Interval frequency

approx. 3 Hz

Sound pressure

88 dB (A) \pm 8 dB at a distance of 0.1 m

Volume variable with a 1 M Ω potentiometer or corresponding fixed resistor

Operation Voltage/Current

Typ. 10 VAC ... 55 VAC, 25 mA

Typ. 10 VDC ... 75 VDC, 15 mA

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Service temperature

-25 °C ... +55 °C

Protection degree

IP40

Approvals

Approbations

Germanischer Lloyd

Declaration of conformity

CE

Buzzer Typ-Nr. 31-801.002

Switching system

Buzzer system

Electronic non-contacting buzzer
with IC oscillator

Material

Alarm buzzer case

Polyetherimide

Front bezel

Polyamide

Mechanical characteristics

Terminals

Plug-in terminal 2.8x0.5 mm

Electrical characteristics

Frequency (tone)

ca. 2.0 kHz

Interval frequency

2 Hz

Sound pressure

88 db (A) \pm 8 dB at a distance of 0.1 m

Operation Voltage/Current

10 VDC ... 26 VDC, \leq 20 mA

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Service temperature

-25 °C ... +55 °C

Protection degree

IP40

Approvals

Approbations

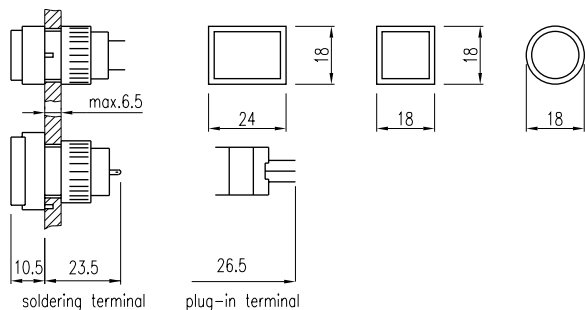
Germanischer Lloyd

Declaration of conformity

CE

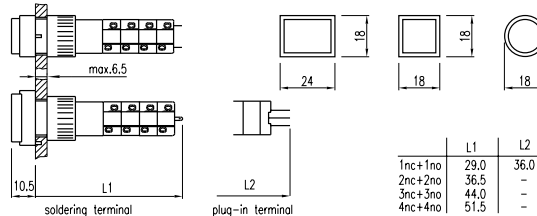
31 Indicator

Raised, Round, Square, Rectangular



31 Pushbutton

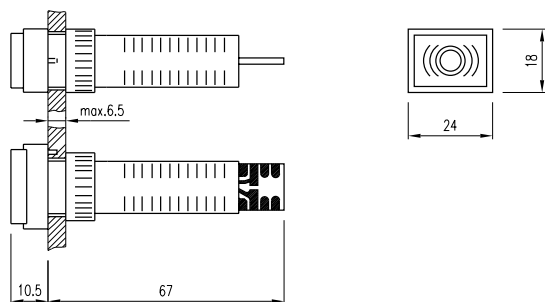
Illuminated, Raised, Round, Square, Rectangular



	L1	L2
1nc+1no	29.0	36.0
2nc+2no	36.5	-
3nc+3no	44.0	-
4nc+4no	51.5	-

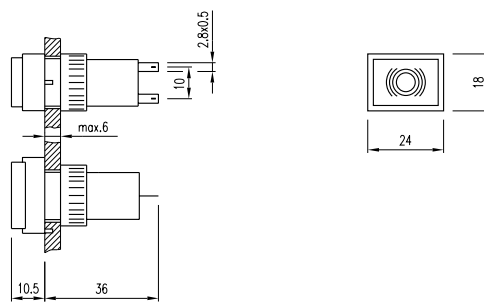
31 Buzzer

Raised



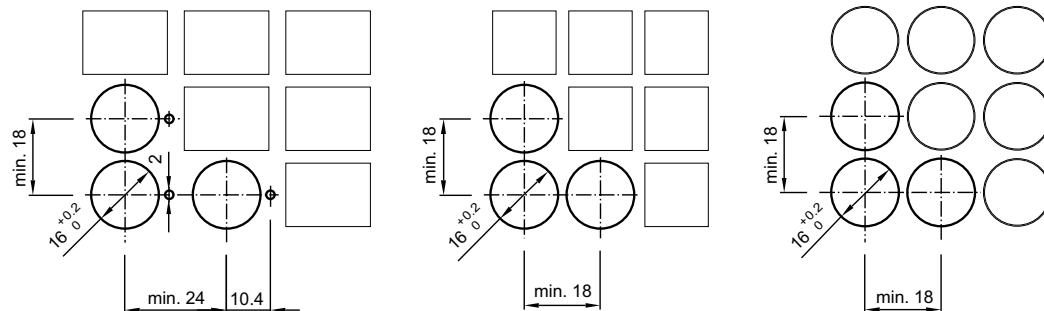
31 Buzzer

Raised, Solder-/plug-in terminal



31 Cut-outs

Raised, Round, Square, Rectangular



Series 44

22.5mm 30.5mm IP65 10A 660VAC



Choose one component from each of the coloured sections to assemble a complete switch. For other options or further information please contact your local sales office.

Product Profile

The Series 44 is a high quality switch range that includes pushbuttons, indicators, selectors, mushroom headed switches, key switches, control switches, double pushbutton switches, potentiometer drives and Emergency-stops.

The switches utilise self cleaning slow-make switching elements.

Technical data see page 69

- IP65 Protection
- Switch Rating, 10A , 660VAC
- Raised Mounting into 22.5 mm cut out
- Flush Mounting into 30.5 mm cut out
- Illumination using Ba9 Lamps or LED's
- Screw terminal connections

Indicator



Indicator, round, raised, full face with plastic matt chrome bezel, 22.5 mm mounting, lamp block included

Colour	Part No.
● Red	44-750.22.000
● Yellow	44-750.24.000
● Green	44-750.25.000
○ Clear	44-750.27.000



Indicator, round, raised with plastic matt chrome bezel, 22.5 mm mounting, lamp block included

Colour	Part No.
● Red	44-751.22.000
● Yellow	44-751.24.000
● Green	44-751.25.000
○ Clear	44-751.29.000

For complete switch also order

For complete switch also order

Non-Illuminated pushbutton



Non-Illuminated raised pushbutton with plastic matt chrome bezel, switching element included, 22.5 mm mounting

Colour	Part No.	Function	Contact type
● Red	44-701.22.001	Momentary	1NC
● Green	44-701.25.010	Momentary	1NO
○ White	44-701.29.010	Momentary	1NO
● Black	44-701.20.100	Momentary	1NO/1NC
● Green	44-702.25.010	Maintained	1NO
● Black	44-702.20.100	Maintained	1NO/1NC

Illuminated pushbutton



Illuminated raised pushbutton with plastic matt chrome bezel, switching element included, 22.5 mm mounting

Colour	Part No.	Function	Contact type
● Red	44-746.22.001	Momentary	1NC
● Yellow	44-746.24.010	Momentary	1NO
● Green	44-746.25.010	Momentary	1NO
○ White	44-746.29.100	Momentary	1NO/1NC
● Green	44-747.25.010	Maintained	1NO
○ White	44-747.29.100	Maintained	1NO/1NC

Double pushbutton actuator



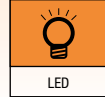
Double pushbutton actuator with plastic matt chrome bezel, without switching element or contact block holder



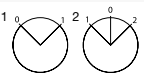
Colour	Part No.	Markings	Function
● Green/Red	44-770.2	No markings	Momentary
● Green/Red	44-771.2	I + 0	Momentary
● Black/White	44-773.2	No markings	Momentary
● Black/White	44-774.3	I + 0	Momentary





For complete switch also order

For complete switch also order **A**

Choose one component from each of the coloured sections to assemble a complete switch.
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Emergency-stop switch		Keylock switch																					
																							
<p>Emergency-stop, twist release, 37 mm diameter, foolproof to EN 60947-5-1 and DIN EN ISO 13850</p>		<p>Emergency-stop, key release, 37 mm diameter, foolproof to EN 60947-5-1 and DIN EN ISO 13850</p>																					
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Selector switch		Mushroom head pushbutton		Joystick																																								
																																												
<p>Selector switch, raised, black lever, 2 and 3 position with plastic matt chrome bezel, switching element included</p> 		<p>Mushroom head pushbutton, 50 mm diameter, plastic matt chrome bezel, without switching element or contact block holder</p>		<p>Joystick, raised with switching element, 2, 4 or 8 positions</p>																																								
<table border="1"> <thead> <tr> <th>Graphic</th> <th>Part No.</th> <th>Function</th> <th>Contact type</th> <th>Position</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>44-720.20.100</td> <td>Maintained</td> <td>1NO/1NC</td> <td>2</td> </tr> <tr> <td>2</td> <td>44-724.20.020</td> <td>Maintained</td> <td>2NO</td> <td>3</td> </tr> </tbody> </table>		Graphic	Part No.	Function	Contact type	Position	1	44-720.20.100	Maintained	1NO/1NC	2	2	44-724.20.020	Maintained	2NO	3	<table border="1"> <thead> <tr> <th>Colour</th> <th>Part No.</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>● Red</td> <td>44-707.22</td> <td>Momentary</td> </tr> <tr> <td>● Green</td> <td>44-707.25</td> <td>Momentary</td> </tr> <tr> <td>● Black</td> <td>44-707.20</td> <td>Momentary</td> </tr> </tbody> </table>		Colour	Part No.	Function	● Red	44-707.22	Momentary	● Green	44-707.25	Momentary	● Black	44-707.20	Momentary	<table border="1"> <thead> <tr> <th>Part No.</th> <th>Contact type</th> <th>Positions</th> </tr> </thead> <tbody> <tr> <td>44-800.2</td> <td>2x 1NO/1NC</td> <td>2 positions</td> </tr> <tr> <td>44-800.4</td> <td>4x 1NO/1NC</td> <td>4 positions</td> </tr> <tr> <td>44-800.8</td> <td>4x 1NO/1NC</td> <td>8 positions</td> </tr> </tbody> </table>		Part No.	Contact type	Positions	44-800.2	2x 1NO/1NC	2 positions	44-800.4	4x 1NO/1NC	4 positions	44-800.8	4x 1NO/1NC	8 positions
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For complete switch also order **A**

Series 44

22.5mm 30.5mm IP65 10A 660VAC

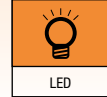


Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Potentiometer drive		Switching element				
 <p>Potentiometer drive (without potentiometer), plastic matt chrome bezel, marked 1-5, for potentiometers with 6 mm shafts</p>		 <p>Contact block, screw terminal, slow-make forced opening contacts, stackable</p>				
 <p>Contact block, screw terminal, slow-make forced opening contacts, non-stackable</p>						
Part No.	Part No.	Contact type	Contact material	Part No.	Contact type	Contact material
44-744.20	44-161	1NO	Hard silver	44-121	1NO	Hard silver
	44-151	1NC	Hard silver	44-111	1NC	Hard silver
	44-131	1NO/1NC	Hard silver			

LED			Accessories		
 <p>LED, BA9s single chip, 28 Volt and 230 Volt. (Also available in 6 Volt, 12 Volt, 24 Volt and 48 Volt.)</p>			 <p>Lamp block for Ba9 LED</p>		
 <p>Contact/Lamp block holder for double pushbutton actuator and mushroom headed pushbutton</p>					
Colour	Part No.	Voltage	Part No.	Part No.	
● Red	10-2513.1142	28VAC/DC, 15mA	44-524	44-900	
● Yellow	10-2513.1144	28VAC/DC, 15mA			
● Green	10-2513.1145	28VAC/DC, 15mA			
● Blue	10-2513.1146	28VAC/DC, 15mA			
○ White	10-2513.1149	28VAC/DC, 15mA			
● Red	10-2H25.2042	230VAC / 3mA			
● Yellow	10-2H25.2044	230VAC / 3mA			
● Green	10-2H25.2045	230VAC / 3mA			
● Blue	10-2H25.2046	230VAC / 3mA			
○ White	10-2H25.2049	230VAC / 3mA			

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories

Front bezel set for 30.5 mm flush mount, black plastic, for illuminated pushbutton, selector and keylock	Front bezel set for 30.5 mm flush mount with label support, black plastic, for illuminated pushbutton, selector and keylock	Engraving label for front bezel set for 30.5 mm flush mount with label support, self adhesive																								
<table border="1"> <thead> <tr> <th>Part No.</th> <th>Product description</th> </tr> </thead> <tbody> <tr> <td>44-946.03-A</td> <td></td> </tr> <tr> <td>44-946.01-A</td> <td>For potentiometer and indicator only</td> </tr> </tbody> </table>	Part No.	Product description	44-946.03-A		44-946.01-A	For potentiometer and indicator only	<table border="1"> <thead> <tr> <th>Part No.</th> <th>Product description</th> </tr> </thead> <tbody> <tr> <td>44-946.04</td> <td></td> </tr> <tr> <td>44-946.02</td> <td>For potentiometer and indicator only</td> </tr> </tbody> </table>	Part No.	Product description	44-946.04		44-946.02	For potentiometer and indicator only	<table border="1"> <thead> <tr> <th>Image</th> <th>Part No.</th> <th>Size</th> <th>Colour</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>44-946</td> <td>23.5x14.5 mm</td> <td>Aluminium</td> </tr> <tr> <td>2</td> <td>44-946.0</td> <td>23.5x14.5 mm</td> <td>Black</td> </tr> </tbody> </table>	Image	Part No.	Size	Colour	1	44-946	23.5x14.5 mm	Aluminium	2	44-946.0	23.5x14.5 mm	Black
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1	44-946	23.5x14.5 mm	Aluminium																							
2	44-946.0	23.5x14.5 mm	Black																							

A Accessories

Protective cover for raised pushbutton only	Emergency-stop switch label, 60 mm and 45 mm diameter, (90 mm versions also available) English, French, German and no markings	Emergency-stop protective shroud, yellow painted aluminium with 22.5 mm mounting hole																																					
<table border="1"> <thead> <tr> <th>Part No.</th> </tr> </thead> <tbody> <tr> <td>44-922</td> </tr> </tbody> </table>	Part No.	44-922	<table border="1"> <thead> <tr> <th>Part No.</th> <th>Markings</th> <th>Diameter</th> </tr> </thead> <tbody> <tr> <td>44-950</td> <td>NO MARKINGS</td> <td>60 mm</td> </tr> <tr> <td>44-950.1</td> <td>NOT AUS</td> <td>60 mm</td> </tr> <tr> <td>44-950.2</td> <td>EMERGENCY STOP</td> <td>60 mm</td> </tr> <tr> <td>44-950.3</td> <td>ARRET D'URGENCE</td> <td>60 mm</td> </tr> <tr> <td>44-950.4</td> <td>NOT-HALT</td> <td>60 mm</td> </tr> <tr> <td>44-951</td> <td>NO MARKINGS</td> <td>45 mm</td> </tr> <tr> <td>44-951.1</td> <td>NOT AUS</td> <td>45 mm</td> </tr> <tr> <td>44-951.2</td> <td>EMERGENCY STOP</td> <td>45 mm</td> </tr> <tr> <td>44-951.3</td> <td>ARRET D'URGENCE</td> <td>45 mm</td> </tr> <tr> <td>44-951.4</td> <td>NOT-HALT</td> <td>45 mm</td> </tr> </tbody> </table>	Part No.	Markings	Diameter	44-950	NO MARKINGS	60 mm	44-950.1	NOT AUS	60 mm	44-950.2	EMERGENCY STOP	60 mm	44-950.3	ARRET D'URGENCE	60 mm	44-950.4	NOT-HALT	60 mm	44-951	NO MARKINGS	45 mm	44-951.1	NOT AUS	45 mm	44-951.2	EMERGENCY STOP	45 mm	44-951.3	ARRET D'URGENCE	45 mm	44-951.4	NOT-HALT	45 mm	<table border="1"> <thead> <tr> <th>Part No.</th> </tr> </thead> <tbody> <tr> <td>704.927.4</td> </tr> </tbody> </table>	Part No.	704.927.4
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Series 44

22.5mm 30.5mm IP65 10A 660VAC



Choose one component from each of the coloured sections to assemble a complete switch.
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A Accessories



Mounting tool

Part No.
44-935

Slow-make switching element

Switching system

The double-break switching system can be supplied for the following switching functions: 1 normally closed, 1 normally open or 1 changeover contact with or without overlap.

The normally closed contacts have forced opening according to DIN 0660, IEC 60947-5-1 and DIN VDE 0113.

The switching element exhibits high reliability due to its H-contact system with relative friction. The normally open and normally closed contacts can be used electrically separated.

The standard version is ideal for high breaking capacities. For lower capacities a special version can be supplied.

Material

Material of contact

Standard version: Ag-Ni alloy
special version: Gold/Silver

Plastics

UL listed, Cd-free

Switching element

PC, PA 6.6 self-extinguishing

Mechanical characteristics

Actuating force

per switching element ≤ 5 N

Illuminated pushbutton actuator ≤ 10 N

Emergency stop pushbutton actuator foolproof ≤ 70 N

Double pushbutton ≤ 12 N per contact surface

Actuating travel

approx. 6 mm

Mechanical lifetime

Slow-make switching element 10×10^6 switching operations

Pushbutton momentary action 5×10^6 switching operations

Pushbutton maintained action 1×10^6 cycles of operation

Illuminated pushbutton momentary action 3×10^6 switching operations

Illuminated pushbutton maintained action 1×10^6 cycles of operation

Emergency-stop foolproof > 6050 cycles of operation

Keylock switch 2×10^5 cycles of operation

Selector switch 2×10^5 cycles of operation

Double pushbutton 2×10^5 switching operations per contact surface

Electrical characteristics

Rated Insulation Voltage U_i

Slow-make switching element 660 V

Lamp element 250 V

Lamp transformer 660 V

Rated Operational Voltage U_e

AC 15 (inductive)

120 V, ~ 6 A

230 V, ~ 6 A

400 V, ~ 4 A

500 V, ~ 3 A

600 V, ~ 1.2 A

DC 13

24 V, 3 A

60 V, 1.3 A

120 V, 0.6 A

250 V, 0.3 A

Rated Impulse Withstand Voltage U_{imp}

Lamp element 2.5 kV

Lamp transformer 6 kV

Slow-make switching element 6 kV*

* between the electrically separated normally closed contacts and normally open contacts for slow-make switching elements.

1 NC + 1 NO without overlap

$U_e > 400$ V, same polarity

$U_{imp} = 4000$ V

1 NC + 1 NO with overlap

$U_e > 250$ V, same polarity

$U_{imp} = 4000$ V

Rated Operational Current I_e

AC-12 (resistive)

500 V, ~ 5 A

DC-12

24 V, 10 A

60 V, 8 A

125 V, 3 A

250 V, 1 A

Contact resistance

Starting value (initial) ≤ 50 m Ω

Electrical life

AC-15

400 V, ~ 2 A, 1×10^6 switching operations

Conventional free air thermal current

$I_{th2} = 10$ A

Short-circuit protection

max. series fuse to be provided 10 A gL

lamp transformer is short-circuit-protected

Switch rating

Ag-Ni alloy

(Standard version)

minimal 6 V, 20 mA

minimal 12 V, 10 mA

Gold/Silver

(Special version)

minimal 5 V, 1 mA

maximum 42 V, 100 mA

Degree of pollution

3, as per EN IEC 60947-1

Environmental conditions

Storage temperature

-40 °C ... $+70$ °C

Operating temperature

-25 °C, as per EN IEC 60068-2-1

$+60$ °C, as per EN IEC 60068-2-2

Protection degree

Actuators at front and enclosure IP65, as per EN IEC 60529

Shock resistance

40 g (duration 6 ms), as per EN IEC 60 68-2-27

Vibration resistance

sinusoidal, 5 g at 10-500 Hz, as per EN IEC 60068-2-6

Climate resistance

Humidity and heat constant, as per EN IEC 60068-2-3

Humidity and heat cyclic, as per EN IEC 60068-2-30

Approvals

Approbations

CSA
Germanischer Lloyd
UL
VDE

Declaration of conformity

CE

Actuator

Material

Adapter and enclosure

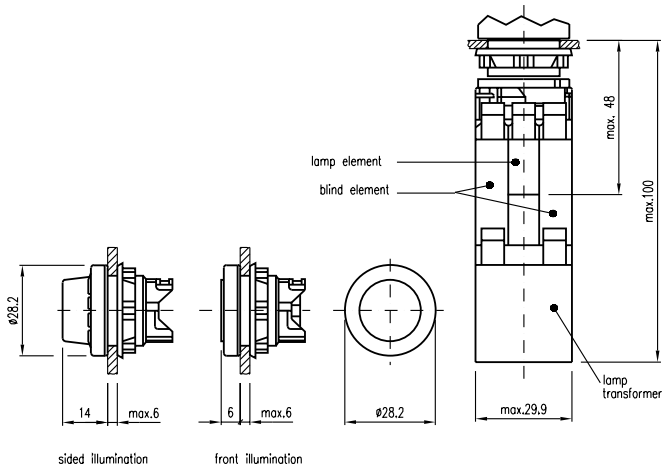
PC

Front parts

PA 6, PA 12, PC, chromium-plated ABS

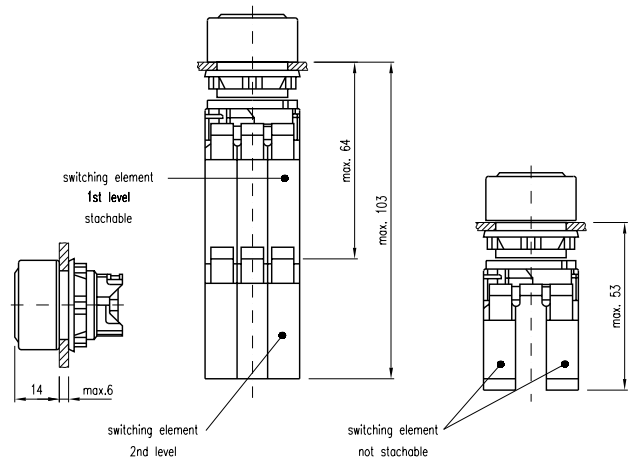
44 Indicator

Raised and Flush



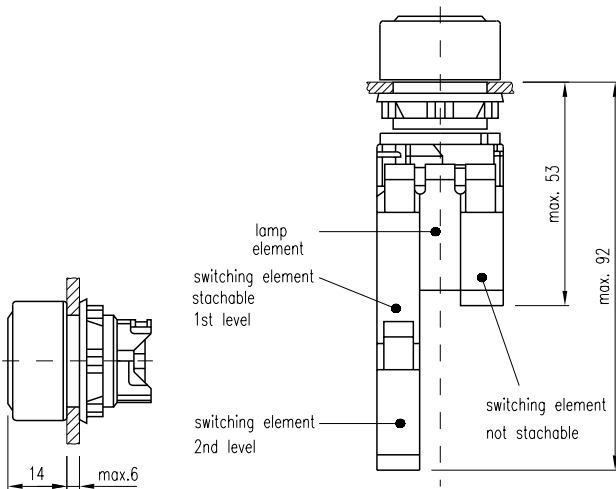
44 Non-Illuminated Pushbutton

Raised

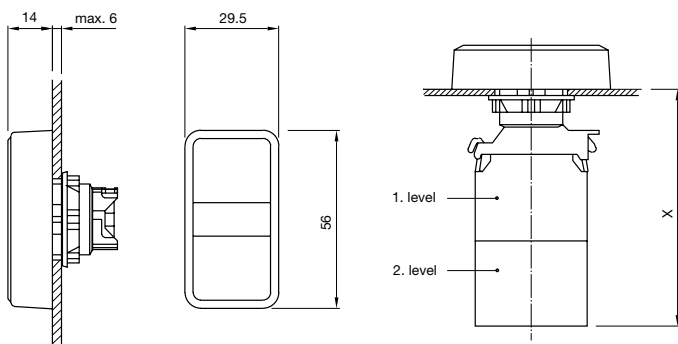


44 Illuminated Pushbutton

Raised



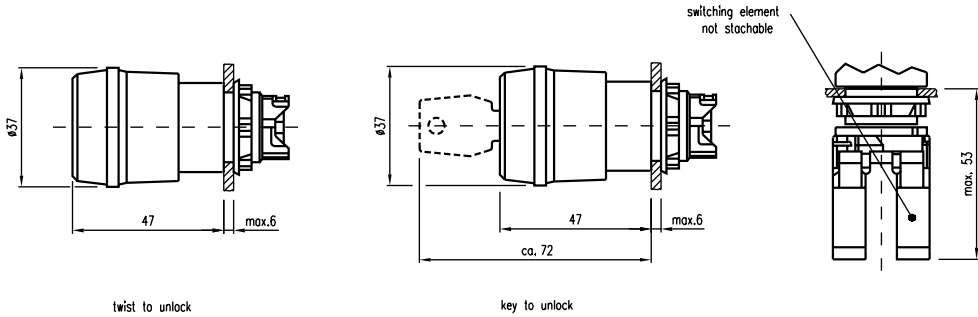
44 Double Pushbutton



Mounting depth X [mm]	1. level	2. level
max. 53	44-111/ 44-121	-
max. 64	44-111- 44-162	-
max. 92	44-131- 44-162	44-111/ 44-121
max. 100	44-131- 44-162	44-970- 44-977
max. 103	44-131- 44-162	44-131- 44-162

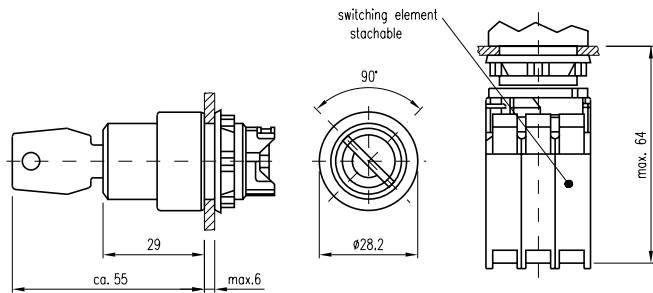
44 Emergency-stop switch

ISO 13850



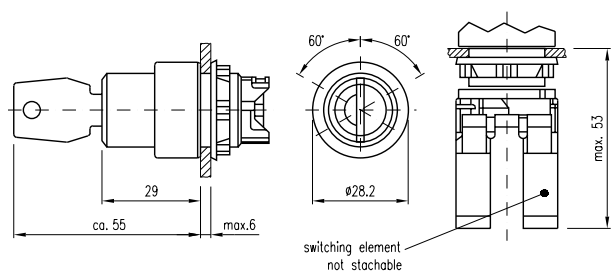
44 Keylock switch

Raised, 2-Position



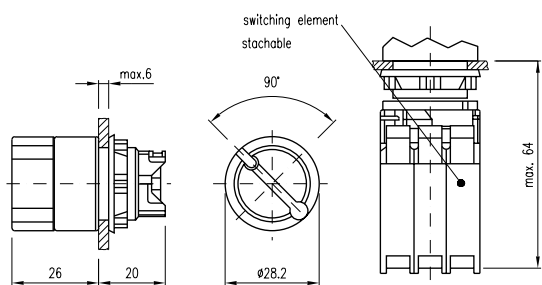
44 Keylock switch

Raised, 3-Position



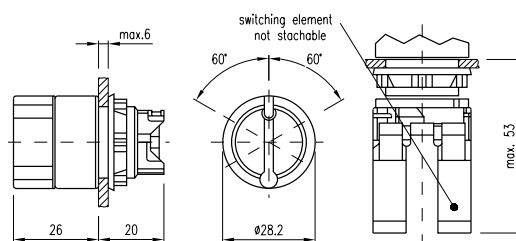
44 Selector switch

Raised, 2-Position

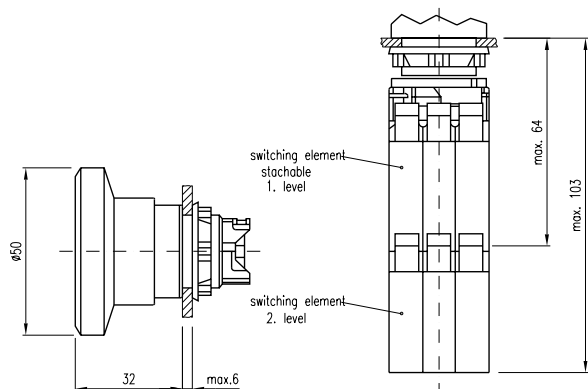


44 Selector switch

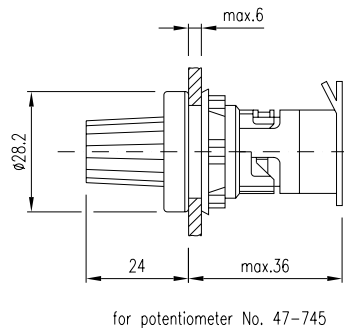
Raised, 3-Position



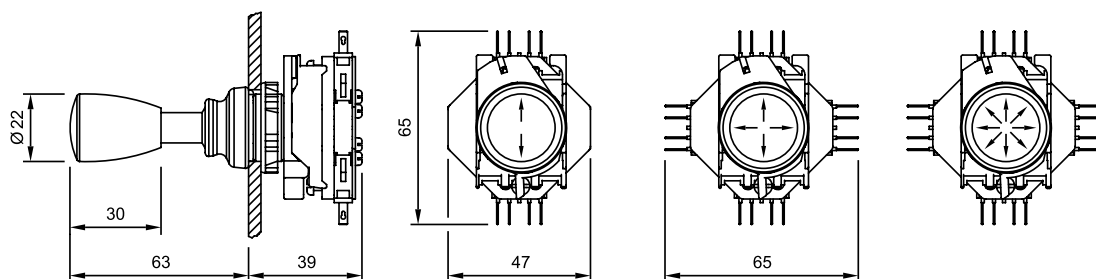
44 Mushroom head pushbutton



44 Potentiometer drive

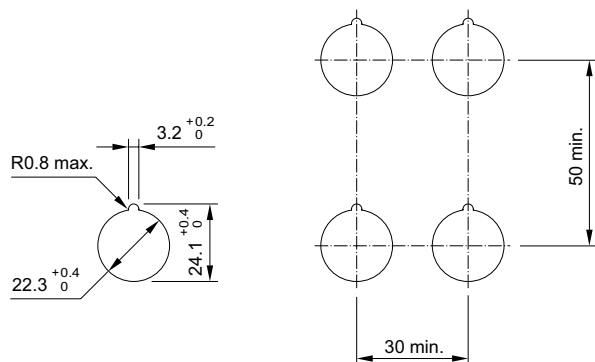


44 Joystick



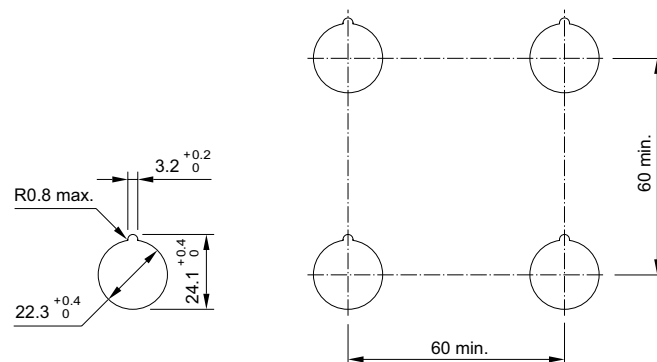
44 Cut-outs

Raised, Indicator, Pushbutton Non-Illuminated & Illuminated, 2-Position Keylock, 2 & 3-Position Selector, Potentiometer

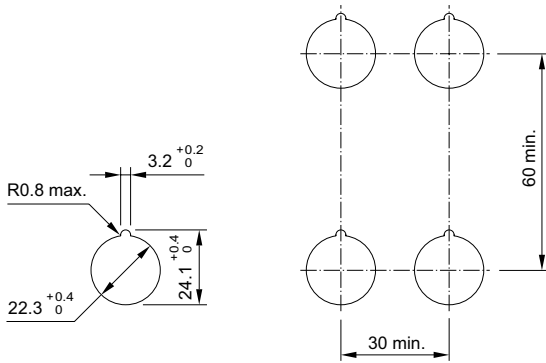


44 Cut-outs

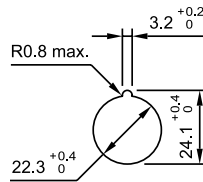
Emergency-stop switch ISO 13850, Mushroom head pushbutton



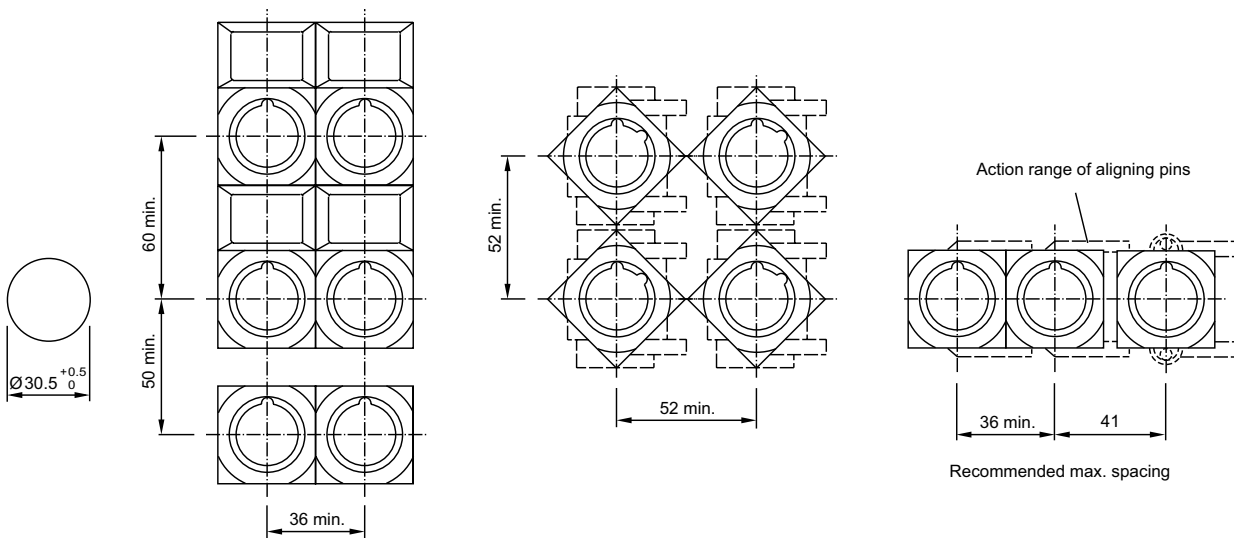
44 Cut-outs, Double Pushbutton



44 Cut-outs, Joystick



44 Cut-outs, Flush Mounting



Technical Solutions Capabilities

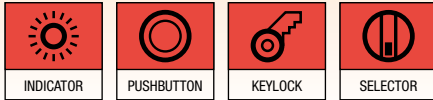
Throughout EAO's customer solutions processes, EAO takes care of the detailed development of the HMI system, whilst at the same time continually exchanging information with you.

Electromechanical switch products	EAO standard and customer-specified products, integrated into a simple or complex solution product, fully wired and functional, with multi-layer PCB, screening and connectors, front panel recesses and lettering.
Front panel	Anodised aluminium, stainless steel, lacquered or powder-coated sheet metal, steel, plastic, plastic foils.
Lettering	Silk-screen printing, laser marking engraving, labelling strips.
Overlay foil	Hard or soft membrane material, customised shapes and styles, using logos and multicolour technology.
Touch sensitive technology	Customised keypads and keyboards and single switches, installation behind all non-conductive materials up to 15mm thick.
Low level input technology	Stainless steel or polydomes, conductive rubber and silver contacts.
Interfaces and specialities	Integration with special components or switching elements, EMC- and RFI-protected, electronic sealing technology, anti-bounce components, RS232, RS-485, CAN-BUS, Interbus, Profibus and other industrial bus systems, IPC or MIL spec.
Industrial design	Functional flow, intuitive layout, selection of colours, international symbols and pictograms, wall mounted, hand held, bench-top, plastic or metal housing, IP/NEMA protected, customised tactile feel, solutions for hand, elbow and foot operation designed to meet the requirements of the disabled, various tactile feel designs.



Series 51

16 mm IP65 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

The Series 51 is a high quality switch range that includes pushbuttons, indicators, selector switches and keylock switches.

It is possible to choose up to 4NO/4NC snap-action switching elements per switch.

Low level switching elements are also available.

Technical data see page 80

- IP65 Protection
- Switch Rating, 5A, 250VAC
- Raised Mounting into 16 mm cut out
- Illumination using midget-grooved T1 $\frac{3}{4}$ lamps or single chip LED's
- All standard lenses are transparent with translucent diffuser available in different colours
- For keylock switches 2 key systems and 145 different keys are available

Indicator



Indicator bodies, raised in round, square and rectangular, black plastic, 16 mm mounting, solder terminals

Image	Part No.	Size
1	51-040.005	18x24 mm
2	51-050.005	18x18 mm
3	51-030.005	18 mm Ø

Illuminated pushbutton



Illuminated pushbutton, snap-action, raised, rectangular, black plastic, 16 mm mounting

Part No.	Moment/Maint	Contact type	Size
51-121.0252	Momentary	1NO/1NC	18x24 mm
51-122.0252	Momentary	2NO/2NC	18x24 mm
51-261.0252	Maintained	1NO/1NC	18x24 mm
51-262.0252	Maintained	2NO/2NC	18x24 mm

For complete switch also order **A**

For complete switch also order **A**

Illuminated pushbutton



Illuminated pushbutton, snap-action, raised, square, black plastic, 16 mm mounting

Part No.	Function	Contact type	Size
51-151.0252	Momentary	1NO/1NC	18x18 mm
51-152.0252	Momentary	2NO/2NC	18x18 mm
51-281.0252	Maintained	1NO/1NC	18x18 mm
51-282.0252	Maintained	2NO/2NC	18x18 mm

Keylock switch



Illuminated pushbutton, snap-action, raised, round, black plastic, 16 mm mounting

Part No.	Function	Contact type	Size
51-131.0252	Momentary	1NO/1NC	18 mm Ø
51-132.0252	Momentary	2NO/2NC	18 mm Ø
51-271.0252	Maintained	1NO/1NC	18 mm Ø
51-272.0252	Maintained	2NO/2NC	18 mm Ø



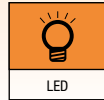
Keylock switch, 2 position, raised, snap-action, round, black plastic, 18 mm Ø

Graphic	Part No.	Function	Contact	Key rem.
	51-135.025D2	Maint.	1NO/1NC	A + C
	51-136.025D2	Maint.	2NO/2NC	A + C
	51-235.025D2	Maint.	1NO/1NC	A
	51-335.025D2	Maint.	1NO/1NC	C
	51-141.025D2	Mom.	1NO/1NC	A

For complete switch also order **A**

For complete switch also order **A**

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Keylock switch

<p>Keylock switch, 2 position, raised, snap-action, square, black plastic, 18x18 mm</p>					<p>Keylock switch, 2 position, raised, snap-action, rectangular, black plastic, 18x24 mm</p>					<p>Keylock switch, 3 position, raised, snap-action, rectangular, black plastic, 18x24 mm</p>					
		<p>1 Mom. 42°</p>		<p>2 Maint. 90°</p>				<p>3 Mom. 42°</p>		<p>4 Maint. 90°</p>		<p>5 Mom. 42°</p>		<p>6 Maint. 90°</p>	
Graphic	Part No.	Function	Contact	Key rem.	Graphic	Part No.	Function	Contact	Key rem.	Graphic	Part No.	Function	Contact type	Key rem.	
1	51-145.025D2	Moment.	1NO/1NC	A	4	51-195.025D2	Maint.	1NO/1NC	A + C	6	51-361.022D	Maint.	2x 1NO/1NC	A	
1	51-146.025D2	Moment.	2NO/2NC	A	4	51-196.025D2	Maint.	2NO/2NC	A + C	6	51-362.022D	Maint.	2x 2NO/2NC	C + A + B	
2	51-155.025D2	Maint.	1NO/1NC	A + C	4	51-295.025D2	Maint.	1NO/1NC	A	5	51-364.022D	Moment.	2x 1NO/1NC	A	
2	51-255.025D2	Maint.	1NO/1NC	A	4	51-296.025D2	Maint.	2NO/2NC	A						
2	51-355.025D2	Maint.	1NO/1NC	C	4	51-395.025D2	Maint.	1NO/1NC	C						
					4	51-396.025D2	Maint.	2NO/2NC	C						
					3	51-495.025D2	Moment.	1NO/1NC	A						
					3	51-496.025D2	Moment.	2NO/2NC	A						

Selector switch

<p>Selector switch, 2 position, raised, snap-action, round, black plastic, 18 mm Ø</p>					<p>Selector switch, 3 position, raised, snap-action, round, black plastic, 18 mm Ø</p>						
		<p>7 Mom. 42°</p>		<p>8 Maint. 90°</p>				<p>9 Mom. 42°</p>		<p>10 Maint. 90°</p>	
Graphic	Part No.	Function	Contact type	Graphic	Part No.	Function	Contact type				
7	52-131.0252	Momentary	1NO/1NC	10	52-571.022A	Maintained	2x 1NO/1NC				
7	52-132.0252	Momentary	2NO/2NC	9	52-572.022A	Momentary	2x 1NO/1NC				
8	52-271.0252	Maintained	1NO/1NC								
8	52-272.0252	Maintained	2NO/2NC								

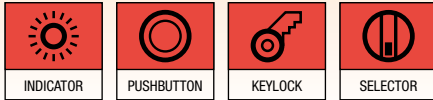
LED

LED, T1¼ MG, single chip, 12 Volt and 28 Volt.
(Also available in 6 Volt, 24 Volt and 48 Volt)

Colour	Part No.	Contact type
Red	10-2J09.1062	12VAC/DC, 15 mA
Yellow	10-2J09.1064	12VAC/DC, 15 mA
Green	10-2J09.1065	12VAC/DC, 15 mA
Blue	10-2J09.1066	12VAC/DC, 15 mA
White	10-2J09.1069	12VAC/DC, 15 mA
Red	10-2J13.1062	28VAC/DC, 7/14 mA
Yellow	10-2J13.1064	28VAC/DC, 7/14 mA
Green	10-2J13.1065	28VAC/DC, 7/14 mA
Blue	10-2J13.1066	28VAC/DC, 7/14 mA
White	10-2J13.1069	28VAC/DC, 7/14 mA

For complete switch also order **A**

For complete switch also order **A**



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

A Accessories



Lens, opaque for rectangular pushbutton actuators, not for illumination

Colour	Part No.	Size
● Black	51-901.0	18 x 24 mm



Lens, front transparent/rear translucent for rectangular indicator and pushbutton actuators

Colour	Part No.	Size
● Red	51-903.2	18 x 24 mm
● Yellow	51-903.4	18 x 24 mm
● Green	51-903.5	18 x 24 mm
● Blue	51-903.6	18 x 24 mm
○ Clear	51-903.7	18 x 24 mm



Lens, opaque for square pushbutton actuators, not for illumination

Colour	Part No.	Size
● Black	51-951.0	18 x 18 mm

A Accessories



Lens, front transparent/rear translucent for square indicator and pushbutton actuators

Colour	Part No.	Size
● Red	51-953.2	18 x 18 mm
● Yellow	51-953.4	18 x 18 mm
● Green	51-953.5	18 x 18 mm
● Blue	51-953.6	18 x 18 mm
○ Clear	51-953.7	18 x 18 mm



Lens, opaque for round pushbutton actuators, not for illumination

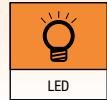
Colour	Part No.	Size
● Black	51-931.0	18 mm Ø



Lens, front transparent/rear translucent for round indicator and pushbutton actuators

Colour	Part No.	Size
● Red	51-933.2	18 mm Ø
● Yellow	51-933.4	18 mm Ø
● Green	51-933.5	18 mm Ø
● Blue	51-933.6	18 mm Ø
○ Clear	51-933.7	18 mm Ø

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Lever for selector switch, coloured lever bar options available as indicated

Flap guard, raised in square and rectangular

Blanking plate

Colour	Part No.	Image	Part No.	Size	Image	Part No.	Size
● Black	52-928.0	1	51-925	18x24 mm	1	51-947.0	18x24 mm
● Red	52-928.20	2	51-920	18x18 mm	2	51-948.0	18x18 mm
● Yellow	52-928.40				3	51-949.0	18 mm Ø
● Green	52-928.50						
● Blue	52-928.60						

A Accessories



Mounting tool, lens and LED remover

Image	Part No.	Product description
1	01-907	Mounting tool
2	02-905	Lens remover
3	61-9740.0	LED remover

Actuator with snap-action switching element**Switching system**

Self-cleaning, double-break, snap action switching system (with contact gap 2x0.5 mm).

1 normally closed or 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 soldering-/plug-in terminal 2.8 mm:

Diallylphthalate DAP, Polyamide 66, Polysulfone, heat-resistant and self-extinguishing.

Soldering terminal: PA 6.6 Ultramid

Actuator housing

Polyetherimide, self-extinguishing

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 soldering terminals, which can also be used as plug-in terminals 2.8x0.5 mm:

Max. wire diameter 2 wires of 1 mm

Max. wire cross-section of stranded cable 2 of 0.75 mm² or 1 x 1.0 mm²

Actuating torque

2.5 Ncm ... 5.5 Ncm, depending on the number of switching elements. Measured at the key or lever of the keylock- or selector switch.

Actuating force

4 N ... 6 N, depending on the number of switching elements

Actuating travel

Illuminated pushbutton 3 mm

Keylock-/selector switch actuator 2 positions:

1x ca. 42° deflection momentary action

1x ca. 90° deflection maintained action

Rebound time

≤5ms

Mechanical lifetime

Momentary action 2 million cycles of operation

Maintained action 1 million cycles of operation

Keylock switch 50 000 cycles of operation

Electrical characteristics**Standards**

IEC 61058, EN 61058

Rated voltage

250 VAC/VDC

Rated current

5 A

Contact resistance

Starting value (initial) ≤50 mΩ

Electrostatic discharge

≤15 KV (Keylock switch)

Conventional free air thermal current

5 A

The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating

250 VAC, 5 A (cosφ 1)

250 VAC, 3 A (cosφ 0.3)

Switch rating AC (cosφ 0.7)

Voltage	125 VAC	250 VAC
Current	3 A	2 A

Switch rating DC (inductive) L:R = 30 ms

Voltage	24 VDC	60 VDC	110 VDC	220 VDC
Current	2 A	0.7 A	0.2 A	0.1 A

Electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60512-2-11

Protection class

Class II

Environmental 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

IP65 front side, as per IEC 60529

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 10 Hz ... 1500 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 and 2-30

Changing condition, as per IEC 60068-2-14 and 2-33

Approvals

Approbations

CB (IEC 61058)
 CSA
 ENEC (EN 61058)
 Germanischer Lloyd
 UL

Declaration of conformity

CE

Actuator with snap-action switching element block (Keylock-/selector switch 3 positions)

Switching system

Self-cleaning, double-break, snap action switching system
 1 normally closed or 1 normally open contact per element.

Material

Material of contact

Gold plated hardsilver

Switch housing

Diallylphthalate (DAP), heat-resistant and self-extinguishing

Actuator housing

Polyetherimide, self-extinguishing

Mechanical characteristics

Terminals

Soldering terminal which can also be used as plug-in terminal
 2.8x0.5mm:
 Max. wire diameter 2 wires of 1 mm
 Max. wire cross-section of stranded cable 2x0.75 mm²

Actuating torque

2.5Ncm ... 5.5Ncm, depending on the number of switching elements.
 Measured at the key or lever of the keylock- or selector switch.

Actuating travel

Keylock-/selector switch actuator with 3 positions
 2x ca. 42° deflection momentary action
 2x ca. 90° deflection maintained action

Rebound time

≤5ms

Mechanical lifetime

Keylock switch	50 000 cycles of operation
Selector switch	100 000 cycles of operation

Electrical characteristics

Electrostatic discharge

≤15 KV (Keylock switch)

Conventional free air thermal current

5 A

The maximum current in continuous operation and at ambient temperature not exceeding the quoted maximum values.

Switch rating

250 VAC, 5 A (cosφ 0.75)

Electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 60512-2-11

Protection class

Class II

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Service temperature

-25 °C ... +55 °C

for selector switches mounted as a block, make sure the heat can escape freely

Protection degree

Front side, as per IEC 60529
 IP65 keylock switch
 IP40 selector switch

Approvals

Approbations

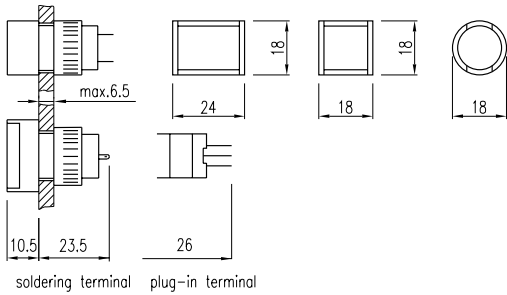
CB (IEC 61058)
 CSA
 ENEC (EN 61058)
 Germanischer Lloyd
 UL

Declaration of conformity

CE

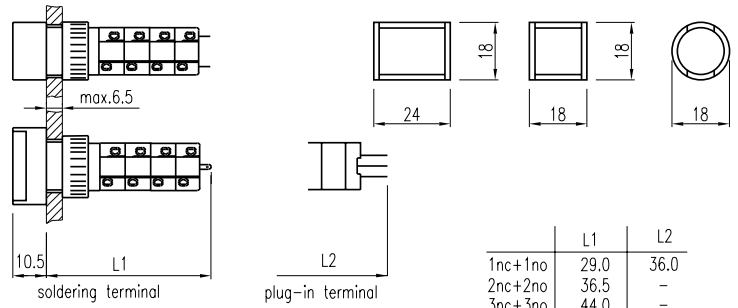
51 Indicator

Raised, Round, Square, Rectangular



51 Pushbutton

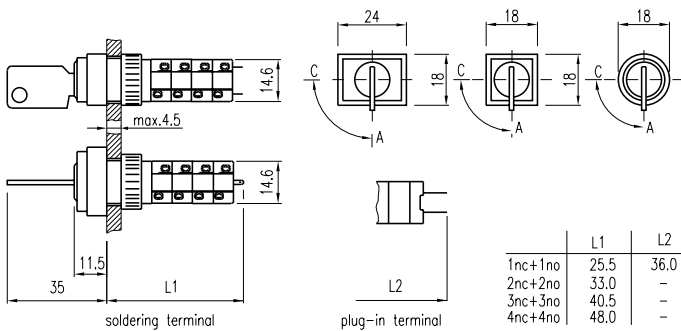
Raised, Round, Square, Rectangular



	L1	L2
1nc+1no	29.0	36.0
2nc+2no	36.5	-
3nc+3no	44.0	-
4nc+4no	51.5	-

51 Keylock switch

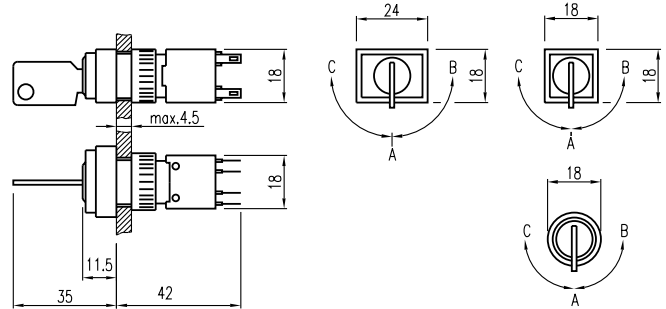
Raised, 2-Position, Round, Square, Rectangular



	L1	L2
1nc+1no	25.5	36.0
2nc+2no	33.0	-
3nc+3no	40.5	-
4nc+4no	48.0	-

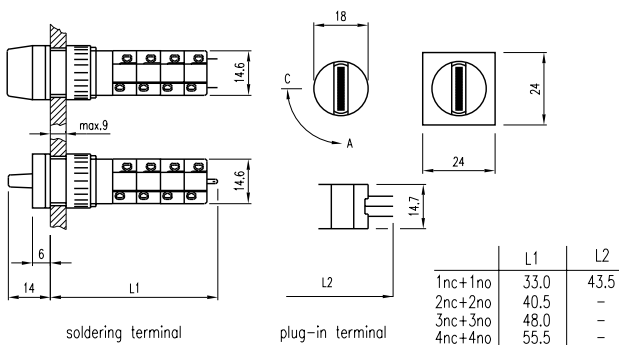
51 Keylock switch

Raised, 3-Position, Round, Square, Rectangular



52 Selector switch

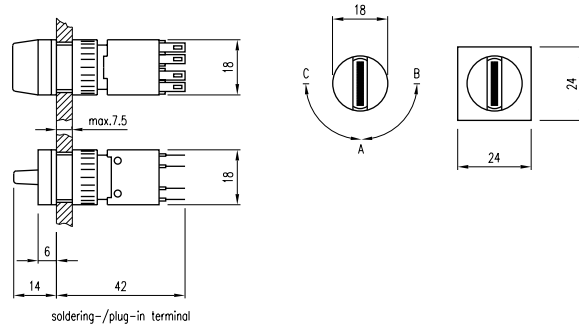
Raised, 2-Position, Round



	L1	L2
1nc+1no	33.0	43.5
2nc+2no	40.5	-
3nc+3no	48.0	-
4nc+4no	55.5	-

52 Selector switch

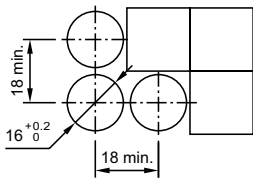
Raised, 3-Position, Round



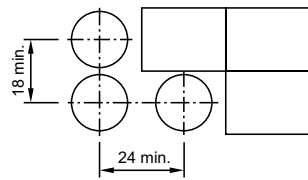
51 Cut-outs

Indicator, Pushbutton, Round, Square, Rectangular

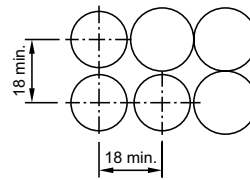
18 x 18 mm



18 x 24 mm



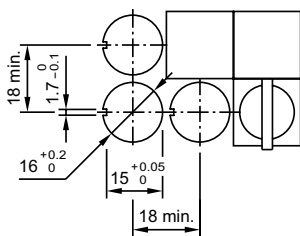
Ø 18 mm



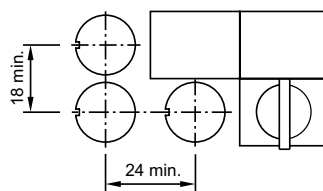
51 Cut-outs

Keylock 2-Position Round, Keylock 2-Position Square,
Keylock 2-Position Rectangular, 2 & 3-Position Selector Round

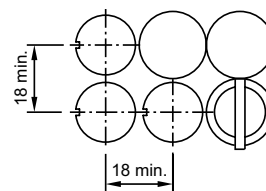
18 x 18 mm



18 x 24 mm

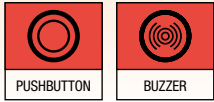


Ø 18 mm



Series 56

IP67 or IP69K / 24 VDC $\pm 30\%$ / min. 5VDC, 5 mA, max. 137VDC/VAC, max. 200 mA



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

The Series 56 is a high quality switch range that includes pushbuttons and indicators.

Options include double side pushbuttons, glass mount pushbuttons, raised palm push lenses, raised tactile symbols and Braille front bezels.

Technical data see page 88

- IP67 front protection
- Switch Rating:
Minimum: 5VDC, 5 mA
Maximum: 137VDC, 200 mA
- Electrical Strength:
4000VAC, 50 Hz
1 min. between all terminals and mounting plate
- 200 mm cable standard
- Options for cable length and LED colours
- As standard AMP connector with plug in housing 2.8x0.8 mm

Double side pushbutton



Double side pushbutton for glass mount with 24VDC operated LEDs

Part No.	LED colour	Lens colour	Lens style
56-3213.4*004*	Red	*	Raised metal
56-2213.4*004*	Green	*	Raised metal
56-1213.4*004*	Red/Green	*	Raised metal
56-3213.260026	Red	Natural anodised	Flush metal
56-2213.260026	Green	Natural anodised	Flush metal
56-1213.260026	Red/Green	Natural anodised	Flush metal
56-3213.1*001*	Red	*	Flush plastic
56-3213.1*001*	Green	*	Flush plastic
56-3213.1*001*	Red/Green	*	Flush plastic

* Denotes colour of lens add 2= red, 4=Yellow, 5=green, 6=blue

For complete switch also order **A**

Single side pushbutton



Single side pushbutton for glass mount with metal palm-push raised lens with 24VDC operated LEDs

Part No.	LED colour	Lens colour	Lens style
56-3213.4*00G	Red	*	Raised metal
56-2213.4*00G	Green	*	Raised metal
56-1213.4*00G	Red/Green	*	Raised metal
56-3213.2600G	Red	Natural anodised	Flush metal
56-2213.2600G	Green	Natural anodised	Flush metal
56-1213.2600G	Red/Green	Natural anodised	Flush metal
56-3213.1*00G	Red	*	Flush plastic
56-2213.1*00G	Green	*	Flush plastic
56-1213.1*00G	Red/Green	*	Flush plastic

* Denotes colour of lens add 2= red, 4=Yellow, 5=green, 6=blue

For complete switch also order **A**

Single side pushbutton



Single side panel mount pushbutton switch with 24VDC operated LEDs

Part No.	LED colour	Lens style
56-130.22.200.25.*	Yellow	Raised metal
56-130.22.200.23.*	Green	Raised metal
56-130.22.200.21.*	Green/Red	Raised metal
56-130.22.200.24.*	Red	Raised metal
56-130.22.200.22.*	Red/Green	Raised metal
56-030.04.200.00.*	Without	Raised metal

* Denotes colour of lens add 04=blue, 02=yellow,

03=green, 05=natural, 01=red

For complete switch also order **A**



Single side panel mount pushbutton switch with 24VDC operated LEDs

Part No.	LED colour	Lens colour	Lens style
56-120.22.200.25.05	Yellow	Natural anodised	Flush metal
56-120.22.200.23.05	Green	Natural anodised	Flush metal
56-120.22.200.21.05	Green/Red	Natural anodised	Flush metal
56-120.22.200.24.05	Red	Natural anodised	Flush metal
56-120.22.200.22.05	Red/Green	Natural anodised	Flush metal
56-020.04.200.00.05	Without	Natural anodised	Flush metal

For complete switch also order **A**



Single side panel mount pushbutton switch with 24VDC operated LEDs

Part No.	LED colour	Lens style
56-110.22.200.25.*	Yellow	Flush plastic
56-110.22.200.23.*	Green	Flush plastic
56-110.22.200.21.*	Green/Red	Flush plastic
56-110.22.200.24.*	Red	Flush plastic
56-110.22.200.22.*	Red/Green	Flush plastic
56-010.05.200.00.*	Without	Flush plastic

* Denotes colour of lens add 04=blue, 02=yellow,

03=green, 05=natural, 01=red

For complete switch also order **A**

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Single side pushbutton



Single side pushbutton for panel mount with 110VDC operated LED's



Single side pushbutton for panel mount with 110VDC operated LED's



Single side pushbutton for panel mount with 110VDC operated LED's

Part No.	LED colour	Lens style
56-530.22.200.25.*	Yellow	Raised metal
56-530.22.200.23.*	Green	Raised metal
56-530.22.200.21.*	Green/Red	Raised metal
56-530.22.200.24.*	Red	Raised metal
56-530.22.200.22.*	Red/Green	Raised metal
56-030.05.200.00.*	Without	Raised metal

* Denotes colour of lens add 04=blue, 02=yellow, 03=green, 05=natural, 01=red

Part No.	LED colour	Lens colour	Lens style
56-520.22.200.25.05	Yellow	Natural anodised	Flush metal
56-520.22.200.23.05	Green	Natural anodised	Flush metal
56-520.22.200.22.05	Red/Green	Natural anodised	Flush metal
56-520.22.200.24.05	Red	Natural anodised	Flush metal
56-520.22.200.21.05	Red/Green	Natural anodised	Flush metal
56-020.05.200.00.05	Without	Natural anodised	Flush metal

Part No.	LED colour	Lens style
56-510.22.200.25.*	Yellow	Flush plastic
56-510.22.200.23.*	Green	Flush plastic
56-510.22.200.21.*	Green/Red	Flush plastic
56-510.22.200.24.*	Red	Flush plastic
56-510.22.200.22.*	Red/Green	Flush plastic
56-010.05.200.00.*	Without	Flush plastic

* Denotes colour of lens add 04=blue, 02=yellow, 03=green, 05=natural, 01=red

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

Single side indicator



Single side indicator for panel mount with or without hidden legends/text, 24VDC. Up to three lines of text or a symbol can be shown

Part No.	LED colour	Lens colour	Markings
56-3213.90	Red	Red	Symbol*
56-3213.91	Red	Red	1 line*
56-3213.92	Red	Red	2 lines*
56-3213.93	Red	Red	3 lines*
56-3213.8	Red	Red	Without
56-9213.8	White	White	Without

*Text on symbol must be specified when ordering

For complete switch also order **A**

Single side raised indicator



Single side indicator for panel mount with raised front lens. The illumination can be red, yellow, green, blue or white. Standard voltage 24VDC or 110VDC

Part No.	LED colour	Lens colour	Voltage
56-2213.70	Green	Green	24VDC
56-3213.70	Red	Red	24VDC
56-6213.70	Yellow	Yellow	24VDC
56-8213.70	Blue	Blue	24VDC
56-9213.70	White	White	24VDC
56-2913.70	Green	Green	110VDC
56-3913.70	Red	Red	110VDC
56-6913.70	Yellow	Yellow	110VDC
56-8913.70	Blue	Blue	110VDC
56-9913.70	White	White	110VDC

For complete switch also order **A**

Multi-tone Sound Module



Single side for panel mount, standard voltage 24VDC, IP69K

Part No.	Tone sequence*	Cap style	Marking
56-61010-00.6	Transportation	Raised cap	Symbol
56-61010-00.8	Machinery	Raised cap	Symbol

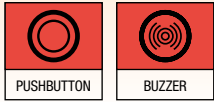
Please ask your local sales agent for more information

* Can be listened to on the EAO website: www.eao.com/mtsm_en

For complete switch also order **A**

Series 56

IP67 or IP69K / 24 VDC $\pm 30\%$ / min. 5VDC, 5 mA, max. 137VDC/VAC, max. 200 mA



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Multi-tone Sound Module



Single side for panel mount, standard voltage 24VDC, IP69K



Single side for panel mount, standard voltage 24VDC, IP69K



Single side for panel mount, standard voltage 24VDC, IP69K

Part No.	Tone sequence*	Cap style	Marking
56-61000-00.7	Transportation	Raised cap	without
56-61000-00.9	Machinery	Raised cap	without

Part No.	Tone sequence*	Cap style	Marking
56-61010-00.7	Transportation	Flush cap	Symbol
56-61010-00.9	Machinery	Flush cap	Symbol

Part No.	Tone sequence*	Cap style	Marking
56-61000-00.8	Transportation	Flush cap	without
56-61000-00.10	Machinery	Flush cap	without

Please ask your local sales agent for more information

Please ask your local sales agent for more information

Please ask your local sales agent for more information

* Can be listened to on the EAO website: www.eao.com/mtsm_en

* Can be listened to on the EAO website: www.eao.com/mtsm_en

* Can be listened to on the EAO website: www.eao.com/mtsm_en

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

A Accessories



Round front bezel for single side glass mount pushbutton, single pushbutton switches, indicators, and mounting on the exterior side of the double side switch



Round front bezel for mounting on the interior side of double side glass mount pushbuttons



Round plastic front bezel with text and braille for use with single side glass mount pushbutton, single pushbutton switches and indicators

Part No.	Colour	Bezel material
56-1000	Black	Plastic
56-1600	Blue RAL 5017	Plastic
56-1800	Dark grey RAL 7043	Plastic
56-1800A	Light Grey RAL 7040	Plastic
56-1500	Green RAL 6024	Plastic
56-1300	Orange RAL 2003	Plastic
56-1200	Red RAL 3020	Plastic
56-1400	Yellow RAL 1023	Plastic
56-3600	Matt Chrome	Metal

Part No.	LED/Colour	Bezel material
56-5600	Blue RAL 5017	Plastic
56-5800	Dark grey RAL 7043	Plastic
56-5800A	Light Grey RAL 7040	Plastic
56-5500	Green RAL 6024	Plastic
56-5300	Orange RAL 2003	Plastic
56-5200	Red RAL 3020	Plastic
56-5400	Yellow RAL 1023	Plastic
56-7600	Matt Chrome	Metal

Part No.	LED/Colour	Markings
56-1491	Yellow RAL 1023	Open
56-1492	Yellow RAL 1023	Close
56-1391	Orange RAL 2003	Open
56-1392	Orange RAL 2003	Close

Also available in square

Other shapes (square/triangular), colours and languages on request

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Symbols available for front lens, engraved or embossed. Many more available on request. Quote symbol number when ordering switch



Dismantling tool for front bezel



Dismantling tool for front bezel

Symbol	Symbol No.	Symbol	Symbol No.	Part No.	Part No.
	00.868		60523	56-998	56-999
	00.869				
	00.835				
	00836				
	40089				

Pushbutton

Switching system

Self-cleaning, double-breaking snap-action switching system
1 Normally Open contact, momentary function

Material

Connection cable

Halogene free Polydefine mixture

Lens

Aluminium anodized or Polybutylenterephthalat (PBT),
as per UL94 V0

Front bezel

Zinc matt chromium plated or Polybutylenterephthalat (PBT),
as per UL94 V0

Actuator

Polycarbonate (PC), as per UL94 V0

Material of contact

Gold plated silver

Mechanical characteristics

Terminals

Cable 4-poles with plug-in connection 2.8x0.8mm
Flat plug-in housing rectangular, AMP No. 626 057-0

Counterpart to AMP Flat plug-in housing
(not part of delivery)
Receptacle housing AMP No. 626 056-0
Receptacle socket AMP No. 160 655-2

Other version:

Cable 4 poles with plug-in connection 6.3x0.8mm
Flat plug-in housing rectangular, AMP No. 180 901-0

Counterpart to AMP Flat plug-in housing
(not part of delivery)
Receptacle housing AMP No. 180 900-0
Receptacle socket AMP No. 160 860-2

Wire cross-section

0.5 mm²

Fixing screws

Single pushbutton and Indicator for panel mounting raised
mounting M4x8 mm
Double side pushbutton for glass mounting M4x25 mm
Single side pushbutton for glass mounting M4x20 mm (for glass
≥5 mm)
Single side pushbutton for glass mounting M4x16 (for 4 mm glass)

Tightening torque

Screws Single side pushbutton and Indicator for front panel
mounting 80 Ncm ... 100 Ncm
Screws Single side- and Double side pushbutton for glass mounting
50 Ncm

Key (mounting and dismantling)

Hexagon socket wrench size 2.5 mm

Actuating force

6 N ... 12 N

Actuating travel

~0.5 mm

Mechanical lifetime

2 million cycles operation

Electrical characteristics

Illumination

Ready status, 8 LED green, red or yellow
optical switch on status, 2 LED green or red
(3 LED for special versions)
Supply voltage 24 / 36 / 48 / 72 / 96 / 110VDC
Tolerance +25% ... -30%
Current consumption <50 mA
Illuminating can vary, for production-technical reasons of the LED
manufacturers

EMC approved, as per

EN 50081-1
EN 50082-1
EN 50082-2
EN 50121-3-2

Switch rating

min. 5VDC, 5 mA
max. 137VDC/VAC, max. 200 mA

Electric strength

4000 VAC, 50 Hz, 1 min. between all terminals and mounting plate /
front element

Environmental conditions

Storage temperature

-45 °C ... +90 °C

Operating temperature

-40 °C ... +80 °C

Front protection

Front side IP67
Rear side IP65

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

Shock resistance

(semi-sinusoidal)
max. 250 m/s², pulse width 11 ms, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)
max. 100 m/s² at 10 Hz ... 500 Hz, as per EN IEC 60068-2-6

Approvals

Declaration of conformity

CE

Multi-tone Sound Module

Material

Connection cable

Halogene free Polydefine mixture

Housing switching unit and speaker cap

Polycarbonate (PC), as per UL94 V0

Front bezel

Zinc matt chromium plated or Polybutylenterephthalat (PBT), as per UL94 V0

Mechanical characteristics

Terminals

Cable 6x0.5 mm², length 200 mm

Fixing screws

For panel mounting raised mounting M4 x 8 mm (3x)

Tightening torque

Screws for front panel mounting 80 Ncm ... 100 Ncm

Key (mounting and dismantling)

Hexagon socket wrench size 2.5 mm

Electrical characteristics

Standards

The devices comply with EN 50155

EMC approved, as per

EN 50121-3-2 und EN 61000-4-4

Operating voltage/-current

Operation voltage 24 VDC ±30 %

Current rating <50 mA depending on voltage and volume

Electric strength

4000 VAC, 50 Hz, 1 min. between all terminals and mounting plate / front element

Acoustic characteristics

The volume of each tone sequence is configured in five steps by 6 dB, adjustable from the rear side. All sounds are controlled using a wire cable.

Frequency range

500 Hz ... 3000 Hz ±1 %

Time range of tone sequence

0 ... ∞ (endless)

Acoustic pressure level

90 dB ±8 dB at a distance of 0.1 m at 1 kHz

One tone sequence consists of

Two frequencies at any duration and any repeat steps

Environmental conditions

Storage temperature

-45 °C ... +90 °C

Operating temperature

-40 °C ... +85 °C

Front protection

Front side IP69K

Rear side IP65

Climate resistance

Damp heat, cyclic

48 hours, +25 °C / 97 %, +55 °C / 93 % relative humidity, as per EN IEC 60068-2-30

Saline mist 96 hours, as per EN IEC 60068-2-11

Shock resistance

(semi-sinusoidal)

max. 50 m/s², pulse width 30 ms, as per EN 61373

Vibration resistance

Max. 7.9 m/s² at 10 Hz ... 150 Hz, as per EN 61373

Approvals

Declaration of conformity

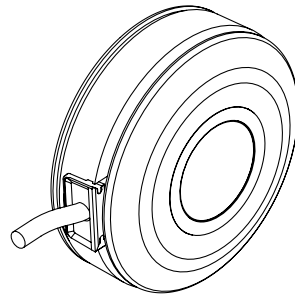
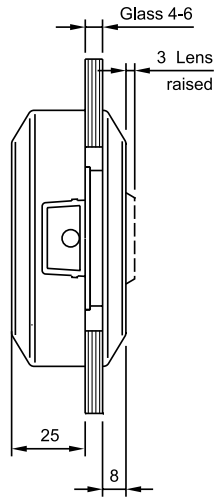
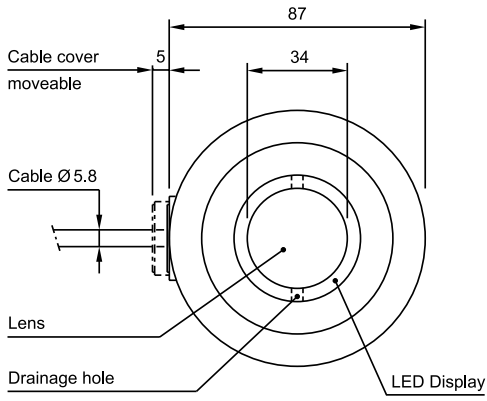
CE

e1

E1

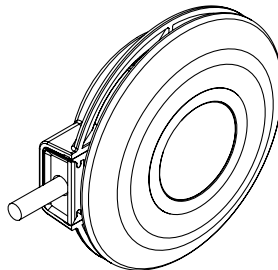
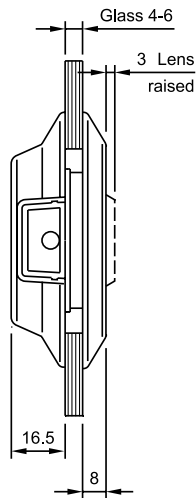
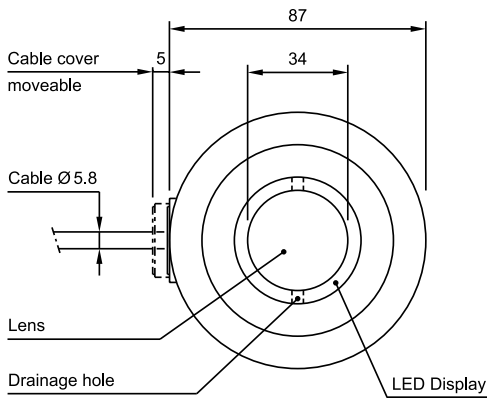
56 Double side pushbutton

For glass mount



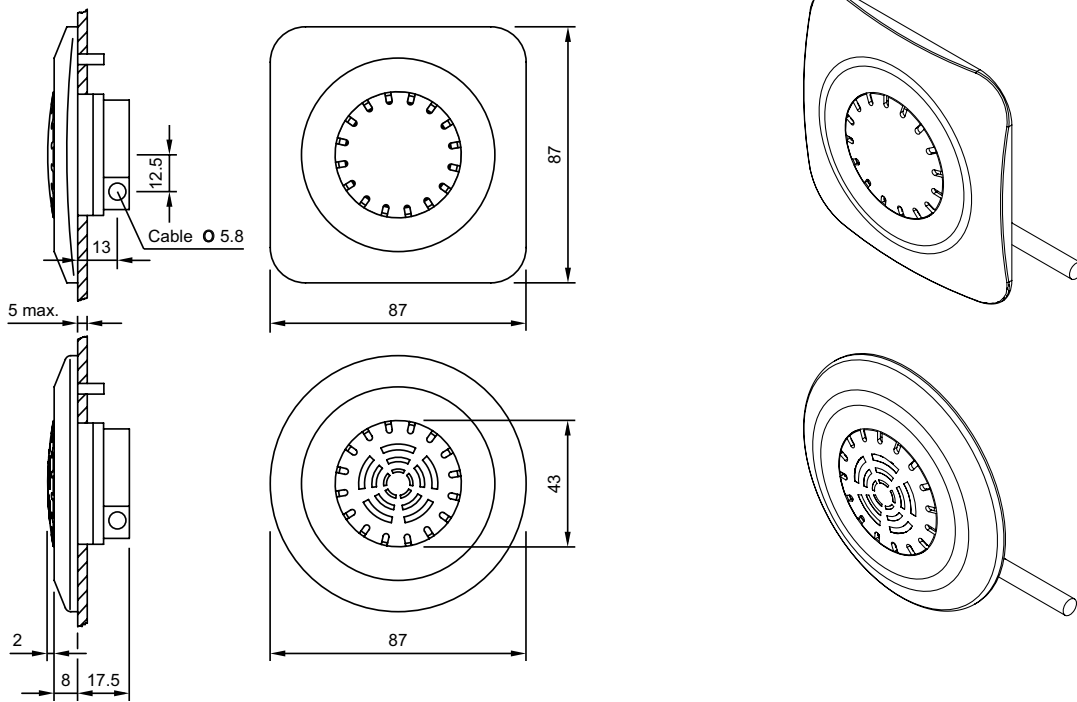
56 Single side pushbutton

For glass mounting



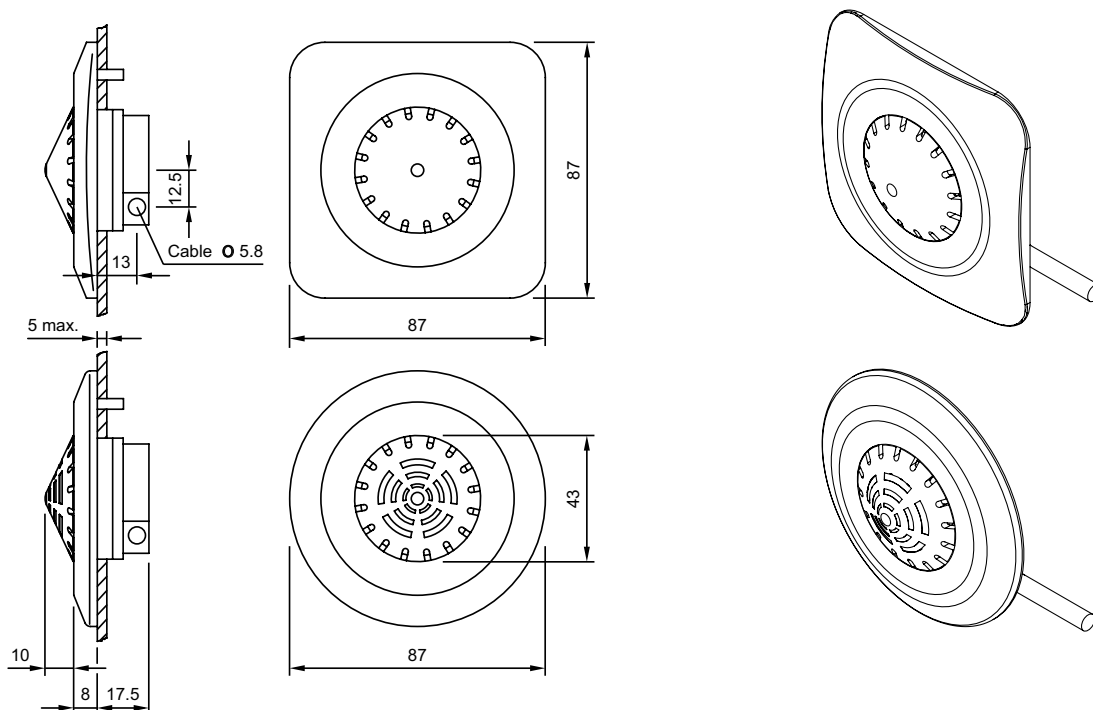
56 Multi-tone Sound Module

Flush, For front panel mount



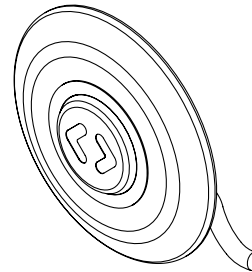
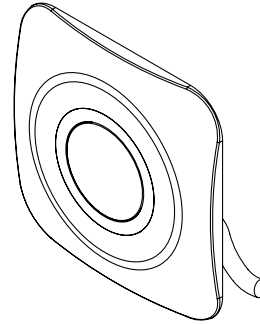
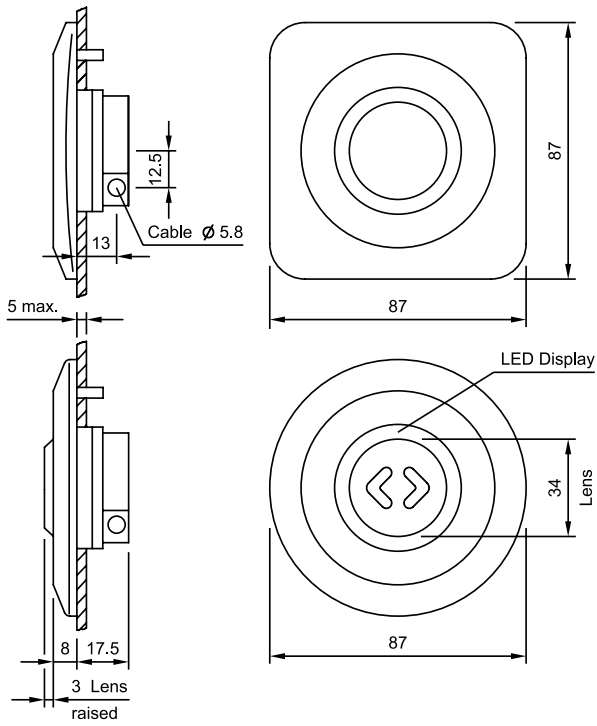
56 Multi-tone Sound Module

Raised, For front panel mount



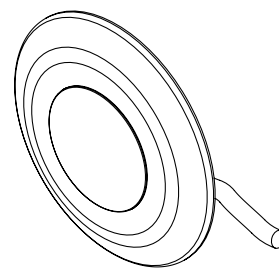
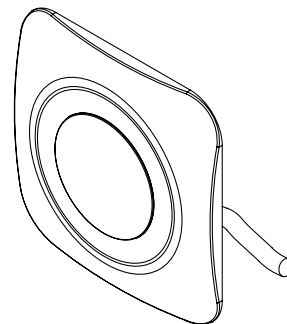
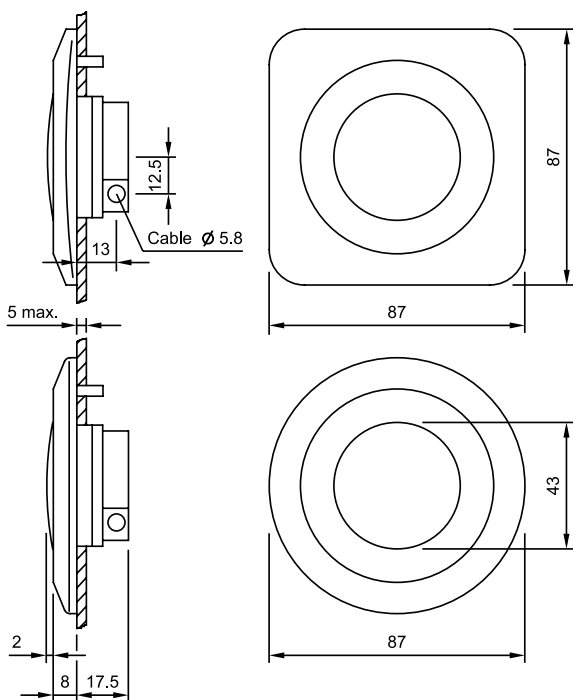
56 Single side pushbutton

For front panel mount



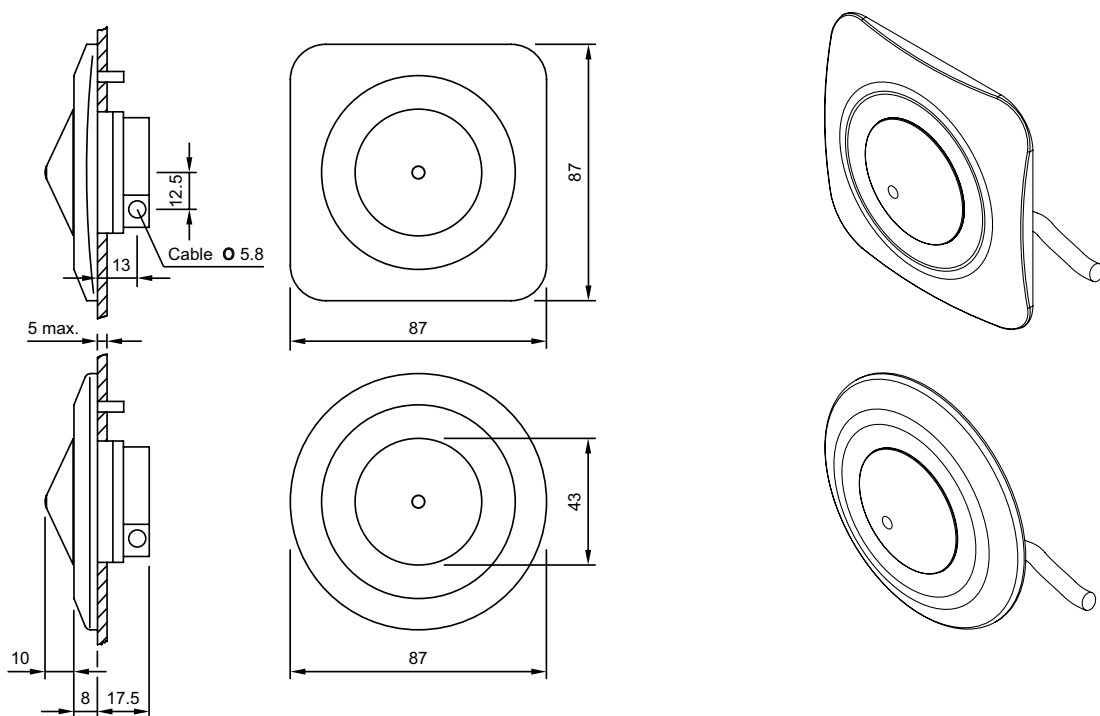
56 Single side Indicator

For front panel mount



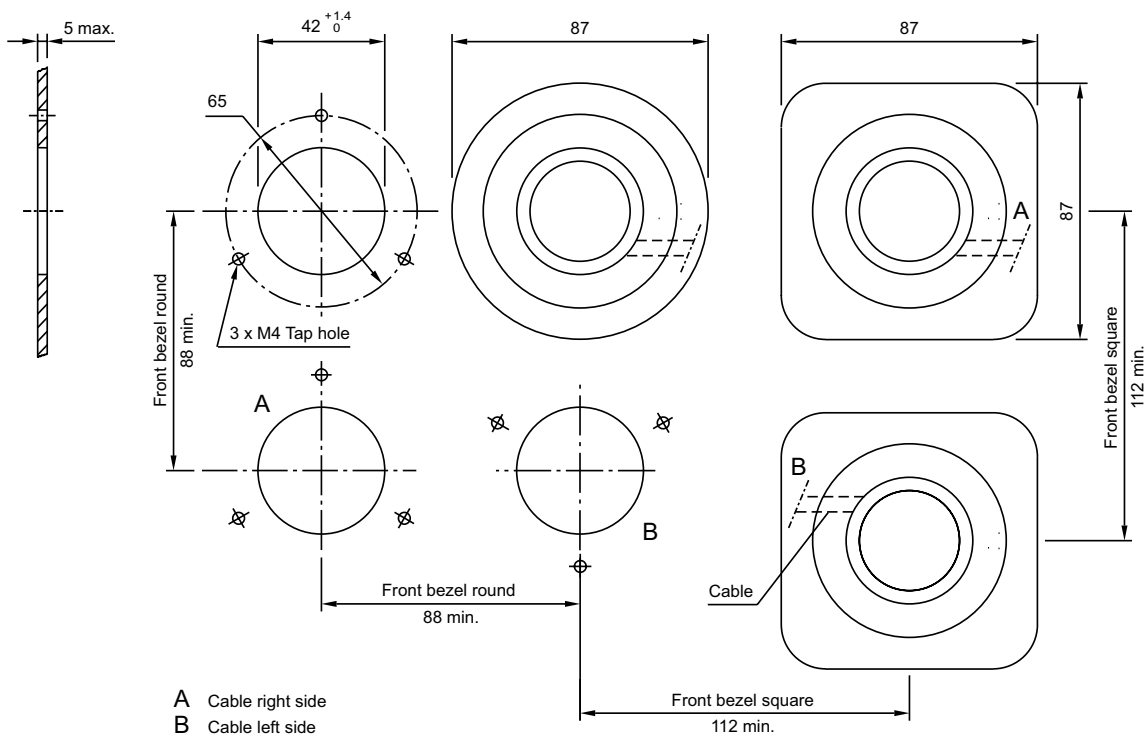
56 Single side Raised Indicator

For front panel mount



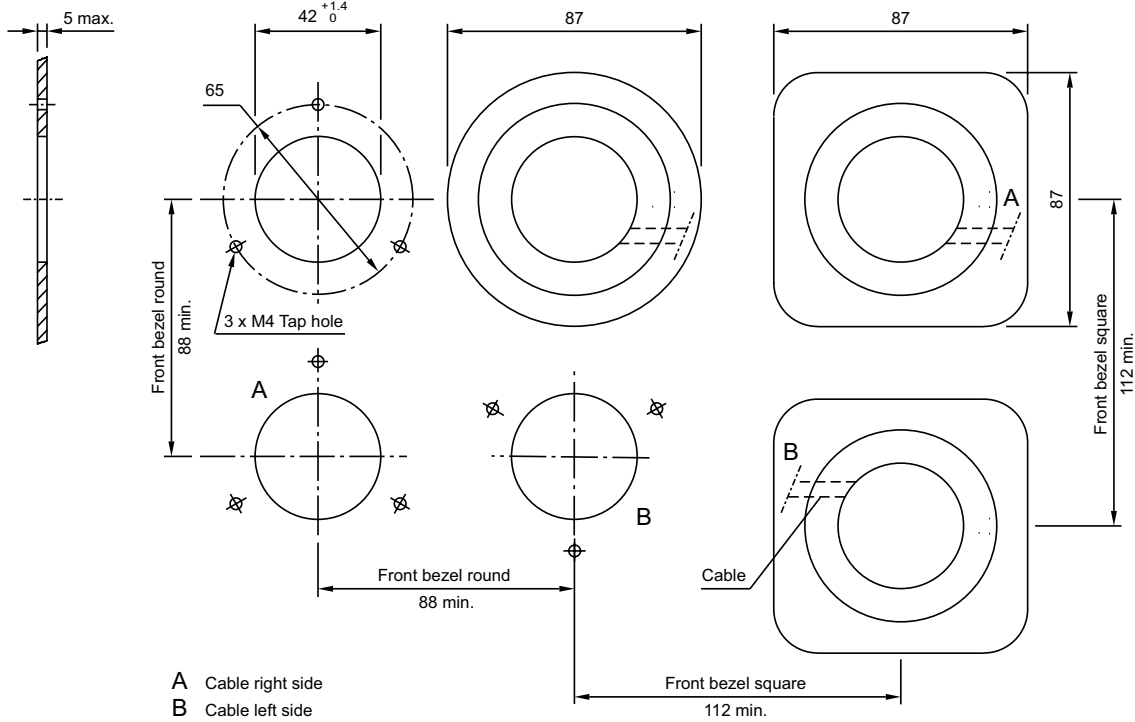
56 Cut-outs, Panel mount

Single side Push button



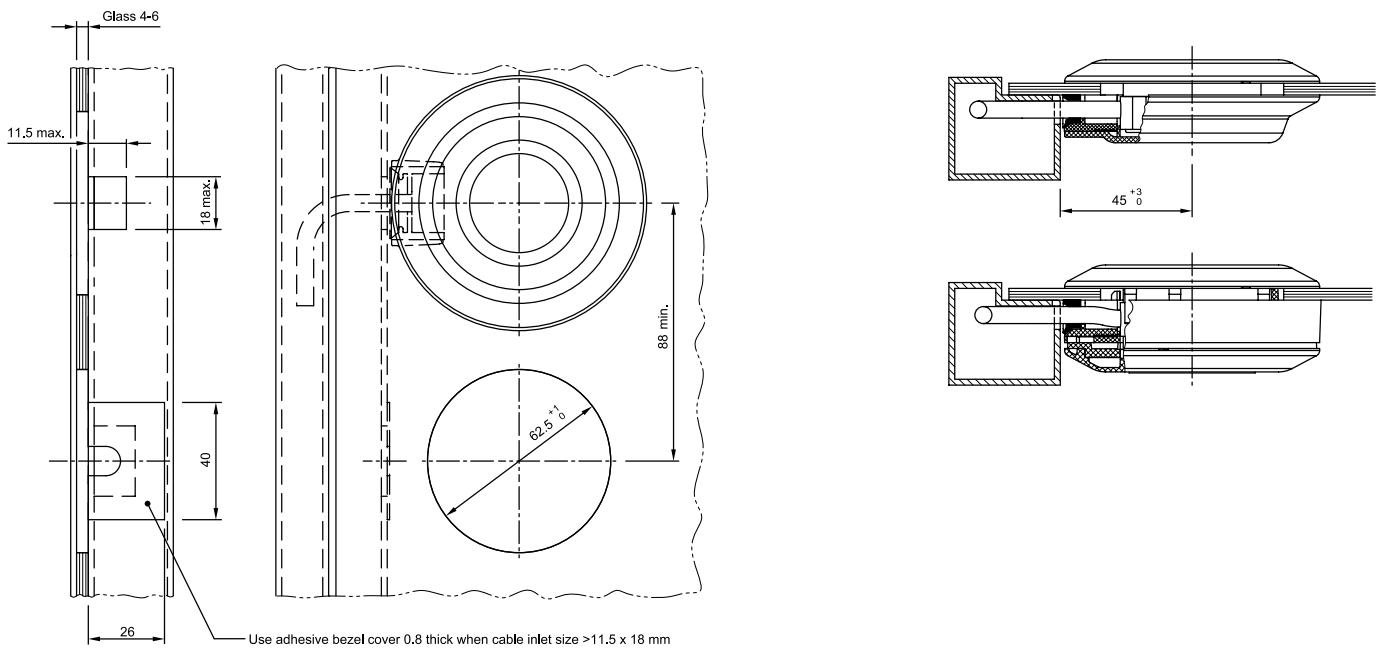
56 Cut-outs, Panel mount

Single side Raised Indicator, Single side Indicator



56 Cut-outs, Glass mount

Double side Pushbutton, Single side Pushbutton



Engraving for Keypads and Keyboards

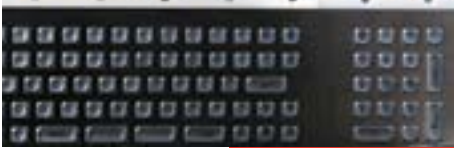
EAO offers fully-customised keypads and keyboards with function keys that can be engraved to exact needs. Customers can specify the engraving that they need from a wide range of characters and symbols, including upper and lower case lettering, graphics and engineering characters – Roman and Greek – and superscripts and subscripts. Original graphics may also be introduced.



Where appropriate, metal keys can be marked using high-tech, computer-controlled laser engraving machines. These markings are effectively burnt into the keys so they are far more wear-resistant than conventional engraving. EAO also offers a conventional engraving service on plastic keys.

LED illumination is available on certain products as an alternative to engraving.

EAO's range of customisable products are suited to most applications, including payment terminals, access control.



Series 61

16 mm 22.5 mm 21x21 mm 21x27 mm IP65 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch. For other options or further information please contact your local sales office.

Product Profile

The Series 61 is a high quality, modular switch range that includes pushbuttons, indicators, selector switches, keylock switches and Emergency-stops. Available in raised or flush mount.

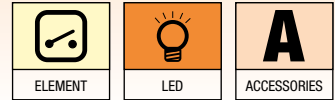
Self cleaning snap-action and slow-make switching elements available.

Technical data see page 103

- IP65 Protection
- Switch Rating, 5A, 250VAC
- Raised Mounting into 16 mm cut out
- Flush Mounting into 22.5 mm, 21 x 21 mm and 21 x 27 mm cut out
- Illumination using midget-grooved T13/4 lamps or single chip LED's
- All standard lenses are transparent with translucent diffuser available in different colours
- For keylock switches 135 different keys are available

Indicator	LED	Accessories	Accessories	Ordering Guide	
				Choice of front bezel determines front shape	
For a complete indicator you will need to order the appropriate LED, lens and bezel (for flush mount only)					
Illuminated pushbutton	Switching element	LED	Accessories	Accessories	Accessories
For a complete illuminated pushbutton you will need to order the appropriate contact block, LED, lens and bezel (for flush mount only)					
Keylock switch	Switching element	Switching element	Accessories	Accessories	Accessories
For a complete keylock switch you will need to order the appropriate LED, lens and bezel (for flush mount only)					
Selector switch	Switching element	Switching element	LED	Accessories	Accessories
For a complete selector switch you will need to order the appropriate contact block, LED, lever and bezel (for flush mount only)					

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Indicator			Illuminated pushbutton																																																					
<p>1 2 3 4</p> <p>Indicator bodies, raised, round, square and rectangular, black plastic, 16 mm mounting</p> <table border="1"> <thead> <tr> <th>Image</th> <th>Part No.</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>61-0050.02</td> <td>24x24 mm</td> </tr> <tr> <td>2</td> <td>61-0030.02</td> <td>18x24 mm</td> </tr> <tr> <td>3</td> <td>61-0020.02</td> <td>18x18 mm</td> </tr> <tr> <td>4</td> <td>61-0010.02</td> <td>18 mm Ø</td> </tr> </tbody> </table>			Image	Part No.	Size	1	61-0050.02	24x24 mm	2	61-0030.02	18x24 mm	3	61-0020.02	18x18 mm	4	61-0010.02	18 mm Ø	<p>Indicator body for flush mount, black plastic, 22.5 mm mounting</p> <table border="1"> <thead> <tr> <th>Image</th> <th>Part No.</th> <th>Function</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>61-1150.0</td> <td>Momentary</td> <td>24x24 mm</td> </tr> <tr> <td>1</td> <td>61-1250.0</td> <td>Maintained</td> <td>24x24 mm</td> </tr> <tr> <td>2</td> <td>61-1130.0</td> <td>Momentary</td> <td>18x24 mm</td> </tr> <tr> <td>2</td> <td>61-1230.0</td> <td>Maintained</td> <td>18x24 mm</td> </tr> <tr> <td>3</td> <td>61-1120.0</td> <td>Momentary</td> <td>18x18 mm</td> </tr> <tr> <td>3</td> <td>61-1220.0</td> <td>Maintained</td> <td>18x18 mm</td> </tr> <tr> <td>4</td> <td>61-1110.0</td> <td>Momentary</td> <td>18 mm Ø</td> </tr> <tr> <td>4</td> <td>61-1210.0</td> <td>Maintained</td> <td>18 mm Ø</td> </tr> </tbody> </table>			Image	Part No.	Function	Size	1	61-1150.0	Momentary	24x24 mm	1	61-1250.0	Maintained	24x24 mm	2	61-1130.0	Momentary	18x24 mm	2	61-1230.0	Maintained	18x24 mm	3	61-1120.0	Momentary	18x18 mm	3	61-1220.0	Maintained	18x18 mm	4	61-1110.0	Momentary	18 mm Ø	4	61-1210.0	Maintained	18 mm Ø
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For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

Illuminated pushbutton		Emergency-stop switch		Keylock switch																																	
<p>Illuminated flush mount pushbutton actuator, round, black plastic, 22.5 mm mounting</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>61-1100.0</td> <td>Momentary</td> </tr> <tr> <td>61-1200.0</td> <td>Maintained</td> </tr> </tbody> </table>		Part No.	Function	61-1100.0	Momentary	61-1200.0	Maintained	<p>Emergency-stop, twist release and key release, 27 mm diameter for 16 mm mounting, foolproof to EN 60947-5-5 and DIN EN ISO 13850</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Product reference</th> </tr> </thead> <tbody> <tr> <td>61-3440.4/1</td> <td>Twist release</td> </tr> <tr> <td>61-5441.4/K</td> <td>Key release</td> </tr> </tbody> </table>		Part No.	Product reference	61-3440.4/1	Twist release	61-5441.4/K	Key release	<p>Keylock switch, actuator, 2 position for raised and flush mount</p> <table border="1"> <thead> <tr> <th>Graphic</th> <th>Part No.</th> <th>Function</th> <th>Key rem.</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>61-2101.0/D</td> <td>Momentary</td> <td>A</td> </tr> <tr> <td>2</td> <td>61-2201.0/D</td> <td>Maintained</td> <td>A</td> </tr> <tr> <td>2</td> <td>61-2203.0/D</td> <td>Maintained</td> <td>C</td> </tr> <tr> <td>2</td> <td>61-2205.0/D</td> <td>Maintained</td> <td>C + A</td> </tr> </tbody> </table>		Graphic	Part No.	Function	Key rem.	1	61-2101.0/D	Momentary	A	2	61-2201.0/D	Maintained	A	2	61-2203.0/D	Maintained	C	2	61-2205.0/D	Maintained	C + A
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For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

For flush mount order front bezel and front bezel set

Series 61

16mm 22.5mm 21x21mm 21x27mm IP65 5A 250VAC

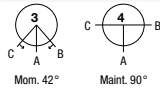


Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

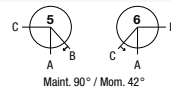
Keylock switch Selector switch



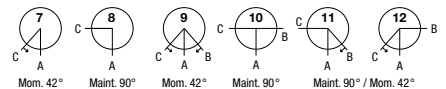
Keylock switch, actuator, 3 position for raised and flush mount



Keylock switch, actuator, 3 position for raised and flush mount



Selector switch, actuator, 2 and 3 position for raised and flush mount



Graphic	Part No.	Function	Key rem.	Graphic	Part No.	Function	Key rem.	Graphic	Part No.	Function	
3	61-2501.0/D	Momentary/Momentary	A	5	61-2701.0/D	Maintained/Momentary	A	7	61-4110.0	Momentary	
4	61-2601.0/D	Maintained/Maintained	A	5	61-2703.0/D	Maintained/Momentary	C	8	61-4210.0	Maintained	
4	61-2602.0/D	Maintained/Maintained	B	5	61-2705.0/D	Maintained/Momentary	C + A	9	61-4510.0	Momentary/Momentary	
4	61-2603.0/D	Maintained/Maintained	C	6	61-2801.0/D	Momentary/Maintained	A	10	61-4610.0	Maintained/Maintained	
4	61-2604.0/D	Maintained/Maintained	A + B	6	61-2802.0/D	Momentary/Maintained	B	11	61-4710.0	Maintained/Momentary	
4	61-2605.0/D	Maintained/Maintained	C + A	6	61-2804.0/D	Momentary/Maintained	A + B	12	61-4810.0	Momentary/Maintained	
4	61-2606.0/D	Maintained/Maintained	C + B								
4	61-2607.0/D	Maintained/Maintained	C + A + B								
For flush mount order front bezel and front bezel set				For flush mount order front bezel and front bezel set							

For complete switch also order **A**

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Contact block



Contact block for pushbuttons and 2 position keylock and selector switches, snap-action, solder/plug-in terminal



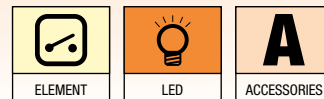
Emergency-stop contact block, slow make, screw terminal or solder/plug-in terminal



Contact block, 3 position keylock and selector switch, snap-action, solder/plug-in terminal

Part No.	Contact type	Contact material	Image	Part No.	Contact type	Contact material	Part No.	Contact type	Contact material
61-8410.12	1NO	Silver	1	61-8755.11	2NC	Silver	61-8520.12	2NO	Silver
61-8410.22	1NO	Gold	2	61-8755.17	2NC	Silver	61-8520.22	2NO	Gold
61-8420.12	2NO	Silver	1	61-8775.11	1NO/1NC	Silver			
61-8420.22	2NO	Gold	2	61-8775.17	1NO/1NC	Silver			
61-8470.12	1NO/1NC	Silver							
61-8470.22	1NO/1NC	Gold							

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



LED



LED, T1¼ MG, single chip, 12 Volt and 28 Volt.
Also available in 6 Volt, 24 Volt and 48 Volt

Colour	Part No.	Voltage
● Red	10-2J09.1062	12VAC/DC, 7/14mA
● Yellow	10-2J09.1064	12VAC/DC, 7/14mA
● Green	10-2J09.1065	12VAC/DC, 7/14mA
● Blue	10-2J09.1066	12VAC/DC, 7/14mA
○ White	10-2J09.1069	12VAC/DC, 7/14mA
● Red	10-2J13.1062	28VAC/DC, 7/14mA
● Yellow	10-2J13.1064	28VAC/DC, 7/14mA
● Green	10-2J13.1065	28VAC/DC, 7/14mA
● Blue	10-2J13.1066	28VAC/DC, 7/14mA
○ White	10-2J13.1069	28VAC/DC, 7/14mA

A Accessories



Lens, plastic for raised, rectangular indicator and pushbutton actuators

Colour	Part No.	for switch
● Red	61-9331.2	18x24 mm
● Yellow	61-9331.4	18x24 mm
● Green	61-9331.5	18x24 mm
● Blue	61-9331.6	18x24 mm
○ Clear	61-9331.7	18x24 mm



Lens, plastic for raised, square indicator and pushbutton actuators

Colour	Part No.	for switch
● Red	61-9351.2	24x24 mm
● Yellow	61-9351.4	24x24 mm
● Green	61-9351.5	24x24 mm
● Blue	61-9351.6	24x24 mm
○ Clear	61-9351.7	24x24 mm

A Accessories



Lens, plastic for raised, square indicator and pushbutton actuators

Colour	Part No.	for switch
● Red	61-9321.2	18x18 mm
● Yellow	61-9321.4	18x18 mm
● Green	61-9321.5	18x18 mm
● Blue	61-9321.6	18x18 mm
○ Clear	61-9321.7	18x18 mm



Lens, plastic for raised, round indicator and pushbutton actuators

Colour	Part No.	for switch
● Red	61-9311.2	18 mm Ø
● Yellow	61-9311.4	18 mm Ø
● Green	61-9311.5	18 mm Ø
● Blue	61-9311.6	18 mm Ø
○ Clear	61-9311.7	18 mm Ø



Lens, plastic for flush mount, rectangular indicator and pushbutton actuators

Colour	Part No.	for switch
● Red	61-9681.2	24x30 mm
● Yellow	61-9681.4	24x30 mm
● Green	61-9681.5	24x30 mm
● Blue	61-9681.6	24x30 mm
○ Clear	61-9681.7	24x30 mm

Series 61

16 mm 22.5 mm 21x21 mm 21x27 mm IP65 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

A Accessories



Lens, plastic for flush mount, round indicator and pushbutton actuators

Colour	Part No.
● Red	61-9642.2
● Yellow	61-9642.4
● Green	61-9642.5
● Blue	61-9642.6
○ Clear	61-9642.7



Lens, plastic for flush mount, square indicator and pushbutton actuators

Colour	Part No.	for switch
● Red	61-9671.2	24 x 24 mm
● Yellow	61-9671.4	24 x 24 mm
● Green	61-9671.5	24 x 24 mm
● Blue	61-9671.6	24 x 24 mm
○ Clear	61-9671.7	24 x 24 mm



Lever for selector switch, raised and flush mount, coloured lever bar options available as indicated

Colour	Part No., Raised	Part No., Flush mount
● Red	52-928.20	61-9028.20
● Yellow	52-928.40	61-9028.40
● Green	52-928.50	61-9028.50
● Blue	52-928.60	61-9028.60
○ White	52-928.9	61-9028.9
● Black	52-928.0	61-9028.0

A Accessories



Keylock switch front bezel, raised black plastic

Image	Part No.	for switch
1	61-9250.0	24 x 24 mm
2	61-9230.0	18 x 24 mm
3	61-9220.0	18 x 18 mm
4	61-9210.0	18 mm Ø



Keylock switch front bezel, flush mount or raised, black plastic

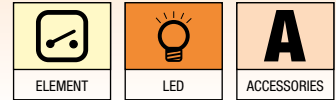
Image	Part No.	for switch
1	61-9230.0	24 x 30 mm
2	61-9220.0	24 x 24 mm
3	61-9210.0	25 mm Ø



Front bezel set for flush mount indicator, illuminated pushbutton and square and rectangular keylock switch

Image	Part No.	Material	Size
1	61-9933.10	Plastic black	25 mm Ø
2	61-9933.0	Aluminium nat.	25 mm Ø
3	61-9931.0	Plastic black	24 x 30 mm
4	61-9930.0	Plastic black	24 x 24 mm

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Front bezel set for round flush mount selector, round keylock switch and square selector switch

Image	Part No.	Material	Size
1	61-9932.10	Plastic black	25 mm Ø
2	61-9936.0	Plastic black	24x24 mm
3	61-9932.0	Aluminium nat.	25 mm Ø



Flap guard, raised and flush mount

Image	Part No.	Size	Mounting
1	61-9922.0	24x30 mm	Flush
2	61-9921.0	24x24 mm	Flush
3	61-9924.0	25 mm Ø	Flush
4	61-9920.0	24x24 mm	Raised
5	51-925	18x24 mm	Raised
6	51-920	18x18 mm	Raised



Blanking plate

Image	Part No.	Size	Mounting hole
1	61-9450.0	24x24 mm	16 mm Ø
2	61-9452.0	24x30 mm	21x27 mm
3	61-9451.0	24x24 mm	21x21 mm
4	51-947.0	18x24 mm	16 mm Ø
5	51-948.0	18x18 mm	16 mm Ø
6	51-949.0	18 mm Ø	16 mm Ø
	61-9453.0	25 mm Ø	22.5 mm Ø

A Accessories



Flat receptacle for plug-in terminal size 2.8x0.5 mm and insulation socket

Image	Part No.
1	31-929
2	31-946



Emergency-stop protective shroud, yellow painted aluminium with 16 mm mounting hole

Part No.
61-9965



Emergency-stop label, 43 mm diameter, English, German, French and no markings

Part No.	Markings
61-9970.0	no markings
61-9970.2	EMERGENCY STOP
61-9970.1	NOT AUS
61-9970.3	ARRET D'URGENCE
61-9970.6	NOT-HALT

Series 61

16mm 22.5mm 21x21mm 21x27mm IP65 5A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
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A Accessories



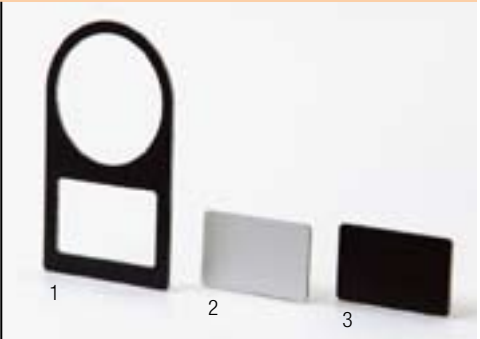
Emergency-stop switch enclosure with 16 mm mounting hole, 65 mm (w) x 65 mm (h) x 57 mm (d) and cable gland M16, IP66

Image	Part No.	Thread
1	61-9480.5	
2	61-9481.6	M16



Lens remover for flush mount, mounting tool, lens remover for raised, contact block remover and LED remover

Image	Part No.	Product description
1	61-9730.0	Lens remover for flush mount
2	01-907	Mounting tool
3	02-905	Lens remover for raised
4	61-9711.0	Contact block remover
5	61-9740.0	LED remover



Legend plate, adhesive, natural anodised aluminium finish for flush mount round pushbuttons, 25 mm mounting hole

Image	Part No.	Size	Colour
1	61-9980.0	50x30 mm Ø	Black
2	704.968.0		Aluminium
3	704.968.1		Black

A Accessories



Lens plastic transparent; illuminated ring; for raised and flush mounting, round indicators and illuminated pushbuttons

Colour	Part No.	Comment
● Red	61-9643-201	
● Orange	61-9643-301	
● Yellow	61-9643-401	
● Green	61-9643-501	
● Blue	61-9643-601	
○ Clear	61-9643-701	



Lens aluminium; convex raised; for raised and flush mounting, round indicators and illuminated pushbuttons

Colour	Part No.
● Red	61-9842.2
● Yellow	61-9842.4
● Green	61-9842.5
● Blue	61-9842.6
○ Aluminium	61-9842.8
● Black	61-9842.0



Lens with spot illumination; aluminium; for raised and flush mounting, round indicators and illuminated pushbuttons

Colour	Part No.
● Red	61-9841.2A
● Yellow	61-9841.4A
● Green	61-9841.5A
● Blue	61-9841.6A
○ Aluminium	61-9841.8A
● Black	61-9841.0A

Actuator with snap-action switching element

Switching system

Self-cleaning, double-break snap-action switching system with contact opening width 2x0.5mm (switch with small contact opening width as per EN IEC 61058-1).

The switching elements are optionally equipped with the following switching functions:

One to three normally open (NO) or normally closed (NC), or any combination of NO and NC plus connections for T1 3/4 LED or lamp. The number of switching elements cannot exceed three.

The switching elements provided for the 3-position switch actuators are equipped with max. 2NC or 2NO or any combination. The number of switching elements cannot exceed two.

Material

Lens

Raised mounting Polymethylmethacrylat (PMMA), as per UL 94 HB, flush mounting Polycarbonat (PC), as per UL 94 V0, or Aluminium anodized

Front bezel

Polyetherimid (PEI), as per UL 94 V0, or Aluminium anodized

Front ring

Aluminium anodized

Material of contact

Silver or silver with gold plating

Switching element

Diallylphthalate (DAP), as per UL 94 V0 and Polyamide (PA 66), as per UL 94 V0

Actuator housing

Polyetherimide (PEI), as per UL 94 V0, self-extinguishing

Mechanical characteristics

Terminals

	rigid	flexible	superflexible
1 wire	0.5 ... 1.5 mm ²	0.5 ... 0.75 mm ²	0.5 mm ²
2 wires	0.75 mm ²	0.5 mm ²	

Actuating torque

Selector-/Keylock switch 2.5 ... 10 Ncm

Actuating force

Pushbutton 2.7 ... 3.6 N

Actuating travel

Pushbutton 3 mm

	2 positions	3 positions
Selector-/ keylock switch	2 positions	3 positions
Momentary action	approx. 42°	approx. 2 x 42°
Maintained action	approx. 90°	approx. 2 x 90°

Rebound time

The rebound times apply to normal manual activation

Contact making	3 ms
Contact breaking	5 ms

Mechanical lifetime

as per DIN IEC 60512-5-6 and EN IEC 60947-5-1

Pushbutton maintained action	1 million	cycles of operation
Pushbutton momentary action	2 million	cycles of operation
Keylock switch	50 000	cycles of operation
Selector switch	100 000	cycles of operation

Electrical characteristics

Standards

The devices comply with: EN IEC 61058-1 and EN IEC 60947-5-1

Rated Operational Voltage Ue

250 VAC/DC as per EN IEC 60947-1

Rated Insulation Voltage Ui

320 VAC, as per EN IEC 60947-5-1

Rated Impulse Withstand Voltage Uimp

4 kV, as per EN IEC 60947-5-1

Contact resistance

New state with silver contact $\leq 100 \text{ m}\Omega$
 as per DIN IEC 60512-2-4, measured at 100 mA, 10 V
 New state with gold plated contact $\leq 50 \text{ m}\Omega$
 as per DIN IEC 60512-2-3, measured at 20 mV, 10 mA

Electrical life

$\geq 50\,000$ cycles of operation at 250 VAC, 5 A, $\cos\phi 0.95$, as per EN IEC 60947-5-1

Electrostatic discharge

Keylock switch 11 kV

Conventional free air thermal current Ith

5 A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

Switch rating

Switch rating AC with silver contact or silver contact with gold plating, service category AC-15, as per EN IEC 60947-5-1

Voltage	125 VAC	250 VAC
Current	2.5 A	2 A

Switch rating DC for silver contact or silver contact with gold plating, service category DC-13, as per EN IEC 60947-5-1

Voltage	250 VDC
Current	0.15 A

Recommended minimum operational data

Material of contact	Silver	Silver with gold plating
Voltage	20 VAC/DC	5 VAC/DC
Current	100 mA	10 mA

Electric strength

2500 VAC, 50 Hz, 1 min., as per DIN IEC 60512-2-11 between all terminals and earth

Overvoltage category

III, as per EN IEC 60947-5-1

Protection class

Class II, as per EN IEC 61058-1

Degree of pollution

3, as per EN IEC 60947-1

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +55 °C

Protection degree

as per EN IEC 60529

Frontside IP65 | rear side IP40

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. 100 m/s² at 10 Hz ... 500 Hz, 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, 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

CB (IEC 60947)

CB (IEC 61058)

CSA

ENEC (EN 61058)

Germanischer Lloyd

GOST

UL

VDE

Declaration of conformity

CE

Actuator with slow-make switching element**Switching system**

Double-break slow-make system, contact opening width 2x1.5 mm, with 2x2 contact points per switching element.

NC-contact elements in the slow-make elements fulfill requirements of switches with forced opening as per EN IEC 60947-5-1 2.17

The slow-make elements are optionally obtainable with the following switching functions: 1 NO or 2 NO, 1 NC or 2 NC, 1 NO + 1 NC.

Material**Lens**

Raised mounting Polymethylmethacrylat (PMMA), as per

UL 94 HB, flush mounting Polycarbonat (PC), as per UL 94 V0, or Aluminium anodized

Front bezel

Polyetherimid (PEI), as per UL 94 V0, or Aluminium anodized

Front ring

Aluminium anodized

Material of contact

Silver or gold (specified for operation for low level switching)

Switching element

Diallylphthalate (DAP), as per UL 94 V0 and Polyamide (PA 66), as per UL 94 V0

Actuator housing

Polyetherimide (PEI), as per UL 94 V0, self-extinguishing

Mechanical characteristics**Terminals**

	rigid	flexible	superflexible
- Solder			
1 wire	0.5 ... 1.5 mm ²	0.5 ... 0.75 mm ²	0.5 mm ²
2 wires	0.75 mm ²	0.5 mm ²	

- Screw

1 wire	0.5 ... 1.5 mm ²	0.5 ... 0.75 mm ²	0.5 mm ²
2 wires	0.75 mm ²	0.5 mm ²	0.5 mm ²

Actuating torque

Selector-/ Keylock switch 4 ... 16 Ncm

Actuating force

Pushbutton 3.5 ... 11 N

Emergency-stop switch max. 65 N

Actuating travel

Pushbutton 3 mm

Emergency-stop switch 10 mm

Selector-/ keylock switch	2 positions	3 positions
Momentary action	approx. 42°	approx. 2 x 42°
Maintained action	approx. 90°	approx. 2 x 90°

Rebound time

2 ms, contact making and contact breaking

the rebound times apply to normal manual activation

Mechanical lifetime

as per DIN IEC 60512-5-6 and EN IEC 60947-5-1

Pushbutton maintained action	1 million	cycles of operation
Pushbutton momentary action	2 million	cycles of operation
Emergency-stop pushbutton	6 050	cycles of operation
Keylock switch	50 000	cycles of operation
Selector switch	100 000	cycles of operation

Electrical characteristics

Standards

The devices comply with: EN IEC 61058-1 and EN IEC 60947-5-1, EN IEC 60947-5-5 (Emergency-stop)

Electrical life

≥50 000 cycles of operation at 250 VAC, 5 A, $\cos\phi$ 0.95, as per EN IEC 60947-5-1

Switching Element of Emergency-stop 6050 cycles of operation, as per EN IEC 60947-5-5

Electrostatic discharge

Keylock switch 11 kV

Electric strength

4000 VAC, 50 Hz, 1 min., as per DIN IEC 60512-2 between all terminals and earth

Overvoltage category

III, as per EN IEC 60947-5-1

Protection class

Class II, as per EN IEC 61058-1

Degree of pollution

3, as per EN IEC 60947-1

Electrical characteristics for silver contacts

Rated Operational Voltage U_e

250 VAC/DC as per EN IEC 60947-1

Rated Insulation Voltage U_i

320 VAC, as per EN IEC 60947-5-1

Rated Impulse Withstand Voltage U_{imp}

4 kV, as per EN IEC 60947-5-1

Contact resistance

New state $\leq 50\text{ m}\Omega$, as per DIN IEC 60512-2-4, measured at 100 mA, 10 V

Conventional free air thermal current I_{th}

5 A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

Switch rating

Switch rating AC with silver contact and screw terminal, service category AC-15, as per EN IEC 60947-5-1

Voltage	125 VAC	250 VAC
---------	---------	---------

Current	3 A	2 A
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Switch rating with silver contact and screw terminal, service category

DC-13, as per EN IEC 60947-5-1

Voltage	250 VDC
---------	---------

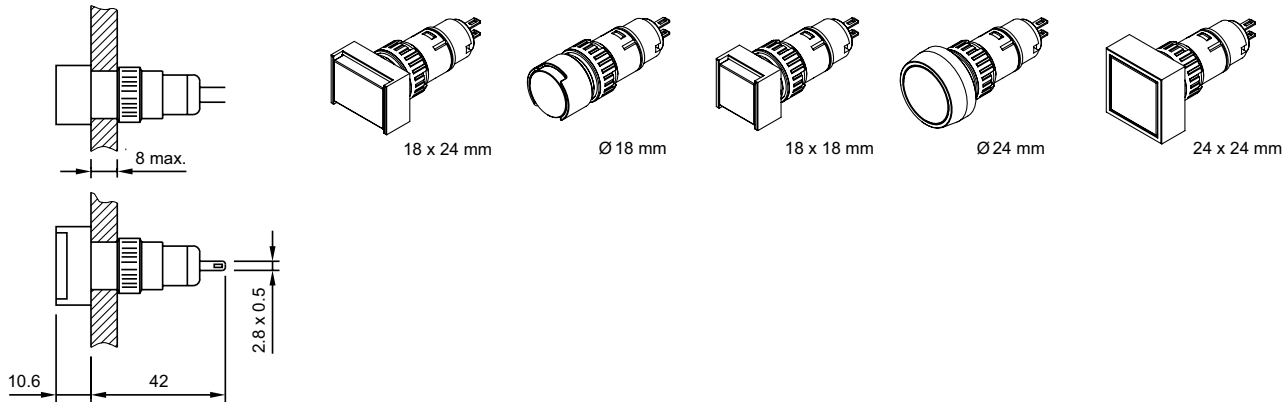
Current	0.2 A
---------	-------

Recommended minimum operational data

20 VAC/DC, 100 mA

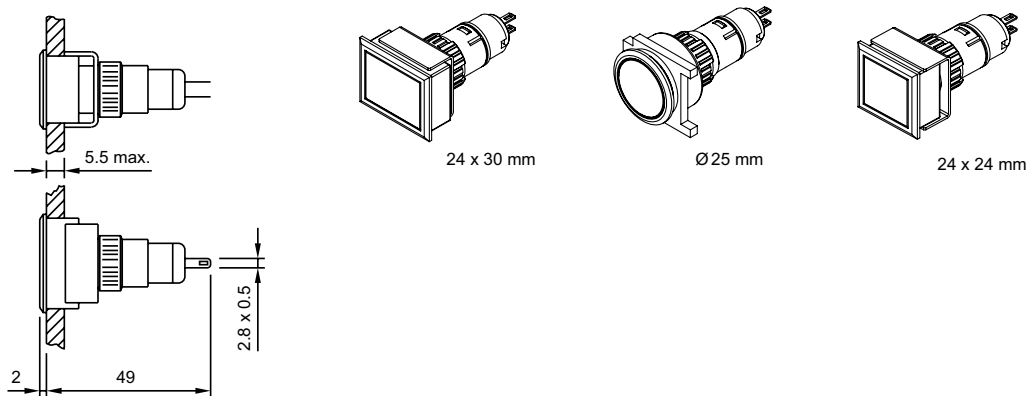
61 Indicator

Raised, Round, Square, Rectangular



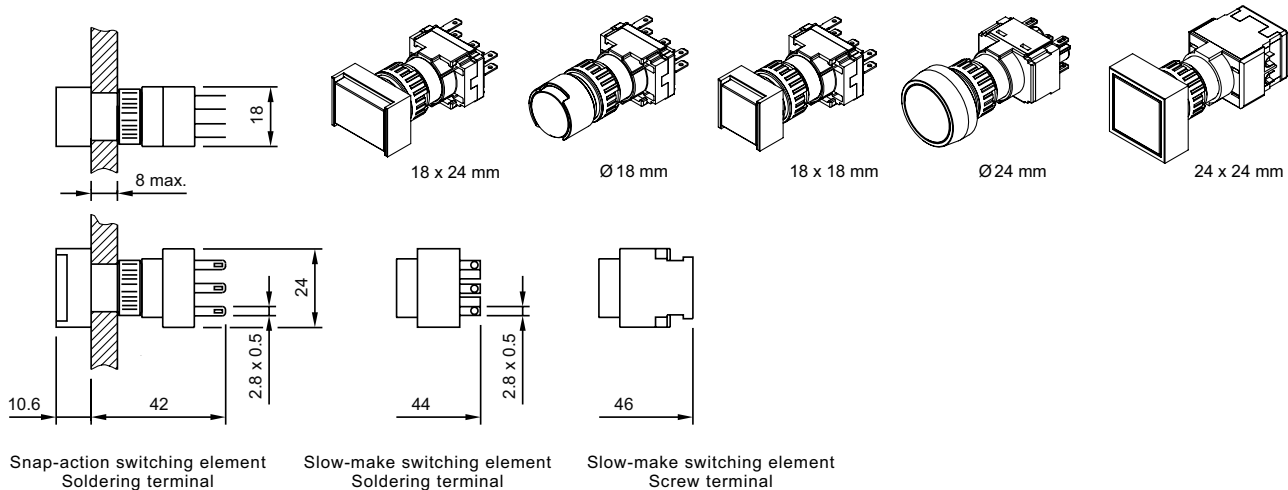
61 Indicator

Flush, Round, Square, Rectangular



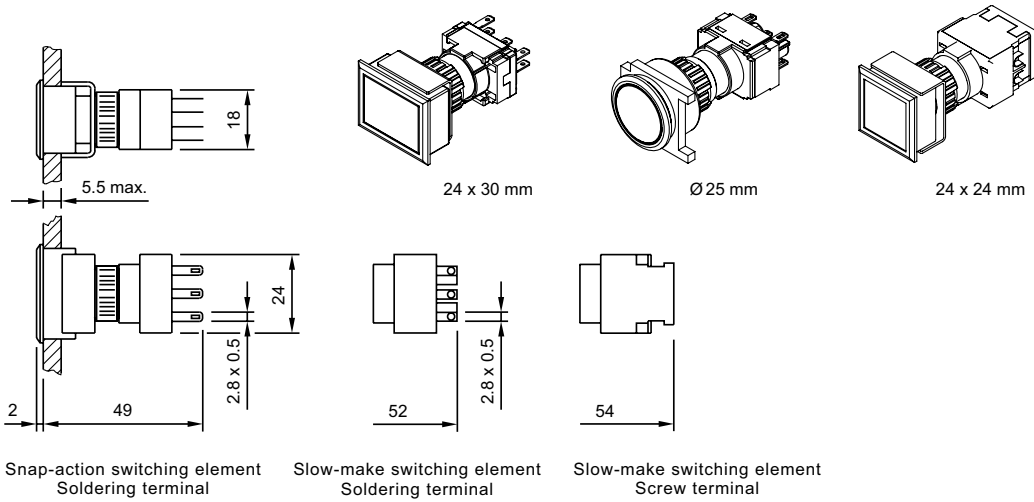
61 Illuminated Pushbutton

Raised, Round, Square, Rectangular



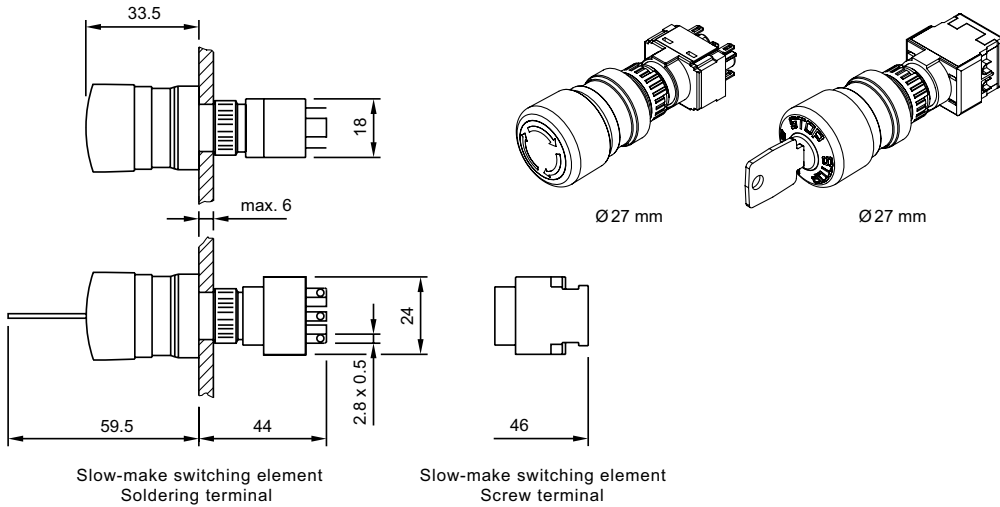
61 Illuminated Pushbutton

Flush, Round, Square, Rectangular



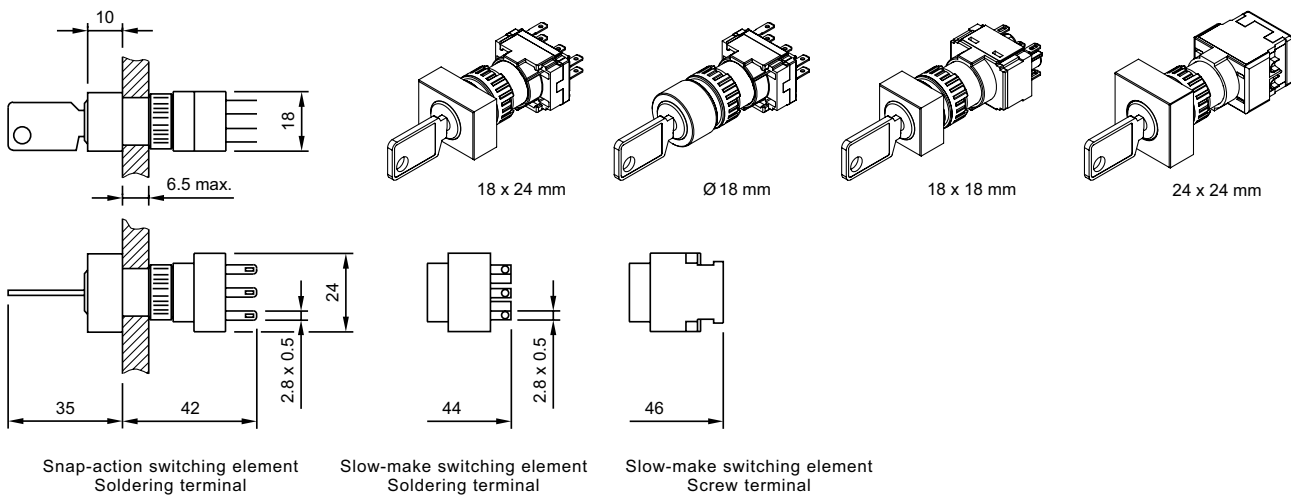
61 Emergency-stop switch

ISO 1385, Twist release, Key release



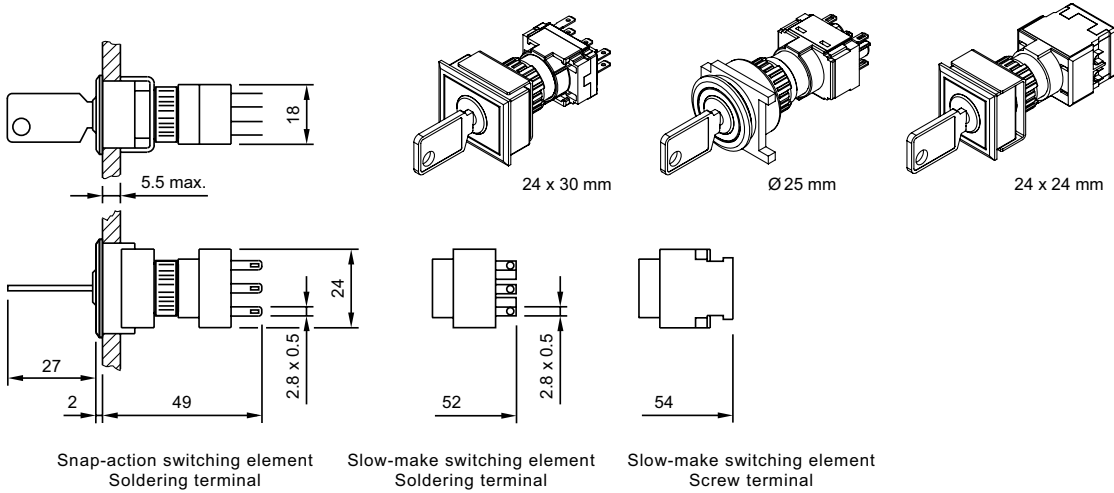
61 Keylock switch

2 & 3-Position, Raised, Round, Square, Rectangular



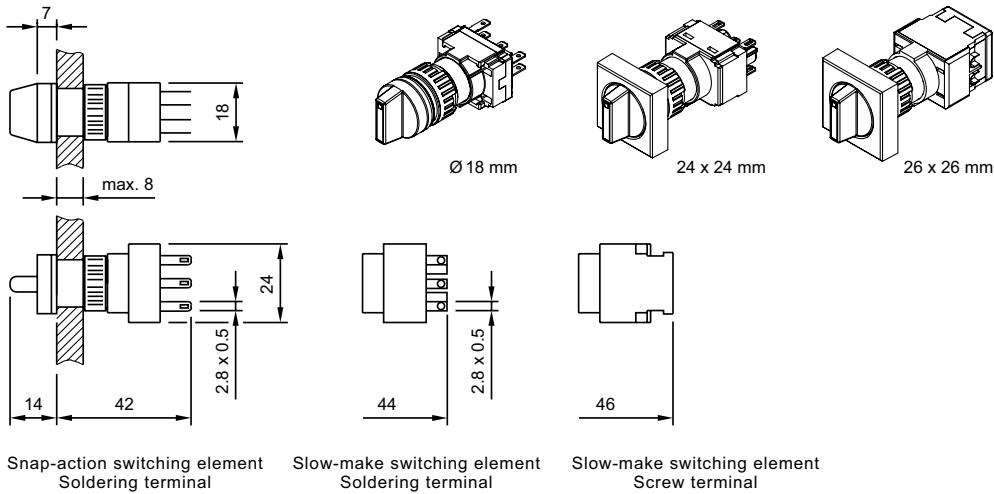
61 Keylock switch

2 & 3-Position, Flush, Round, Square, Rectangular



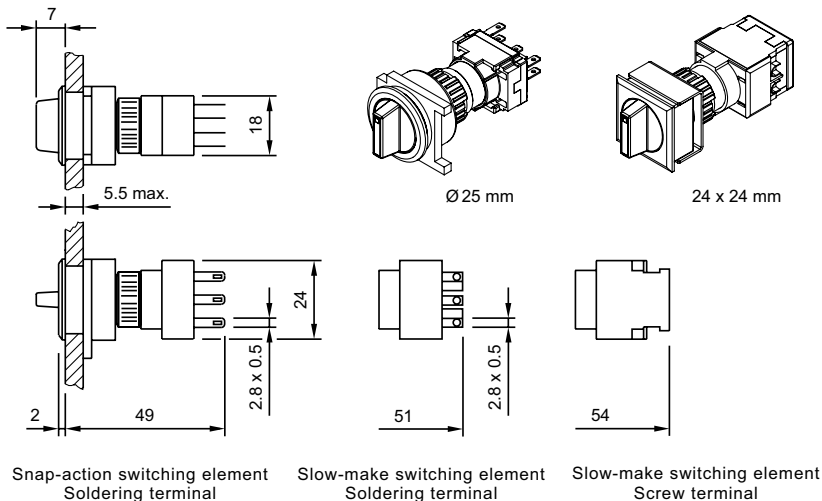
61 Selector switch

2 & 3-Position, Raised, Round, Square, Rectangular



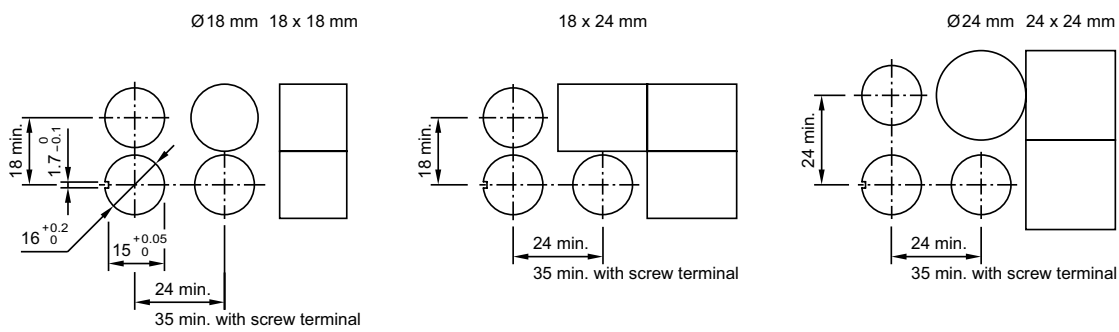
61 Keylock switch

2 & 3-Position, Flush, Round, Square, Rectangular



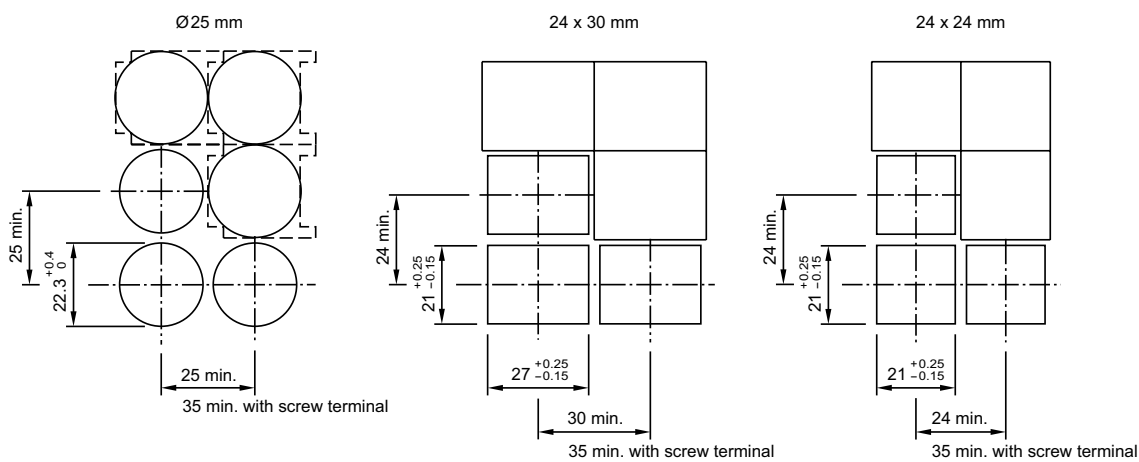
61 Cut-outs

Raised Indicators, Pushbuttons, Keylocks and Selectors



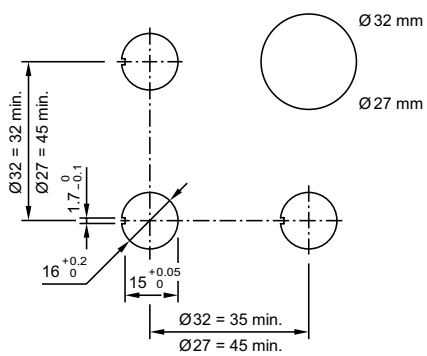
61 Cut-outs

Indicator Flush, Pushbutton Flush



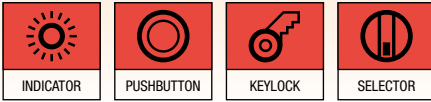
61 Cut-outs, Emergency-Stop

ISO 13850, Twist release, Key release



Series 71

22.5 mm 21x21 mm 21x27 mm IP65 3A 250VAC



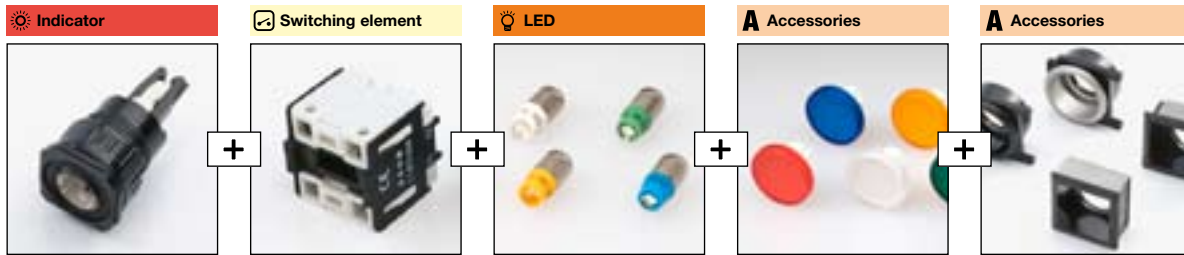
Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

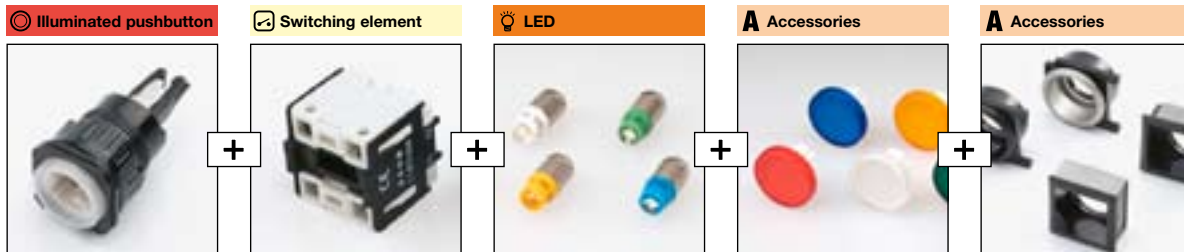
The Series 71 is a high quality, modular switch range that includes pushbuttons, indicators, selector switches and keylock switches in flush mount with self cleaning snap-action switching elements. The switching elements may be soldered directly onto the PCB and the actuators are lockable with an interlocking pin, no spacing pins needed.

Technical data see page 114

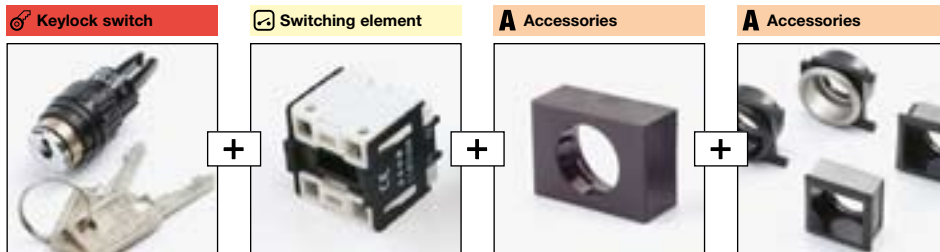
- IP65 Protection
- Switch Rating, 3A, 250VAC
- Flush Mounting into 22.5 mm, 21 x21 mm and 21 x27 mm cut out
- Illumination using midget-grooved T13/4 lamps or single chip LED's
- All standard lenses are transparent with translucent diffuser available in different colours
- For keylock switches 135 different keys are available



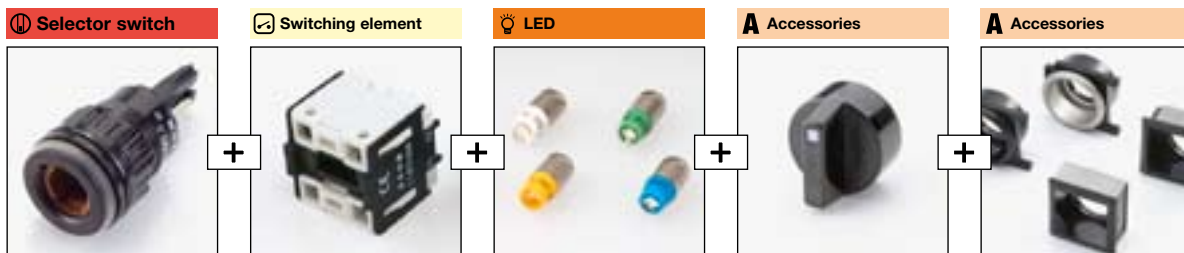
For a complete indicator you will need to order the appropriate contact block, LED, lens and bezel



For a complete illuminated pushbutton you will need to order the appropriate contact block, LED, lens and bezel



For a complete keylock switch you will need to order the appropriate contact block and bezel

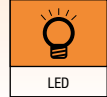


For a complete selector switch you will need to order the appropriate contact block, LED, lever and bezel

Ordering Guide

Choice of front bezel determines front shape

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Indicator



Indicator body for flush mount, black plastic

Part No.
71-600.0

For complete switch also order **A**

Illuminated pushbutton



Illuminated flush mount pushbutton actuator, round, black plastic

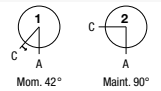
Part No.	Function
71-611.0	Momentary
71-612.0	Maintained

For complete switch also order **A**

Keylock switch



Keylock switch actuator, 2 position for flush mount



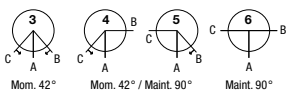
Graphic	Part No.	Function	Key rem.
1	71-621.0/D	Momentary	A
2	71-622.0/D	Maintained	A
2	71-623.0/D	Maintained	C
2	71-624.0/D	Maintained	A + C

For complete switch also order **A**

Keylock switch



Keylock switch actuator, 3 position for flush mount



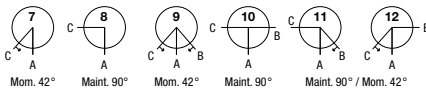
Graphic	Part No.	Function	Key rem.
3	71-631.0/D	Momentary/Momentary	A
4	71-638.0/D	Momentary/Maintained	A
4	71-639.0/D	Momentary/Maintained	A + B
5	71-636.0/D	Maintained/Momentary	A
5	71-637.0/D	Maintained/Momentary	A/C
6	71-632.0/D	Maintained/Maintained	A
6	71-635.0/D	Maintained/Maintained	A + B + C
6	71-634.0/D	Maintained/Maintained	B + C
6	71-633.0/D	Maintained/Maintained	C

For complete switch also order **A**

Selector switch



Selector switch actuator, 2 and 3 position for flush mount



Graphic	Part No.	Function	Positions
7	71-641.0	Momentary	2
8	71-642.0	Maintained	2
9	71-651.0	Momentary/Momentary	3
12	71-658.0	Momentary/Maintained	3
11	71-656.0	Maintained/Momentary	3
10	71-652.0	Maintained/Maintained	3

For complete switch also order **A**

Contact block

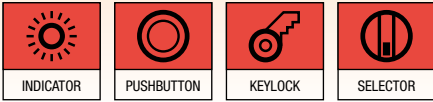


Indicator Element and Switching Element. Interlocking pin for PCB assembly supplied with each element

Image	Part No.	Contact type	Product description
1	71-670.006		Indicator element
2	71-671.026	1NO/1NC	Switching element
3	71-672.026	2NO/2NC	Switching element

Series 71

22.5 mm 21x21 mm 21x27 mm IP65 3A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

LED



LED, T1¼ MG, 12 Volt and 28 Volt.
(Also available in 6 Volt, 24 Volt and 48 Volt)

Colour	Part No.	Voltage
● Red	10-2J09.1062	12VAC/DC, 7/14mA
● Yellow	10-2J09.1064	12VAC/DC, 7/14mA
● Green	10-2J09.1065	12VAC/DC, 7/14mA
● Blue	10-2J09.1066	12VAC/DC, 7/14mA
○ White	10-2J09.1069	12VAC/DC, 7/14mA
● Red	10-2J13.1062	28VAC/DC, 7/14mA
● Yellow	10-2J13.1064	28VAC/DC, 7/14mA
● Green	10-2J13.1065	28VAC/DC, 7/14mA
● Blue	10-2J13.1066	28VAC/DC, 7/14mA
○ White	10-2J13.1069	28VAC/DC, 7/14mA

A Accessories



Lens, plastic for flush mount rectangular indicator and pushbutton actuators

Colour	Part No.	Size
● Red	61-9681.2	24 x 30 mm
● Yellow	61-9681.4	24 x 30 mm
● Green	61-9681.5	24 x 30 mm
● Blue	61-9681.6	24 x 30 mm
○ Clear	61-9681.7	24 x 30 mm



Lens, plastic for flush mount round indicator and pushbutton actuators

Colour	Part No.	Size
● Red	61-9642.2	25 mm Ø
● Yellow	61-9642.4	25 mm Ø
● Green	61-9642.5	25 mm Ø
● Blue	61-9642.6	25 mm Ø
○ Clear	61-9642.7	25 mm Ø

A Accessories



Lens, plastic for flush mount square indicator and pushbutton actuators

Colour	Part No.	Size
● Red	61-9671.2	24 x 24 mm
● Yellow	61-9671.4	24 x 24 mm
● Green	61-9671.5	24 x 24 mm
● Blue	61-9671.6	24 x 24 mm
○ Clear	61-9671.7	24 x 24 mm



Lever for selector switch, flush mount, coloured lever bar options available as indicated

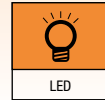
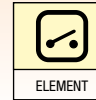
Colour	Part No.
● Red	61-9028.20
● Yellow	61-9028.40
● Green	61-9028.50
● Blue	61-9028.60
○ White	61-9028.9
● Black	61-9028.0



Keylock switch front bezel, black plastic

Image	Part No.	Size
1	61-9230.0	24 x 30 mm
2	61-9220.0	24 x 24 mm
3	61-9210.0	25 mm Ø

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Front bezel set for flush mount indicator, illuminated pushbutton and square and rectangular keylock switch

Image	Part No.	Material	Size
1	61-9933.10	Plastic black	25 mm Ø
2	61-9933.0	Aluminium nat.	25 mm Ø
3	61-9931.0	Plastic black	24x30 mm
4	61-9930.0	Plastic black	24x24 mm



Front bezel set for round flush mount selector, keylock switch and square selector switch

Image	Part No.	Material	Size
1	61-9932.10	Plastic black	25 mm Ø
2	61-9936.0	Plastic black	24x24 mm
3	61-9932.0	Aluminium nat.	25 mm Ø



Flap guard, flush mount

Image	Part No.	for switch
1	61-9922.0	24x30 mm
2	61-9921.0	24x24 mm
3	61-9924.0	25 mm Ø

A Accessories



Blanking plate

Image	Part No.	Mounting hole
1	61-9453.0	22.5 mm Ø
2	61-9452.0	21x27 mm
3	61-9451.0	21x21 mm



Lens remover for flush mount, mounting tool and LED remover

Image	Part No.	Product description
1	61-9730.0	Lens remover for flush mount
2	01-907	Mounting tool
3	61-9740.0	LED remover

System switch 71

Switching system

Self-cleaning, double-break snap-action switching system with one NC- (Normally closed) and one NO-contact (Normally open).

Material

Lens

Polycarbonat (PC), as per UL 94 V0, or Aluminium anodized

Front bezel

Polyetherimid (PEI), as per UL 94 V0, or Aluminium anodized

Material of contact

AgNi, 2 µm gold plated

Switching element

Polyethylene terephthalate (PETP), as per UL 94 V0

Actuator housing

Polyetherimide (PEI), as per UL 94 V0

Mechanical characteristics

Terminals

PCB terminal, Brass gold plated

Actuating torque

Selector-/Keylock switch 4 Ncm ... 8 Ncm

Actuating force

Pushbutton 2 N ... 3 N

Actuating travel

Pushbutton 3 mm

Selector-/keylock switch	2 positions	3 positions
Momentary action	approx. 42°	approx. 2 x 42°
Maintained action	approx. 90°	approx. 2 x 90°

Rebound time

≤1 ms

Mechanical lifetime

Pushbutton maintained action	1 million	cycles of operation
Pushbutton momentary action	2 million	cycles of operation
Keylock switch	50 000	cycles of operation
Selector switch	100 000	cycles of operation

Resistance to heat of soldering

Manual soldering	350 °C, 3 sec.
Flow soldering	260 °C, 5 sec.

Electrical characteristics

Contact resistance

Starting value (initial) ≤50 mΩ

Isolation resistance

≥10¹² Ω

Switch rating

Switch rating AC cosφ 0.7 ... 0.8

Voltage 250 VAC

Current 3 A

Switch rating DC

Voltage 24 VDC 250 VDC

Current 3 A 0.5

Recommended minimum operational data

Voltage 5 VAC

Current 10 mA

Electric strength

2000 VAC, 50 Hz, 1 min. between all terminals and earth

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +55 °C

Protection degree

Frontside IP65

Shock resistance

(semi-sinusoidal)

max. 500 m/s², pulse width 11 ms, 3-axis, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

max. 100 m/s² at 10 Hz ... 500 Hz, as per EN IEC 60068-2-6

Climate resistance

Damp heat, state

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

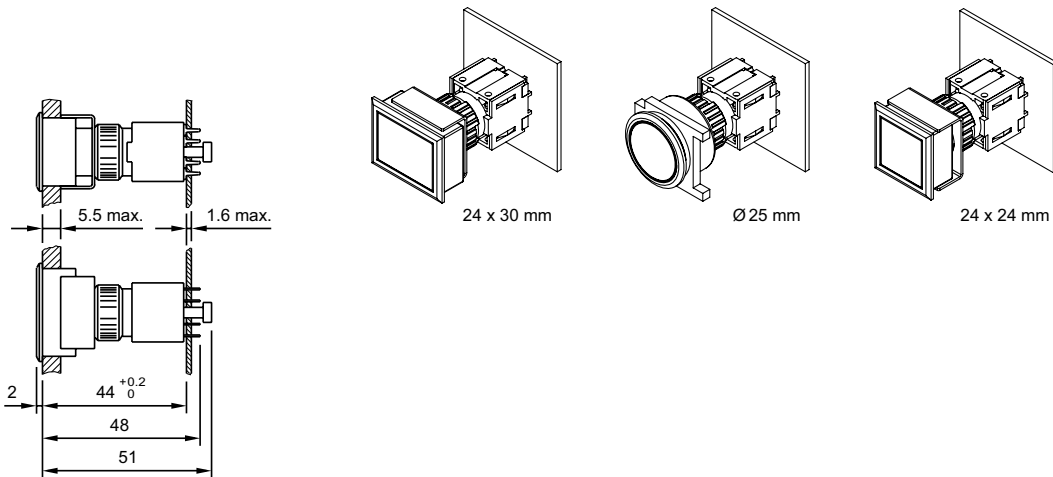
Approvals

Declaration of conformity

CE

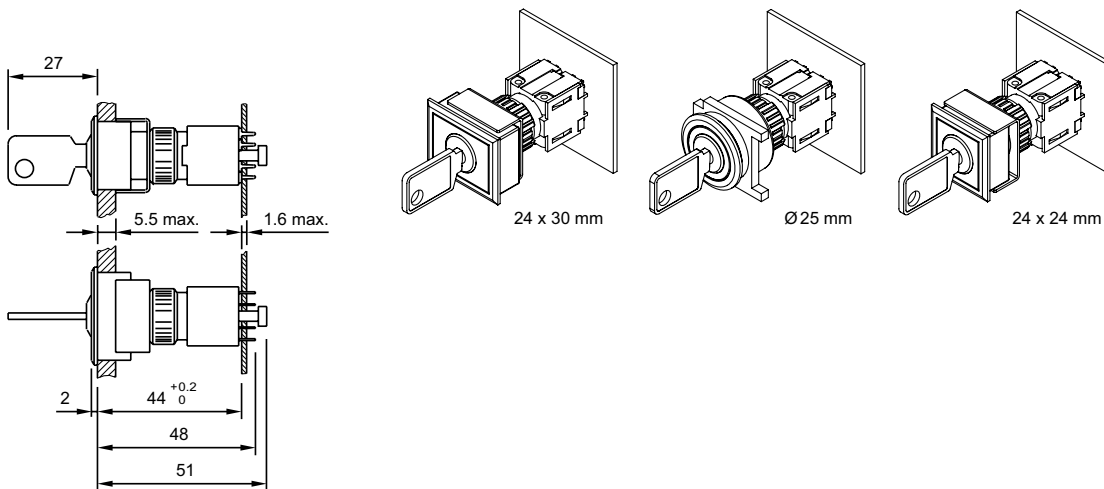
71 Indicator Illuminated, Pushbutton

Flush, Round, Square, Rectangular



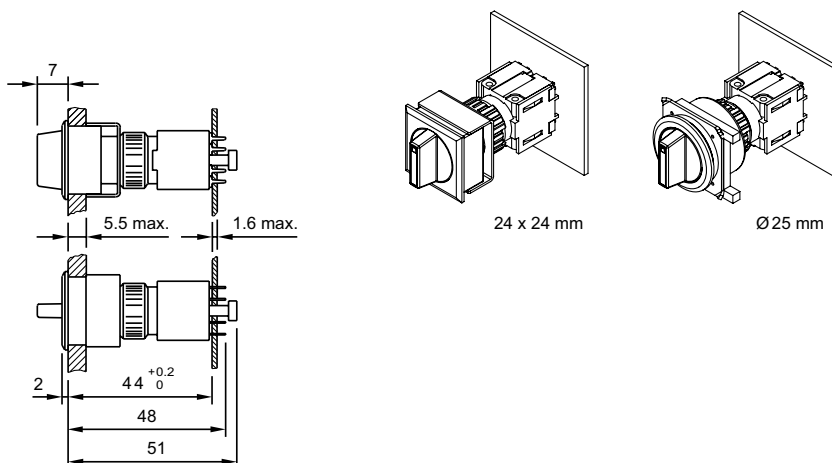
71 Keylock switch

Flush, Round, Square, Rectangular



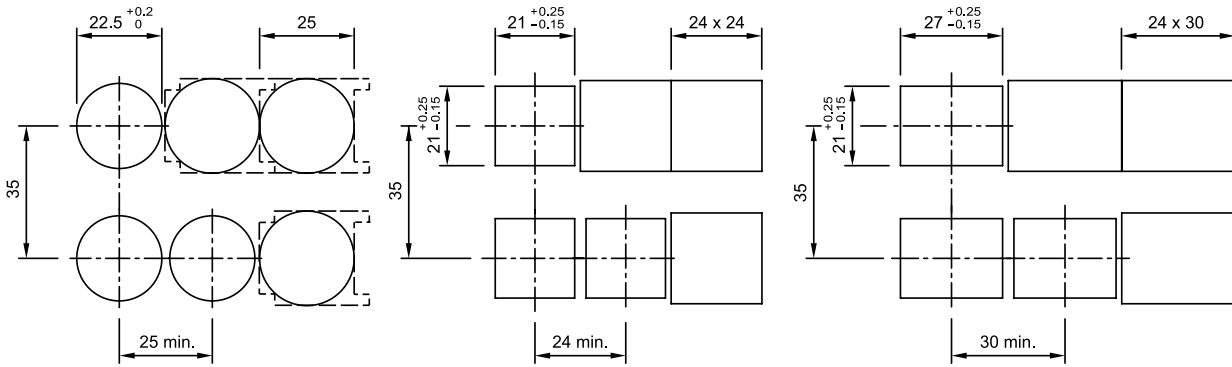
71 Selector switch

Flush, Round, Square, Rectangular



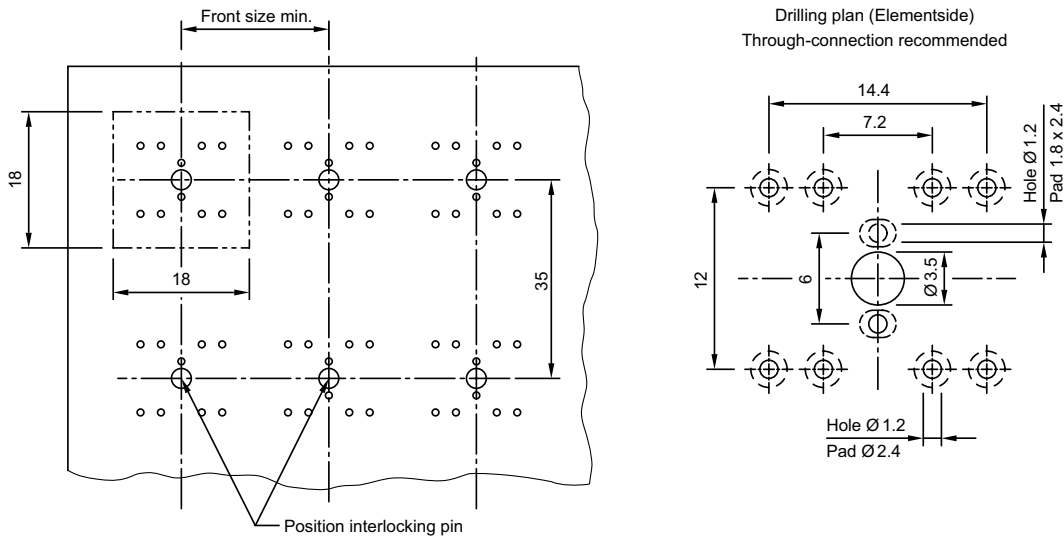
71 Cut-outs

Indicator, Pushbutton Flush, Keylock Flush, Selector Flush



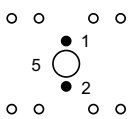
71 PCB Layout

Indicator, Pushbutton Flush, Keylock Flush, Selector Flush

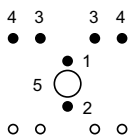


Note:
Pitch of the print circuit board hole Ø 3.5 must agree with the mounting holes on the front plate

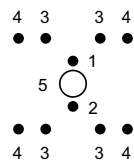
Layout



Illumination element
71-670.006



Switching element
71-671.026



Switching element
71-672.006

- 1 Lamp cathode (-)
- 2 Lamp anode (+)
- 3 Contact normally closed
- 4 Contact normally open
- 5 Hole for interlocking pin



EAO delivers added value to its products, through the offering of a wide range of well engineered tools and accessories that service a variety of functions. These tools are common to either one or many series. Please see the individual series pages for relevant tools.



- 1 Lens remover for flush mount bezel
- 2 Mounting tool
- 3 Lens remover for raised bezel
- 4 Contact block remover
- 5 LED remover
- 6 Lens remover
- 7 Mounting tool
- 8 LED remover
- 9 Lens, LED and lamp remover
- 10 Mounting tool

Series 84

22.5 mm IP67 42V 100mA E-stop: IP65 3A 250VAC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

The Series 84 consists of indicators, pushbuttons and low depth monoblock Emergency-stop switches. The indicators and pushbuttons are a modular system of lens, actuator and switching element with connections using plug-in terminals.

Within the many different colours, the lenses are available either in plastic or anodised aluminium.

Technical data see page 126

Emergency-stop switches

- IP65 Protection (Emergency-stop switches)
- Switch Rating for emergency-stop switch: 3A/120VAC, 1.5A/240VAC
- LED Voltage for Emergency-stop switch: 5-30VDC
- Compact Emergency-stop meets EN 60947-5-1, EN 60947-5-5 and DIN EN ISO 13850
- Mounting into 22.5 mm mounting hole
- Switching elements with solder/plug-in terminal or ribbon cable, 300 mm long

Actuators/Elements

- IP67 Protection (Switches and Indicators)
- Illumination using Single or Multi-LED's in red, orange, yellow, green, blue or white
- Switch Rating for indicator and pushbutton: 10 mA – 100 mA, 50 mVAC/VDC – 42VAC/VDC
- Flush Mounting into 22.5 mm mounting hole
- Switching elements with solder/plug-in terminal or ribbon cable, 300 mm long

Detailed product selectors pages see 122-125

Emergency-stop switch



Emergency-stop red LED illuminated, plug-in terminals, twist release, 32 mm diameter for 22.5 mm mounting, foolproof to EN 60947-5-5

Part No.	Contact type
84-5021.2B20	1NC
84-5041.2B20	2NC
84-5031.2B20	1NC/1NO



Emergency-stop red LED illuminated, ribbon cable, twist release, 32 mm diameter for 22.5 mm mounting, foolproof to EN 60947-5-5

Part No.	Contact type
84-5021.2B40	1NC
84-5041.2B40	2NC
84-5031.2B40	1NC/1NO

Emergency-stop switch



Emergency-stop non illuminated, plug-in terminals, twist release, 32 mm diameter for 22.5 mm mounting, foolproof to EN 60947-5-5

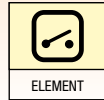
Part No.	Contact type
84-5020.0020	1NC
84-5040.0020	2NC
84-5030.0020	1NC/1NO



Emergency-stop non illuminated, ribbon cable, twist release, 32 mm diameter for 22.5 mm mounting, foolproof to EN 60947-5-5

Part No.	Contact type
84-5020.0040	1NC
84-5040.0040	2NC
84-5030.0040	1NC/1NO

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Indicator actuator



Indicator actuator for flush mount, black plastic, IP67 front protection, 22.5 mm mounting

Part No.	Material
84-0100.0	Plastic
84-0200.7	Aluminium

For complete switch also order **A**

Actuator Halo Illumination



Halo Indicator actuator for flush mount, plastic translucent, IP67 front protection, 22.5 mm mounting

Part No.
84-0090.7

For complete indicator: order lens 84.7205.X00X or 84-7202.X00A

For complete switch also order **A**

Illum. pushbutton actuator



Pushbutton actuator for flush mount, black plastic, impulse function; IP67 front protection, 22.5 mm mounting

	Part No.	Material
	84-1101.0	Plastic
	84-1201.2	Aluminium
	84-1201.4	Aluminium
	84-1201.5	Aluminium
	84-1201.6	Aluminium
	84-1201.7	Aluminium

For complete switch also order **A**

Actuator Halo Illumination



Halo Pushbutton actuator for flush mount, plastic translucent, IP67 front protection, 22.5 mm mounting

Part No.
84-1091.7

For complete pushbutton: order lens 84.7205.X00X or 84-7202.X00A

For complete switch also order **A**

Indicator element



Indicator element, 24VDC LED, plug-in terminals

	Part No.	
	84-8001.2620	Single-chip LED
	84-8001.3620	Single-chip LED
	84-8001.4620	Single-chip LED
	84-8001.5620	Single-chip LED
	84-8001.6620	Single-chip LED
	84-8001.9620	Single-chip LED



Indicator element, bi-colour, 24VDC, L/S, plug-in terminals

Colour	Part No.
	84-8005.8620
	84-8005.7620

Series 84

22.5 mm IP67 42V 100mA E-stop: IP65 3A 250VAC

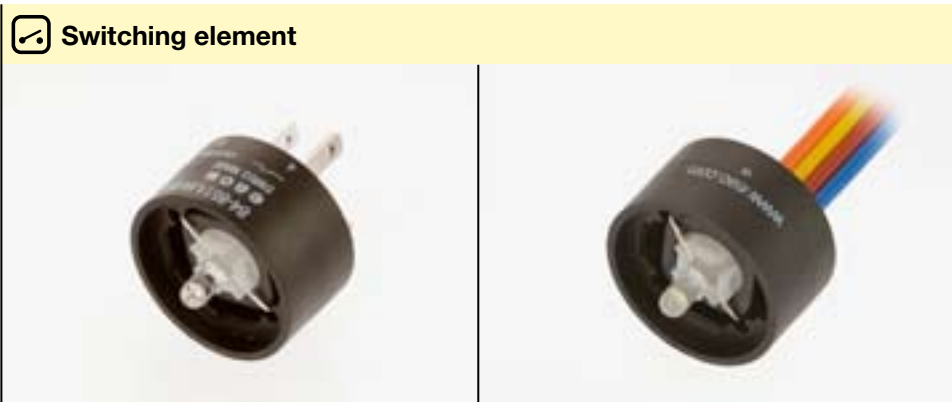


Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Indicator element, bi-colour, 24VDC, ribbon cable 300 mm, three strands, 1NO

Colour	Part No.
Red/Green	84-8005.8640
Yellow/Green	84-8005.7640



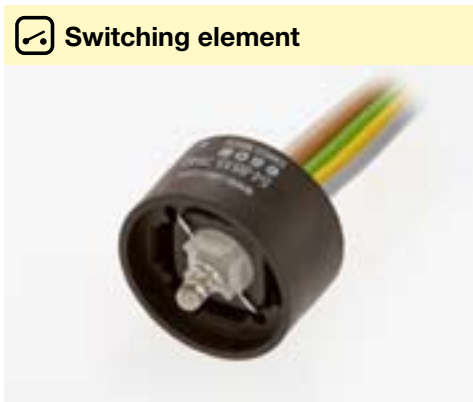
Switching element, 24VDC LED, plug-in terminals, 1NO

Colour	Part No.	Comment
Red	84-8511.2620	Single-chip LED
Orange	84-8511.3620	Single-chip LED
Yellow	84-8511.4620	Single-chip LED
Green	84-8511.5620	Single-chip LED
Blue	84-8511.6620	Single-chip LED
White	84-8511.9620	Single-chip LED
	84-8510.0020	No LED - switching element only



Switching element, 24VDC, IP67; ribbon cable 300 mm, four strands, 1NO

Colour	Part No.	Comment
Red	84-8511.2640	Single-chip LED
Orange	84-8511.3640	Single-chip LED
Yellow	84-8511.4640	Single-chip LED
Green	84-8511.5640	Single-chip LED
Blue	84-8511.6640	Single-chip LED
White	84-8511.9640	Single-chip LED
	84-8510.0040	No LED - switching element only



Switching element, bi-colour, 24VDC, IP67; ribbon cable, 300 mm, five strands, 1NO

Colour	Part No.
Red/Green	84-8515.8640
Yellow/Green	84-8515.7640



Lens, plastic for flush mount, round indicator and pushbutton actuators

Colour	Part No.	Comment
Red	84-7111.200	
Yellow	84-7111.400	
Green	84-7111.500	
Blue	84-7111.600	
Clear	84-7111.700	
Black	84-7121.000	Not for illumination

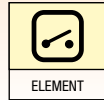


Lens, plastic; transparent; illuminated ring; flat

Colour	Part No.
Red	84-7111.201
Orange	84-7111.301
Yellow	84-7111.401
Green	84-7111.501
Blue	84-7111.601
Clear	84-7111.701

Not recommended for Halo Illumination

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Recommended Lens for Halo illumination, aluminium, flat raised

Colour	Part No.	Comment
● Red	84-7211.200A	for Halo
● Yellow	84-7211.400A	for Halo
● Green	84-7211.500B	for Halo
● Blue	84-7211.600A	for Halo
○ Aluminium	84-7211.800A	for Halo
● Black	84-7211.000A	for Halo



Recommended Lens for Halo illumination, aluminium, convex raised

Colour	Part No.	Comment
● Red	84-7202.200A	for Halo
● Yellow	84-7202.400A	for Halo
● Green	84-7202.500A	for Halo
● Blue	84-7202.600A	for Halo
○ Aluminium	84-7202.800A	for Halo
● Black	84-7202.000A	for Halo



Lens, aluminium flat – with dot

Colour	Part No.
● Red	84-7211.200
● Yellow	84-7211.400
● Green	84-7211.500
● Blue	84-7211.600
○ Aluminium	84-7211.800
● Black	84-7211.000

A Accessories



Lens, aluminium raised – with dot

Colour	Part No.
● Red	84-7215.200
● Yellow	84-7215.400
● Green	84-7215.500
● Blue	84-7215.600
○ Aluminium	84-7215.800
● Black	84-7215.000



Emergency-stop switch enclosure with 22.5 mm Ø mounting hole, 65 mm (w) x 65 mm (h) x 57 mm (d), anti twist hole. Cable gland M16 or M20, IP66

Image	Part No.	Thread
1	61-9480.5	
2	61-9481.6	M16
3	704-945.6	M20



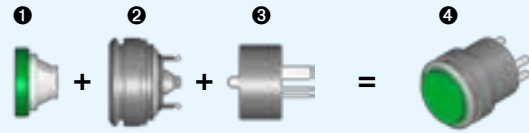
Lens remover for flush mount, mounting tool and switching element remover

Image	Part No.	Product description
1	61-9730.0	Lens remover for flush mount
2	84-997	Mounting tool
3	84-998	Switching element remover
4	84-996	Mounting tool, E-stop

Series 84 Product Selector

Part Number Assistant

Featured here are our product combinations.
Other options available on request.



Illuminated (Illuminated lens, non-illuminated bezel)

Lens ①

Description								
Material	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Aluminium	Aluminium
Shape	Flush	Flush	Flush	Flush	Flush	Flush	Flush	Flush
Mounting type	Level with bezel	Level with bezel	Level with bezel	Level with bezel	Level with bezel	Raised above bezel	Level with bezel	Raised above bezel
Black							84-7211.000	84-7215.000
Red	84-7111.201	84-7111.202	84-7111.203	84-7111.200	84-7111.200	84-7115.200	84-7211.200	84-7215.200
Orange	84-7111.301			84-7111.300	84-7111.300	84-7115.300		
Yellow	84-7111.401			84-7111.400	84-7111.400	84-7115.400	84-7211.400	84-7215.400
Green	84-7111.501	84-7111.502	84-7111.503	84-7111.500	84-7111.500	84-7115.500	84-7211.500	84-7215.500
Blue	84-7111.601	84-7111.602	84-7111.603	84-7111.600	84-7111.600	84-7115.600	84-7211.600	84-7215.600
Transparent	84-7111.701	84-7111.702	84-7111.703	84-7111.700	84-7111.700	84-7115.700		
Anodised aluminium							84-7211.800	84-7215.800
Grey								
Bi-colour possible		X	X	X			X	X
Marking of marking plate possible					X	X		

Actuator (with bezel) ②

Front dimension	25 mm dia.		25 mm dia.		25 mm dia.		40 mm dia.
Mounting hole	22.5 mm dia.		22.5 mm dia.		22.5 mm dia.		30.5 mm dia.
Front protection	IP40		IP67		IP67		IP67
Actuator for	Illum. pushbutton	Indicator	Illum. pushbutton	Indicator	Illum. pushbutton	Indicator	Illum. pushbutton
Bezel material	Plastic	Plastic	Plastic	Plastic	Aluminium	Aluminium	Aluminium
Black	84-2101.0	84-3100.0	84-1101.0	84-0100.0	84-1201.0		
Red					84-1201.2		
Yellow					84-1201.4		
Green					84-1201.5		
Blue					84-1201.6		
Natural					84-1201.7	84-0200.7	84-1221.7
White translucent							

Switching element ③

Terminal	Cable 300 mm		Plug-in 2.8 x 0.8 mm		Cable 300 mm		Plug-in
Switching element for	Illum. pushbutton	Indicator	Illum. pushbutton	Indicator	Illum. pushbutton	Indicator	Illum. pushbutton
Operating voltage/-current of LED	12VDC, 10 mA	12VDC, 10 mA	12VDC, 10 mA	12VDC, 10 mA	24VDC, 10 mA	24VDC, 10 mA	24VDC, 10 mA
Red	84-8511.2340	84-8001.2340	84-8511.2320	84-8001.2320	84-8511.2640	84-8001.2640	84-8511.2620
Orange	84-8511.3340	84-8001.3340	84-8511.3320	84-8001.3320	84-8511.3640	84-8001.3640	84-8511.3620
Yellow	84-8511.4340	84-8001.4340	84-8511.4320	84-8001.4320	84-8511.4640	84-8001.4640	84-8511.4620
Green	84-8511.5340	84-8001.5340	84-8511.5320	84-8001.5320	84-8511.5640	84-8001.5640	84-8511.5620
Blue	84-8511.6340	84-8001.6340	84-8511.6320	84-8001.6320	84-8511.6640	84-8001.6640	84-8511.6620
White	84-8511.9340	84-8001.9340	84-8511.9320	84-8001.9320	84-8511.9640	84-8001.9640	84-8511.9620
Bi-colour LED red/green							
Bi-colour LED yellow/green							
Non-illuminated							

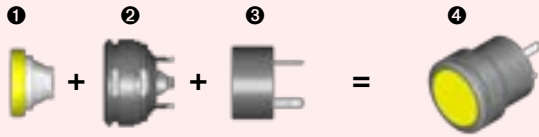
Accessories (optional)

Accessories part			
Description	Marking on plate is possible by engraving or hot stamping. Specific symbols and markings are available on request. 	Legend frame 30 x 50 mm alu black adhesive for 25 mm dia. devices	Legend plate insert 14.5 x 23.5 mm alu natural adhesive 14.5 x 23.5 mm alu black adhesive
Part-No.	61-9707.7	61-9980.0	704.968.0 704.968.1

Example of complete switch ④

Illuminated pushbutton consisting of	Items no.	Part	Part No.
	1	Lens: plastic; green; transparent; raised	84-7115.500
	2	Actuator: aluminium; natural; IP67	84-1201.7
	3	Switching element: LED white; 12VDC; 10 mA; plug-in terminal 2.8 x 0.8 mm	84-8511.9320
		Marking plate Engraving on marking plate "START"; 4 mm letters; black filled	

Dimensions/Mounting types: Refer to last page



**Non-illuminated
(Lens and bezel non-illuminated)**

**Halo Illumination
(Illuminated bezel)**

Opaque Plastic Flush Level with bezel	Opaque Plastic Flush Raised above bezel	Opaque Aluminium Flush Level with bezel	Opaque Aluminium Flush Raised above bezel	Opaque Aluminium Convex Level with bezel	Opaque Aluminium Convex Raised above bezel	Opaque Plastic Mushroom Raised above bezel	Opaque Aluminium Flush Raised above bezel	Opaque Aluminium Convex Raised above bezel
84-7121.000	84-7125.000	84-7201.000 84-7201.200 84-7201.400 84-7201.500 84-7201.600 84-7201.800	84-7205.000 84-7205.200 84-7205.400 84-7205.500 84-7205.600 84-7205.800	84-7202.000 84-7202.200 84-7202.400 84-7202.500 84-7202.600 84-7202.800	84-7202.000A 84-7202.200A 84-7202.400A 84-7202.500A 84-7202.600A 84-7202.800A	84-7124.000A 84-7124.200A 84-7124.400A 84-7124.500A 84-7124.600A	84-7205.000A 84-7205.200A 84-7205.400A 84-7205.500B 84-7205.600A 84-7205.800A	84-7202.000A 84-7202.200A 84-7202.400A 84-7202.500A 84-7202.600A 84-7202.800A

25mm dia. 22.5mm dia. IP40 Pushbutton Plastic	25mm dia. 22.5mm dia. IP67 Pushbutton Plastic	25mm dia. 22.5mm dia. IP67 Pushbutton Aluminium	40mm dia. 30.5mm dia. IP67 Pushbutton Aluminium	Illum. pushbutton Plastic	Indicator Plastic
84-2101.0	84-1101.0	84-1201.0 84-1201.2 84-1201.4 84-1201.5 84-1201.6 84-1201.7	84-1221.7	84-1091.7	84-0090.7

						All switching elements of the "illuminated" range may be used. Bi-colour switching elements are not recommended. Please refer to blue area
2.8 x 0.8mm Indicator 24VDC, 10mA	Cable 300mm Illum. pushbutton 24VDC, 20mA	Indicator 24VDC, 20mA	Plug-in 2.8 x 0.8mm Indicator 24VDC, 20mA	Cable 300mm Pushbutton	Plug-in 2.8 x 0.8mm Pushbutton	
84-8001.2620 84-8001.3620 84-8001.4620 84-8001.5620 84-8001.6620 84-8001.9620	84-8515.8640 84-8515.7640	84-8005.8640 84-8005.7640	84-8005.8620 84-8005.7620	84-8510.0040	84-8510.0020	

Front protective cap Silicon, for flat lenses only	Blind plug Size 25mm dia. black for 25mm dia. devices	Blind plug Size 36mm dia. black for 40mm dia. devices	Flat receptacle 2.8 x 0.8mm	Insulation sleeve For flat receptacle	Plug Two plugs are needed for IP67 rear protection of switching element	Lens remover	Mounting tool For tightening or loosening of fixing nut of 25mm dia. devices	Dismantling tool For dismantling of switching element of actuator
84-9103.7	61-9453.0	704.964.8	84-9420	31-929	84-900	61-9730.0	84-997	84-998

Colour of metal part
Anodised aluminium parts may have visible variations due to technical production reasons.
Additional colours are available on request.

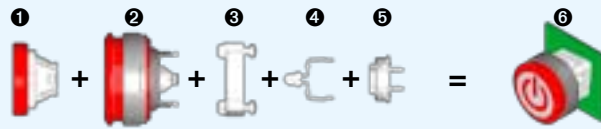
For in-depth information, please refer to the EAO catalogue.

www.eao.com/84STD-ps_en

eao

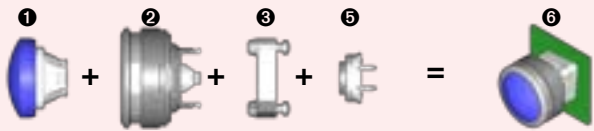
Series 84 PCB Product Selector Part Number Assistant

Featured here are our product combinations.
Other options available on request.

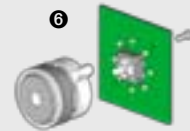


Illuminated (Illuminated lens, non-illuminated bezel)

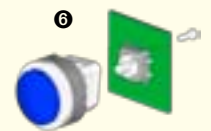
Lens ①								
Description								
Material		Plastic	Plastic	Plastic	Plastic	Plastic	Aluminium	Aluminium
Shape		Flush	Flush	Flush	Flush	Flush	Flush	Flush
Mounting type		Level with bezel	Level with bezel	Level with bezel	Level with bezel	Raised above bezel	Level with bezel	Raised above bezel
Black							84-7211.000	84-7215.000
Red		84-7111.201	84-7111.202	84-7111.203	84-7111.200	84-7115.200	84-7211.200	84-7215.200
Orange		84-7111.301			84-7111.300	84-7115.300		
Yellow		84-7111.401			84-7111.400	84-7115.400	84-7211.400	84-7215.400
Green		84-7111.501	84-7111.502	84-7111.503	84-7111.500	84-7115.500	84-7211.500	84-7215.500
Blue		84-7111.601	84-7111.602	84-7111.603	84-7111.600	84-7115.600	84-7211.600	84-7215.600
Transparent		84-7111.701	84-7111.702	84-7111.703	84-7111.700	84-7115.700		
Anodised aluminium							84-7211.800	84-7215.800
Grey								
Bi-colour possible		X	X	X			X	X
Marking on plate possible					X	X		
Actuator (with bezel) ②								
Front dimension		25 mm dia. 22.5 mm dia. IP40		25 mm dia. 22.5 mm dia. IP67		25 mm dia. 22.5 mm dia. IP67		40 mm dia. 30.5 mm dia. IP67
Mounting hole								
Front protection								
Actuator for		Illum. pushbutton	Indicator	Illum. pushbutton	Indicator	Illum. pushbutton	Indicator	Illum. pushbutton
Bezel material		Plastic	Plastic	Plastic	Plastic	Aluminium	Aluminium	Aluminium
Black		84-2101.0	84-3100.0	84-1101.0	84-0100.0	84-1201.0		
Red						84-1201.2		
Yellow						84-1201.4		
Green						84-1201.5		
Blue						84-1201.6		
Natural						84-1201.7		
White translucent							84-0200.7	
Colourless transparent								84-1221.7
Flange ③								
Standard version (non-illuminated)								
Halo illumination multi-colour bezel		92-960.0						
LED ④								
LED series resistor has to be defined by user.								
LED for switching element*								
Red	2.1VDC, 20 mA							
Orange	2.1VDC, 20 mA					10-2602.3202L		
Yellow	2.2VDC, 20 mA					10-2602.3203L		
Green	3.5VDC, 20 mA					10-2602.3174D		
Blue	3.5VDC, 20 mA					10-2602.3205L		
White	3.5VDC, 20 mA					10-2602.3206L		
Bi-colour LED red/green	1.9/3.5VDC, 20 mA					10-2602.3209L		
Bi-colour LED yellow/green	2.0/3.2VDC, 20 mA							10-2603.320AL
LED for Halo	up to 8 pcs. possible							10-2603.320CL
Switching element ⑤								
Switch rating:								
Voltage	50 mVAC/DC ... 42 VAC/DC							
Current	10 µA ... 100 mA at 240 Ω							
Power	2 W							
Terminal, PCB mount								
Switching element for		X		X				
without LED		Illum. pushbutton		Indicator				
		92-851.342		92-800.042				
Example of complete switch ⑥								
Illuminated pushbutton consisting of	Item no.	Part		Part No.				
	1	Lens: plastic; red; flush; symbol "Stand by"		84-7111.203				
	2	Actuator: aluminium; red; IP67		84-1201.2				
Dimensions/Mounting types: Refer to last page	3	Flange: standard version		92-960.0				
Accessories:	4	LED: red; 2.1 VDC; 20 mA		10-2602.3202L				
Refer to Product Selector Series 84	5	PCB mount switching element without LED		92-851.342				



**Non-illuminated
(Non-illuminated lens and bezel)**



**Halo Illumination
(Multi-colour bezel)**



**Halo Illumination
(Illuminated bezel)**

							<p>All lenses of the "illuminated" and the "non-illuminated" range may be used (with the exception of the mushroom head cap).</p> <p>Please refer to blue and red area</p>		
Opaque Plastic Flush Level with bezel	Opaque Plastic Flush Raised above bezel	Opaque Aluminium Flush Level with bezel	Opaque Aluminium Flush Raised above bezel	Opaque Aluminium Convex Level with bezel	Opaque Aluminium Convex Raised above bezel	Opaque Plastic Mushroom Raised above bezel		Opaque Aluminium Flush Raised above bezel	Opaque Aluminium Convex Raised above bezel
84-7121.000	84-7125.000	84-7201.000 84-7201.200 84-7201.400 84-7201.500 84-7201.600	84-7205.000 84-7205.200 84-7205.400 84-7205.500 84-7205.600	84-7202.000 84-7202.200 84-7202.400 84-7202.500 84-7202.600	84-7202.000A 84-7202.200A 84-7202.400A 84-7202.500A 84-7202.600A	84-7124.000A 84-7124.200A 84-7124.400A 84-7124.500A 84-7124.600A		84-7205.000A 84-7205.200A 84-7205.400A 84-7205.500B 84-7205.600A	84-7202.000A 84-7202.200A 84-7202.400A 84-7202.500A 84-7202.600A
84-7121.800	84-7125.800	84-7201.800	84-7205.800	84-7202.800	84-7202.800A		84-7205.800A	84-7202.800A	

25mm dia. 22.5mm dia. IP40	25mm dia. 22.5mm dia. IP67	25mm dia. 22.5mm dia. IP67	40mm dia. 30.5mm dia. IP67	25mm dia. 22.5mm dia. IP67	25mm dia. 22.5mm dia. IP67	25mm dia. 22.5mm dia. IP67	25mm dia. 22.5mm dia. IP67
Pushbutton Plastic	Indicator Plastic	Pushbutton Plastic	Indicator Plastic	Pushbutton Aluminium	Indicator Aluminium	Pushbutton Aluminium	Indicator Plastic
84-2101.0	84-3100.0	84-1101.0	84-0100.0	84-1201.0 84-1201.2 84-1201.4 84-1201.5 84-1201.6 84-1201.7	84-0200.7	84-1221.7	84-1091.7 84-0090.7
							84-1081.7 84-0080.7

92-960.0	84-960.0	92-960.0

	<p>* All LEDs of the "illuminated" range may be used for switching elements</p> <p>Please refer to blue area</p> <p>10-2602.3202L 10-2602.3203L 10-2602.3174D 10-2602.3205L 10-2602.3206L 10-2602.3209L</p>
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Recommendation:
Osram Hyper Mini TOPLED®

X Pushbutton 92-851.342	X Indicator 92-800.042	X Pushbutton 92-851.342	X Indicator 92-800.042

Colour of metal part
Anodised aluminium parts may have visible variations due to technical production reasons.
Additional colours are available on request.

For in-depth information, please refer to the EAO catalogue.

www.eao.com/84PCB-ps_en



Emergency-stop

Switching system

The double-break switching system can be supplied for the following switching functions: 1 Normally closed, 2 Normally closed, 1 Normally closed + 1 Normally open.

The Normally closed contacts have forced opening according to EN IEC 60947-5-1

Material

Connection cable

Polyvinylchloride (PVC), operating temperature up to +65 °C

Mushroom-head cap

Polybutylenterephthalate (PBT), as per UL 94 V0 (red items)

Actuator housing

Polyamide (PA 66), as per UL 94 V0, Flat ribbon cable-cover
Polyamide (PA 6.6), as per UL 94 V0

Material of contact

Silver alloy gold plated

Mechanical characteristics

Front panel thickness

Standard 1 ... 4mm

With emergency-stop protective shroud Typ-Nr. 84-902, 1-3mm

Mounting hole

22.5mm dia. as per EN IEC 60947-5-1 with anti-twist device

Terminals

Soldering terminals 2.8x0.5 mm (solderable), CuSn₆ tin-plated
Flat ribbon cable 2-, 4-, or 6-poles 0.35 mm² (AWG 22)

Tightening torque

Fixing nut 80Ncm

Actuating force

22N ±4 N

Actuating travel

approx. 4mm to release the internal operation part

Mechanical lifetime

≥50 000 cycles of operations

Electrical characteristics

Standards

The devices comply with: EN IEC 60947-5-1, EN IEC 60947-5-5 (Emergency-stop), DIN EN ISO 13850, EN IEC 60204

Illumination

LED red with pole reversal, constant current source
Operation Voltage 5VDC ... 30VDC
Current consumption 9.7mA ... 12.4mA

Rated Operational Voltage U_e

250VAC, as per EN IEC 60947-1

Rated Insulation Voltage U_i

250V, as per EN IEC 60947-1

Rated Impulse Withstand Voltage U_{imp}

2.5kV, as per EN IEC 60947-1

Contact resistance

New state ≤50 mΩ, as per DIN IEC 60512-2-3

Isolation resistance

>1011 Ω between the open contacts at 500VDC, as per DIN IEC 60512-2-10

Electrical life

≥50 000 cycles of operations (inductive cosφ 0.4), as per EN IEC 60947-5-1

Voltage	120 VAC	240 VAC	125 VDC	250 VDC
Current	3 A	1.5 A	0.55 A	0.27 A

Reduced load ≥50 000 cycles of operations (resistive)

Voltage	1 VAC/DC	42 VAC/DC
Current	100 mA	200 mA

Conventional free air thermal current I_{th}

5A, as per EN IEC 60947-5-1

the maximum current in continuous operation and at ambient temperature must not exceed the quoted maximum values.

Switch rating

Switch rating AC with silver contact (gold plated), service category AC-15, as per EN IEC 60947-5-1

Voltage	120 VAC	240 VAC
Current	3 A	1.5 A

Switch rating DC for silver contact (gold plated), service category DC-13, as per EN IEC 60947-5-1 (inductive)

Voltage	12VDC	24VDC	48VDC	60VDC	125VDC	250VDC
Current _{plug}	5 A	4 A	2.1 A	1.7 A	0.55 A	0.27 A
Current _{cable}	3 A	3 A	2.1 A	1.7 A	0.55 A	0.27 A

Recommended minimum operational data

Silver contacts (gold plated)

Voltage	1 VAC/DC
Current	1 mA

Electric strength

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

Rated conditional short-circuit current

1000A, type of short-circuit unit 6A gG, as per EN IEC 60947-5-1

Protection class

Class II, as per EN IEC 60947-5

Overvoltage category

II, as per EN IEC 60947-1

Degree of pollution

3, as per EN IEC 60947-1

Environmental conditions

Operating temperature

-25°C ... +65°C

Front protection

IP65, as per EN IEC 60529

Shock resistance

(semi-sinusoidal)

max. 150m/s², pulse width 11 ms, 3-axis, as per EN IEC 60068-2-27

Vibration resistance

(sinusoidal)

max. 50m/s² at 10 Hz ... 500Hz, 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

SEV

UL

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 2.8x0.8mm (solderable)

Flat ribbon cable 0.5mm²

PCB terminal

Actuating force

4.0N ±0.2N (measured at the lens)

Actuating travel

~0.5mm

Rebound time

≤1 ms

Resistance to heat of soldering

260 °C, 5 s (PCB assembly)

350 °C, 10 s (when using a soldering iron)

as per EN IEC 60068-2-20

Mechanical lifetime

≥1 million cycles of operations

Electrical characteristics

Illumination

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

Operation Voltage 12VDC 24VDC

Current consumption 40mA 20mA

Contact resistance

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

Isolation resistance

≥1 G Ω between all terminals at 100VDC, as per DIN IEC 60512-2

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 12VDC, 250 mA at 48 Ω

1 million cycles of operation 24VDC, 50 mA at 480 Ω

1 million cycles of operation 24VDC, 100 mA at 240 Ω

5 million cycles of operation 42VDC, 25 mA at 1680 Ω

1.5 million cycles of operation 42VDC, 50 mA at 840 Ω

100 000 cycles of operation 42VDC, 100 mA at 420 Ω

500 000 cycles of operation 24VDC, 200 mA at L/R=30ms

300 000 cycles of operation 42VDC, 100 mA at L/R=30ms

100 000 cycles of operation 42VDC, 200 mA at L/R=30ms

Switch rating

Voltage 50 mVAC/DC ... 42VAC/DC

Current 10 μA ... 100mA

Power max. 2W

Electric strength

500VAC, 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

For IP67 back protection, cable version only, use blind plug Typ-Nr. 84-900

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 10Hz ... 500Hz, 10 cycles, 3-axis, as per

EN IEC 60068-2-6

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 hole

22.5 mm dia. and 30.5 mm dia.

Tightening torque

Fixing nut max. 80 Ncm

Actuating force

4.0 N \pm 0.2 N (measured at the lens)

Actuating travel

Total switching travel 1.2 mm

Mechanical lifetime

\geq 1 million cycles of operations

Electrical characteristics

Electrostatic breakdown value

Plastic case \leq 15 kV

Aluminium case \leq 5 kV

as per IEC 61000-4-2, mounted in plastic front panel

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +70 °C

Front protection

IP67, IP65 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

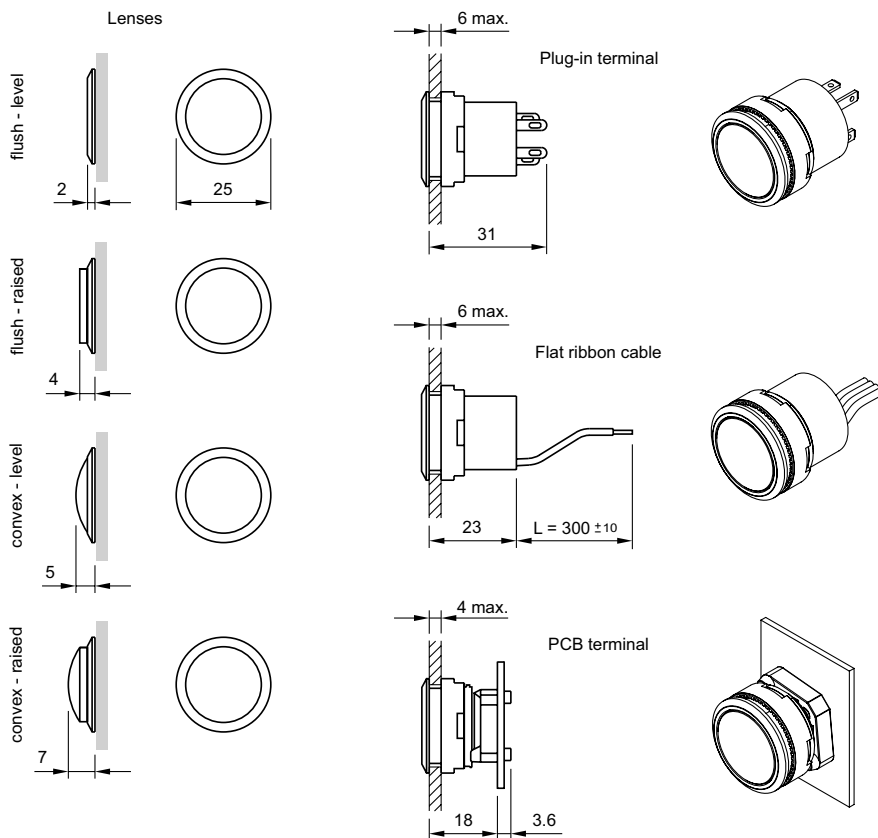
56 days, +40 °C / 93% relative humidity, as per EN IEC 60068-2-78

Rapid change of temperature

100 cycles, -40 °C ... +80 °C, as per EN IEC 60068-2-14

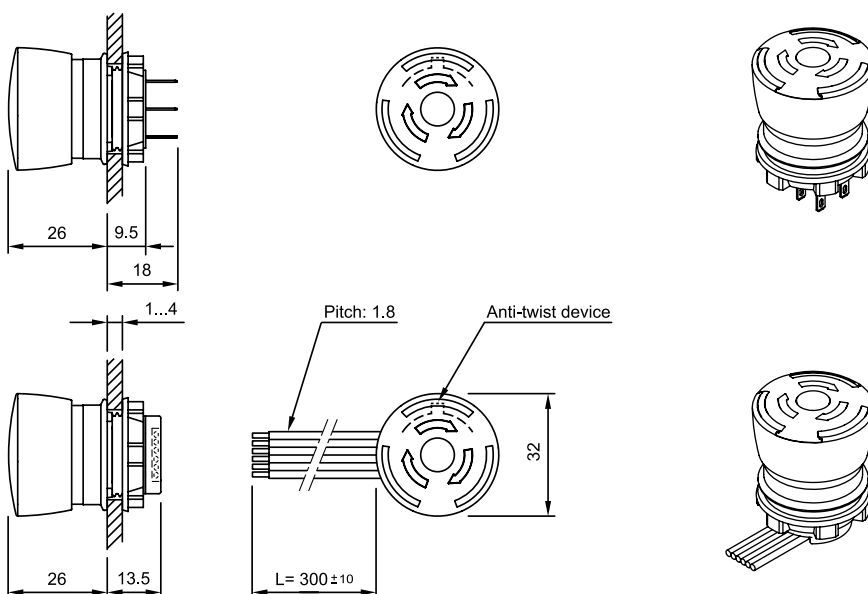
84 Complete Indicator, Complete Pushbutton

Flush, plug-in terminals, Flat ribbon, PCB



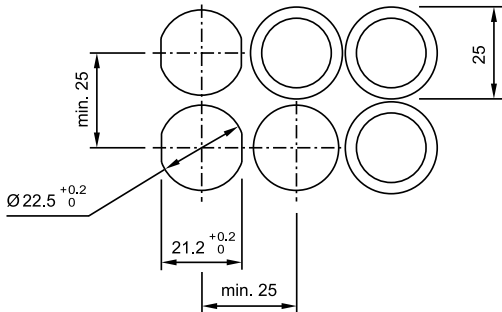
84 Emergency-stop switch

ISO 13850, Illuminated, Non-illuminated, Plug-in, Flat ribbon



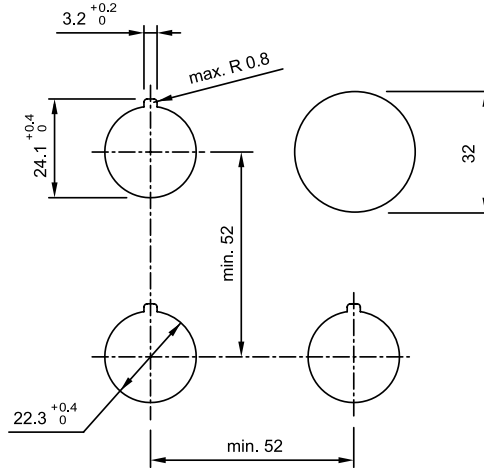
84 Cut-outs

Indicator, Pushbutton



84 Cut-outs, E-Stop

ISO 13850, illuminated, Non-Illuminated, Plug-in, Ribbon Cable

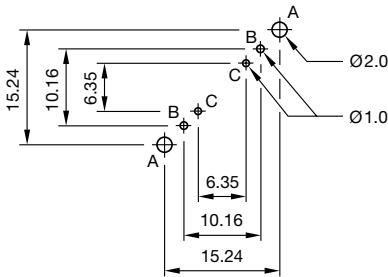


84 PCB-Layout, Indicator

Single-LED

Drilling plan (Elementside)

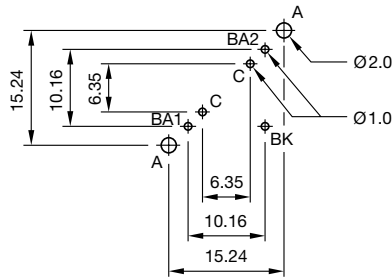
- A Fixing holes for mounting flange (92-960.0)
- B Holes for LED
- C Holes for centering pins



Bi-colour-LED

Drilling plan (Elementside)

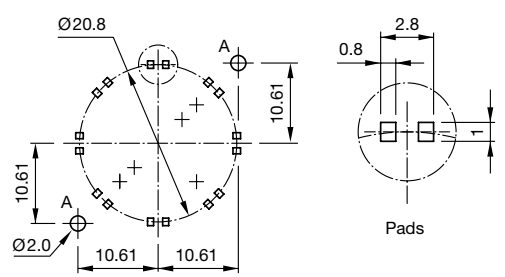
- A Fixing holes for mounting flange (92-960.0)
- B Holes for Bi-colour LED: BA1 (green) + BA2 (yellow or red) = Anodes, BC = Cathode
- C Holes for centering pins



Hyper mini SMD-LED

Drilling plan (Elementside)

- A Fixing holes for mounting flange (84-960.0)

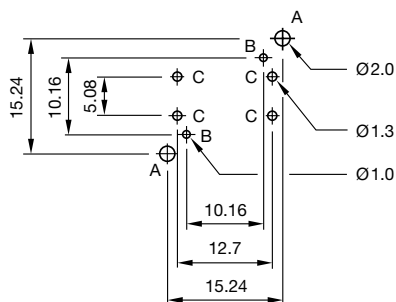


84 PCB-Layout, Pushbutton actuators

Single-LED

Drilling plan (Elementside)

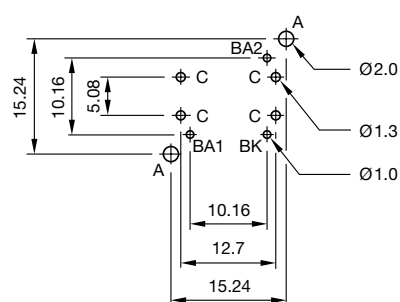
- A Fixing holes for mounting flange (92-960.0)
- B Holes for LED
- C Holes for contact pins
- Pad max. $\varnothing 2.5$ mm
- Through-connection recommended



Bi-colour-LED

Drilling plan (Elementside)

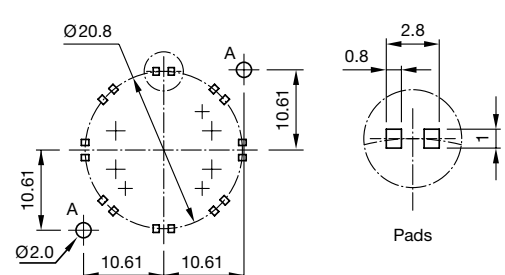
- A Fixing holes for mounting flange (92-960.0)
- B Holes for Bi-colour LED: BA1 (green) + BA2 (yellow or red) = Anodes, BK = Cathode
- C Holes for contact pins
- Pad max. $\varnothing 2.5$ mm
- Through-connection recommended



Hyper mini SMD-LED

Drilling plan (Elementside)

- A Fixing holes for mounting flange (84-960.0)



Multi-tone Sound Module



EAO now offers a sound module within the market-leading Series 56 switch range.

The Multi-tone Sound Module can be programmed to emit clear warning sounds which are specific to a particular operating environment. Possible uses include pedestrian crossings, orientation signals for the visually impaired, public transportation vehicles warning systems or any public area application such as lifts or emergency call equipment.

Up to five different tone sequences can be played in any sequence at different volumes, durations and intervals to create a unique sequence. A set of standard sounds is pre-programmed for equipment in Transport applications.

The robust build and distinctive design makes this an eye-catching feature in any operating environment.

See page 85 for more information.



Series 95

12.1 mm 15.2 mm 18.4 mm IP40 50 mA 48VDC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

Product Profile

The Series 95 is a high quality switch range containing illuminated and non-illuminated pushbuttons. The switching elements are equipped with goldplated, self cleaning and momentary contact elements.

Technical data see page 135

- IP40 Protection
- Switch Rating, 50 mA, 48VDC
- Suitable for mounting on PCB's with thickness of 1.5 to 2.5 mm
- Switch held during the soldering process by the spring clip contacts
- Illumination using SMD LED's with PLCC housing (height 2.1 mm) and a radiation angle of approx. 120°
- Lenses available matt translucent or clear transparent in flat, concave or convex
- Available sizes are: 12.1 mm, 15.2 mm and 18.4 mm square
- Greater than 5 million switch cycles
- Independent illumination allows for flexibility
- Silent operation as required in some audio/ video applications and light and stage technology

☉ Illuminated pushbutton



Illuminated pushbutton, front measurement 12.1 x 12.1 mm, plastic lens colourless transparent, PCP measurement 12.7 x 12.7 mm, 1 NO, IP40

Part No.	Finish	Shape
95-313.720	Matt	Flush
95-313.750	Clear	Flush



Illuminated pushbutton, front measurement 15.2 x 15.2 mm, plastic lens colourless transparent, PCP measurement 15.88 x 15.88 mm, 1 NO, IP40

Part No.	Finish	Shape
95-515.740	Matt	Concave
95-515.720	Matt	Flush
95-515.770	Clear	Concave
95-515.750	Clear	Flush

☉ Illuminated pushbutton



Illuminated pushbutton, front measurement 18.4 x 18.4 mm, plastic lens colourless transparent, PCP measurement 19.05 x 19.05 mm, 1 NO, IP40

Part No.	Finish	Shape
95-414.740	Matt	Concave
95-414.720	Matt	Concave
95-414.770	Clear	Concave
95-414.750	Clear	Flush

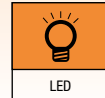
A Accessories



Diffuser, 12.1 mm x 12.1 mm (small)

Part No.	
● Red	95-803.220
● Yellow	95-803.420
● Orange	95-803.320
● Green	95-803.520
● Blue	95-803.620
○ White	95-803.920 standard

Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



A Accessories



Diffuser, 15.2 mm x 15.2 mm (medium)

	Part No.
● Red	95-805.220
● Yellow	95-805.420
● Orange	95-805.320
● Green	95-805.520
● Blue	95-805.620
○ White	95-805.920 standard



Diffuser, 18.4 mm x 18.4 mm (large)

	Part No.
● Red	95-804.220
● Yellow	95-804.420
● Orange	95-804.320
● Green	95-804.520
● Blue	95-804.620
○ White	95-804.920 standard

Switching element



Front measurements, 12.1 mm x 12.1 mm (small)
PCP measurements 12.7 mm x 12.7 mm

	Part No.
	95-313.000

Switching element



Front measurements, 15.2 mm x 15.2 mm (medium)
PCP measurements 15.88 mm x 15.88 mm

	Part No.
	95-515.000



Front measurements, 18.4 mm x 18.4 mm (medium)
PCP measurements 19.05 mm x 19.05 mm

	Part No.
	95-414.000

LED



Please note that EAO does not offer LED's for this product.
The required specification is detailed below

SMD-LED type:
P-LCC package or similar, radiation angle approx. 120°
use of smaller SMD-LED is possible.

SMD-LED configurations:
max. 2 SMD-LED's (switch size 12.7 mm)
max. 3 SMD-LED's (switch size 15.88 mm or 19.05 mm)
single colour or multi colour

Height of SMD-LED:
max. 2.1 mm

Series 95

12.1 mm 15.2 mm 18.4 mm IP40 50 mA 48VDC



Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

A Accessories



Lens flat, matt translucent or clear transparent, 12.1 mm x 12.1 mm (small)



Lens flat, matt translucent or clear transparent, 15.2 mm x 15.2 mm (medium)



Lens flat, matt translucent or clear transparent, 18.4 mm x 18.4 mm (large)

Colour	Part No.	Lens shape	Lens material
● Neutral	95-703.720	Flat	Matt transparent
● Neutral	95-703.750	Flat	Clear transparent

Colour	Part No.	Lens shape	Lens material
● Neutral	95-705.720	Flat	Matt transparent
● Neutral	95-705.750	Flat	Clear transparent
● Neutral	95-705.740	Concave	Matt transparent
● Neutral	95-705.770	Concave	Clear transparent

Colour	Part No.	Lens shape	Lens material
● Neutral	95-704.720	Flat	Matt transparent
● Neutral	95-704.750	Flat	Clear transparent
● Neutral	95-704.740	Concave	Matt transparent
● Neutral	95-704.770	Concave	Clear transparent
● Neutral	95-704.730	Convex	Matt transparent
● Neutral	95-704.760	Convex	Clear transparent

A Accessories



Lens remover and mounting tool for use with all three switch sizes

Image	Part No.	Product description
1	95-900.009	Mounting tool
2	95-900.005	Lens remover

Pushbutton- and Illuminated pushbutton

Switching system

Gold plated momentary contact, 1 normally open, self-cleaning

Material

Plastic items

PC, as per UL 94 HB, Cd-free

Material of contacts

CuSn, contact gold-plated, soldering terminal tinned

Mechanical characteristics

Actuating travel

4.5 mm

Actuating force

3 N to end position

Switching point

at 2.3 ± 0.8 mm operation

Life time

>5 million operations, as per IEC 60512-5-9a

Electrical characteristics

Illumination

recommended SMD-LED types:

P-LCC package or similar, radiation angle approx. 120°; use of smaller

SMD-LED is possible

SMD-LED configurations size:

max. 2 SMD-LEDs for switch size 12.70 mm

max. 3 SMD-LEDs for switch size 15.88 mm and 19.05 mm, single

colour or multi-colour

Height of SMD-LED:

max. 2.1 mm

Switch rating

min. 1 mVDC, 100 µA

max. 48 VDC, 50 mA

Electric strength

≤50 mΩ, as per IEC 60512-2-2b at new state

Isolation resistance

>1 TΩ, as per IEC 60512-2-3a between contacts

Electric strength

2.5 kVAC, as per IEC 60512-2-11

Environmental characteristics

Front protection

IP40 before front plate for complete switch

Operating temperature

–25 °C ... +70 °C

Storage temperature

–40 °C ... +80 °C

Vibration resistance

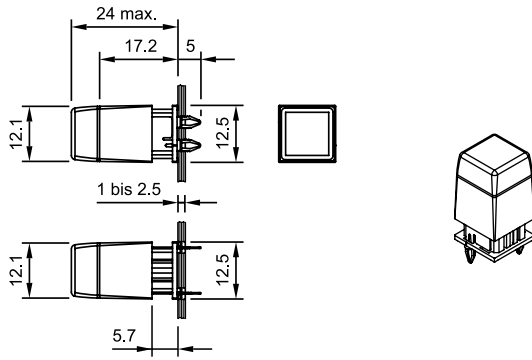
10 g, at 10 – 2000 Hz, 0.75 mm, as per IEC 60512-4-4

Shock resistance

50 g, 11 ms, as per IEC 60512-4-3

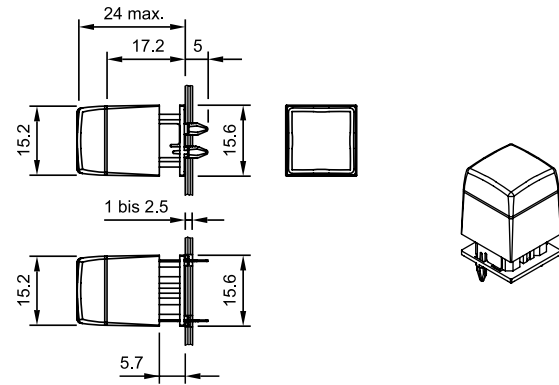
95 Pushbutton

Small



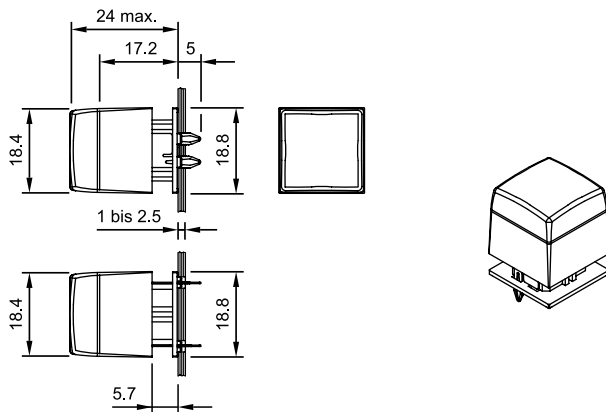
95 Pushbutton

Medium



95 Pushbutton

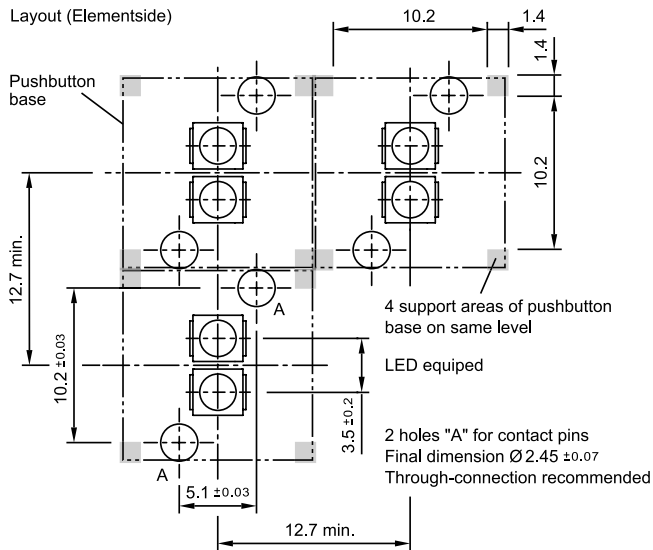
Large



95 PCB Layout

Small

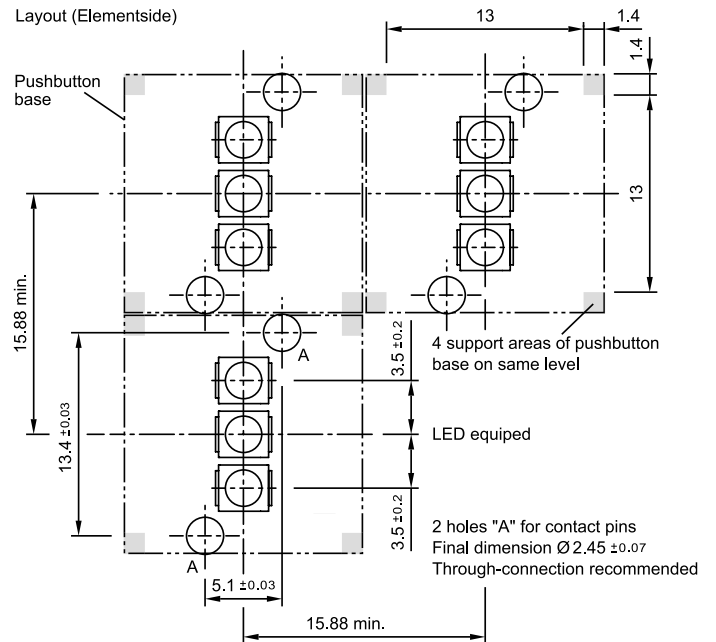
Layout (Elementside)



95 PCB Layout

Medium

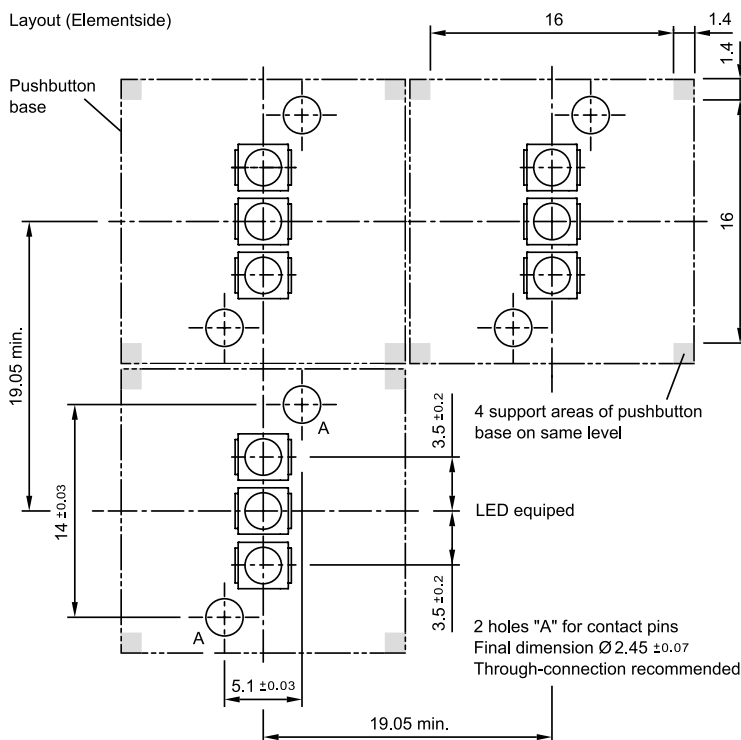
Layout (Elementside)



95 PCB Layout

Large

Layout (Elementside)





For other options or further information please contact your local sales office.

Product Profile

The AVME Series is a high quality, vandal resistant keypad range especially designed to meet the needs of public environment applications, vending machines, ticket machines and access systems.

Technical data see page 139

- Anti pull-off keys
- Alternative concave or flat profile keys
- Positive tactile feel using click dome technology
- IP67 front face sealing behind panel
- 12 or 16 key versions

Keypad



Non illuminated keypad, 3 x 4 keys, pin header connection, concave keys, telephone markings

Part No.	Output type	Key shape
A.12150.C01	Matrix	Concave
A.12100.C01	Common point	Concave



Non illuminated keypad, 4 x 4 keys, pin header connection, concave keys, hexadecimal markings

Part No.	Output type	Key shape
A.16350.C01	Matrix	Concave

Keypad



Non illuminated keypad, 3 x 4 keys, pin header connection, flat keys, telephone markings

Part No.	Output type	Key shape
A.12150.P01	Matrix	Flat
A.12100.P01	Common point	Flat



Non illuminated keypad, 4 x 4 keys, pin header connection, flat keys, hexadecimal markings

Part No.	Output type	Key shape
A.16350.P01	Matrix	Flat

Keypad

Material

Keys

Aluminium

Membrane Case

Polychloroprene Elastomer black (CR)

Back plate

Steel chromated

Contacts

Stainless steel 0.1 µm Gold

Cu tracks on PCB 0.1 µm Gold

Mechanical characteristics

Actuating force

4.3N ±30%

Actuating travel

1.0mm ±0.2mm

Rebound time

≤1 ms

Electrical characteristics

Operating voltage/-current

Nominal 24V, 50mA

Maximum voltage 50V

Minimum voltage 5V

Minimum current 1mA

Isolation resistance

≥1000MΩ at 100VDC

Contact resistance

≤1Ω

Electrical life

≥1 Million cycles of operation per key

Electrostatic breakdown value

5kV

Electric strength

1500Vrms, 50Hz, 1min., as per EN IEC 60512-2

Capacity between open terminals

≤1.5 pF at 1kHz

Environmental conditions

Storage temperature

-40°C ... +85°C

Operating temperature

-25°C ... +85°C

Front protection

IP67 as per IEC 60529, when mounted

Climate resistance

as per EN IEC 60512-6

Damp heat: 21 days

Dry heat: 10 days, +85°C

Saline mist: 48 hours

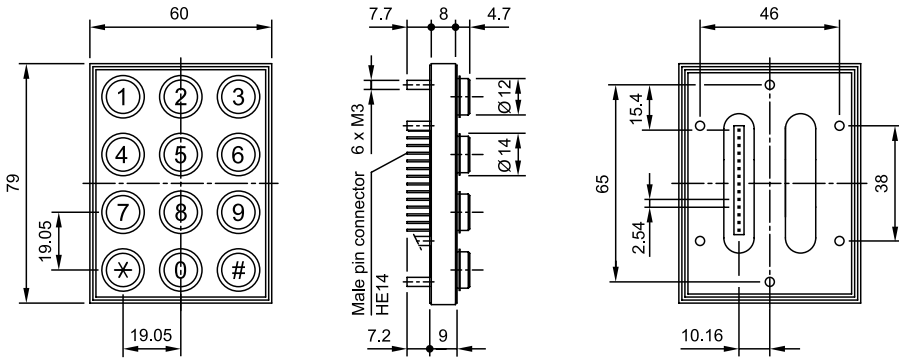
Approvals

Declaration of conformity

CE

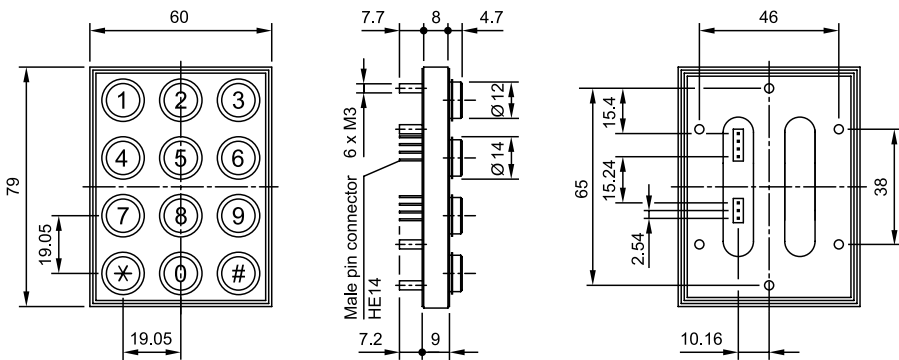
Keypad

Common point, 3x4 keys



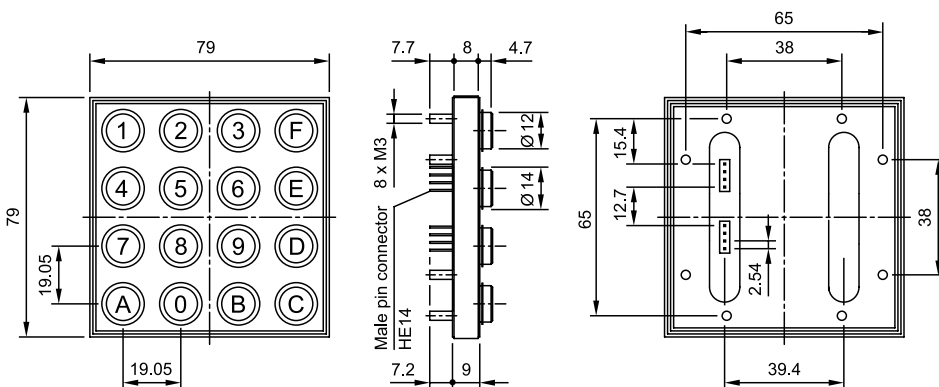
Keypad

Matrix, 3x4 keys



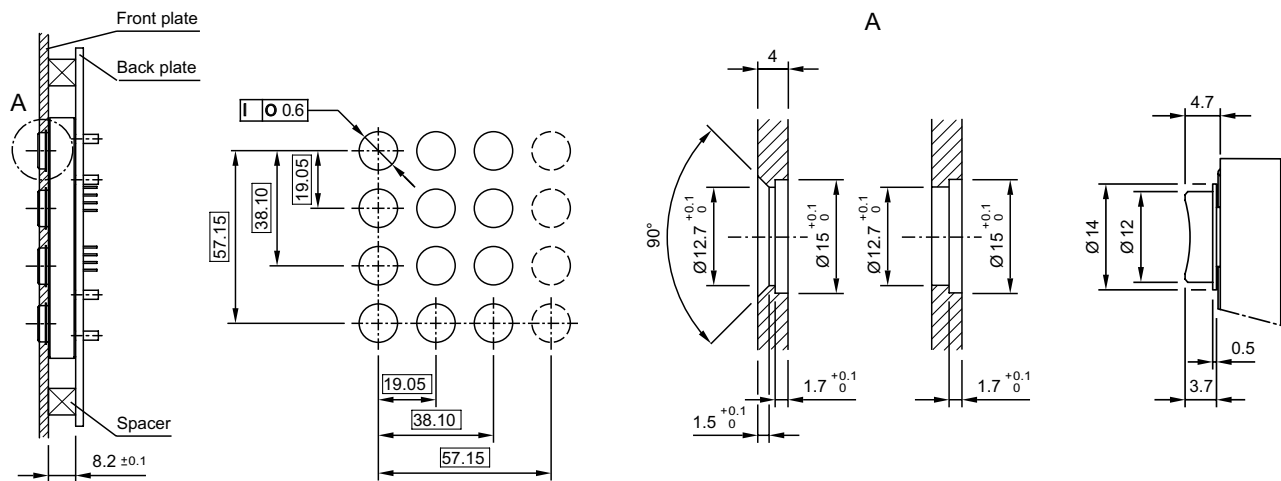
Keypad

Matrix, 4x4 keys



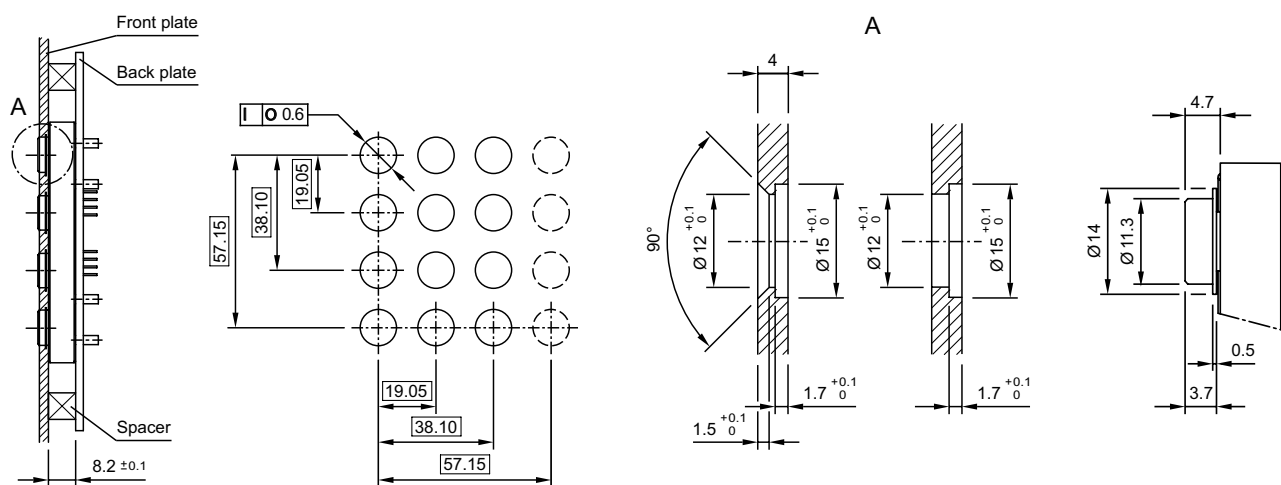
Cut-outs

Concave keys



Cut-outs

Flat keys





For other options or further information please contact your local sales office.

Product Profile

The M.series is an adaptable, vandal-resistant keypad for fitting behind a panel. The modular construction and truly innovative technology allows for total design flexibility, generally without the need for additional engineering or tooling costs. Suitable for access and security control, banking and payment terminals, vending machines, information terminals and kiosks, and machinery and process control.

Technical data see page 144

- Create a unique layout! Choose key illumination, colour, material, tactile feedback and length of travel
- Shock and impact up to IK09X
- Sealed up to IP67
- Integral anti-fraud protection circuit
- Readily adaptable to biometric door-entry systems
- 4, 12 and 16 key versions

Non-Illuminated keypad



Non illuminated keypad, 4 keys, round concave, pin header connection, 1 2 3 4 markings

Part No.	Output type	Contact Type
M04PARSANLPA	Common point	Carbon pill
M04PARSANSPA	Common point	Domes



Non illuminated keypad, 12 keys, round concave, pin header connection, telephone markings

Part No.	Output type	Contact Type
M12PARSANLMT	Matrix	Carbon pill
M12PARSANSMT	Matrix	Domes

Non-Illuminated keypad



Non illuminated keypad, 16 keys, round concave, pin header connection, hexadecimal markings

Part No.	Output type	Contact Type
M16PARSANLMH	Matrix	Carbon pill
M16PARSANSMH	Matrix	Domes



Non illuminated keypad, 16 keys, round concave, pin header connection, banking version with domes, security and coloured keys

Part No.	Output type	Contact Type
M16PARSBNSMB	Matrix	Domes

For other options or further information please contact your local sales office.



☐ Illuminated keypad



Illuminated keypad, 4 keys, round concave, pin header connection, 1 2 3 4 markings

Colour	Part No.	Output type	Contact Type
Yellow	M04iARSAYLPA	Common point	Carbon pill
Yellow	M04iARSAYSPA	Common point	Domes



Illuminated keypad, 12 keys, round concave, pin header connection, telephone markings

Colour	Part No.	Output type	Contact Type
Yellow	M12iARSAYLMT	Matrix	Carbon pill
Yellow	M12iARSAYSMT	Matrix	Domes
Blue	M12iARSABLMT	Matrix	Carbon pill
Blue	M12iARSABSMT	Matrix	Domes



Illuminated keypad, 16 keys, round concave, pin header connection, hexadecimal markings

Colour	Part No.	Output type	Contact Type
Yellow	M16iARSAYLMH	Matrix	Carbon pill
Yellow	M16iARSAYSMH	Matrix	Domes
Blue	M16iARSABLMH	Matrix	Carbon pill
Blue	M16iARSABSMH	Matrix	Domes

☐ Illuminated keypad



Illuminated keypad, 16 keys, round concave, pin header connection, banking version with domes, security and coloured keys type

Part No.	Output type	Contact Type
M16iARSBYSMB	Matrix	Domes

A Accessories



Mounting bracket (two per unit, for all versions of M.series)

Part No.
FIX.M001

Keypad**Material****Plastic parts**

Plastic parts, as per UL 94 V0

Sealing gasket and membrane

Silicone, as per UL 94 HB

Keys

Aluminium anodised

Contacts

Dome version: Nickel/Gold

Membrane version: Carbone/Gold

PCB

PCB: Epoxy FR4, as per UL 94 V0, with gold coating

Mechanical characteristics**Terminals**

Male pin connector: HE14 (number of pins according drawing)

Tightening torque

50 Ncm \pm 5 Ncm (screws for thermoplastic)

Actuating force

Dome version: 4.5 N \pm 30%

Membran version: 1.9 N \pm 30%

Actuating travel

Dome version: 0.6 mm ... 1 mm

Membrane version: 0.8 mm ... 1.3 mm

Rebound time

Dome version: <1 ms

Membrane version: <10 ms

Life time (cycles per key)

Dome version: 1 million actuations

Membrane version: 4 million actuations

Electrical characteristics**Operating voltage/-current**

Operating voltage: 5 VDC

Current rating: 240 mA max.

Illumination

Current consumption for single LED:

20 mA at 2.1 V (yellow and green)

20 mA at 1.9 V (red)

15 mA at 3.7 V (white)

10 mA at 3.4 V (blue)

Interface

4 key version: Common point

Matrix as standard, others on request (common point, USB)

Contact resistance

Dome version: <1 Ω

Membrane version: <200 Ω

Electrostatic breakdown value

15 kV with a metallic front plate

Environmental conditions**Storage temperature**

-40 °C ... +85 °C (-30 °C for illuminated version)

Operating temperature

-25 °C ... +85 °C

Protection degree

IP67 (front face)

Climate resistance

as per EN IEC 60512-6

Damp heat: 21 days, +40 °C

Dry heat: 10 days, +85 °C

Saline mist: 96 hours

UV resistance: 56 days

Impact resistance

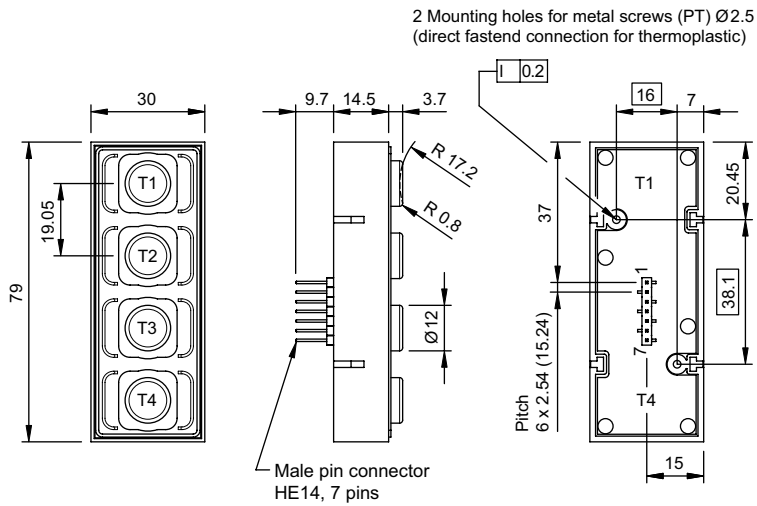
IK 09 for standard version with a 3 mm thick stainless steel front plate

Approvals**Declaration of conformity**

CE

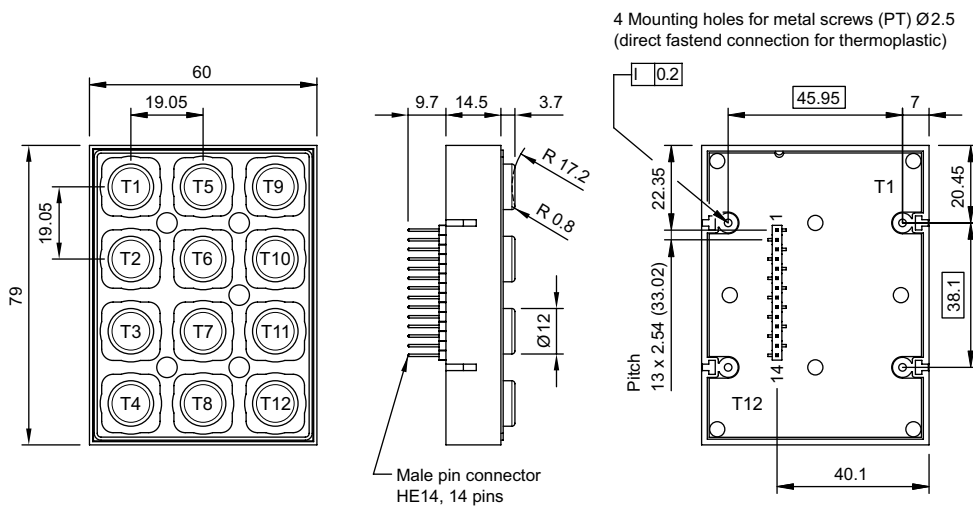
Keypad

4 keys



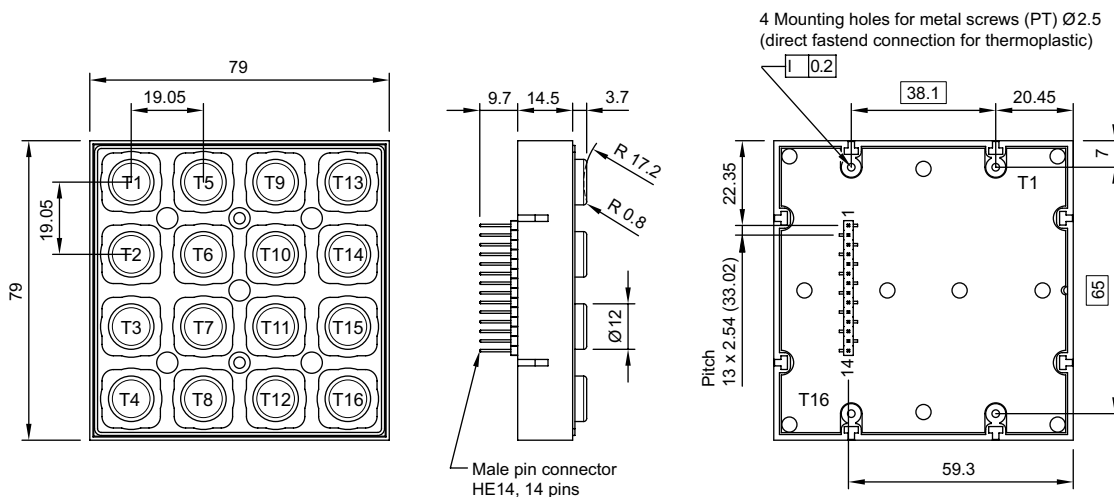
Keypad

12 keys



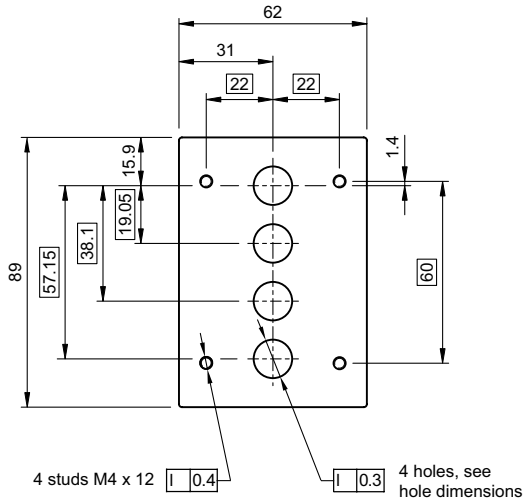
Keypad

16 keys

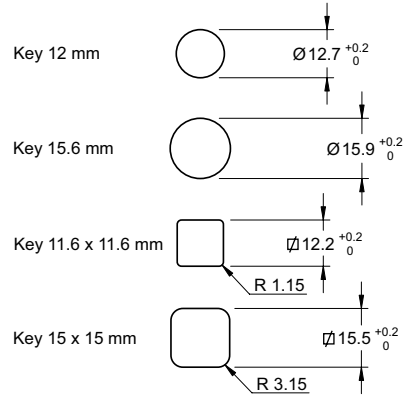


Cut-outs

4 keys

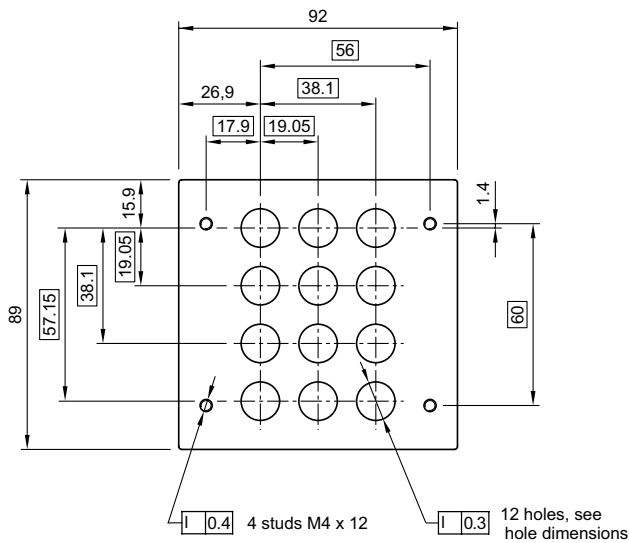


Hole dimensions

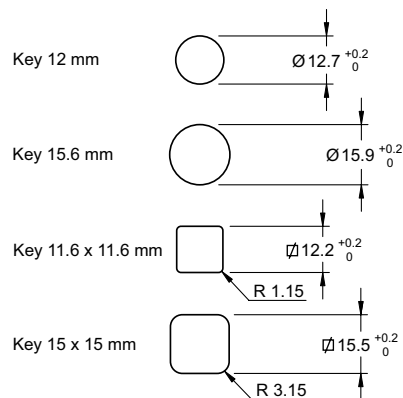


Cut-outs

12 keys

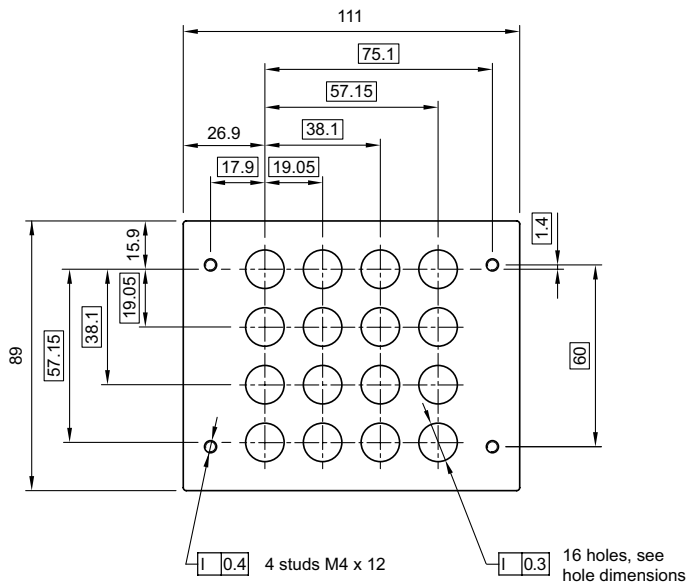


Hole dimensions

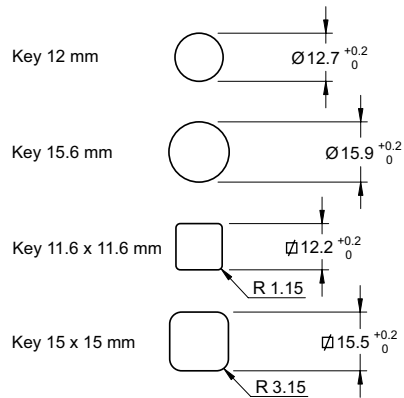


Cut-outs

16 keys



Hole dimensions





For other options or further information please contact your local sales office.

Product Profile

The S.series is a high quality, vandal resistant keypad range especially designed to meet the needs of public environment applications, vending machines, ticket machines, door entry systems, telephones and industrial machinery.

Technical data see page 149

- Illuminated or non illuminated options
- Anti pull-off keys
- High impact resistance
- All metal construction (chromed Zamak keys and housing)
- IP67 front face sealing with gasket supplied
- Front or rear panel mounting
- 12 or 16 key versions

Non-Illuminated keypad



Non illuminated keypad, 3 x 4 keys, pin header connection

Part No.	Output type
S.12150.001	Matrix
S.12100.001	Common point



Non illuminated keypad, 4 x 4 keys, pin header connection

Part No.	Output type
S.16350.001	Matrix
S.16300.001	Common point

Illuminated keypad



Illuminated keypad, 3 x 4 keys, pin header connection

Colour	Part No.	Output type
● Yellow	S.12150.241	Matrix
● Yellow	S.12100.241	Common point
● Blue	S.12150.211	Matrix
● Blue	S.12100.211	Common point



Illuminated keypad, 4 x 4 keys, pin header connection

Colour	Part No.	Output type
● Yellow	S.16350.241	Matrix
● Yellow	S.16300.241	Common point
● Blue	S.16350.211	Matrix
● Blue	S.16300.211	Common point

Keypad

Material

Keys

Zamak 5 with chrome finish

Housing

Zamak 5 with chrome finish

Back plate

Steel chromated

Contacts

Carbon pill

Carbon on Cu tracks

Mechanical characteristics

Actuating force

1 N ... 3 N

Actuating travel

1.3 mm \pm 0.3 mm

Rebound time

\leq 40 ms

Electrical characteristics

Operating voltage/-current

Nominal 5 V, 5 mA

Maximum voltage 24 V

Minimum voltage 0.5 V

Minimum current 0.1 mA

Illumination

Current consumption for single LED:

20 mA at 2.1 V (yellow and green)

20 mA at 1.9 V (red)

10 mA at 3.4 V (blue)

Isolation resistance

\geq 1000 M Ω at 100 VDC

Contact resistance

\leq 200 Ω

Electrical life

4 Million cycles of operation per key

Electrostatic breakdown value

5 kV

Electric strength

1500 Vrms, 50 Hz, 1 min., as per EN IEC 60512-2

Environmental conditions

Storage temperature

-30 °C ... +85 °C

Operating temperature

-25 °C ... +85 °C

Front protection

IP67 as per IEC 60529, when mounted

Climate resistance

as per EN IEC 60512-6

Damp heat: 21 days

Dry heat: 10 days, +85 °C

Saline mist: 96 hours

Impact resistance

IK10 (20 J)

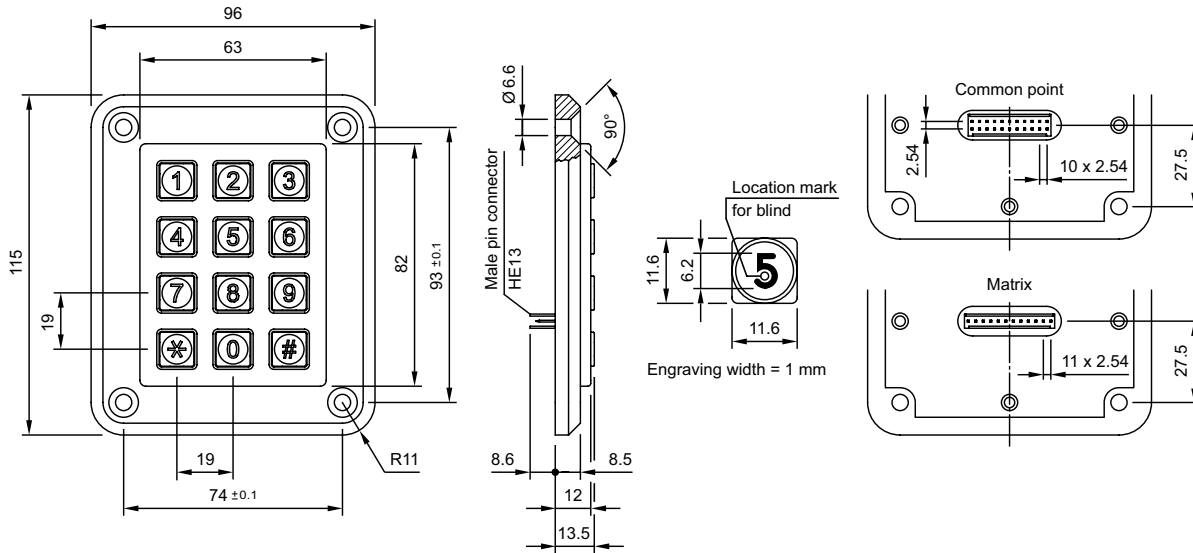
Approvals

Declaration of conformity

CE

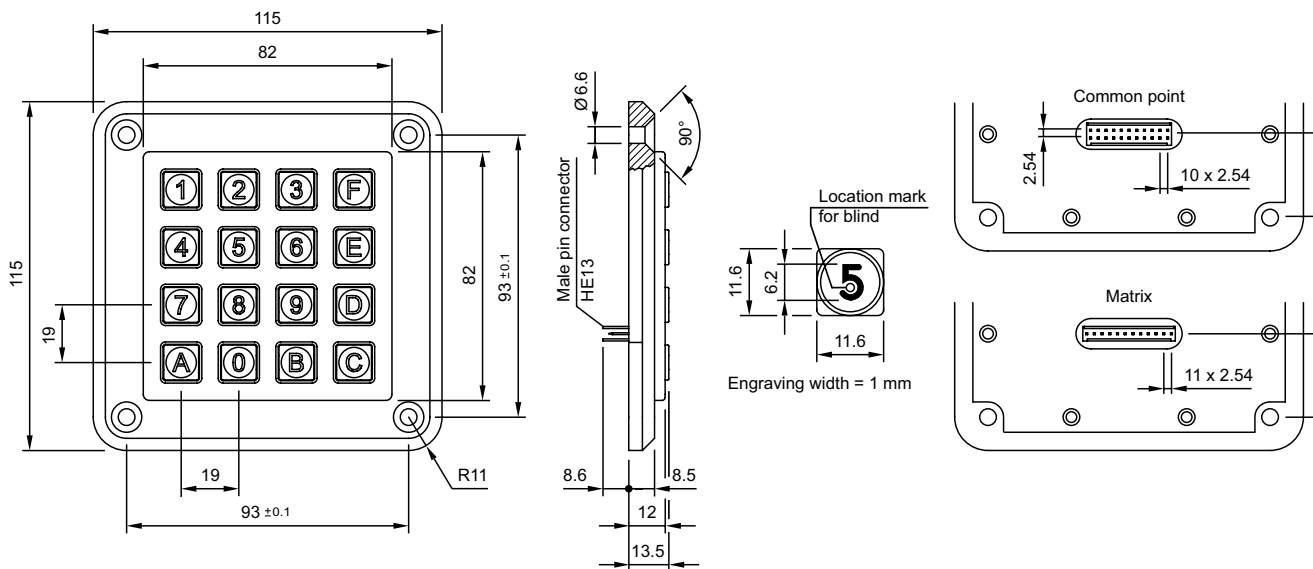
Keypad

3x4 keys



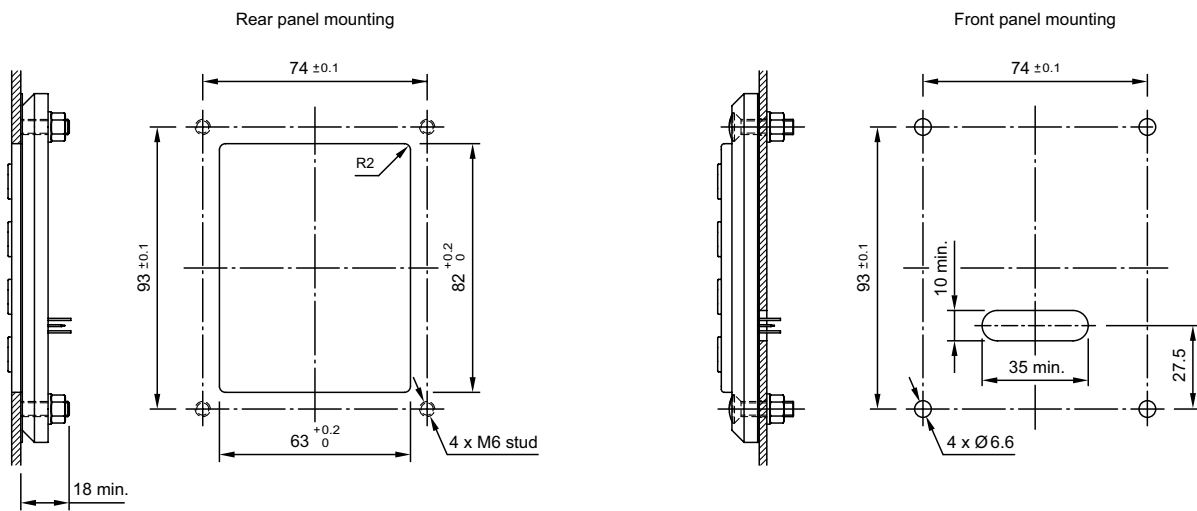
Keypad

4x4 keys



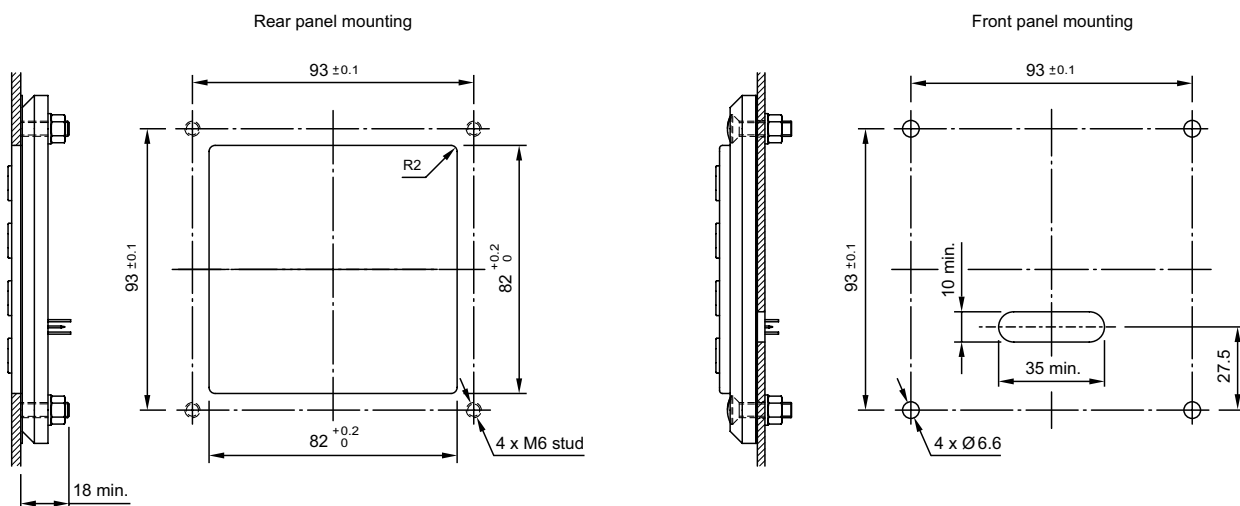
Cut-outs

3x4 keys



Cut-outs

4x4 keys





For other options or further information please contact your local sales office.

Product Profile

The Touch Sensitive Keyboard range operates from under a transparent protective screen, designed to resist cleaning agents and fluids, moisture, dirt ingress and damage from shock and impact, making it ideally suitable for a wide range of applications in industrial and public areas.

Technical data see page 154

- IP65
- Works under polycarbonate or glass up to 10 mm thick
- Adjustable sensitivity
- With or without touchpad
- PS2 or USB connection
- Environment: PS2, Win NT4, 98 SE, ME, 2000 PRO Pack II, XP
- Available in several language layouts
- SCB software included with 74 key unit for design of keyboard and touchpad overlay
- Customisation of key functions on 74 key unit using SCB software
- 105 key OEM version supplied with mounting kit
- Custom layouts possible
- Desktop or behind-panel mounting styles

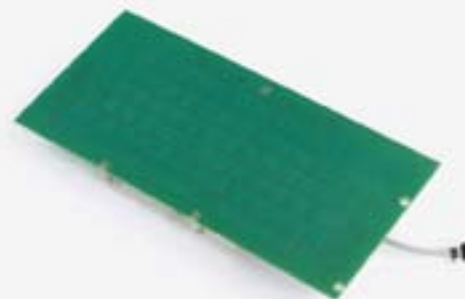
Rugged touch sensitive touchpad



Touchpad without overlay available with 1 click or 2 clicks

Part No.	Interface	Comment
75.00100.U02	USB	1 click
75.00200.U03	USB	2 clicks

Rugged touch sensitive keyboard



Alphanumeric programmable keyboard, 74 keys laid out on PCB without overlay, cable output, layouts in English, German, French and US English

Part No.	Layout	Interface
75.074K0.S01	English	PS2
75.074D0.S01	German	PS2
75.074F0.S01	French	PS2
75.074U0.S01	US English	PS2
75.074K0.U01	English	USB
75.074D0.U01	German	USB
75.074F0.U01	French	USB
75.074U0.U01	US English	USB

Keyboard mounting kit, part no. 75.00005.K01 is available on request

Rugged touch sensitive keyboard



Alphanumeric keyboard, OEM version, 105 keys laid out on PCB with overlay, cable output, layouts in English, German, French and US English

Part No.	Layout	Interface
75.105K1.S01	English	PS2
75.105D1.S01	German	PS2
75.105F1.S01	French	PS2
75.105U1.S01	US English	PS2
75.105K1.U01	English	USB
75.105D1.U01	German	USB
75.105F1.U01	French	USB
75.105U1.U01	US English	USB



Alphanumeric keyboard, desktop housing version, 105 keys, cable output, layouts in English, German, French and US English

Part No.	Layout	Interface
75.105K1.S06	English	PS2
75.105D1.S06	German	PS2
75.105F1.S06	French	PS2
75.105U1.S06	US English	PS2
75.105K1.U06	English	USB
75.105D1.U06	German	USB
75.105F1.U06	French	USB
75.105U1.U06	US English	USB

For other options or further information please contact your local sales office.



Rugged touch sensitive keyboard with touchpad



Alphanumeric keyboards, integrated touchpad, OEM version, 105 keys on PCB with overlay, cable output, layouts in English, German, French and US English



Alphanumeric keyboard with integrated touchpad, desktop housing version, 105 keys, cable output, layouts in English, German, French and US English

Part No.	Layout	Interface	Part No.	Layout	Interface
75.105K2.S01	English	PS2	75.105K2.S06	English	PS2
75.105D2.S01	German	PS2	75.105D2.S06	German	PS2
75.105F2.S01	French	PS2	75.105F2.S06	French	PS2
75.105U2.S01	US English	PS2	75.105U2.S06	US English	PS2
75.105K2.U01	English	USB	75.105K2.U06	English	USB
75.105D2.U01	German	USB	75.105D2.U06	German	USB
75.105F2.U01	French	USB	75.105F2.U06	French	USB
75.105U2.U01	US English	USB	75.105U2.U06	US English	USB

Touch-Sensitive Keyboards Overview

The Technology

Touch-sensitive technology involves the use of high-frequency signals whose amplitude is modified when a key is activated, i.e. when it is touched or skimmed by the user's finger.

A touch-sensitive keyboard consists of three elements:

- a set of keys, laid out on a printed circuit board;
- an interface card;
- a non-conductive front panel (glass, polycarbonate, etc).

Each key circuit features a detector circuit or cell. The detector circuit is protected by an EAO patent.

An HF generator sends the HF signal to the keys.

An interface card based around a micro-controller controls all the keys. The keyboard's output signal is transmitted to the PC via a standard PS2 or USB port.

Principle

Each key on the keyboard consists of a copper area linked to a HF-emitting detector cell. This copper area may be considered as the armature of a capacitor, with the front panel of the keyboard acting as the dielectric (the non-conductive isolating material).

When a human finger touches the area in front of the copper area, it acts as the second armature of the capacitor, earthed through the user's body. The body's electrical properties then act as a serial RLC (Resistor-Self-Capacitor) network, diverting part of the HF voltage generated on the key towards the earth. This drop in voltage constitutes a change in the output state and is detected as such by the micro-controller.

105-key Touch Sensitive Keyboard

Material

Front plate

6 mm tempered glass	Housing as standard
6, 8, 10 mm glass	OEM without Touchpad
4, 6 mm polycarbonate	
6 mm glass	OEM with Touchpad
3 mm polycarbonate	

Mechanical characteristics

Dimensions

	OEM with metal frame	Desktop with housing
PS/2	437 x 160 x 32 mm	480 x 204.5 x 32 mm
USB	437 x 160 x 22 mm	480 x 204.5 x 22 mm

Electrical characteristics

Operating voltage/-current

Operating voltage 5VDC ±5%

Power consumption	PS/2	USB
– active Keyboard (3 LEDs ON)	70 mA	82 mA
– inactive Keyboard (3 LEDs OFF)	42 mA	76 mA
– active Touchpad		17 mA
– inactive Touchpad		13 mA
Active Keyboard with Touchpad connected on its HUB for:		
– aktive Touchpad		97 mA
– inactive Touchpad		93 mA

Interface

Keyboard PS/2 or USB

Touchpad USB

Environment

PS/2 Win NT4, 98 SE, 98 ME, 2000 PRO pack II, XP, LINUX

USB 98 SE, 98 ME, 2000 PRO pack II, XP, LINUX

Standards

FCC part 15, 1995 edition, class B

EMC compatibility (89/336/EC EMC guidelines)

Emissions EN 55022, 1998 edition, class B

Immunity EN 55024, 1998 edition

EN 61000-4-2, 1995 edition

EN 61000-4-3, 1996 edition

EN 61000-4-4, 1995 edition

EN 61000-4-5, 1995 edition

EN 61000-4-6, 1996 edition

EN 61000-4-11, 1994 edition

Mean operating Time Between Failures (MTBF)

287 000 hours (20 years) for PS/2 and USB keyboards

Environmental conditions

Storage temperature

–40°C ... +85°C

Operating temperature

0°C ... +60°C for PS/2 und USB, version with Touchpad

–20°C ... +80°C for PS/2, version without Touchpad

0°C ... +70°C for USB, version without Touchpad

Front protection

OEM version up to IP65 depending on type of mounting

Desktop version IP65

Approvals

Approbations

FCC

Declaration of conformity

CE

74-key Touch Sensitive Keyboard

Material

Front plate

6, 8, 10 mm glass
4, 6 mm polycarbonate

Mechanical characteristics

Dimensions

Keyboard 133x285x32 mm
Mouse 102x102x23.1 mm

Electrical characteristics

Operating voltage/-current

Operating voltage 5VDC \pm 5%

Power consumption	PS/2	USB
- Keyboard (LEDs OFF)	50 mA	68 mA
- Mouse pad	17 mA	17 mA

Power supply for mouse pad is supplied from PC through PS/2 or USB port

Interface

Keyboard PS/2 or USB
Mouse pad USB

Environment

PS/2 Win NT4, 98 SE, 98 ME, 2000 PRO pack II, XP, LINUX
USB 98 SE, 98 ME, 2000 PRO pack II, XP,
LINUX (depends on LINUX version), Mac OS9 / OSX

Standards

FCC part 15, 1995 edition, class B
EMC compatibility (89/336/EC EMC guidelines)
Emissions EN 55022, 1998 edition, class B
Immunity EN 55024, 1998 edition
EN 61000-4-2, 1995 edition
EN 61000-4-3, 1996 edition
EN 61000-4-4, 1995 edition
EN 61000-4-5, 1995 edition
EN 61000-4-6, 1996 edition
EN 61000-4-11, 1994 edition

Mean operating Time Between Failures (MTBF)

287 000 hours (20 years) for PS/2 and USB keyboards

Environmental conditions

Storage temperature

-40 °C ... +100 °C for Keyboard
-40 °C ... +65 °C for Mouse pad

Operating temperature

-20 °C ... +80 °C for PS/2
0 °C ... +70 °C for USB
0 °C ... +60 °C for Mouse pad

Front protection

up to IP65 depending on type of mounting

Approvals

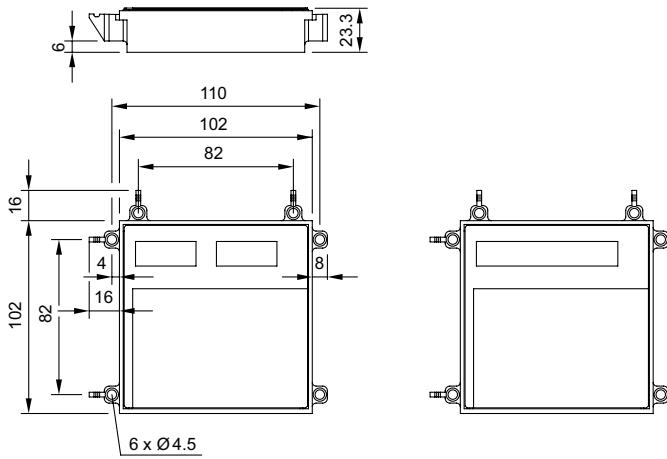
Approbations

FCC

Declaration of conformity

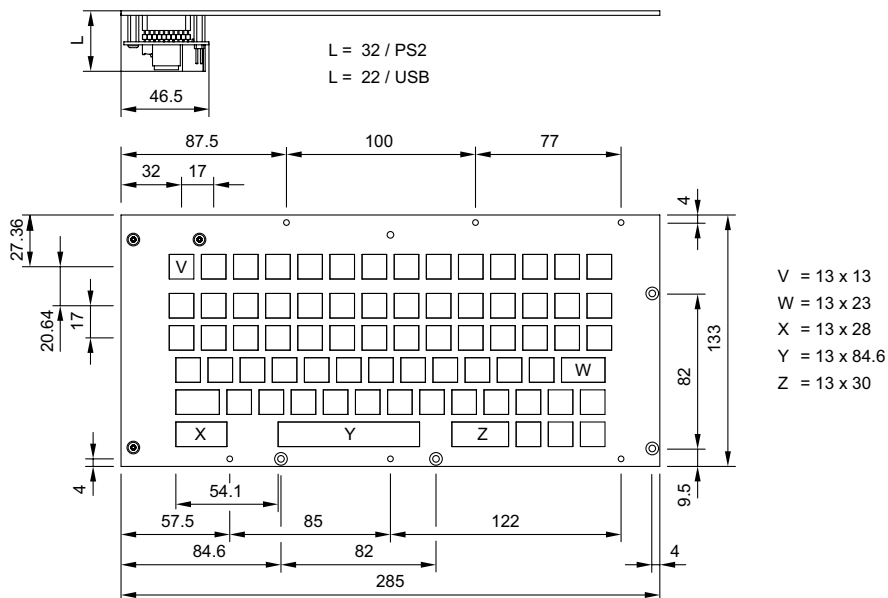
CE

Touchpad



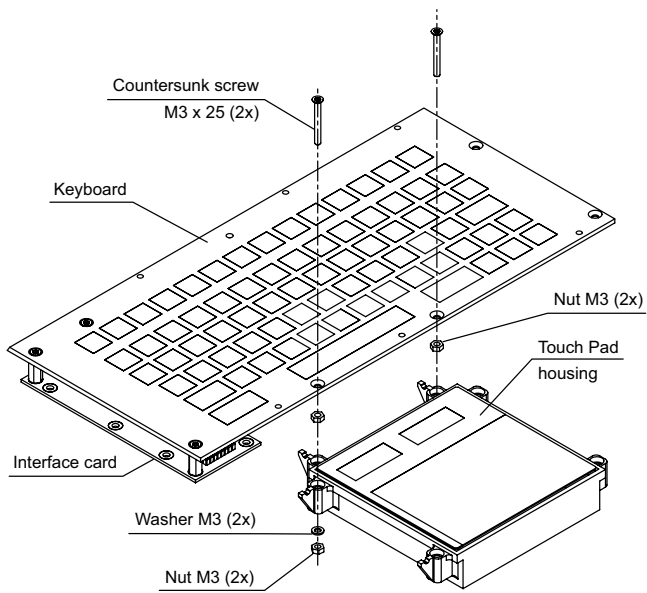
Keyboard

Alphanumeric programmable, 74 keys



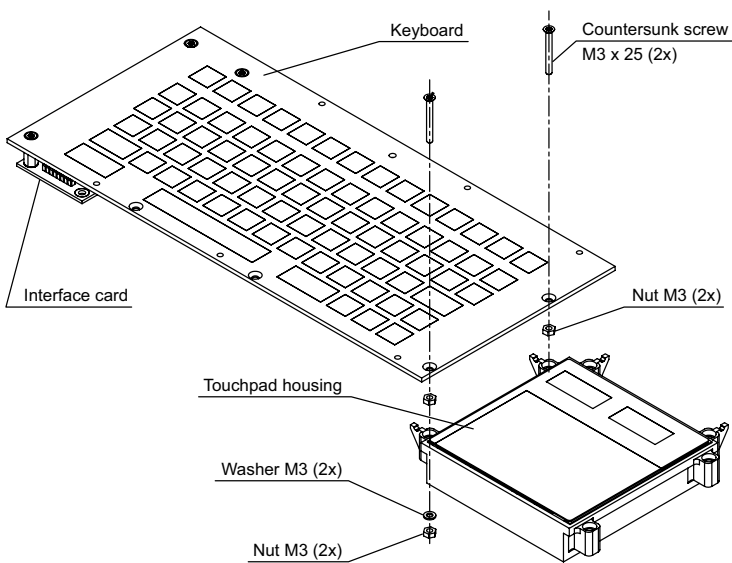
Keyboard

74 keys, mouse below



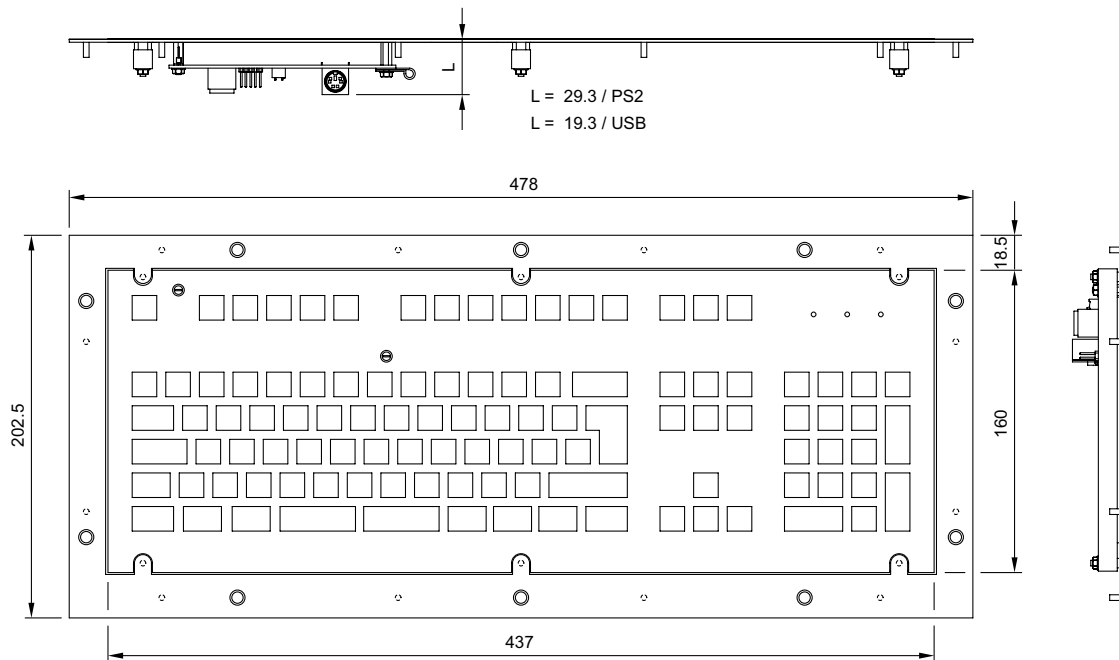
Keyboard

74 keys, mouse on side



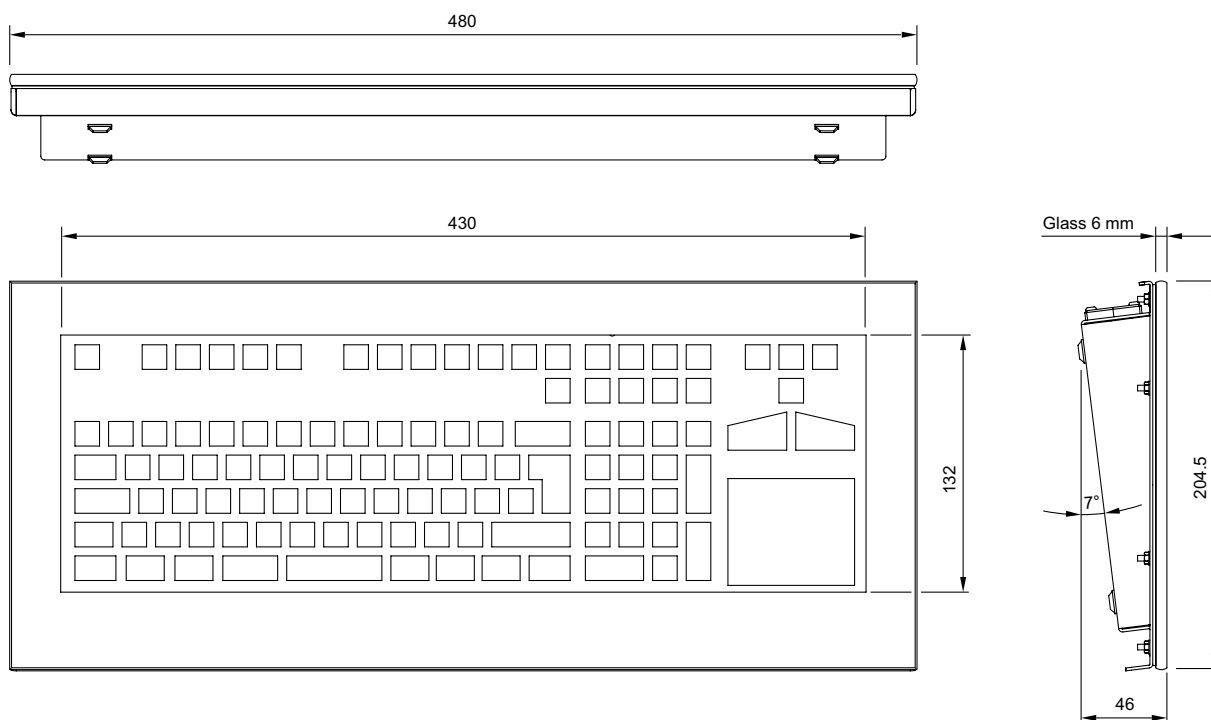
Keyboard

105 keys, OEM version

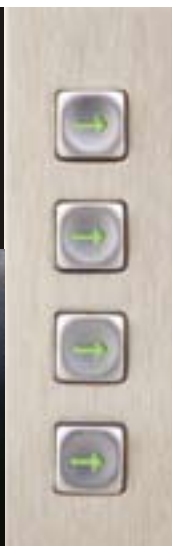
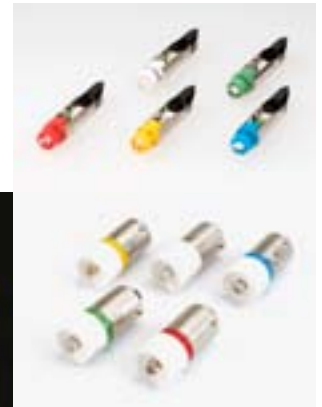


Keyboard

105 keys, desktop housing



EAO offers a comprehensive range of sealed, heavy-duty, illuminated indicator pushbuttons and keypads which benefit the end user in terms of visibility in all kinds of lighting and weather conditions.



LED technology

Operating at relatively low current levels, our LEDs are robust, have a virtually limitless service life and are fast replacing unreliable filament lamp light sources in various applications. LEDs are available in a variety of colours including red, green, yellow, blue and white with a choice of continuous or flashing light elements.

We are confident that once you have experienced the benefit of our LED assemblies you will not return to an alternative. Full details of EAO illuminated products can be found within the appropriate sections of the catalogue.



For other options or further information please contact your local sales office.

Product Profile

The W.series mechanical tactile keyboards are designed to operate in hostile environments, making them ideal for applications in industrial and public areas.

Technical data see page 163

- All metal construction (chromed Zamak keys and brushed stainless steel for the front plate)
- Laser engraving ensuring good and long term legibility
- High resistance to vandalism: up to 10J
- Anti pull-off keys
- Sealed against liquid penetration to IP67
- Top or back mounting
- PS2 or USB connection
- Environment: PS2, Win NT4, 98 SE, ME, 2000 PRO Pack II, XP
- With or without pointing device: Standard or optical trackball and touchpad
- Available in different language layouts with standard or customised markings

Rugged mechanical keyboard



Alphanumeric keyboard, back mounting, 63 keys, layouts in English, German, French and US English

Part No.	Layout	Interface
W.630KW.S10	English	PS2
W.630DW.S10	German	PS2
W.630FW.S10	French	PS2
W.630UW.S10	US English	PS2
W.630KW.U10	English	USB
W.630DW.U10	German	USB
W.630FW.U10	French	USB
W.630UW.U10	US English	USB



Alphanumeric keyboard, top mounting, 63 keys, layouts in English, German, French and US English

Part No.	Layout	Interface
W.630KW.S11	English	PS2
W.630DW.S11	German	PS2
W.630FW.S11	French	PS2
W.630UW.S11	US English	PS2
W.630KW.U11	English	USB
W.630DW.U11	German	USB
W.630FW.U11	French	USB
W.630UW.U11	US English	USB

Rugged mechanical keyboard



Alphanumeric keyboard, stainless steel trackball, 2 clicks, back mounting, 65 keys, layouts English, German, French and US English

Part No.	Layout	Interface
W.65BKW.S10	English	PS2
W.65BDW.S10	German	PS2
W.65BFW.S10	French	PS2
W.65BUW.S10	US English	PS2
W.65BKW.U10	English	USB
W.65BDW.U10	German	USB
W.65BFW.U10	French	USB
W.65BUW.U10	US English	USB



Alphanumeric keyboard, stainless steel trackball, 2 clicks, top mounting, 65 keys, layouts English, German, French and US English

Part No.	Layout	Interface
W.65BKW.S11	English	PS2
W.65BDW.S11	German	PS2
W.65BFW.S11	French	PS2
W.65BUW.S11	US English	PS2
W.65BKW.U11	English	USB
W.65BDW.U11	German	USB
W.65BFW.U11	French	USB
W.65BUW.U11	US English	USB

For other options or further information please contact your local sales office.



Rugged mechanical keyboard



Alphanumeric keyboard, top mounting, 106 keys, 6 rows/MF2, PS2 and USB output types, English, German, French and US English layouts

Part No.	Language	Interface
W.106FKP.X11	English	PS2/USB
W.106FDP.X11	German	PS2/USB
W.106FFP.X11	French	PS2/USB
W.106FUP.X11	US English	PS2/USB



Alphanumeric keyboard, top mounting, 91 keys, stainless steel track ball, 6 rows/MF2, 2 clicks, PS2 and USB output types, English, German, French and US English layouts

Part No.	Language	Interface
W.91BKP.X11	English	PS2/USB
W.91BDP.X11	German	PS2/USB
W.91BFP.X11	French	PS2/USB
W.91BUP.X11	US English	PS2/USB



Alphanumeric keyboard, top mounting, 91 keys, phenolic track ball, 6 rows/MF2, 2 clicks, PS2 and USB output types, English, German, French and US English layouts

Part No.	Language	Interface
W.91CKP.X11	English	PS2/USB
W.91CDP.X11	German	PS2/USB
W.91CFP.X11	French	PS2/USB
W.91CUP.X11	US English	PS2/USB

Rugged mechanical keyboard



Alphanumeric keyboard, top mounting, 91 keys, optical trackball, 6 rows/MF2, 2 clicks, PS2 and USB output types, English, German, French and US English layouts

Part No.	Language	Interface
W.91DKP.X11	English	PS2/USB
W.91DDP.X11	German	PS2/USB
W.91DFP.X11	French	PS2/USB
W.91DUP.X11	US English	PS2/USB

Trackball Module



Stainless steel trackball module, 2 clicks, front mounting, 38 mm diameter

Part No.	Interface
W.02B01.S11	PS2
W.02B01.U11	USB



For other options or further information please contact your local sales office.

Product Profile

The W.series is a high quality, vandal resistant keypad range especially designed to meet the needs of banking markets, public environment applications and other industrial applications.

Technical data see page 163

- High impact resistance up to 10J
- All metal construction (chromed Zamak keys and brushed stainless steel for the front plate)
- Anti pull-off keys
- IP67 sealing when mounted
- 4, 16 or 20 key versions
- Illuminated versions available

Rugged keypad



Keypad with 4 blank keys



Keypad, 4 keys engraved with arrows and black paint in-fill

Part No.	Contact terminals	Part No.	Contact terminals
W.04000.P01	Pin Header	W.0400X.038	Pin Header

Rugged keypad



Keypad, 4 yellow illuminated keys, A-D



Customised keypad capabilities. Customisation possible for layouts and key markings. For further details please contact your local sales office.

Part No.	Contact terminals
W.0400X.016	Pin Header

Keyboard standard layout

Material

Front plate

Brushed stainless steel 304 L

Keys

Zamak 5 with matt chrome finish

Printed circuit board

Epoxy resin (FR4), as per UL 94 V0

Contacts

Carbon pills

Carbon on Cu tracks

Track ball

Standard (opto-mechanical) Stainless steel or Phenolic Plastic

Optical Epoxy resin

Touch pad

Composite material

Mechanical characteristics

Tightening torque

50Ncm for studs, front- and back mounting

Actuating force

1 N ... 3 N for single key 12x12mm

3 N ... 6 N for double key 12x31mm

Actuating travel

1.5mm ±0.3mm

Mechanical lifetime (keys)

4 Million cycles of operation per key

Track ball

Ball diameter 1.5"

Resolution 800 pulses per revolution

Touch pad

XY position sensing resolution 40 counts per mm

XY position reporting relative

Tracking speed maximum 1.016m/s

Electrical characteristics

Operating voltage/-current

Operating voltage 5VDC ±5%

Current rating 20mA

Interface

	PS/2	USB
Windows	Win NT4 98SE ME 2000 Pack II XP Pro	98SE ME 2000 Pack II XP Pro

Note:

EAO cannot guarantee a full compatibility with every computer configuration. It is therefore recommended that prior investigation is carried out.

EMC approved, as per

EN 50081-1 Emission (residential environment)

EN 50082-1 Immunity (residential environment)

FCC part 15, class B

EN 60950 Safety

Electric strength

500VAC, 50Hz, 1 min.

Environmental conditions

Storage temperature

	PS/2 and USB
With alpha version	-40°C ... +85°C
With standard Trackball	-40°C ... +85°C
With optical Trackball	-25°C ... +85°C
With Touchpad	-25°C ... +65°C

Operating temperature

	PS/2	USB
With alpha version	-20°C ... +80°C	0°C ... +70°C
With standard Trackball	-10°C ... +70°C	0°C ... +70°C
With optical Trackball	0°C ... +55°C	0°C ... +55°C
With Touchpad	0°C ... +55°C	0°C ... +55°C

Front protection

	Static	Dynamic
Alpha version	IP67	IP67
Standard Trackball	IP65	IP54
Optical Trackball	IP67	IP67

Impact resistance

IK 09 (10 J) for alpha version and Trackball

IK 07 (2 J) for Touchpad

Shock resistance

(semi-sinusoidal)

3 axis, 150m/s², puls width 11 ms, as per EN IEC 60512-4

Vibration resistance

(sinusoidal)

5 Hz ... 200Hz, as per EN IEC 60512-4

Climate resistance

as per EN IEC 60512-6

Damp heat 21 days

Dry heat 10 days, +85°C

Saline mist 96 hours

Approvals

Approbations

FCC

Declaration of conformity

CE

Keyboard MF2 layout

Material

Front plate

Brushed stainless steel 304 L

Keys

Zamak 5 with matt chrome finish

Printed circuit board

Epoxy resin (FR4), as per UL94 V0

Contacts

Carbon pills

Cu tracks on PCB

Membrane

Silicone, as per UL94 HB, with carbon pills

Track ball

Standard (opto-mechanical) Stainless steel or Phenolic Plastic

Optical Epoxy resin

Mechanical characteristics

Tightening torque

50 Ncm for studs, front mounting

Actuating force

~1 N ... 3 N for single key

~3 N ... 6 N for double and triple key

Actuating travel

1.5 mm ±0.3 mm

Mechanical lifetime (keys)

4 Million cycles of operation per key

Track ball

Ball diameter 38 mm

Electrical characteristics

Operating voltage/-current

Operating voltage 5 VDC ±5%, via computer cable

Current rating 20 mA

Interface

PS/2 and USB versions Windows XP, XP Pro, 2000, 98SE, Linux

EMC approved, as per

EN 50081-1 Emission (residential environment)

EN 50082-1 Immunity (residential environment)

FCC part 15, class B

EN 60950 Safety

Electric strength

500 VAC, 50 Hz, 1 min.

Environmental conditions

Storage temperature

	PS/2 and USB
With Pin pad	-40 °C ... +85 °C
With standard Trackball	-40 °C ... +85 °C
With optical Trackball	-25 °C ... +85 °C

Operating temperature

	PS/2 and USB
With Pin pad	0 °C ... +70 °C
With standard Trackball	0 °C ... +70 °C
With optical Trackball	0 °C ... +55 °C

Front protection

	Static	Dynamic
Pin pad version	IP67	IP67
Standard Trackball	IP65	IP54
Optical Trackball	IP67	IP67

Impact resistance

IK 09 (10 J)

Shock resistance

(semi-sinusoidal)

3 axis, 150 m/s², puls width 11 ms, as per EN IEC 60512-4

Vibration resistance

(sinusoidal)

5 Hz ... 200 Hz, as per EN IEC 60512-4

Climate resistance

as per EN IEC 60512-6

Damp heat 21 days, +40 °C

Dry heat 10 days, +85 °C

Saline mist 96 hours

Approvals

Approbations

FCC

Declaration of conformity

CE

Track ball module

Material

Front plate

Brushed stainless steel 304 L

Keys

Stainless steel

Track ball

Standard (opto-mechanical) Stainless steel or Phenolic Plastic

Optical Epoxy resin

Mechanical characteristics

Mechanical lifetime

>2 Million ball revolutions, standard versions

>1 Million ball revolution, optical version

1 Million cycles of operation per key

Track ball

Ball diameter 38 mm, 50 mm (optical version)

Resolution 800 pulses per revolution for standard Track ball

Resolution 1256 pulses per revolution for optical Track ball

Electrical characteristics

Operating voltage/-current

Operating voltage (standard version) 5 VDC ±10%

Operating voltage (optical version) 3.6 ... 5.5 V

Current rating 110 mA typical / 150 mA max.

EMC approved, as per

EN 55022 Class B Emission (residential environment)

FCC CFR47 part 15 class B

EN 55024 Immunity (residential environment)

EN UL 60950 Safety

Environmental conditions

Storage temperature

-25 °C ... +85 °C

Operating temperature

0 °C ... +55 °C

Front protection

	Static	Dynamic
Button	IP65	IP65
Standard Trackball	IP65	IP54
Optical Trackball	IP67	IP67

Impact resistance

IK 09 (~10 J) Track ball 38 mm dia.

IK 08 (~5 J) Track ball 50 mm dia.

Climate resistance

as per EN IEC 60512-6

Damp heat 21 days

Dry heat 10 days, +85 °C

Saline mist 96 hours

Approvals

Declaration of conformity

CE

Keypad 4-keys and 16-keys

Material

Front plate

Brushed stainless steel 304 L

Keys

Zamak 5 with matt chrome finish

Printed circuit board

Epoxy resin (FR4), as per UL 94 V0

Contacts

Carbon pill

Cu tracks on PCB

Housing (4-key Keypad)

Acrylnitril-Butadien-Styrol (ABS), as per UL 94 V0

Mechanical characteristics

Tightening torque

50 Ncm for studs

Actuating force

1 N ... 3 N for single key 12x12 mm

3 N ... 6 N for double key 12x31 mm

Actuating travel

1.5 mm ±0.3 mm

Mechanical lifetime (keys)

4 Million cycles of operation per key

Environmental conditions

Storage temperature

-30 °C ... +85 °C

Operating temperature

-25 °C ... +85 °C

Front protection

IP67 as per IEC 60529, when mounted

Climate resistance

as per EN IEC 60512-6

Damp heat 21 days, +40 °C

Dry heat 10 days, +85 °C

Saline mist 96 hours

Impact resistance

IK 09 (10 J)

Shock resistance

(semi-sinusoidal)

3 axis, 150 m/s², puls width 11 ms, as per EN IEC 60512-4

Vibration resistance

10 Hz, 100 m/s², 1.5 mm, as per EN IEC 60512-4

Electrical characteristics

Operating voltage/-current

Nominal 5V, 5 mA

Maximum voltage 24V

Minimum voltage 0.5V

Minimum current 0.1 mA

Illumination

Current consumption for single LED:

20 mA at 2.1 V (yellow and green)

20 mA at 1.9 V (red)

10 mA at 3.4 V (blue)

Isolation resistance

≥1000 MΩ at 100 VDC

Contact resistance

≤200 Ω

Electrical life

4 Million cycles of operation per key

Electrostatic breakdown value

5 kV

Electric strength

1500 Vrms, 50 Hz, 1 min., as per EN IEC 60512-2

Approvals

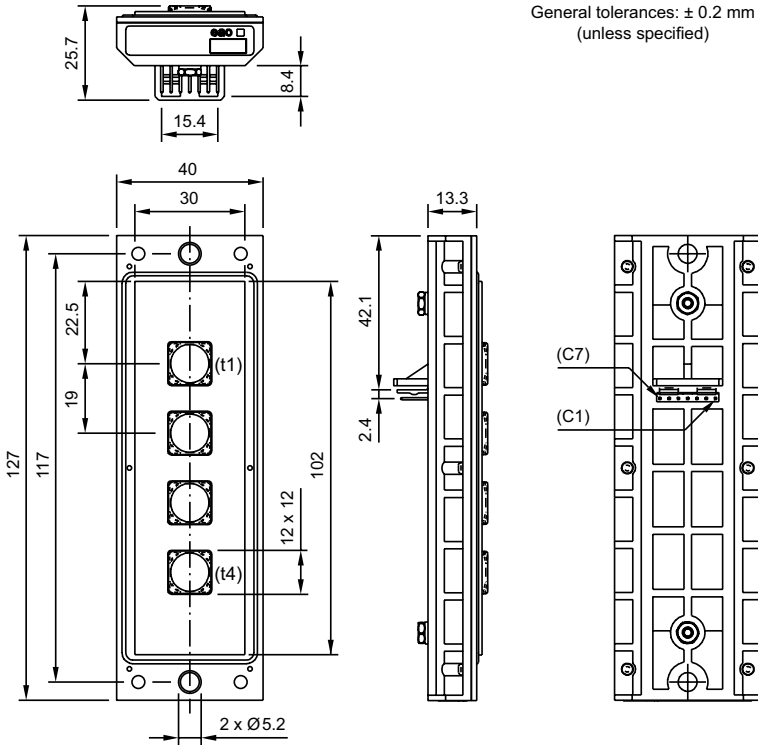
Declaration of conformity

CE

Keypad

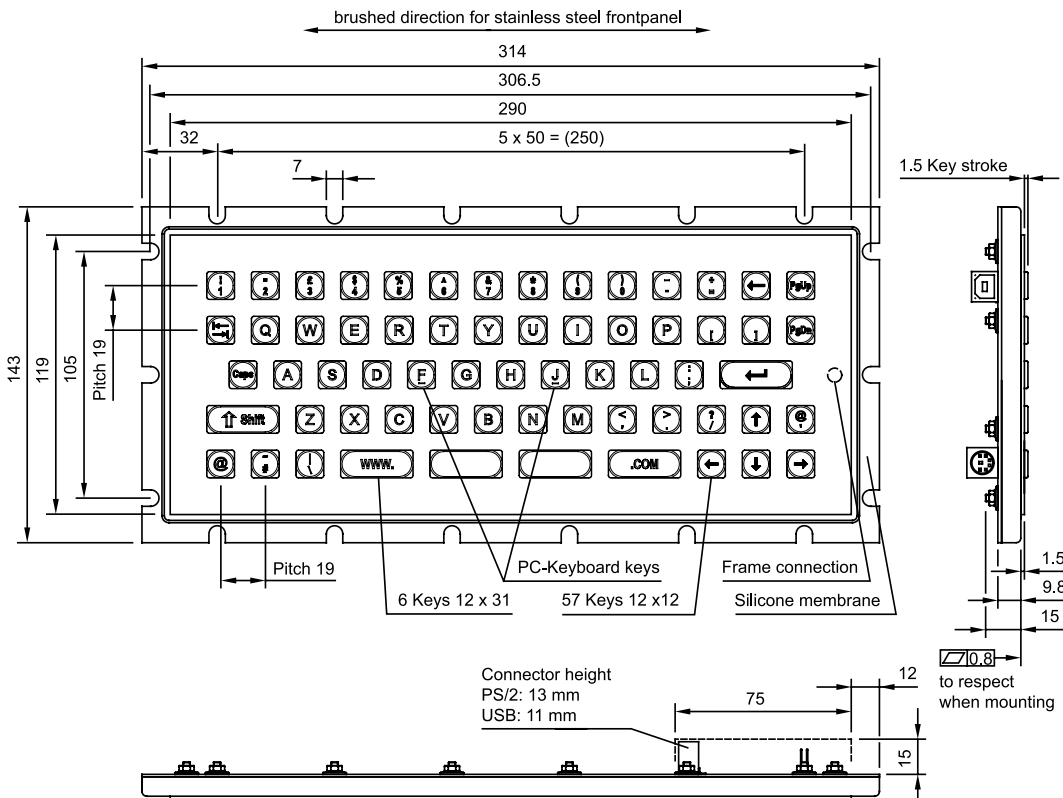
Keypad 4 Keys Blank, 4 Keys Arrows, 4 Keys Illuminated A-D

General tolerances: ± 0.2 mm
(unless specified)



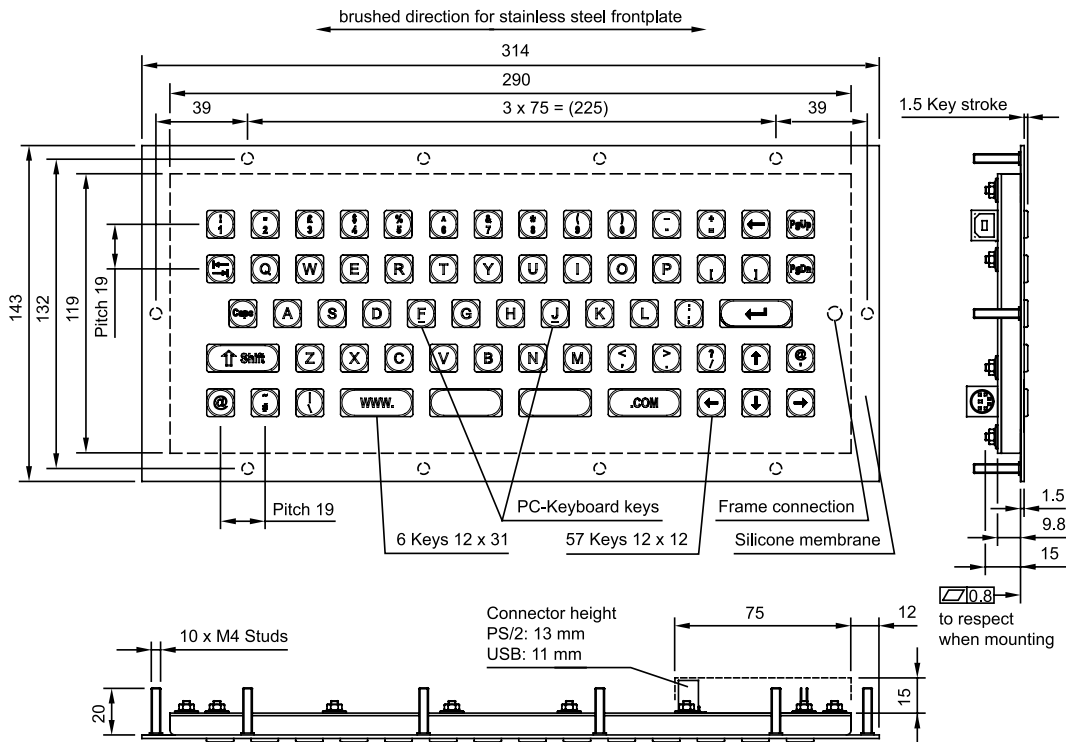
Keyboard

Alphanumeric Mechanical 63 Keys Back Mount



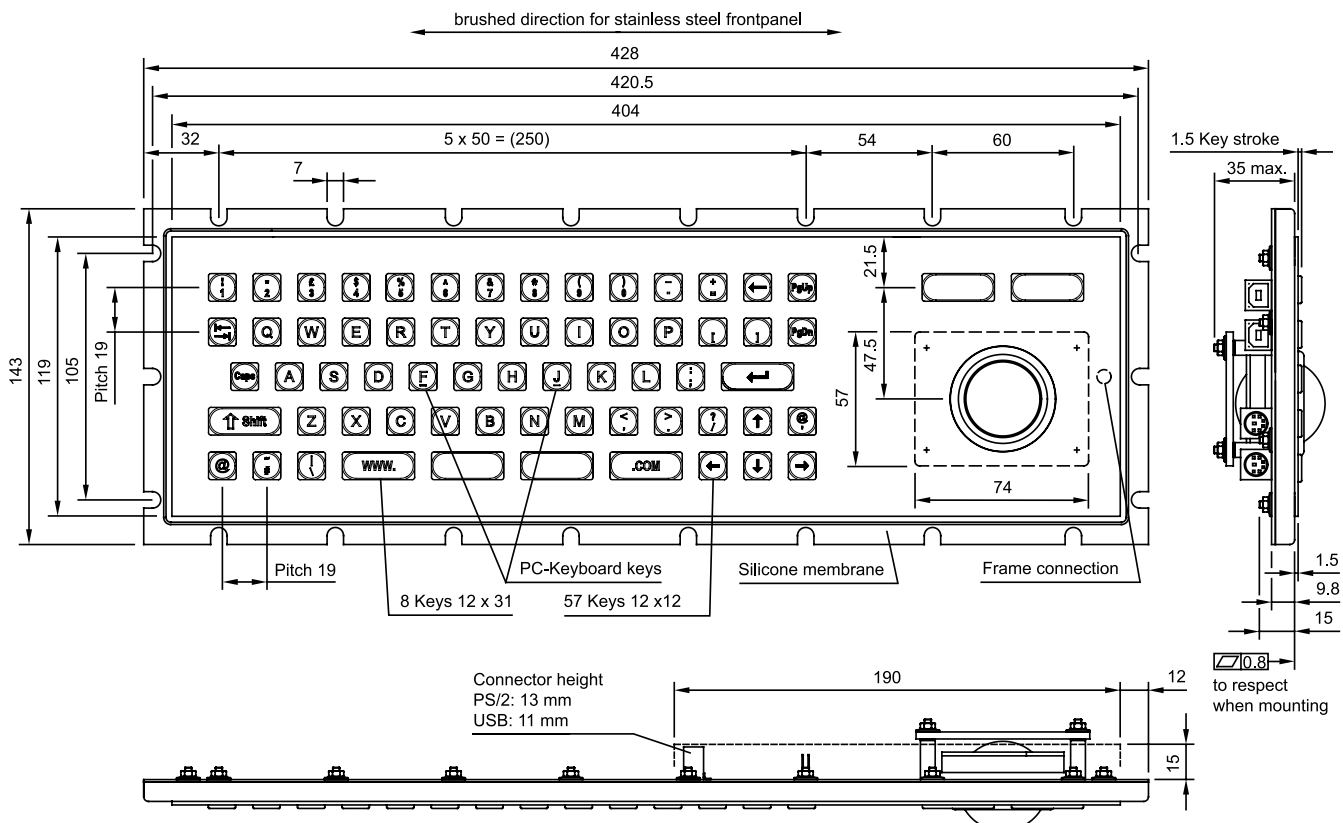
Keyboard

Alphanumeric Mechanical 63 Keys Top Mount



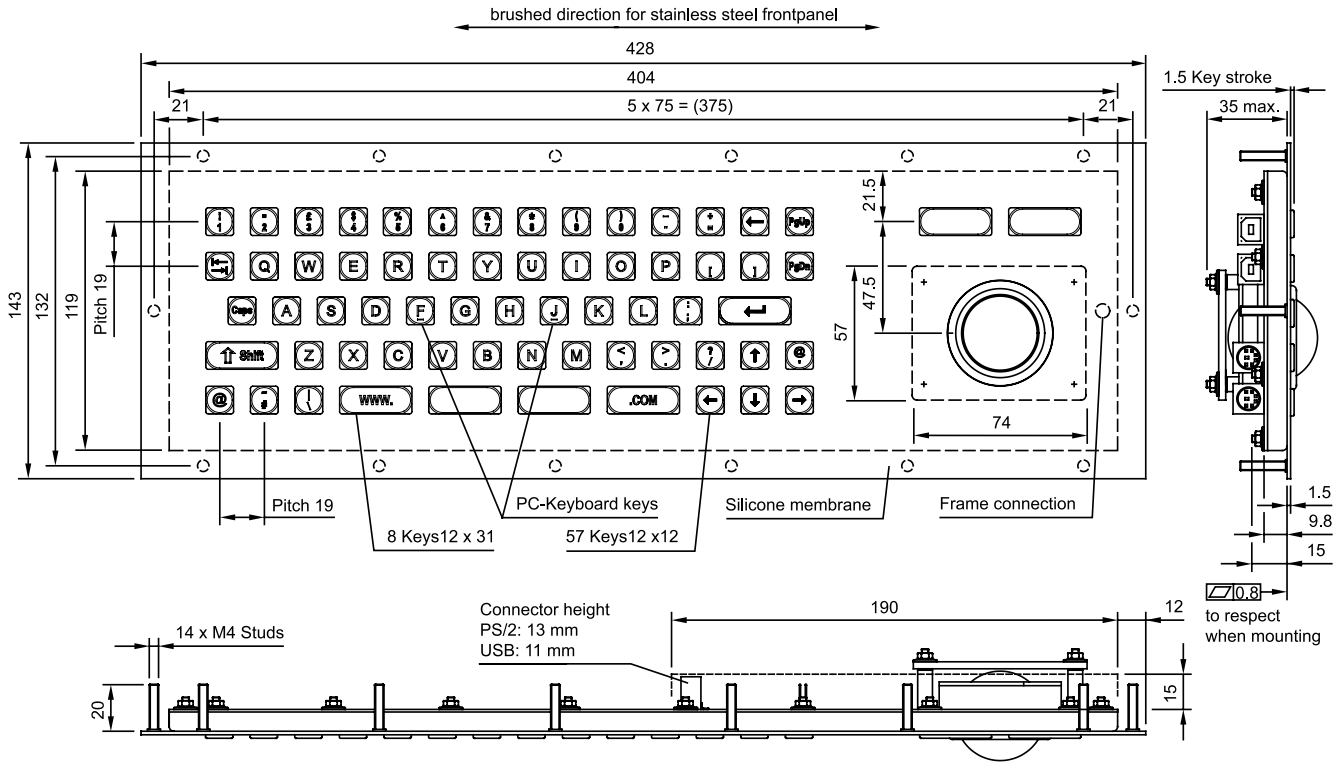
Keyboard

Alphanumeric Mechanical 65 Keys Back Mount



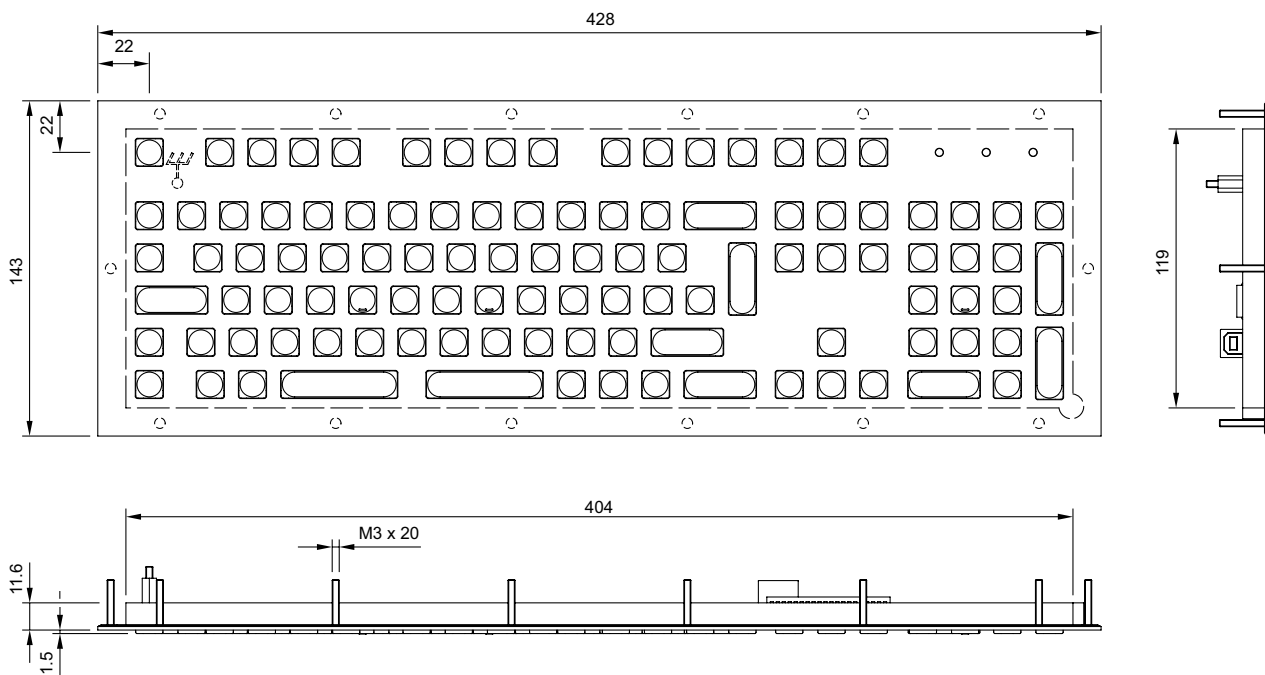
Keyboard

Alphanumeric Mechanical 65 Keys Top Mount



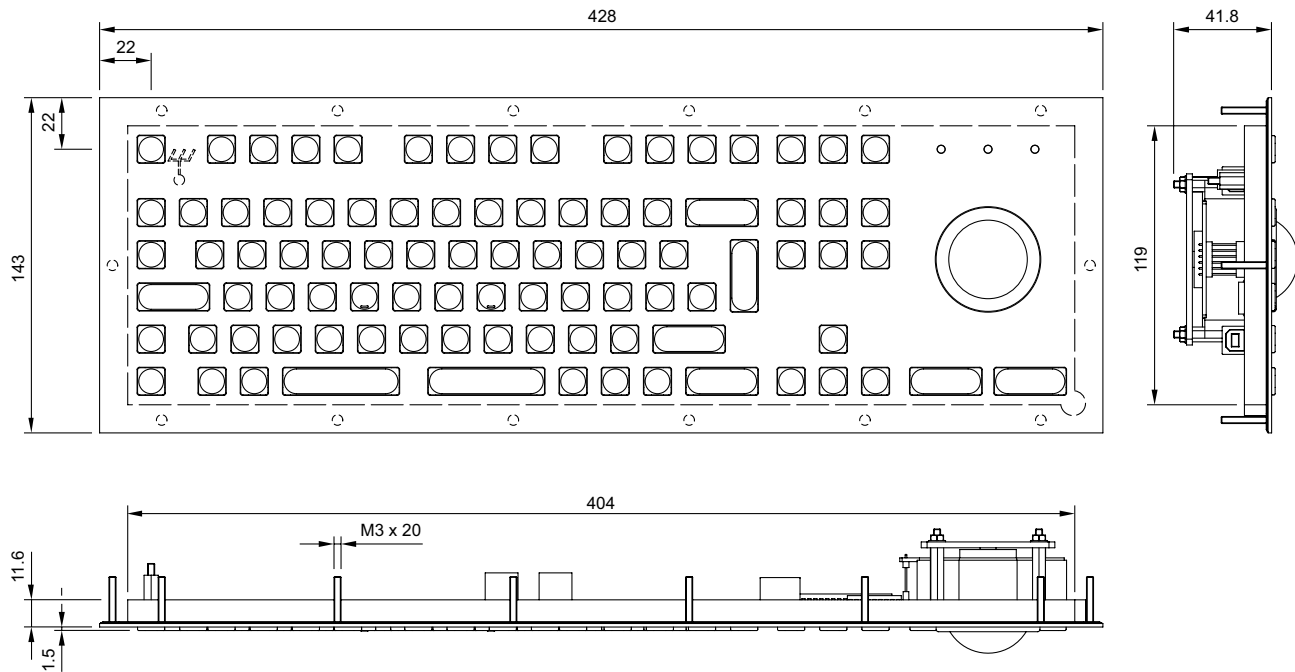
Keyboard

Alphanumeric Mechanical 106 Keys Top Mount



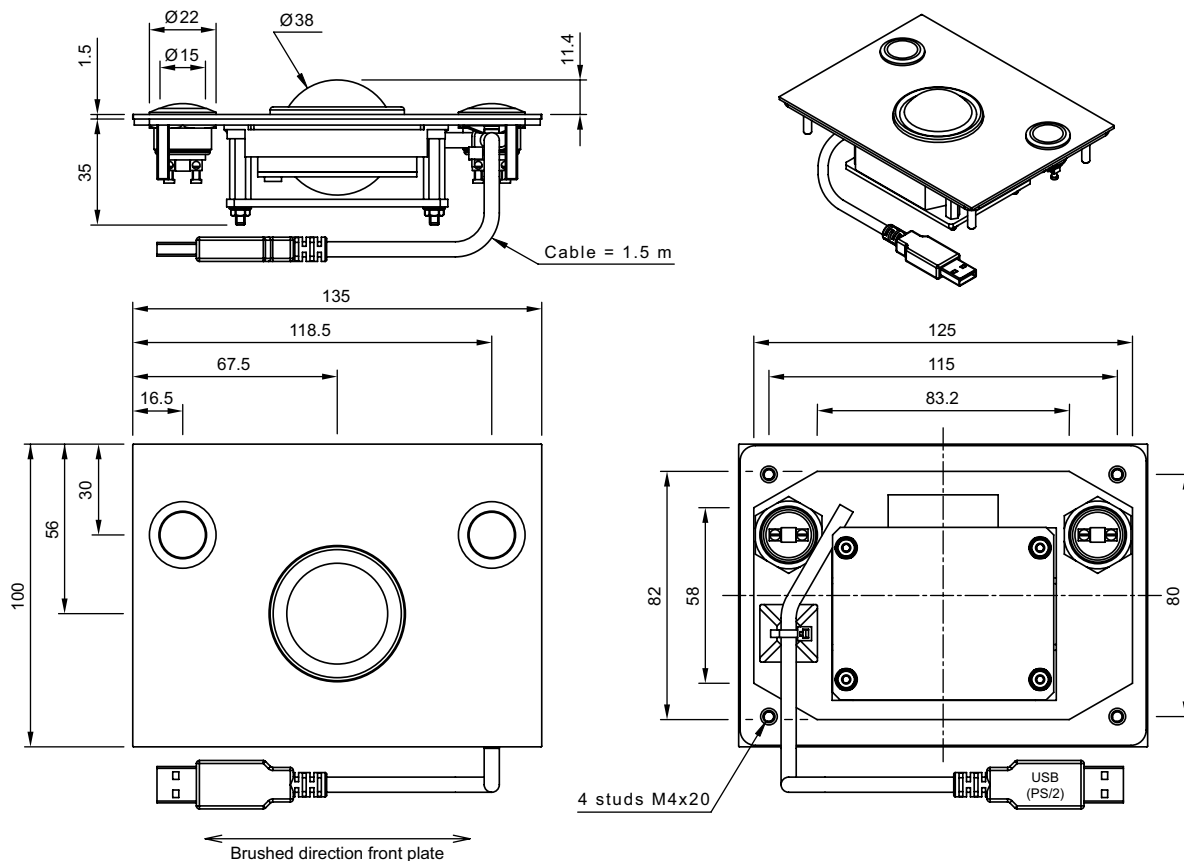
Keyboard

Alphanumeric Mechanical 91 Keys Top Mount, Stainless Steel Trackball. Phenolic Trackball Optical Trackball



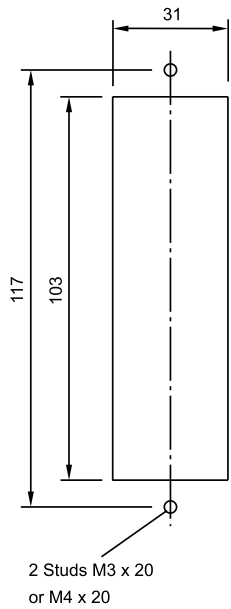
Trackball Module

Stainless Steel Trackball Top Mount



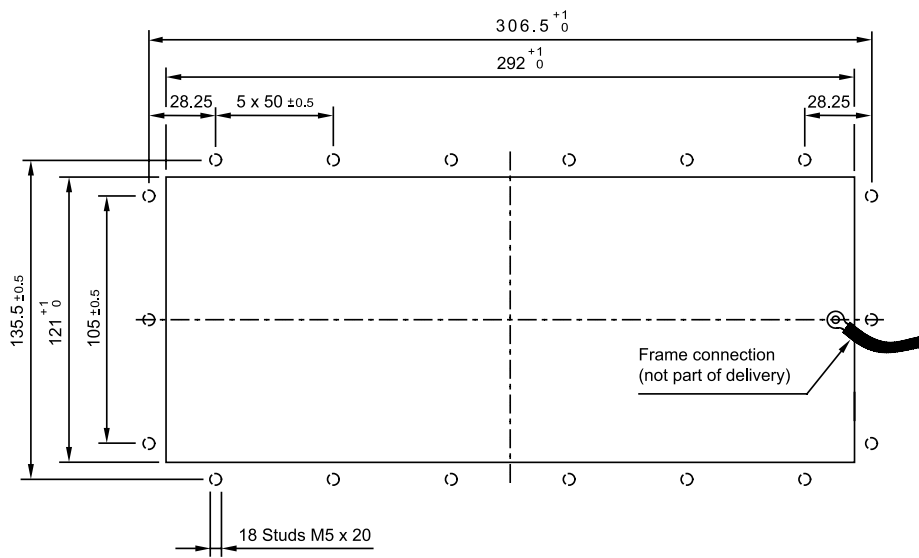
Cut-outs, Keypad

1 x 4 keypad



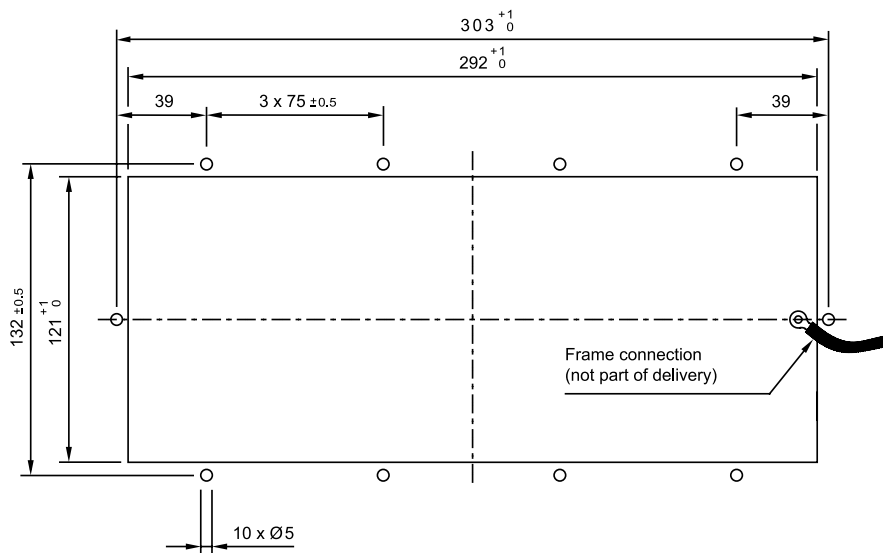
Cut-outs, Keyboard

Alphanumeric Mechanical 63 Keys Back Mount



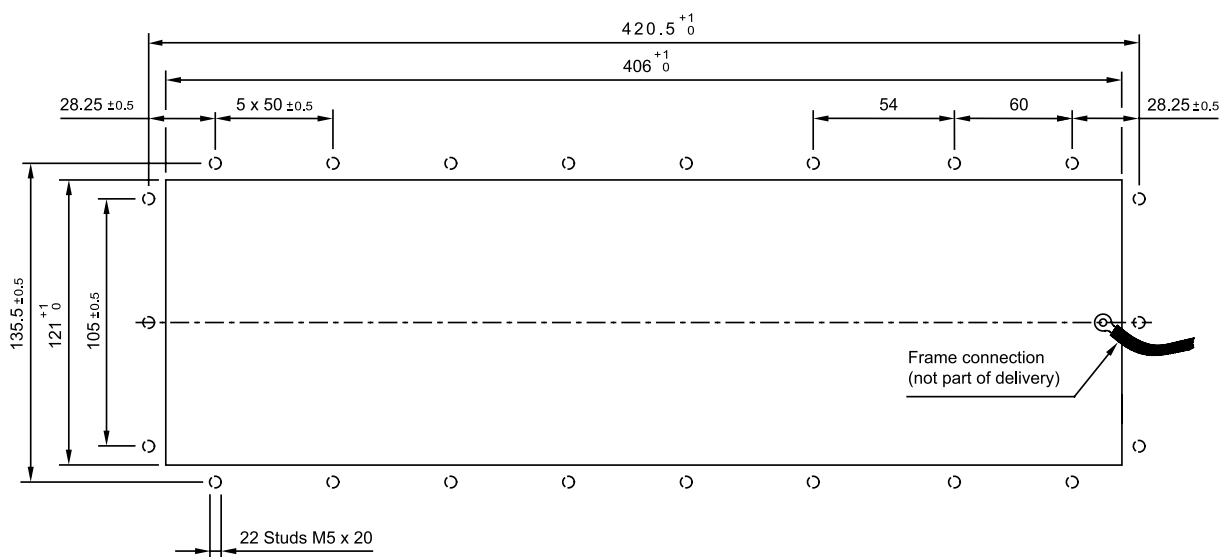
Cut-outs, Keyboard

Alphanumeric Mechanical 63 Keys Top Mount



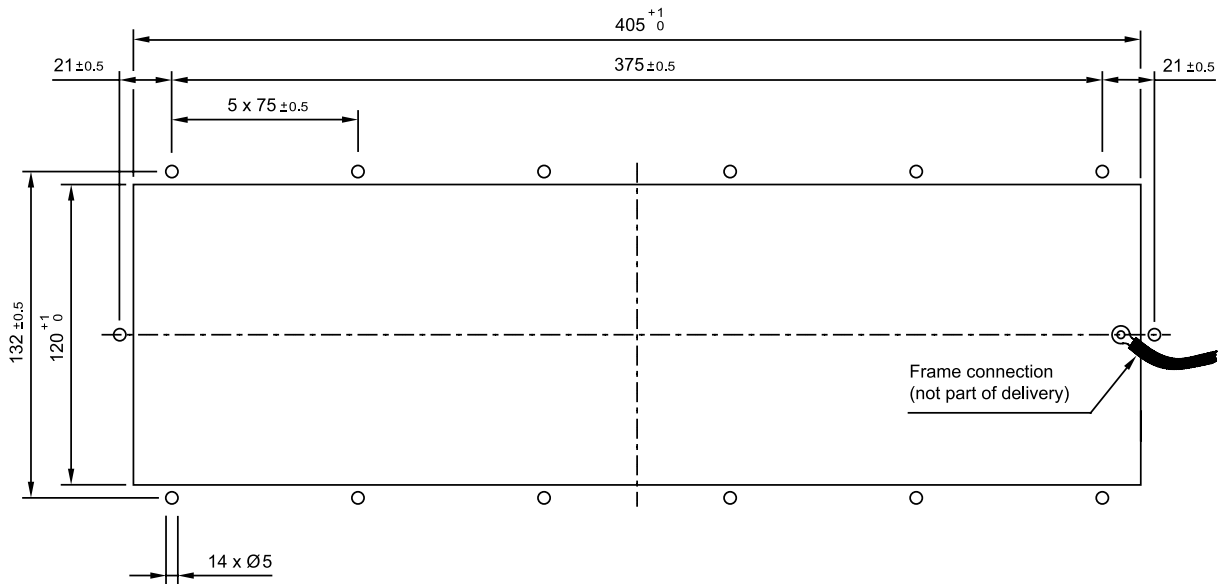
Cut-outs, Keyboard

Alphanumeric Mechanical 65 keys Back Mount



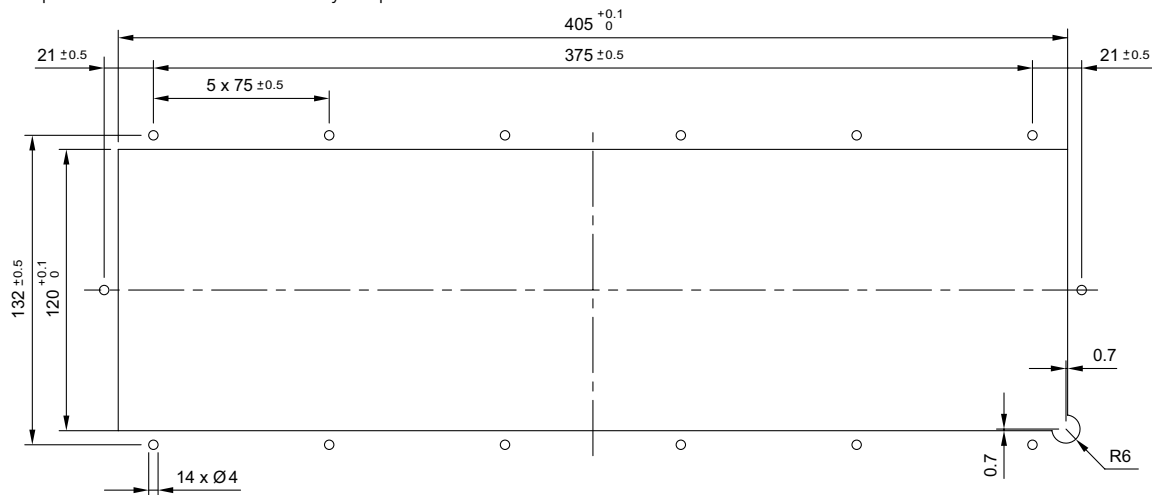
Cut-outs, Keyboard

Alphanumeric Mechanical 65 keys Top Mount



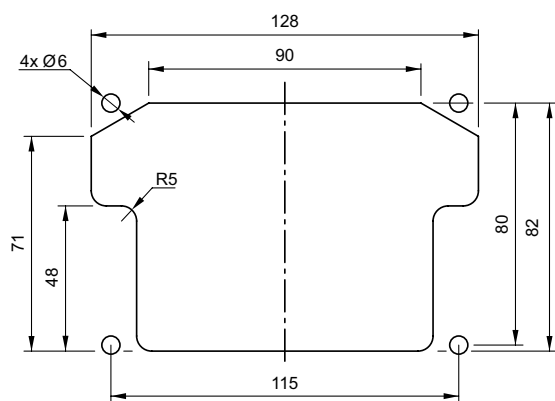
Cut-outs, Keyboard

Alphanumeric Mechanical 91 Keys Top Mount, Stainless Steel Trackball. Phenolic Trackball Optical Trackball
Alphanumeric Mechanical 106 keys Top Mount



Cut-outs, Trackball

Stainless Steel Trackball Top Mount



1K2

For other options or further information please contact your local sales office.

Product Profile

The 1K2 Series is recommended for all PCB applications and is the most compact changeover switch on the market.

Technical data see page 175

- Miniature single-pole changeover slide switch
- Ideal as a jumper replacement
- Highly compact with 2.54 mm pitch pins
- End and side by side stackable at 2.54 mm pitch
- Straight and right angled versions
- High reliability
- Gold contact as standard
- Fully sealed base suitable for solvent cleaning
- Raised actuator version suitable for through-panel operation

Changeover switch



1K2 changeover switch, PCB mount

Part No.	Slider	Orientation	Contact Material
09.03290.01	Extended (black)	Straight	Standard Gold plated
09.10290.01	Extended (black)	Right Angled	Standard Gold plated
09.03201.02	Low Profile (red)	Straight	Standard Gold plated
09.10201.02	Low Profile (red)	Right Angled	Standard Gold plated
19.03201.01	Low Profile (red)	Straight	Tropicalised Gold plated

Actuator position is opposite of switch contact

Change over slide switch

Material

Material of contact

0.4 µm Au/Ni (standard version)
2 µm Au/Ni (tropicalized version)

Mechanical characteristics

Terminals

0.4 µm Au/Ni (standard version)
2 µm Au/Ni (tropicalized version)

Actuating travel

1.6 mm nominal

Mechanical lifetime

10 000 operations

Resistance to heat of soldering

at 250 °C, 5 sec.

Electrical characteristics

Operating voltage/-current

Nominal 12V, 500mA
Maximum voltage 24V
Minimum voltage 10mV, 1mA

Isolation resistance

>10 000MΩ at 100VDC

Contact resistance

<22mΩ

Electrical life

1 000 operations nominal

Switch rating

6W

Electric strength

250Vrms, 50Hz

Environmental conditions

Operating temperature

-40 °C ... +85 °C

Climate resistance

Damp heat steady:
4 days,
21 days (tropicalised version),
as per IEC 60512-6-11c

Saline mist:

24 hours
96 hours (tropicalised version),
as per IEC 60512-6-11f

Shock resistance

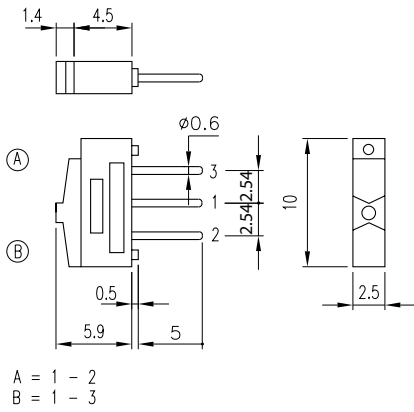
50g, 11 ms, as per IEC 60512-4-6c

Resistance to vibrations

10 ... 500Hz, 10g, as per IEC 60512-4-6d

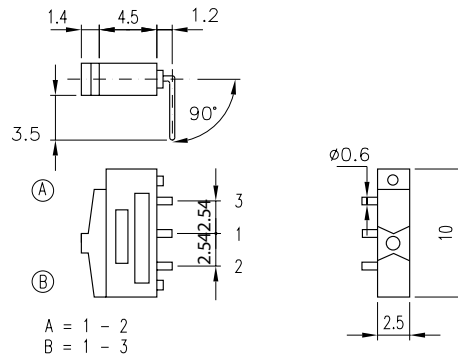
1K2

Low Profile Straight



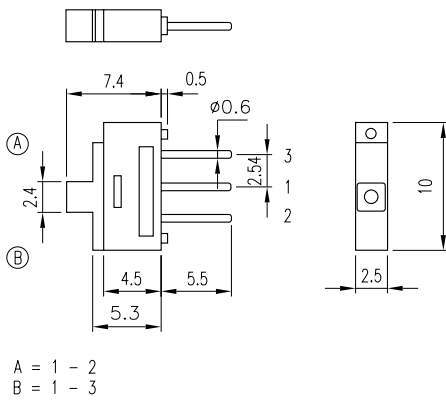
1K2

Low Profile Right Angle



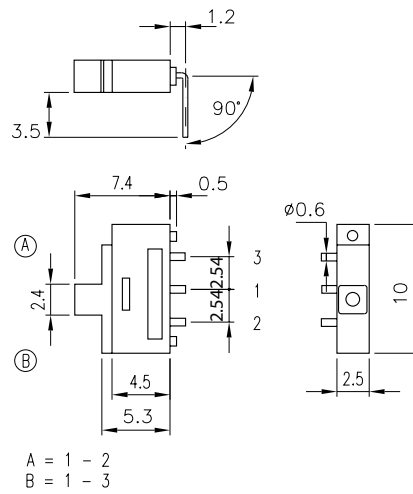
1K2

Extended Straight

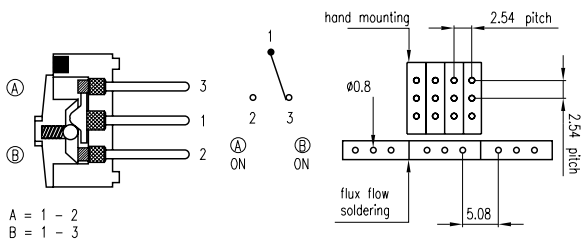


1K2



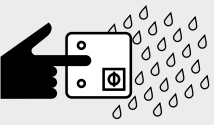
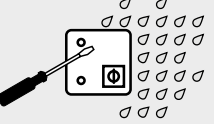
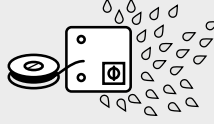
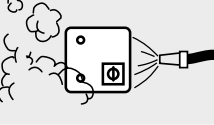
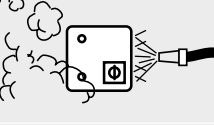


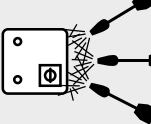
Extended Right Angle




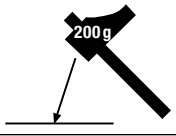
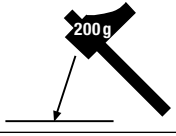
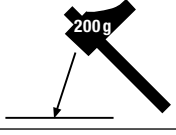
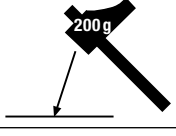
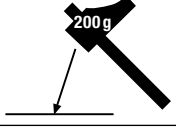
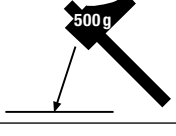
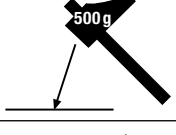
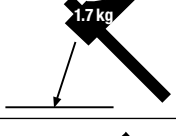
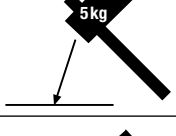
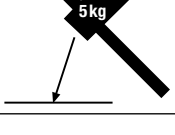
1K2 Layout



Degrees of protection to EN 60529

Protection against ingress of solid objects		Protection against water	
IP	First Figure	Second Figure	IP
No Protection	0		0 No Protection
Solid object Ø ≥50.0 mm	1		1 Vertical drops of water
Solid object Ø ≥12.5 mm	2		2 Water droplets (at 15° from the vertical)
Solid object Ø ≥2.5 mm	3		3 Sprinkled water
Solid object Ø ≥1.0 mm	4		4 Water sprayed from any direction
Protection against dust: limited ingress	5		5 Water jets from any direction
Total protection against dust	6		6 Strong jets of water
			7 Temporary immersion
			8 Long periods of immersion
			9k* High pressure/ high-temperature jets of water *DIN 40050-9

Degrees of protection to EN 50102

Protection against external mechanical impacts		
IK		
	00	No Protection
	01	Impact energy 0.15 joule
	02	Impact energy 0.2 joule
	03	Impact energy 0.35 joule
	04	Impact energy 0.5 joule
	05	Impact energy 0.7 joule
	06	Impact energy 1 joule
	07	Impact energy 2 joule
	08	Impact energy 5 joule
	09	Impact energy 10 joule
	10	Impact energy 20 joule

For more details please contact your personal EA0 consultant

Glossary

Note

This glossary contains short explanations of terms used in this catalogue. Definitions are given for these terms and, regulations relating to them.

A

Actuating force

Force (N) exerted on an operation part that is necessary for the execution of the required activation

Actuating point

Position of actuator at which contact operation occurs

Actuating torque

Torque (Nm) exerted on an Operation part that is necessary for the execution of the required activation

Actuating travel

Path travelled by Operation part in mm

Actuator

The part of a switch assembly used by the operator that causes switch contacts to engage or disengage. Actuators include pushbuttons, levers, slides, keylocks, toggles, emergency stop caps, etc.

Alternations

DIN EN 61058-1

Consequence of the changing of one switch position into another and back into the first, via all other switch positions, if such switch positions are present

Ambient temperature (enclosed)

Temperature (°C) at which a switchgear in a closed housing can be operated. The power loss of the switchgear (filament lamp operation also) has to be taken into consideration as it can lead to heating up in the interior of the housing ambient temperature, open

Ambient temperature (open)

Temperature (°C) of the space in which the switchgear is being operated. Ambient temperature, enclosed

Application class (climatic)

Specification in code letters for the climatic stress

AWG

Abbreviation for American Wire Gauge, a system of indicating wire sizes and dimensions

B

Behind panel depth

Distance from the rear surface of a panel to the far end of the switch mounted on the panel

Blind plug

For covering unused mounting holes

Bounce

Rebounding of contacts as they come together. Can prolong arcing or may open and close rapidly before stabilizing

Break

Interruption of a circuit. Double-break occurs when two contacts are opened simultaneously

Breakdown voltage

The voltage (V, kV), at which an insulating material fails electrically

Break-make contact

Contact made of a combination of NO (normally open) and NC (normally closed) contacts, with 3 connections (changeover switch contact)

Buzzer

Acoustic buzzer, piezo technology

Buzzer element

Acoustic indicator (Swisstac)

C

CE declaration

The CE declaration used on a product declares that it complies with the relevant fundamental requirements of all applicable guidelines and that the stipulated conformity evaluation procedure has been executed

Changeover contact

Contact made of a combination of NO (normally open) and NC (normally closed) contacts, with 3 connections (break-make contact)

Clearance

EN IEC 60947-1, EN IEC 61058-1

Shortest distance (mm) through the air between two electrically conducting parts or between an electrically conducting part and a metal foil on the touchable surface made of insulating material

Climatic resistance

Specifies the permissible temperature range and relative humidity of the switchgear

Contact gap

Open distance between contacts

Contact resistance

Resistance value (mostly in mΩ) between two connections, whose related contacts in the closed state compete a circuit

Contact resistance

Resistance value which arises in a switchgear between the contact parts of the circuit being switched

Contacts

A pair of devices that touch or come apart at the point where the switch throw makes or breaks the circuit. Silver contacts are common because of their low conductivity and low electrical resistance. Gold contacts are used for low level (signal level) switching

Contacts (of mechanical switchgear)

Conductive part that opens or closes a circuit by being activated

Conventional thermal current I_{th}

EN IEC 60947-5-1

highest current (A) that a switchgear can conduct for at least 8 hours without thermal overload, generally corresponds to the maximum rated higher current

CSA

Abbreviation for Canadian Standards Association, a Canadian rating organization

Current consumption

Current, expressed in mA, which flows in an illumination device subject to electric tension

Cycle of operation

Consequence of the changing of one switch position into another and back into the first, via all other switch positions, if such switch positions are present

D

Degree of pollution

EN IEC 60947-1

Reference number for the expected quantity of conductive dirt and air humidity which can lead to the reduction of the electric strength of a switchgear. The degree of pollution is described in 4 different grades

Diode element

Blocking diode for free connection e.g. for lamp testing in an element block

Double break

Contact, in which the two disconnection points of the circuit are present

Double break

A mechanism which breaks the circuit at two points simultaneously

Double pushbutton

Two independent pushbuttons in a single switchgear device

Double pushbutton actuator

Front part of a double pushbutton, without switching element

E

Electrical lifetime

Wear-resistant property of a switch under a specified electrical load, expressed in numbers of actuations. Expected cycle life when switch is operated at full rated load

Electrostatic breakdown value

Static electric strength (kV) between operation part and conducting material of the switchgear (contact, terminal)

Element block

Unit with integrated function parts e.g. lamp transformer

EMC

Abbreviation for electromagnetic compatibility

Emergency-stop pushbutton actuator

Front parts of an emergency stop button, without switching element

Emergency-stop pushbutton with key to unlock

For the switching off of current consumers, which could endanger persons, animals and property. Generally the activation surface is mushroom-shaped. Unlocking is effected by means of an insertable key into the operation part. The contact must automatically open the circuit

Emergency-stop pushbutton with twist to unlock

For the switching off of current consumers, which could endanger persons, animals and property. Generally the activation surface is mushroom-shaped. Unlocking is effected by twisting the operation part. The contact must automatically open the circuit

Emergency-stop switching element

Switching element with a guided NC contact

ENEC mark

The ENEC-Logo is the certification mark that has been agreed upon by the national certification authorities of European countries. It certifies the conformity of electro-technical products. The ENEC-Logo stands for the conformity with European norms and is used by a single authority

F

Filament lamp

Illumination part, where the light is produced by means of wire spiral

Fixing nut

For fastening the device in the front panel

Flasher with Indicator

Indicator with integrated flashing device

Flashing frequency

Pulses per time unit in Hz

Flush mounting

Almost flush installation of the pushbutton in a front panel

Foolproof (Emergency-stop pushbutton)

A triggering process which cannot be reversed. The switchgear locks into the „triggered position“. Chance or intentional manipulation (inching operation) is impossible

Forced opening

EN IEC 60947-1

Opening movement which ensures that the contacts of a switchgear have reached the „open position“ if the operation part is in the Off position

Frequency (sound)

Amplitude of oscillation of the sound of an acoustic signaller, expressed in Hz

Front bezel set, flush mounting

Accessory part for „flush mounting“

Front protective ring

Prevents the penetration of dust and liquids

G

Guided motion

Connection between operation part and contact, which has the effect of directly transmitting (without spring parts) the force exerted on the operation part on to the contact

I

Illuminated pushbutton actuator

Front part of an illuminated pushbutton, without contacts

Illuminated pushbutton maintained action

Pushbutton (maintained action) with integrated lampholder

Illumination

The illumination of an indicator area or of the operating part of an illuminated pushbutton by means of an illuminating device (filament lamp, LED)

Indicator

Light signal indicating a state by being illuminated or extinguished

Indicator actuator

Front part of an indicator without integrated lampholder

Indicator cap

Transparent, also coloured, cover for an indicator

Indicator element

Unit with integrated lampholder for mounting an illuminant

Insulating clearance

Distance between electrically active parts of opposite polarity or to ground

Insulation sleeve

Protection against contact of the live part of the blade flat receptacle

Interlocking pushbutton actuator

Pushbutton actuator (without contact), which is locked into a position by an additional pushing

Interval frequency

Oscillations per time unit in Hz

Isolation resistance

DIN IEC 60512-2

Resistance ($k\Omega$, $M\Omega$) between the different poles of a switch (base insulation) and between all parts which are under electric tension and are associated with each other and a metal foil which is superimposed on the touchable metal parts which are in contact with the base insulation. Quality of non-conducting material to withstand a maximum voltage

Glossary

K

Keylock switch

Switch with a key as operation part

Keylock switch actuator

Switch actuator (without contact) with a key as operation part

L

Lamp

Light source for the illumination of the lens or indicator cap e.g. filament lamp, LED

Lamp block (element)

Unit with integrated lampholder for the mounting of an illuminant

Lamp transformer

Voltage reduction e.g. of a control voltage to a lower voltage for the supply of an illuminant (generally 230VAC to 24VAC)

Leakage path

EN IEC 60947-1, DIN EN 61058-1

Shortest distance (mm) along the surface of the insulation material between conducting parts or between an electrically conducting part and metal foil on the touchable surface made of insulating material

LED

Illuminations, where the light is produced by current flow through a semiconductor element (substantially higher life than filament lamps)

Lens

Operation part for the activation of the electrical contact of a push-button

Lever

Operation part for the activation of the selector switch

Low level switching element

Four-fold contact (slow-make element) for the switching of low currents and voltages with very high certainty of switching

M

Maintained action

The circuit stays open or closed after switch actuation until the next time the switch is actuated

Mechanical lifetime

Wear-resistant property of a switch without electrical load, expressed in number of actuations

Membrane switching system

Switching system with one or more contacts under a common foil (also designated as membrane keyboard)

Momentary action

The circuit is opened or closed only as long as the switch is actuated

Mounting tool

For simple mounting of a switchgear or indicator

Mushroom-head cap

Mushroom-shaped operation part for the activation of an electrical contact

N

Normally closed/NC

Contact, which is closed in the non-activated position and opens a circuit on activation

Normally open/NO

Contact, which is open in the non-activated position and closes a circuit on activation

O

Opaque

Light-impervious, e.g. black or grey lens

Open circuit

Open circuit is contact lift-off or a result of low contact pressure

Operating part

EN IEC 61058-1

The part (lens, lever, etc.) of a hand-activated switchgear which is used for effecting the contact

Operating temperature

Permissible temperature range for the operation of a device

Overtravel

Distance from operating position (actuation point) to the end of the actuators travel

Overvoltage category

EN IEC 60947-1

Reference number for overvoltages, e.g. by lightning effects or switching processes which can occur at the installation site. There is a classification into four grades

P

Plug-in connection

Connection of the electrical circuit by means of a plugging-in device (flat receptacle)

Pretravel

Distance from free position to operating position

Protection class

EN IEC 61058-1

Designates a classification of switchgear, in which protection against electric shock is based on the base insulation (e.g. safety class 0)

Protection degree

EN IEC 60529

Measure for the protection of the electrical operating material against the penetration of solid bodies and of water, is expressed in IP and figures. The 1st figure defines the solid-body protection, the 2nd figure the water protection

Pushbutton

Switchgear, that is generally activated by the finger and which initiates a switching

Pushbutton actuator

Front part of a pushbutton without switching element

Pushbutton Maintained action

Switch with maintained action and spring resetting on renewed activation as well as a lens, which is generally activated with the finger

Pushbutton Momentary action

Switch with spring resetting and a lens, which is generally activated with the finger

Push-Pull pushbutton

Switch with an operation part, which is activated by pressing and returns to its initial position by pulling, or vice-versa

R

Rated impuls withstand voltage (Ui)

EN IEC 60947-1

Measurement for the strength in the interior of switchgear with regard to rated surge voltage resistance (kV)

Rated insulation voltage (Ui)

EN IEC 60947-1

The voltage, (V, kV), to which insulation tests and leakage paths are related. The highest rated higher voltage may not be greater than the rated insulation voltage

Rated operational current (Ie)

EN IEC 60947-1

The current (A) which a switchgear can conduct, taking into consideration rated higher voltage, operating period, service category and ambient temperature

Rated operational voltage (Ue)

EN IEC 60947-1

Voltage (V) to which the characteristic value of a switchgear is associated. The highest rated higher voltage may not be higher than the rated insulation voltage

Rated uninterrupted current (Iu)

EN IEC 60947-1

Current (A) which a device can conduct in continuous operation (weeks, months, years)

Rebound time

The rebound time for a contact, which closes (opens) its circuit, is the time interval between the first closing (opening) and the final closing (opening)

Regulations

Components of a standard

Resistance to heat of soldering

Time and temperature unit for the connection of conductors to a solder connection of the switchgear

Resistor block

Ohmic resistor in an element block

Resistor-diode block

Combination of blocking diodes and resistor in an element block

S

Screw terminal

Connection of the electrical circuit by means of a screw device

Selector switch

Switch with a lever as operation part

Selector switch actuator

Front part of a selector switch, without contacts

Selector switch long lever

Switch with a long lever as operation part

Service category

EN IEC 60947-1

Combination of fixed requirements which have been chosen, when taking into consideration the operating conditions of a switchgear, in order to meet the needs of a fundamental group of practical cases of application (e.g. AC 15)

Shock resistance

Property of a switchgear to withstand impetus-type movements without change of operational state and without damage

Short-circuit protection

Current value (A) of the fuse to be installed on the switchgear to protect it from short-circuit damage

Short-travel switch

Pushbutton with small actuating travel (mm)

Single-break

Contact, in which a disconnection of the circuit is present. Mechanism that transfers one contact

Slow-make switching element

Switching element, in which the speed of the moving contacts is dependent on the activation speed

Slow-make/break contact

Usually used with AC circuits, especially emergency-stop pushbuttons

Small contact opening width

EN IEC 61058-1

Minimum contact opening that is sufficient for reliable operation

SMD/SMT

Abbreviations for Surface Mount Device and Surface Mount Technology

Snap-action switching element

The rapid transfer of contacts from one position to another. This action is essentially independent of actuator speed. Switching element, in which the speed of the moving contacts is essentially independent of the activation speed

Soldering terminal (and similar)

EN IEC 61058-1

Electrically conducting part of a switch, which has been provided to make a connection with the help of solder

Soldering-/plug-in terminal (and similar)

Electrical connection of a circuit by means of soldered or plug-in terminals

Sound pressure

Measure (dBA) for the volume, in relation to the distance of an acoustic signaller

Spacer

For uniform clearance between front panel and PCB (Series 92)

Spacing cap

For expansion of the clearance between switching element (on PCBs) and front panel (Series 70)

Standard

Contains a number of stipulations for the definition e.g. of a regulation such as IEC

Storage temperature

Permissible temperature range (°C) for the storage of a device

Switch

Device for the closing and opening of one or more circuits by activation of contacts

Switch rating

Specification regarding rated higher currents in dependency on a rated higher voltage

Switchgear

Generic term for all pushbuttons and switches

Switching element

Contains one or more contacts, which are necessary for the opening or closing of a circuit

Switching element and diodes

Combination of switching element and diode element

Glossary

Switch-on current

Loads that require more current when first turned on than needed to continue operation. Light bulbs exhibit high resistive inrush and may draw up to 10 times or more the normal operating current when first turned on. Motors may show high inductive inrush currents when started

T

Tactile feel

An indication, usually by touch, that indicates the operating position (actuation point) has been reached

Tactile point

Feature that indicates actuation point has been reached. Also referred to as tactile feel because of construction element in a switch which provides a tactile response to the activation

Terminal (Connection method)

Electrical connection to the external circuit e.g. soldering-/plug-in terminal, screw terminal

Tightening torque

Measurement (Nm) for the turning effect of a force (N) being applied to a turnable body

Tool

Aid for assembling, disassembly of switchgear or indicators and their individual parts or accessories

Translucent

Light-transmitting, diffuse material structure for uniform illumination by means of filament lamps

Transparent

Light-transmitting, transparent clear structure, e.g. recommended for the use of a film insert in a lens or for illumination by means of a LED

Travel

Travel path of the operation part until activation of the contact, expressed in mm

U

UL

Abbreviation for Underwriters Laboratories, a US rating organization

V

VDE

Abbreviation for the German Testing Agency, a German rating organization

Vibration resistance

Property of a switchgear to withstand undulating movements without a change of operating state and without damage

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