



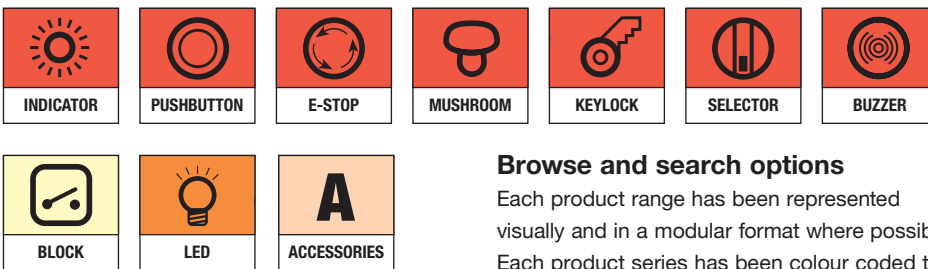
Product Catalogue

Transportation Market

How to get the most from this catalogue

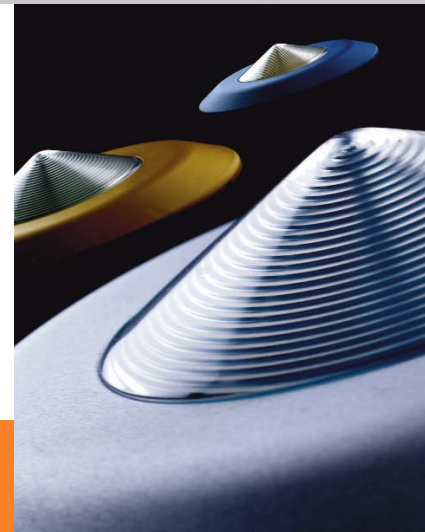
The objective of this catalogue is to provide engineers and purchasers with a quick and easy search facility for the selection and purchase of EAO's most popular transportation product ranges.

This catalogue contains details of EAO's latest state of the art, ergonomically designed range of pushbuttons, switches, keyboards and keypads 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 for a complete part. Additional elements may be actuators, illumination, contact blocks, accessories, and so on.



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

- Mounting hole size
- Contact terminals
- Number of keys
- Illumination
- Front protection (IP Rating)
- Lens cap
- Mounting style
- Marking
- Switch rating
- Application
- Product function
- Approvals

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



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Type	Mounting Style	Mounting Hole Size (mm)	Page
Panel Mount, Unsealed, IP40, Pushbuttons, Switches & Indicators			
Series 18	Raised/Flush	16Ø, 15.8 x 15.8	58
Panel Mount, Sealed, IP65 (Oil & Watertight) Switches & Indicators			
Series 04	Raised/Flush	22.5, 30.5Ø, 30 x 30	26
Series 14	Raised/Flush	22.5, 30.5Ø	48
Series 22	Raised	22 x 30	64
Series 56	Raised/Flush	42Ø, 43.1Ø	70
Series 58	Touch Sensitive Switch	No mounting hole required	78
Series 61	Raised/Flush	16Ø, 21 x 21, 21 x 27, 22.5Ø	82
Series 71	Flush	21 x 21, 21 x 27, 22.5Ø	94
Series 84	Flush	22.5Ø	100
Keylock & Selector Switches			
Series 04	Raised/Flush	22.5, 30.5Ø, 30 x 30	26
Series 14	Raised/Flush	22.5, 30.5Ø	48
Series 22	Raised	22 x 30	64
Series 61	Raised/Flush	16Ø, 21 x 21, 21 x 27, 22.5Ø	82
Series 71	Flush	21 x 21, 21 x 27, 22.5Ø	94
Emergency Stop Switches			
Series 04	Raised	22.5Ø	26
Series 61	Raised	16Ø	82
Series 84	Raised	22.5Ø	100
Buzzers			
Series 04	Flush	30.5Ø	26
Series 14	Flush	30.5Ø	48
Keypads & Keyboards			
AVME Keypads			108
S.series Keypads			112
W.series Keyboards			116
W.series Keypads			117
Special Function Switches			
Key Insert Switch	Flush	30.5Ø	29
Lever Switches	Flush	33.5Ø	33
Stop Request Pushbutton		35Ø, 38Ø (pole size)	102

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.



Our 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 10 specialised Sales and Customer Service Centres around the world and a network of trained specialist agents and representatives in more than 50 countries will bring experience, skill and dedication to your projects.



EAO – Your approved partner

EAO is certified and managed according to ISO 9001, ISO 14001, ISO/TS 16949 and VDA6.1 standards.

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



Global EAO

EAO Sales Companies	Iceland
Austria	India
Belgium	Iran
China	Israel
France	Kazakhstan
Germany	Korea
Italy	Latvia
Japan	Malaysia
Netherlands	Mexico
Sweden	New Zealand
Switzerland	Norway
United Kingdom	Oman
USA	Peru
	Poland
EAO Distributors	Portugal
Argentina	Romania
Australia	Russia
Belarus	Saudi Arabia
Brazil	Singapore
Bulgaria	Slovakia
Chile	Slovenia
Columbia	South Africa
Croatia	Spain
Czech Republic	Sri Lanka
Denmark	Taiwan
Finland	Thailand
Greece	Turkey
Hungary	Ukraine

EAO – Your expert partner for Transportation Solutions

The key drivers of the transportation sector are reliability, longevity, safety, compliance to fire regulations and adherence to standards. Public transport vehicles are constantly exposed to harsh environments, including extreme weather conditions, vibration, high volume of passengers and sometimes vandalism. EAO's philosophy is to deliver quality and reliability through its people, products and processes. EAO aims to achieve total quality satisfaction by fulfilling the ergonomic and aesthetic requirements of its end users as well as the technical and economical value requirements of its customers.

EAO also understands that the Transportation sector differs from that of traditional industrial markets in that it is made up of a multilayered network of global procurement chains which include operators, manufacturers, system suppliers, subsystem suppliers as well as component manufacturers like ourselves.

Having developed good working partnerships with all parties involved in this sector and a detailed knowledge of the individual market segments that make up the Transportation sector, EAO is able to work closely and creatively with the parties involved, to apply our expert knowledge to the delivery of applications.

Rail



EAO understands that reliability, safety, efficiency, passenger comfort and speed are imperative to the rail industry, which is why we've become the foremost global partner for well-designed switching products used by rail vehicles globally. EAO's distinctive, well-designed products are used throughout the world's most modern rail vehicles. Our products are also equally beneficial for refurbishing and upgrading existing rolling stock.



Key features

- Compliant with industry standard specifications for shock, vibration, fire and smoke emissions
- Controls for on board passenger display
- Driver's cab cockpit controls
- Guards' control panels
- HMI products and solutions for new build and refurbishment
- Passenger access controls
- Solutions for disabled users

Customer advantages

New build trains

EAO has a proven track record of working in partnership with the world's leading designers of rail solutions, whose vehicles are at the cutting edge of innovative technology and ergonomic design.

EAO products are renowned for their aesthetic design qualities that complement the engineering and design of new trains, as well as meeting stringent standards in terms of safety and durability.



Refurbishment

Refurbishment projects not only provide train operators with the opportunity to bring a vehicle up to date in terms of standards for safety and reliability, but they also provide an ideal opportunity to enhance the value of an old vehicle.

EAO refurbishment capabilities range from updating passenger access controls to supplying complete specialist control panels for driver's cockpits and guards panels. EAO can deliver fully-wired units in order to meet precise refurbishment schedules.



Applications

Passenger access

Passenger access is one of EAO's specialities. Switches in doors and toilets are areas where unreliable technology can undermine train performance. For instance, an illuminated switch in a door opener that is fitted with a standard filament bulb is more susceptible to failure than one from EAO fitted with LED's.

EAO's products have been developed to overcome these issues. Rugged, vandal-proof and sealed to IP67 to resist extremes of weather, our Series 56 has become one of the market's most successful door openers.



Disabled access

EAO can provide advice and solutions for train operators working to meet disabled access regulations.

EAO understands that imperative to the success of catering for wheelchair access, are pushbuttons fitted at certain heights and operable by palm. In order to cater for visual impairments pushbuttons need to be identifiable by touch. EAO's Series 56 delivers highly visible LED 'halo' illumination and a large 'touch surface' area, which can be engraved with a variety of raised symbols, including Braille and raised legends, which are informative and comfortable for all users.

EAO's disabled access solutions also extend to easy to operate pushbuttons for toilets, and wheelchair ramps.

Driver's cab cockpit controls

EAO plays a leading role in the supply of switches and control panels into driver cockpits. Our illuminated pushbuttons, rotary switches and Emergency-stop switches deliver unparalleled performance in terms of usability, comfort and ease of installation. A switch that fails in a driver's cab can prevent the train from entering service. EAO offers reliability in all products which results in considerable benefits for train operators by reducing out of service.





Guards' vestibules

EAO also supplies switches and assembled panels for guard's vestibules. EAO's flush-mount lever switches and pushbuttons are reliable and deliver good tactile feedback, thus offering reassurance of the status of a certain function.

External functions

If a guard or driver needs to determine from a distance whether all passenger doors are closed, EAO also offers a Series 56 indicator, raised in shape, delivering side view illumination. Visible in all weather conditions, the Series 56 indicator features LED illumination with a lifetime of up to 100,000 hours continuous use. It is available in a choice of red, green, yellow, blue and white. The switch bezel can be supplied in a choice of contrasting colours.



Expert advice

EAO understands that whilst design excellence and engineering expertise are important for the development of Human Machine Interface solutions, critical to the success of customer and end-user applications across industry sectors is our in-depth, global industry knowledge.

EAO's customers and their end-users worldwide rely on our specialists' understanding of what their industries need now and what they will need in the future.

EAO has developed expert knowledge from serving rail-industry customers throughout the world and we share this knowledge to improve our service. For example, from our experience of dealing with the UK's Rail Vehicle Accessibility Regulations (RVAR) and National Organisations representing disabled customers, we are now able to advise our customers on how to overcome potential problems in the future.

Engineering solutions

EAO specialises in creating fully wired switch panels for prestigious global customers. We understand the need to develop commercially viable solutions to meet customer's unique needs and deliver them whenever they require them and however they require them – on time.

EAO's versatile range of products can be tailored to the specific designs, colour schemes and demands of each individual customer.

Advantages

- Access to fully equipped test laboratories and skilled technicians who understand the demands placed on Human Machine Interface systems
- Cost conscious approach to selecting products and services
- Delivered ready to use from a single source
- Local application specialists to develop solutions to meet your specific needs
- Worry free project management from initial consultation to delivery

Buses, Coaches & Trams

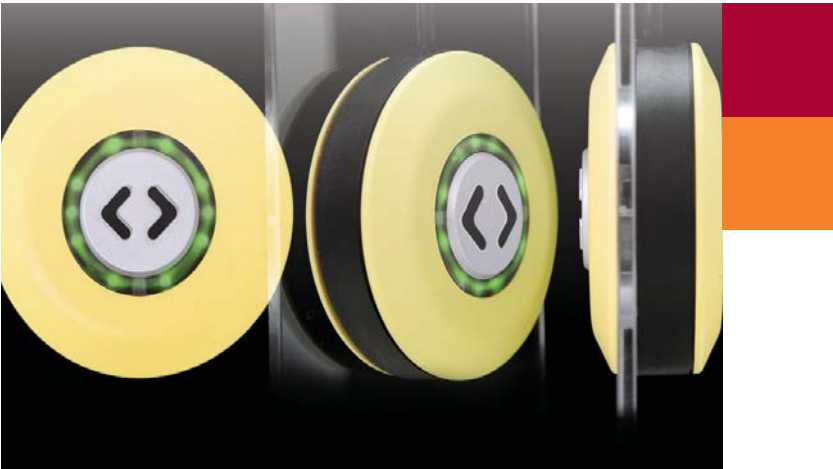


EAO understands that in order to combat city congestion and resulting pollution, those involved in the design and manufacture of buses and trams need to apply the same standards of comfort and design to attract passengers to their vehicles as a car manufacturer would.

Whether it is driver controls or passenger access EAO has a range of expertly and aesthetically designed products for bus, coach and tram applications to improve the operator interface.



EAO has many years experience supplying switches and associated products into this market. This allows us to be at the cutting edge of development, ready to meet the changing needs of the industry as it adapts to fast moving technology, design, customer expectation and regulation.



Key features

- Compliant with industry standard specifications for shock, vibration, fire and smoke emissions
- Driver's cab cockpit controls
- HMI products and solutions for new build and refurbishment
- Keypads for on board passenger display
- Passenger access controls
- Solutions for disabled users

Customer advantages

EAO has tailored its products to be compatible with the bus, coach and tram industry at every level of production and service from initial design to future refurbishment. With offices worldwide EAO can match the supply needs of global companies wherever they are now will be in the future.

Refurbishment

Time is of the essence for refurbishment projects, as vehicles out of service incur costs. EAO has responded with a range of flush-mounting rectangular pushbuttons that can be fitted into existing driver controls as a direct replacement for rocker switches. The advantage of pushbuttons is that they are less susceptible to accidental operation and the large lens area offers a better marking area with improved indication of status.



Buses, Coaches & Trams



Applications

Passenger access

Many new bus designs today require door opener switches that can be mounted onto glass. EAO's Series 58 Touch Sensitive pushbutton is designed to be mounted quickly and easily onto glass without the need to drill holes.

EAO also offers the market leading Series 56, which has become a recognisable feature of many of the world's most modern bus, coach and tram vehicles. With LED 'halo' illumination, a bright thermoplastic housing and a touch surface that only requires a gentle press, this pushbutton helps vehicle builders fulfill the demands of the most stringent disabled access regulations.

Disabled access

Modern bus and tram design often feature low floor vehicles or vehicles with ramps that are designed to provide the disabled passenger with easy entry.

EAO products are perfect for ramp requests on public transport. EAO's Series 14 and Series 61 ranges are available with flush mount design with the option of mushroom headed caps featuring LED illumination, which offer more reliability than filament lamps. These products can also be engraved.

Passengers with sensory or visual impairments will also benefit from EAO's Series 56 which features 'halo' LED illumination and can be supplied with a raised lens to meet the latest disability regulations.

Driver's door control panels and emergency door opening

EAO's Series 61, 71 and 14 switches and indicators are ideally suitable for use in applications such as dashboard control units.

EAO's pushbuttons and indicators are suitable for flush mounting in square or rectangular or round panel cut-outs. With a low back panel depth, sealing of up to IP67, these products benefit from easy wipe cleaning and are tamperproof from the front. Other options include single or multi chip LED illumination in a variety of colours.



Pole mounted stop request

EAO offers a housing to accompany its Series 84 range of switches, which has been designed to be mounted as an aesthetically appealing Stop Request Pushbutton. The pole mounted switch can be mounted onto pole sizes ranging from 25-38mm and is available with either a flying lead or plug-in terminals, various lens colour options and can be LED illuminated.

On board passenger information systems

Manufacturers and designers can also add value to buses, coaches and trams by offering on board, LED passenger information displays. EAO offers a high quality range of durable keypads and keyboards ideally suited for programming display information.



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Expert advice

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EAO's customers and their end-users worldwide rely on our specialists' understanding of what their industries need now and what they will need in the future.

Specialist Vehicles



Reliability, durability, flexibility and low maintenance are key factors for manufacturers of specialist vehicles.

EAO works in close consultation with specialist vehicle manufacturers and end users (police, ambulance teams, firefighters and so on) to ensure that all possible requirements for an emergency or special vehicle are met.



Key features

- Compliant with industry standard specifications for shock, vibration, fire and smoke emissions
- Driver's control panels
- HMI products and solutions for new build and refurbishment
- Lifting and moving controls



Customer advantages

Each specialist vehicle has unique functionality requirements. EAO is an expert in examining the requirements, designing the solution, creating prototypes and meeting tight project schedule requirements.



Lifting controls

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 Human Machine Interface controls are ideally suited to specialist vehicles fitted with lifting functions. EAO's products are both rugged and user friendly and have been successfully installed into applications including hydraulic lifting equipment for ambulances and other vehicles.

Driver control panels

EAO can construct specialist vehicle control panels that for example operate the sirens and flashing lights of a police car, using Series 71 pushbuttons.

As specialist vehicles often require adaption or upgrading, EAO ensures that specialist vehicle panels are designed with optimum flexibility in mind. Front panel design functions may therefore be changed or updated without impacting the PCB.

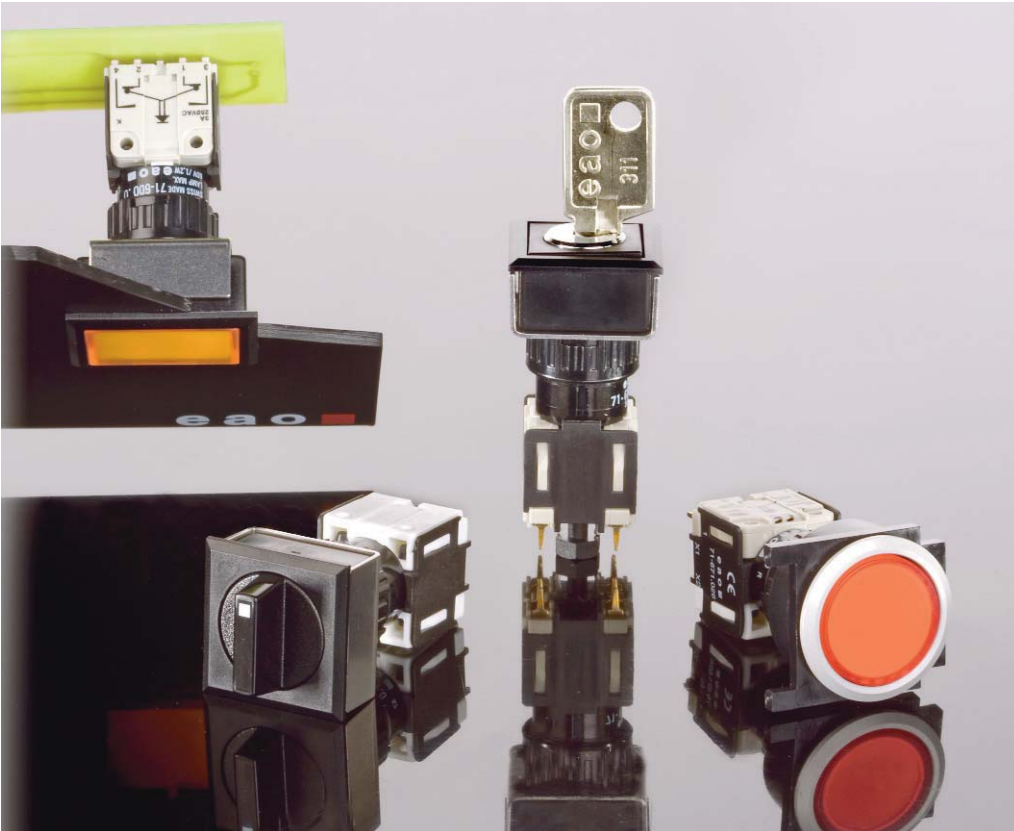
EAO switches feature detachable, snap action contact blocks, which can be mounted direct to the PCB, thus reducing the risk of wiring errors and bad contacts. The switches can be

quickly and easily snapped off the contact blocks for ease of maintenance.

EAO's flush mount Series 61 pushbuttons are also ideal control panel switches. The Series 61 range combines aesthetic design with tactile feedback and a reassuring click. The range is also available for engraving.



Specialist Vehicles



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Aerospace



EAO is a specialised designer of robust, ergonomic controls and interfaces for complex aerospace applications such as cockpit controls and cabin equipment where safety and reliability are critical factors.

EAO integrated an illuminated keypad and trackball within this robust, cockpit solution. The positive tactile response and audible click is reassuring for the user.



This custom-built keypad is for integration within a lightweight VHF/UHF Airborne Transceiver to be used within cockpits of military aircraft.



EAO supplies many leading manufacturers of on-board catering equipment such as water heaters, coffee makers and ovens.

Key features

- HMI products and solutions for new build and refurbishment
- Military and passenger airlines
- Pilot cockpit controls
- Lighting systems
- On board catering equipment
- Compliant with industry standard specifications for shock, vibration, fire and smoke emissions

Customer advantages

EAO products are designed to meet specific Aircraft UL approval, guaranteeing products have passed stringent flammability, electrical and mechanical tests conducted by Underwriters Laboratories, Inc standards.

EAO's Series 61 switches are also approved to CE, EN/IEC 60947-5-1, EN/IEC 61058-1 (ENEC) and CSA, and have been successfully installed in aerospace applications worldwide.



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Marine



EAO has built a strong reputation for the supply of Human Machine Interface products and solutions into the marine industry. Our commitment to engineering quality, testing, and design ensures that our products deliver benefits in terms of durability, water resistance and aesthetic appeal.

Our main markets include:

Commercial

From cruise liners to transit ferries, EAO's reputation for quality has positioned it as a leading supplier of Human Machine Interface products and solutions to the commercial shipping industry. The extreme reliability of our products benefits the industry in terms of cost effectiveness relative to service life, especially when you compare down-time maintenance associated with more inferior products.

Naval & maritime

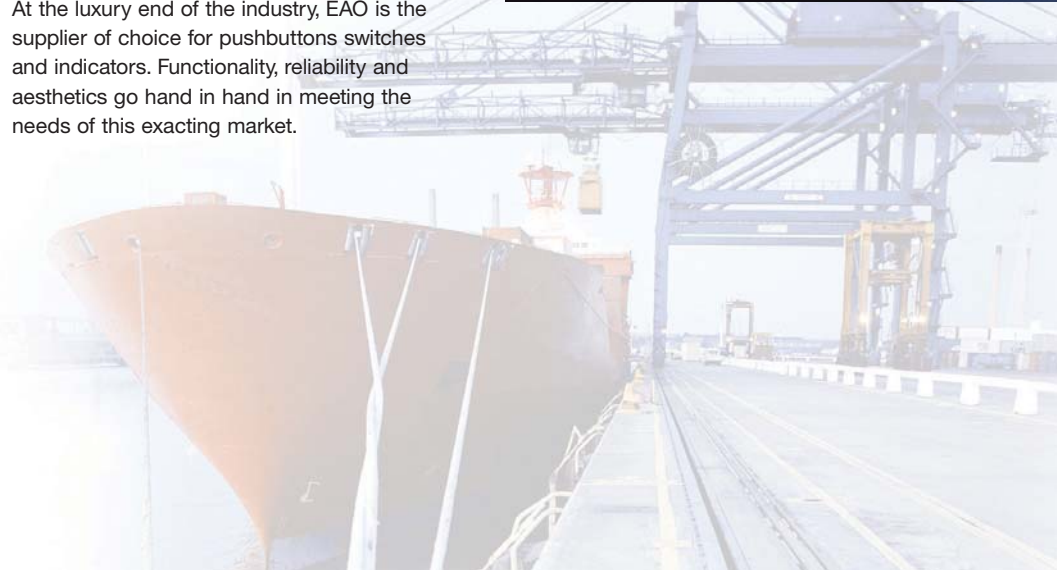
Military control desks are designed to provide users with strategic decision support. By definition, Human Machine Interface technology demands that prerequisite to ergonomic success is full understanding and appreciation of the end use application. By adopting a user centred approach, EAO is able to deliver products that provide the durability required for a military application, combined with end user comfort and confidence delivered through audible, tactile and smooth operation.

Shipping & freight

EAO understands that reliability is a key driver for profitability in the shipping and freight sectors. EAO's products are constructed from high quality materials and are tested rigorously to meet international standards. As a result EAO has won many customers within the shipping and freight industry.

Luxury shipbuilding

At the luxury end of the industry, EAO is the supplier of choice for pushbuttons switches and indicators. Functionality, reliability and aesthetics go hand in hand in meeting the needs of this exacting market.





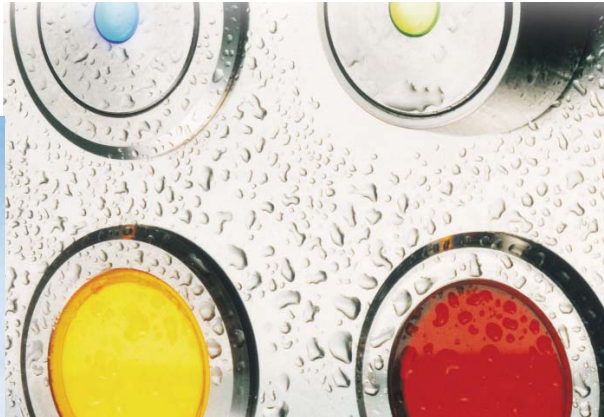
Customer advantages

EAO's modular Series 04 range which includes pushbuttons, indicators, selector switches, keylock switches and Emergency stops is certified to a number of approval standards including UL, Ce, EN/IEC 60947-5-1, EN/IEC 61058-1 (ENEC), and CSA. This makes the range ideal for applications such as shipping control desks that require a good quality seal, impenetrable to corrosive sea water.

Key features

- Compliant with industry standard specifications for shock, vibration, fire and smoke emissions and water resistance
- External functions
- HMI products and solutions for new build and refurbishment
- Propeller function controls
- Shipping control desks





Applications

Ship control and monitoring panels for main propelling and steering systems.

EAO supplies pushbuttons for panels to be fitted to control desks for marine propellers. EAO recommends its Series 61 range of indicators and illuminated pushbuttons for this type of project. The range has a good quality seal and is rated at IP65 from the front, and therefore spray proof. EAO's Series 61 range is also certified to a number of approval standards including UL, CE, EN/IEC 60947-5-1, EN/IEC 61058-1 (ENEC) and CSA. EAO also recommends its Series 14 illuminated pushbuttons, rated at IP67 from the front, and therefore can be immersed to a depth of 1 metre.

Central command control desk for ships

EAO recommends its Series 71, round, flush-mounted pushbuttons for multifunction control desk consoles, to be fitted within the control rooms on naval ships. One of the advantages of EAO's Series 71 range is that this easy to install pushbutton can be mounted as part of the automated assembly of the PCB.





Expert advice

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Engineering solutions

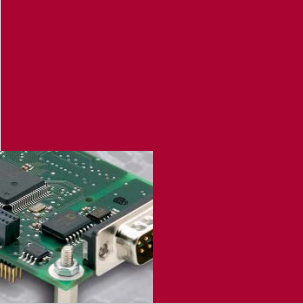
EAO specialises in creating fully wired switch panels for prestigious global customers. We understand the need to develop commercially viable solutions to meet customer's unique needs and deliver them whenever they require them and however they require them – on time.

EAO's versatile range of products can be tailored to the specific designs, colour schemes and demands of each individual customer.

Advantages

- Access to fully equipped test laboratories and skilled technicians who understand the demands placed on Human Machine Interface systems
- Cost conscious approach to selecting products and services
- Delivered ready to use from a single source
- Local application specialists to develop solutions to meet your specific needs
- Worry free project management from initial consultation to delivery

Interface Solutions...



EAO specialises in creating fully-wired switch panels for prestigious global customers. We understand the need to develop commercially viable solutions to meet a customer's unique needs and deliver them whenever they require them and however they require them – on time.

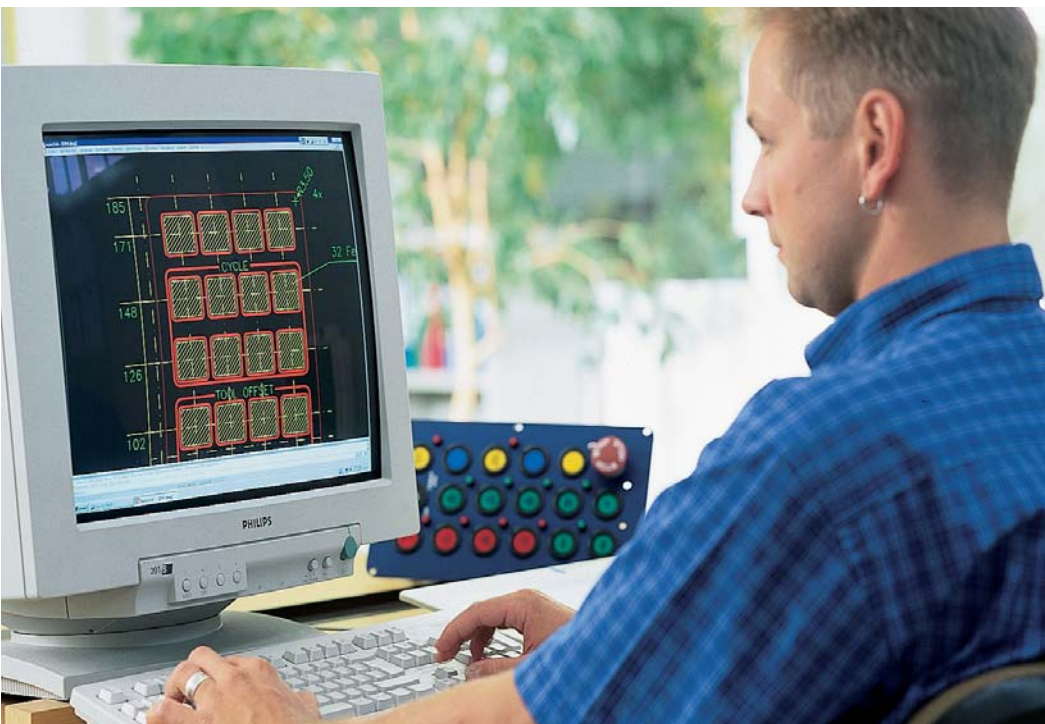
...meeting your needs



EAO's versatile range of products can be tailored to the specific designs, colour schemes and demands of each, individual customer.

EAO plays a leading role in the supply of switches and complete control panels. Our illuminated pushbuttons, rotary switches and emergency-stop switches deliver unparalleled performance in terms of usability, comfort and ease of installation.





CAN Module for HMI Solutions

EAO, the expert in Human Machine Interfaces has now developed a CAN Module, which can be integrated into panel solutions.

Maybe you are currently relying on cable harnesses connected to your operator panel, when the rest of your system is managed with bus systems. You know that using field bus systems reduces the wiring, reduces the installation time and makes fault locating easier with its diagnostic functions.

Get all these advantages in your operator panel solution, with a solution from EAO with its new CAN Module integrated.

The CAN Module developed by EAO gives you the possibility to connect pushbuttons, switches, potentiometers, pilot lights, 7-Segment displays or other panel components that you request into an integrated CAN bus solution.

When working with you on your operator panel design we discuss not only the hardware requirements but also the CAN bus system data, and incorporate your requirements into the final solution. We configure the interface board to suit your needs, and subject to your approval of the final specification, deliver a plug and play solution ready to integrate into your application.





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 pages 40-42
 Technical drawings see pages 43-47

- IP65 Protection
- Switch Rating:
 Maximum Voltage, 500VAC
 Maximum Thermal Current, $I_{th} = 10A$
 230VAC/6A, 24VDC/10A
- Raised Mounting into 22.5mm cut out
- Flush Mounting into 30.5mm 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

For complete switch also order



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*

*Add suffix 'B' for non captive screw with flat washer and spring washer option

For complete switch also order

Indicator



Indicator, flush mount, silver bezel, 30 x 30mm mounting

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

For complete switch also order

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

For complete switch also order **A**

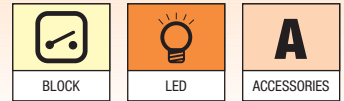


Non illuminated raised pushbutton, aluminium bezel, 22.5mm mounting

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 **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.



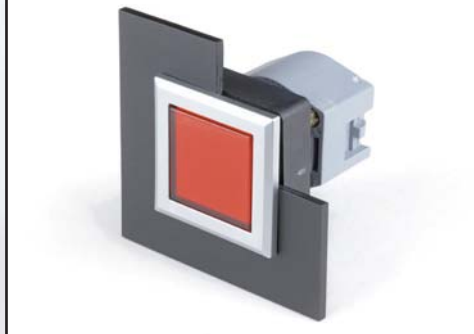
Non Illuminated pushbutton



Non illuminated flush mount pushbutton, aluminium bezel, 30.5mm mounting

Colour	Part No., Momentary	Part No., Maintained
Red	704.012.218	704.042.218
Yellow	704.012.418	704.042.418
Green	704.012.518	704.042.518
Blue	704.012.618	704.042.618
Clear	704.012.718	704.042.718
Black	704.012.018	704.042.018

For complete switch also order **A**



Non illuminated flush mount pushbutton, silver bezel, 30 x 30mm mounting

Colour	Part No., Momentary	Part No., Maintained
Red	704.210.008	704.240.008
Yellow	704.210.208	704.240.208
Green	704.210.408	704.240.408
Blue	704.210.508	704.240.508
Clear	704.210.608	704.240.608
Black	704.210.708	704.240.708

For complete switch also order **A**

Illuminated pushbutton



Illuminated raised pushbutton, grey plastic bezel, 22.5mm mounting

Colour	Part No., Momentary	Part No., Maintained
Red	704.030.2	704.060.2
Yellow	704.030.4	704.060.4
Green	704.030.5	704.060.5
Blue	704.030.6	704.060.6
Clear	704.030.7	704.060.7

For complete switch also order **A**

Illuminated pushbutton



Illuminated raised pushbutton, aluminium bezel, 22.5mm mounting

Colour	Part No., Momentary	Part No., Maintained
Red	704.032.2	704.062.2
Yellow	704.032.4	704.062.4
Green	704.032.5	704.062.5
Blue	704.032.6	704.062.6
Clear	704.032.7	704.062.7

For complete switch also order **A**



Illuminated flush mount pushbutton, aluminium bezel, 30.5mm mounting

Colour	Part No., Momentary	Part No., Maintained
Red	704.032.218*	704.062.218*
Yellow	704.032.418*	704.062.418*
Green	704.032.518*	704.062.518*
Blue	704.032.618*	704.062.618*
Clear	704.032.718*	704.062.718*

*Add suffix 'B' for non captive screw with flat washer and spring washer option

For complete switch also order **A**



Illuminated flush mount pushbutton, silver bezel, 30 x 30mm mounting

Colour	Part No., Momentary	Part No., Maintained
Red	704.230.208*	704.260.208*
Yellow	704.230.408*	704.260.408*
Green	704.230.508*	704.260.508*
Blue	704.230.608*	704.260.608*
Clear	704.230.708*	704.260.708*

*Add suffix 'B' for improved shock and vibration performance option

For complete switch also order **A**



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

Emergency-stop switch		Mushroom headed pushbutton					
<p>Emergency-stop, twist release, 37mm diameter, foolproof to EN 60947-5-1 and EN 418, use slow-make switching elements</p>		<p>Emergency-stop, key release, 37mm diameter, foolproof to EN 60947-5-1 and EN 418, use slow-make switching elements</p>			<p>Mushroom headed pushbutton, plastic bezel and aluminium bezel, 22.5mm 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			
For complete switch also order <input checked="" type="checkbox"/> A		For complete switch also order <input checked="" type="checkbox"/> A			For complete switch also order <input checked="" type="checkbox"/> A		

Complete switch

Features

- IP65 protection
- Renowned in the transportation sector for guaranteed reliability
- Modular switching system
- Intensive LED illumination
- Good snap action tactile feel
- Self cleaning contacts
- Stackable contact blocks
- Flush mount aluminium protective cover (to prevent accidental operation, damage)
- Spring return to close
- Worldwide approvals

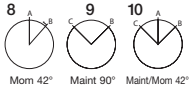
Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



Key insert switch



Crew insert switch, stainless steel front ring, flush mount, 30.5mm mounting



Drawing	Part No.	Momentary/Maintained
8	704.103.0.*28	Momentary
9	704.101.0.*28	Maintained
10	704.093.0.*18	Maintained/Maintained
10	704.095.0.*18	Momentary/Momentary
10	704.097.0.*18	Maintained/Momentary

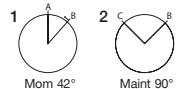
*Customised key shape will be given a specified letter by EAO. When ordering please include dimensional drawing and sample key

For complete switch also order **A**

Keylock switch



Keylock switch 2 position, raised, 22.5mm mounting

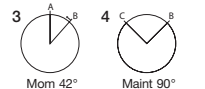


Drawing	Part No.	Momentary/Maintained	Key rem.
1	704.123.0	Momentary	A
2	704.121.0	Maintained	C
2	704.122.0	Maintained	C + B

For complete switch also order **A**



Keylock switch 2 position, flush mount, 30.5mm mounting



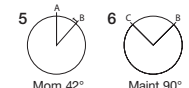
Drawing	Part No.	Momentary/Maintained	Key rem.
3	704.123.018	Momentary	A
4	704.121.018	Maintained	C
4	704.122.018	Maintained	C + B

For complete switch also order **A**

Keylock switch



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

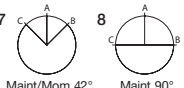


Drawing	Part No.	Momentary/Maintained	Key rem.
5	704.343.008	Momentary	A
6	704.341.008	Maintained	C
6	704.342.008	Maintained	C + B

For complete switch also order **A**



Keylock switch 3 position, raised, 22.5mm mounting

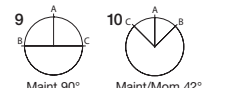


Drawing	Part No.	Momentary/Maintained	Key rem.
7	704.115.0	Momentary	A
7	704.114.0	Maintained	A
7	704.116.0	Maintained	C + B
8	704.113.0	Maintained	C + A + B

For complete switch also order **A**



Keylock switch 3 position, flush mount, 30.5mm mounting




Drawing	Part No.	Momentary/Maintained	Key rem.
9	704.113.018	Maintained	C + A + B
10	704.115.018	Momentary	A
10	704.114.018	Maintained	A
10	704.116.018	Maintained	C + B

For complete switch also order **A**

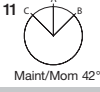


Choose one component from each of the coloured sections to assemble a complete switch.


Keylock switch





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




Selector switch





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



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


Drawing	Part No.	Momentary/Maintained	Key rem.	Drawing	Part No.	Momentary/Maintained	Bezel	Drawing	Part No.	Momentary/Maintained	Bezel
11	704.335.008	Momentary	A	12	704.412.0	Momentary	Grey plastic	14	704.413.018	Momentary	Aluminium
11	704.334.008	Maintained	A	12	704.413.0	Momentary	Aluminium	15	704.411.018	Maintained	Aluminium
11	704.336.008	Maintained	C + B	13	704.410.0	Maintained	Grey plastic				
11	704.333.008	Maintained	C + A + B	13	704.411.0	Maintained	Aluminium				

For complete switch also order **A**



For complete switch also order **A**


For complete switch also order **A**

Selector switch





Selector switch short lever
2 position, flush mount,
30 x 30mm mounting

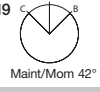


Selector switch short lever
3 position, raised,
22.5mm mounting





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





Drawing	Part No.	Momentary/Maintained	Bezel	Drawing	Part No.	Momentary/Maintained	Bezel	Drawing	Part No.	Momentary/Maintained	Bezel
16	704.512.008	Momentary	Black plastic	18	704.404.0	Momentary	Grey plastic	19	704.405.018	Momentary	Aluminium
17	704.510.008	Maintained	Black plastic	18	704.405.0	Momentary	Aluminium	19	704.403.018	Maintained	Aluminium
				18	704.402.0	Maintained	Grey plastic				
				18	704.403.0	Maintained	Aluminium				

For complete switch also order **A**

For complete switch also order **A**

For complete switch also order **A**

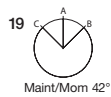
Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.

		A ACCESSORIES
BLOCK	LED	

 Selector switch



Selector switch short lever
3 position, flush mount,
30 x 30mm mounting

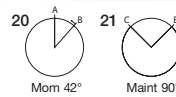


Drawing	Part No.	Momentary/Maintained	Bezel
19	704.504.008	Momentary	Black plastic
19	704.502.008	Maintained	Black plastic

For complete switch also order  **A**

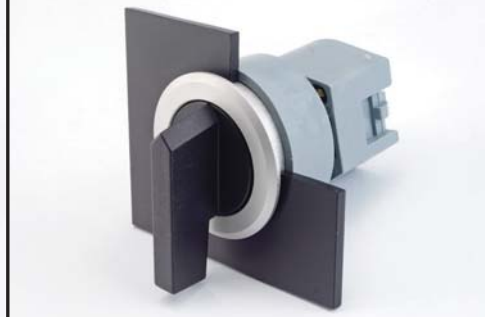


Selector switch long lever
2 position, raised,
22.5mm mounting

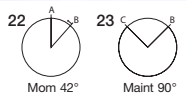


Drawing	Part No.	Momentary/Maintained	Bezel
20	704.102.0	Momentary	Grey plastic
20	704.103.0	Momentary	Aluminium
21	704.100.0	Maintained	Grey plastic
21	704.101.0	Maintained	Aluminium

For complete switch also order  **A**



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



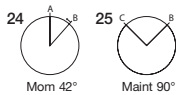
Drawing	Part No.	Momentary/Maintained	Bezel
22	704.103.018	Momentary	Aluminium
23	704.101.018	Maintained	Aluminium

For complete switch also order  **A**

 Selector switch



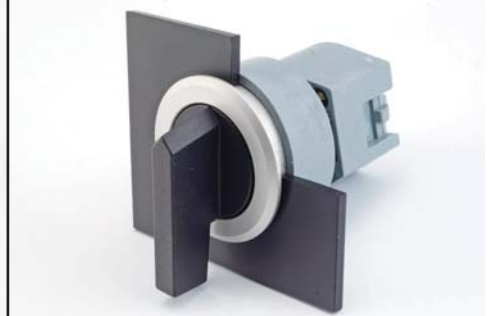
Selector switch long lever
2 position, flush mount,
30 x 30mm mounting



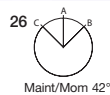
Drawing	Part No.	Momentary/Maintained	Bezel
24	704.302.008	Momentary	Black plastic
25	704.300.008	Maintained	Black plastic

For complete switch also order  **A**

 Selector switch

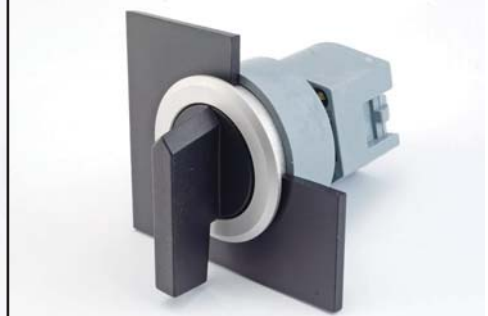


Selector switch long lever
3 position, raised,
22.5mm mounting

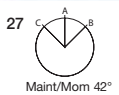


Drawing	Part No.	Momentary/Maintained	Bezel
26	704.094.0	Momentary	Grey plastic
26	704.095.0	Momentary	Aluminium
26	704.092.0	Maintained	Grey plastic
26	704.093.0	Maintained	Aluminium

For complete switch also order  **A**



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



Drawing	Part No.	Momentary/Maintained	Bezel
27	704.095.018	Momentary	Aluminium
27	704.093.018	Maintained	Aluminium

For complete switch also order  **A**

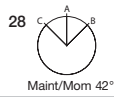


Choose one component from each of the coloured sections to assemble a complete switch.

Selector switch



Selector switch long lever
3 position, flush mount,
30 x 30mm mounting



Drawing	Part No.	Momentary/Maintained	Bezel
28	704.294.008	Momentary	Black plastic
28	704.292.008	Maintained	Black plastic



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

Part No.	Bezel
704.411.118KN	Aluminium

For complete selector switch order
Kraus & Naimer contact block

For complete switch also order **A**



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

Part No.	Bezel
704.101.118KN	Aluminium

For complete selector switch order
Kraus & Naimer contact block

For complete switch also order **A**

Selector switch



Selector switch, short lever multi position,
flush mount, 30 x 30mm mounting

Part No.	Bezel
704.510.108KN	Black plastic

For complete selector switch order
Kraus & Naimer contact block

For complete switch also order **A**

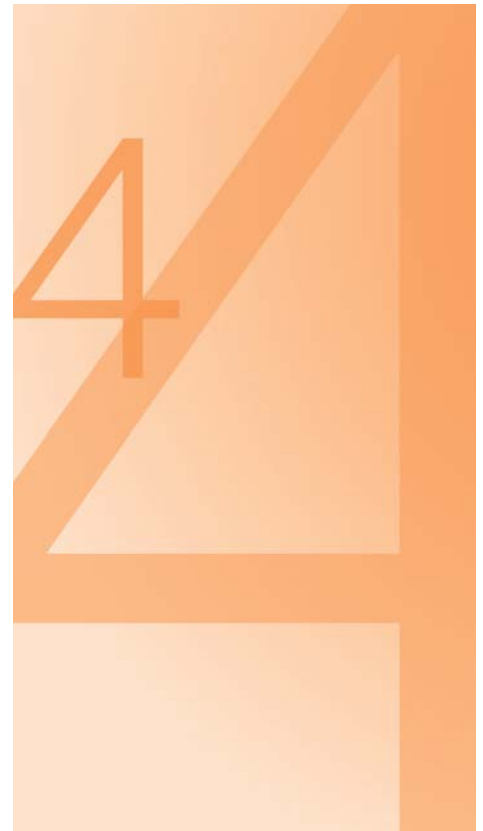


Selector switch, long lever multi position,
flush mount, 30 x 30mm mounting

Part No.	Bezel
704.300.108KN	Black plastic

For complete selector switch order
Kraus & Naimer contact block

For complete switch also order **A**



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

Product Profile

A range of lever switches to compliment the EAO Series 04 and are available with a choice of lever styles and switching action.

Options include momentary and maintained positions with 4 connection method types.

- IP54 Protection
- Switch Rating, 10A, 250VAC
- Flush Mounting into 33.5mm dia. cut out
- Up to 5 switching Positions
- Different handle shapes available
- LED Illumination Option
- Mechanical Life of minimum 5 Million Operations
- Connection types: Screw Terminal, Plug-in, JST Connector, Fast-on 6.3mm, cage clamp®

Lever switch



Lever switch, 2-5 positions, cage clamp®, aluminium bezel, silver contacts, 33.5mm mounting

Colour	Range	Momentary/ Maintained	Contact type	Voltage
● Black	S 41*	Momentary/ Maintained	max. 5 contacts (NC/NO)	max.250VAC/DC, 1.5A
*Part number will be supplied by EAO once schematic diagram has been defined including specification of lever style and switching action. For further information please contact your local sales office.				



Lever switch, 2-5 positions, JST pin header, aluminium bezel, silver contacts, 33.5mm mounting

Colour	Range	Momentary/ Maintained	Contact type	Voltage
● Black	S 42*	Momentary/ Maintained	max. 5 contacts (NC/NO)	max.250VAC/DC, 1.5A
*Part number will be supplied by EAO once schematic diagram has been defined including specification of lever style and switching action. For further information please contact your local sales office.				

Lever switch



Lever switch, 2-5 positions, plug-in terminal, aluminium bezel, silver contacts, 33.5mm mounting

Colour	Range	Momentary/ Maintained	Contact type	Voltage
● Black	S 43*	Momentary/ Maintained	max. 5 contacts (NC/NO)	max.250VAC/DC, 1.5A
*Part number will be supplied by EAO once schematic diagram has been defined including specification of lever style and switching action. For further information please contact your local sales office.				



Lever switch, 2-5 positions, cage clamp®, aluminium bezel, silver contacts with positive opening, 33.5mm mounting

Colour	Range	Momentary/ Maintained	Contact type	Voltage
● Black	S 44*	Momentary/ Maintained	max. 4 contacts (NC/NO)	max.250VAC/DC, 10A
*Part number will be supplied by EAO once schematic diagram has been defined including specification of lever style and switching action. For further information please contact your local sales office.				



Lever switch, 2-5 positions, plug-in or screw terminals, aluminium bezel, silver contacts with positive opening, 33.5mm mounting

Colour	Range	Momentary/ Maintained	Contact type	Voltage
● Black	S 45*	Momentary/ Maintained	max. 4 contacts (NC/NO)	max.250VAC/DC, 10A
*Part number will be supplied by EAO once schematic diagram has been defined including specification of lever style and switching action. For further information please contact your local sales office.				



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

Buzzer



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

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



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

Part No.	Front finish
14-810.910	Black plastic
14-810.918	Chromium-plated

Contact block



Contact block, screw terminal, snap-action with self-cleaning silver 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 available. Please contact us.

*Add suffix 'B' for non captive screw with flat washer and spring washer option

For complete switch also order

Contact block



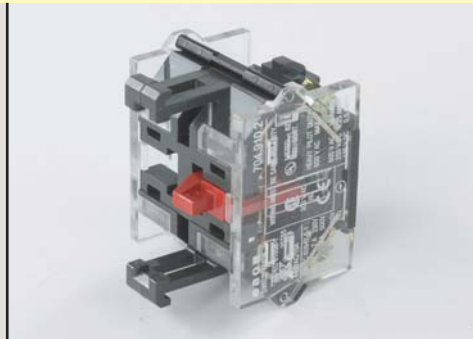
Contact block, plug-in terminal, 6.3mm, snap-action with self-cleaning silver contacts

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 available. Please contact us.

*Add suffix 'D' for double plug-in terminal

For complete switch also order



Contact block, screw terminal, slow-make with forced opening silver contacts

Part No.	Contact type
704.910.2*	1NC
704.910.4*	2NC
704.910.5*	1NO/1NC

Other contact materials available. Please contact us.

*Add suffix 'B' for non captive screw with flat washer and spring washer option

For complete switch also order



Contact block, plug-in terminal, 6.3mm, slow-make with forced opening silver contacts

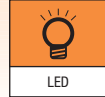
Part No.	Contact type
704.915.2*	1NC
704.915.4*	2NC
704.915.5*	1NO/1NC

Other contact materials available. Please contact us.

*Add suffix 'D' for double plug-in terminal

For complete switch also order

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.



Contact block



Kraus & Naimer contact block, multi position, screw terminal from 2 - 12 positions

LED



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



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

	Colour	Part No.	Voltage	Colour	Part No.	Voltage
	Red	10-2506.1082	6VDC, 17mA	Red	10-2512.1142	24VAC/DC, 15mA
	Yellow	10-2506.1084	6VDC, 17mA	Yellow	10-2512.1144	24VAC/DC, 15mA
	Green	10-2506.1085	6VDC, 17mA	Green	10-2512.1145	24VAC/DC, 7mA
	Blue	10-2506.1086	6VDC, 7mA	Blue	10-2512.1146	24VAC/DC, 15mA
	White	10-2506.1089	6VDC, 17mA	White	10-2512.1149	24VAC/DC, 15mA
	Red	10-2509.1142	12VAC/DC, 16mA	Red	10-2513.1142	28VAC/DC, 13mA
	Yellow	10-2509.1144	12VAC/DC, 16mA	Yellow	10-2513.1144	28VAC/DC, 13mA
Customised switching element part number to be supplied by EAO, once schematic diagram has been defined. For further information please contact your local sales office.	Green	10-2509.1145	12VAC/DC, 7mA	Green	10-2513.1145	28VAC/DC, 7mA
	Blue	10-2509.1146	12VAC/DC, 16mA	Blue	10-2513.1146	28VAC/DC, 13mA
	White	10-2509.1149	12VAC/DC, 16mA	White	10-2513.1149	28VAC/DC, 13mA

For complete switch also order

LED



LED, Ba9s, single chip, 48 Volt



LED, Ba9s, single chip, 110 Volt with surge and transient protection



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

Colour	Part No.	Voltage	Colour	Part No.	Voltage	Colour	Part No.	Voltage
Red	10-2519.1052	48VAC/DC, 8mA	Red	10-2422.3052	110VDC, 5.5mA	Red	10-2H24.2052	130VAC / 5mA
Yellow	10-2519.1054	48VAC/DC, 8mA	Yellow	10-2422.3054	110VDC, 5.5mA	Yellow	10-2H24.2054	130VAC / 5mA
Green	10-2519.1055	48VAC/DC, 4mA	Green	10-2422.3055	110VDC, 5.5mA	Green	10-2H24.2055	130VAC / 3mA
Blue	10-2519.1056	48VAC/DC, 8mA	Blue	10-2422.3056	110VDC, 5.5mA	Blue	10-2H24.2056	130VAC / 5mA
White	10-2519.1059	48VAC/DC, 8mA	White	10-2422.3059	110VDC, 5.5mA	White	10-2H24.2059	130VAC / 5mA
						Red	10-2H25.2042	230VAC / 3mA
						Yellow	10-2H25.2044	230VAC / 3mA
						Green	10-2H25.2045	230VAC / 2mA
						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.

A Accessories



Lamp / LED block, screw terminal



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



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

Part No.	Part No.	Colour	Part No.
704.950.0*	704.950.1*	Red	704.602.2
		Yellow	704.602.4
		Green	704.602.5
		Blue	704.602.6
		Clear	704.602.7
*Add suffix 'B' for non captive screw with flat washer and spring washer option	*Add suffix 'D' for double plug-in terminal		For complete lens also order diffuser 704.609.9 (see page 38)

A Accessories



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



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



Protective cover, raised pushbutton

Part No.	Part No.	Comment	Part No.
Red 704.611.2	Red 704.601.2		704.925.0
Yellow 704.611.4	Yellow 704.601.4		
Green 704.611.5	Blue 704.601.6		
Blue 704.611.6	Silver 704.601.8		
Clear 704.611.7	Silver 704.601.81	Window for illumination	
	Black 704.601.0		
	Black 704.601.01	Window for illumination	
For complete lens also order diffuser 704.610.9 (see page 38)			

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



Aluminium protective cover for flush mount pushbutton with fitted spring, closed

Colour	Part No.
● Red	704.928.12
● Yellow	704.928.14
● Blue	704.928.16
○ Natural	704.928.18



Aluminium protective cover for flush mount selector switch short lever with fitted spring, closed

Colour	Part No.
○ Natural	704.928.28



Aluminium protective cover for flush mount selector switch, lockable

Colour	Part No.
○ Natural	704.928.38

A Accessories



Protective front ring with silicon membrane for raised or flush mount pushbutton

Part No.	Size
704.600.3	29mm Ø for raised pushbutton
704.955.3	35mm Ø for flush mount pushbutton



Emergency-stop protective shroud, yellow painted aluminium with 22.5mm mounting hole

Part No.
704.927.4



Emergency-stop switch label, 60mm diameter, English, German, French and Dutch

Part No.	Markings
704.963.6	Emergency stop
704.963.5	Not Aus
704.963.7	Arret D'urgence
007.963.6	Noodstop



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

A Accessories



Emergency-stop switch enclosure with 22.5mm mounting hole, 83mm (w) x 83mm (h) x 59mm (d)

	Part No.
1	704.945.0
2	704.945.6



Blanking plate

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



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

Part No.
700.006.0

A Accessories

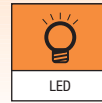
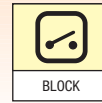
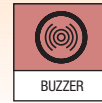


Lens remover for square pushbuttons and indicators

Part No.
98-968



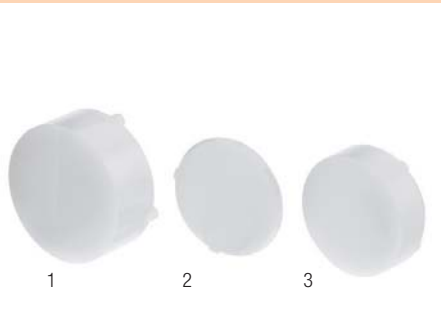
Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



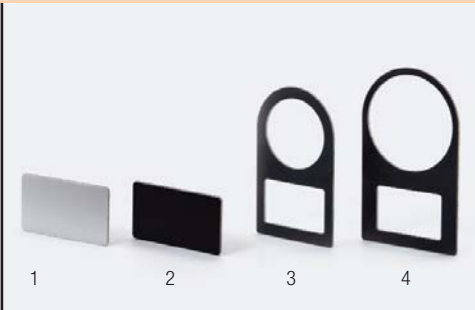
A Accessories



Mounting flange



Diffuser for raised indicator, diffuser for flat lens indicator and pushbutton, diffuser for raised pushbutton



Legend plate, adhesive, natural anodised aluminium finish for raised and flush mount pushbuttons

Part No.	Material	Image	Part No.	Product description	Image	Part No.	Mounting hole	Legend plate
704.960.5	Metal	1	704.608.9	Diffuser for raised indicator	1	704.968.0	23.5 x 14.5mm	Aluminium
704.950.5	Plastic	2	704.609.9	Diffuser for flat lens	2	704.968.1	23.5 x 14.5mm	Black
		3	704.610.9	Diffuser for raised pushbutton	3	704.968.2	22.5mm Ø	Black
					4	704.968.3	30.5mm Ø	Black
						704.968.4	35 x 18mm	Aluminium
						704.968.5	35 x 18mm	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.

Material

Material of contacts

hardsilver, gold/silver, silver/palladium (for aggressive atmospheres)

Switching element

polycarbonate PC

Mechanical characteristics

Connection method

screw terminals

plug-in terminals 6.3 x 0.8 mm:

max. wire cross-section: 2 x 2.5 mm

max. wire cross-section of stranded cable: 2 x 1.5 mm

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

Starting torque

screws at the mounting flange: max. 25 Ncm

screws at switching element: max. 50 Ncm

Actuating force

11-20 N ± 1 N

depending on the number of switching elements, 1 to 3 elements

Storage temperature

-40°C to + 85°C

Mechanical life

- pushbuttons:
- maintained action 1.5 million cycles of operation
 - momentary action 3 million cycles of operation
- selector switch:
- maintained action 1.25 million cycles of operation
 - momentary action 2.5 million cycles of operation
- e-stop switch:
- >= 50'000 cycles of operation
- keylock switch:
- maintained action 25'000 cycles of operation
 - momentary action 50'000 cycles of operation

Rebound time

<= 3 ms

Travel

5.8 ± 0.2 mm

Resistance to shock

(single impacts, semi-sinusoidal)

30 g for 11 ms as per EN 60 947-5-1

Resistance to vibration

(sinusoidal)

10 g at 10-2000 Hz, amplitude 0,75 mm as per EN 60 947-5-1

Ambient air temperature

min. - 25°C (- 40° with restriction)

max. without illumination: + 80°C

max. with neon lamp + 80°C

max. with LED: + 80°C

max. with incandescent lamp: + 40°C

(as per DIN IEC 68-)

Electrical characteristics

Rated insulation voltage

500 VAC/600 VDC as per VDE 0100, group C

Standards

The switches comply with the "Standards for low-voltage switching devices" EN 60 947-5-1

Contact resistance

starting value <= 50 mΩ as per IEC 512-2-4

Insulation resistance

>= 10 mΩ between open contacts at 500 VDC, as per IEC 512-2-10

Continuous thermal current I_{th2}

10 A

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

Switch rating max.

at switch rating AC for gold-, silver- and hard silver contacts service category AC-15 as per EN60947-5-1 (cos φ = 0.7)

voltage: 230 VAC 400 VAC 500 VAC

current: 6 A 4 A 2.5 A

at switch rating DC for gold-, silver- and hard silver contacts service category DC as per EN60947-5-1

L/R=100 ms at P>=50 W and

L/R=2 x P ms<50 W

WOP stands for switch rating in watt

voltage: 24 VDC 60 VDC 110 VDC

current: 10 A 3 A 1 A

Switch rating min.

gold/silver contacts:

voltage: 5 VDC 24 VDC 110 VDC

current: 15 mA 5 mA 2 mA

hard silver contacts:

voltage: 24 VDC 110 VDC

current: 50 mA 10 mA

Electric strength

5000 VAC, 50 Hz, 1 min. between all terminals and earth.

Approvals

- SEV 500 VAC/10 A
- CSA 300 VAC
- UL 600 VAC HD
- German Navy
- German Lloyd
- CE (declaration of conformity)
- CB

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. Slow-make contacts with forced action are ideal for high switch ratings. Up to 3 switching elements can be snapped to each actuator.

Material

Material of contacts

hardsilver, gold/silver, silver/palladium (for aggressive atmospheres)

Switching element

polycarbonate PC

Mechanical characteristics

Connection method

screw terminals
 plug-in terminals 6.3 x 0.8 mm:
 max. wire cross-section: 2 x 2.5 mm
 max. wire cross-section of stranded cable: 2 x 1.5 mm
 For switches with plug-in terminals it is necessary to provide insulation sockets and to maintain a spacing of 65 mm between rows (mounting dimensions).

Starting torque

screws at the mounting flange: max. 25 Ncm
 screws at switching element: max. 50 Ncm

Actuating force

13-36 N ± 1 N
 depending on the number of switching elements, 1 to 3 elements

Storage temperature

-40°C to + 85°C

Mechanical life

pushbuttons: - maintained action 1.5 million cycles of operation
 - momentary action 3 million cycles of operation
 selector switch: - maintained action 1.25 million cycles of operation
 - momentary action 2.5 million cycles of operation
 e-stop switch: - >= 50'000 cycles of operation
 keylock switch: - maintained action 25'000 cycles of operation
 - momentary action 50'000 cycles of operation

Travel

5.8 ± 0.2 mm

Resistance to shock

(single impacts, semi-sinusoidal) 30 g for 11 ms as per EN 60 947-5-1

Resistance to vibration

(sinusoidal) 10 g at 10-2000 Hz, amplitude 0,75 mm as per EN 60 947-5-1

Rebound time

<= 1 ms

Ambient air temperature

min. - 25°C (- 40° with restriction)
 max. without illumination: + 80°C
 max. with neon lamp + 80°C
 max. with LED: + 80°C
 max. with incandescent lamp: + 40°C

Electrical characteristics

Rated insulation voltage

500 VAC/600 VDC as per VDE 0100, group C

Standards

The switches comply with the Rules for low-voltage switching devices EN 60 947-5-1

Contact resistance

starting value <= 50 mΩ as per IEC 512-2-4

Insulation resistance

>= 100 mΩ between open contacts at 500 VDC, as per IEC 512-2-10.

Continuous thermal current Ith₂

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

Switch rating max.

at switch rating AC for gold-, silver- and hard silver contacts
 service category AC-15 as per EN60947-5-1 (cos φ = 0.7)
 voltage: 230 VAC 400 VAC 500 VAC
 current: 7 A 5 A 4 A

At switch rating DC for gold-, silver- and hard silver contacts
 service category DC as per EN60947-5-1

L/R=100 ms at P>=50 W and

L/R=2 x P ms<50 W

WOP stands for switch rating in watt

voltage: 24 VDC 60 VDC 110 VDC

current: 10 A 5 A 2.5 A

Switch rating min.

gold/silver contacts:

voltage 24 VDC 110 VDC

current: 10 mA 2 mA

hard silver contacts:

voltage 24 VDC 110 VDC

current: 50 mA 10 mA

Electric strength

5000 VAC, 50 Hz, 1 min. between all terminals and earth

Approvals

- SEV 500 VAC/10 A
- CSA 300 VAC
- UL 600 VAC HD
- German Navy
- German Lloyd
- CE (declaration of conformity)
- CB

Buzzer

Buzzer system

System

Piezo disc

Material

Alarm buzzer case

polyamide

Front cap

plastic: polyamide

metal: nickel-plated brass sea-water proof

Mechanical characteristics

Connection method

plug-in terminal 2.8 x 0.5 mm

Operating temperature

-25°C to + 50°C

Storage temperature

-25°C to + 50°C

Degree of protection

IP 40 as per IEC 529 (flush mounting)

IP 65 (raised fitting) as per IEC 529

Electrical characteristics

Frequency (tone)

ca. 2.8 kHz continuous tone only

Sound pressure

95 db (A) ± 8 at a distance of 0.1 m

Operation voltage/current

operation voltage: 24 VDC ± 10%

operation current: <= 25 mA

Selector switch actuator

Material

Front ring

polyamide, aluminium or chromium-plated nickel steel

Mounting flange

polyethylene terephthalate

Actuator case

polycarbonate, polyamide

Mechanical characteristics

Actuating force

snap-action switching element: 11-20 N ± 1 N
slow-make switching element: 13-36 N ± 1 N
depending on the number of snap-action elements

Storage temperature

-30°C to + 85°C

Mechanical life

pushbutton: ≥ 3 million operations
selector switch: ≥ 2.5 million operations
emergency stop switch: ≥ 50'000 operations
keylock switch: ≥ 50'000 operations

Travel

5.8 ± 0.2 mm

Degree of protection

front as per IEC 529: IP 65

Ambient air temperature

min. -25°C
max. without illumination: + 80°C
max. with neon lamp: + 80°C
max. with LED: + 80°C
max. with incandescent lamp: + 55°C

Electrical characteristics

Standards

The switches comply with the "Rules for low-voltage switching devices" EN 60 947-5-1

Rotary selector switch element

Mechanical characteristics

Number of positions

2 to 12 positions max.

Number of contacts

1 to 16 max. normally open contacts
(contact positioning to the rotary plan)

Switching angle

Switching position a (90°) is basic position
maintained action switching angle
12 x 30° max.
8 x 45° max.
6 x 60° max.
4 x 90° max.

momentary action with release 24°

(provide at the beginning or at the end)

Standard type of Kraus + Naimer

- CG 4 hardsilver contacts with 1 µ gold layer
- CG 4-1 hardsilver contacts with 35 µ gold layer

Electrical characteristics

DC 1, resistive circuits T = 1 ms

1 contact in line						
permissible voltage	24 V	48 V	60 V	110 V	220 V	440 V
rated service current	10.0 A	6.0 A	2.5 A	0.7 A	0.3 A	0.2 A
2 contacts in line						
permissible voltage	48 V	95 V	120 V	220 V	440 V	660 V
rated service current	10.0 A	6.0 A	2.5 A	0.7 A	0.3 A	0.2 A
3 contacts in line						
permissible voltage	70 V	140 V	180 V	330 V	660 V	
rated service current	10.0 A	6.0 A	2.5 A	0.7 A	0.3 A	
4 contacts in line						
permissible voltage	95 V	190 V	240 V	440 V		
rated service current	10.0 A	6.0 A	2.5 A	0.7 A		
5 contacts in line						
permissible voltage	120 V	240 V	300 V	550 V		
rated service current	10.0 A	6.0 A	2.5 A	0.7 A		
6 contacts in line						
permissible voltage	144 V	290 V	360 V	660 V		
rated service current	10.0 A	6.0 A	2.5 A	0.7 A		
8 contacts in line						
permissible voltage	190 V	350 V	450 V			
rated service current	10.0 A	6.0 A	2.5 A			

Inductive circuits T = 50 ms

1 contact in line					
permissible voltage	24 V	30 V	48 V	60 V	110 V
rated service current	6.0 A	3.0 A	1.0 A	0.7 A	0.3 A
2 contacts in line					
permissible voltage	48 V	60 V	95 V	120 V	220 V
rated service current	6.0 A	3.0 A	1.0 A	0.7 A	0.3 A
3 contacts in line					
permissible voltage	72 V	90 V	140 V	180 V	330 V
rated service current	6.0 A	3.0 A	1.0 A	0.7 A	0.3 A
4 contacts in line					
permissible voltage	96 V	120 V	190 V	240 V	440 V
rated service current	6.0 A	3.0 A	1.0 A	0.7 A	0.3 A
5 contacts in line					
permissible voltage	120 V	150 V	240 V	300 V	550 V
rated service current	6.0 A	3.0 A	1.0 A	0.7 A	0.3 A
6 contacts in line					
permissible voltage	144 V	180 V	290 V	360 V	660 V
rated service current	6.0 A	3.0 A	1.0 A	0.7 A	0.3 A
8 contacts in line					
permissible voltage	190 V	240 V	350 V	450 V	
rated service current	6.0 A	3.0 A	1.0 A	0.7 A	0.3 A

Short-circuit-proof

max. insurance (gL-characteristics) 10 A
conditional rated short-circuit current 3 kA

Rated service voltage

IEC	500 V
UL	300 V
SEV	380 V
CEE 24	380 V

Rated service current I₀

10 A
AC 21 switching of resistive load with low overload
AC 1 non or bad inductive load
AC 22 switching of mixed resistive and inductive load with low overload
AC 11 switching of magnetic drives, contactors, valves, draw-in magnet

Thermic rated current I_{th2}

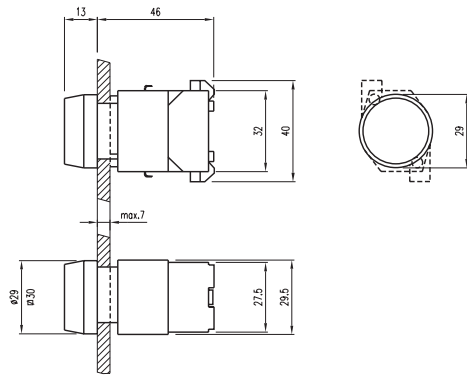
I_{th2} = 10 A

Resistance/motor load

CEE 24 4/2 A

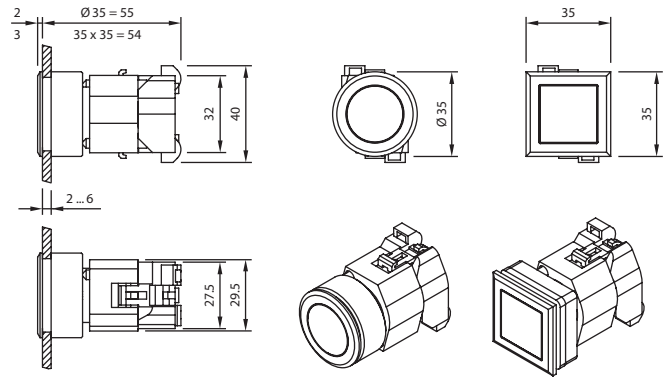
04 Indicator

Raised



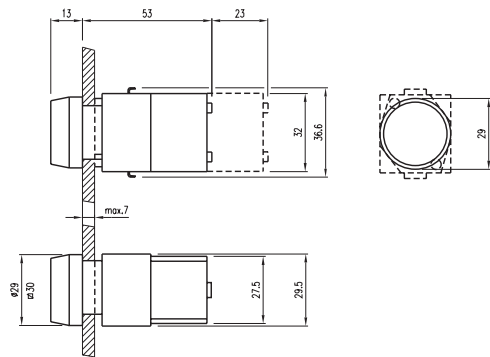
04 Indicator

Flush



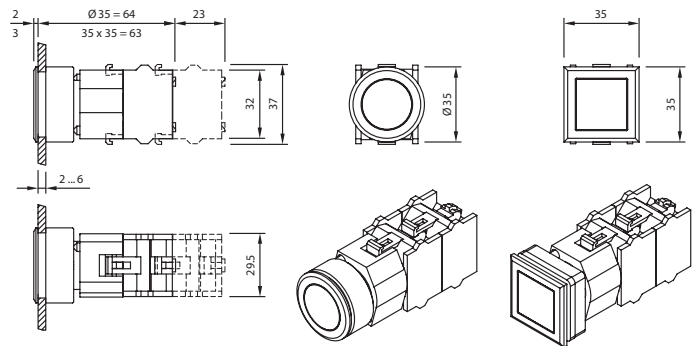
04 Pushbutton

Non-Illuminated, Raised



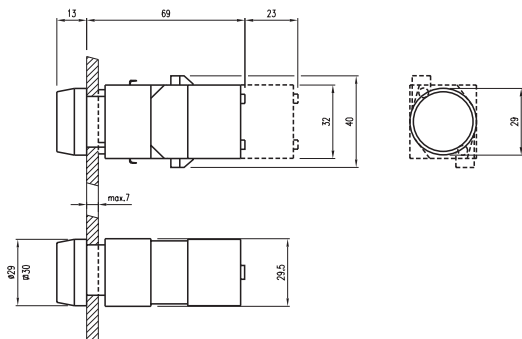
04 Pushbutton

Non-Illuminated, Flush



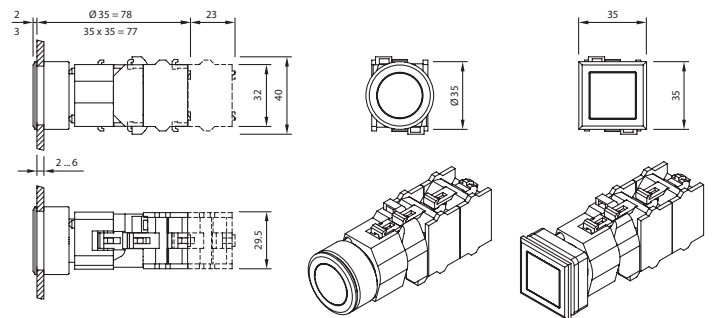
04 Pushbutton

Illuminated, Raised



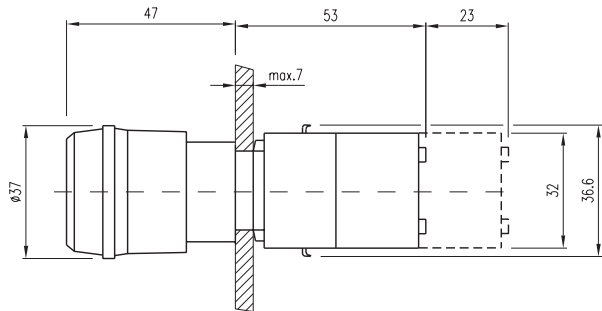
04 Pushbutton

Illuminated, Flush



04 E-Stop

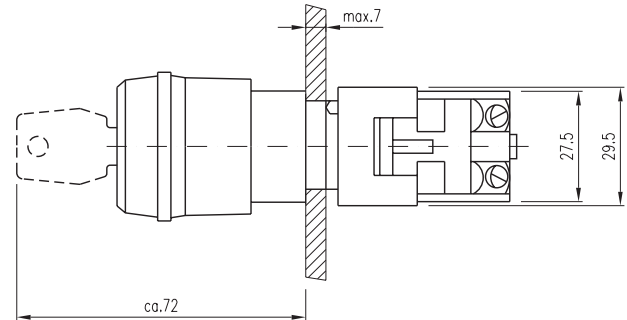
EN 418



twist to release

04 E-Stop

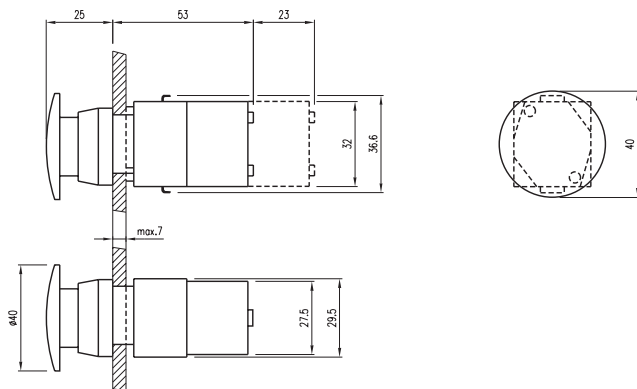
EN 418 with optional key



key to unlock

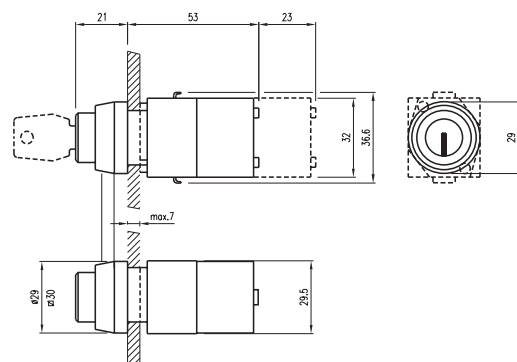
04 E-Stop Mushroom

Pushbutton Mushroom



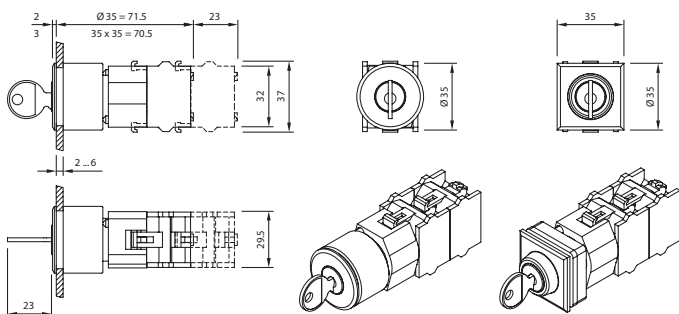
04 Keylock

2-Position, 3-Position, Raised



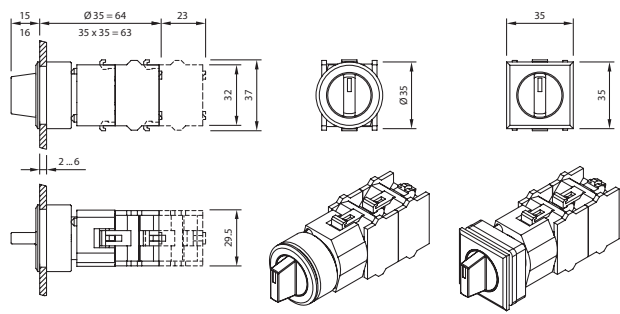
04 Keylock

2-Position, 3-Position, Flush



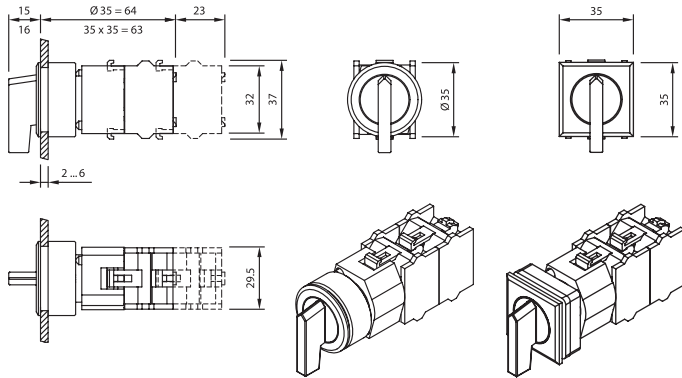
04 Selector

2-Position, 3-Position, Short, Flush



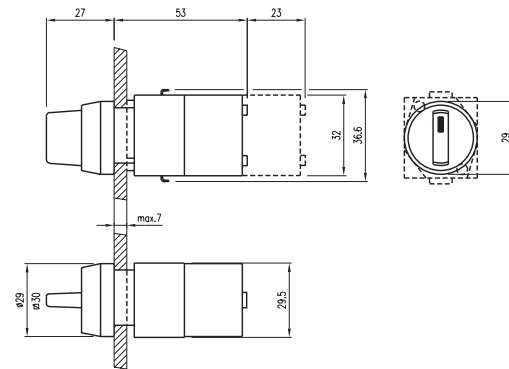
04 Selector

2-Position, 3-Position, Long, Flush



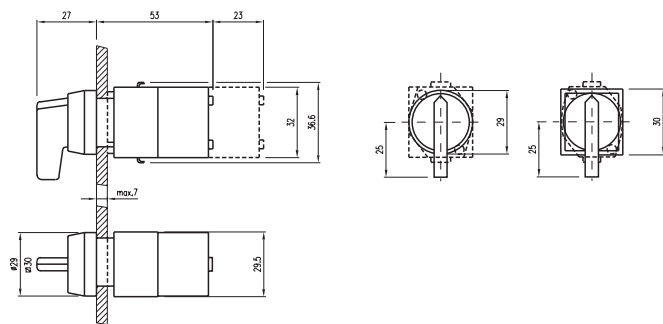
04 Selector, Short Lever

2-Position, 3-Position, Raised



04 Selector, Long Lever

2-Position, 3-Position, Raised

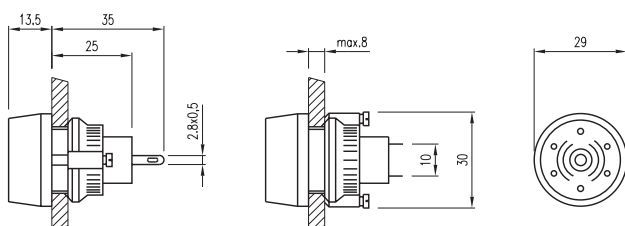


04 Lever switch

Separate technical document available.
Please contact your local sales office.

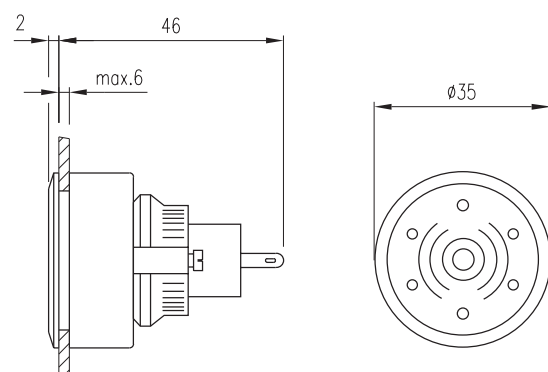
04 Buzzer

Raised

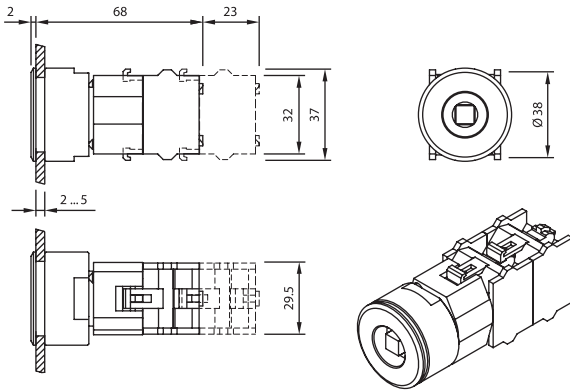


04 Buzzer

Flush

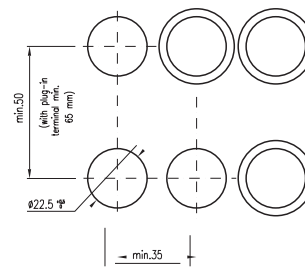


04 Key Insert Switch



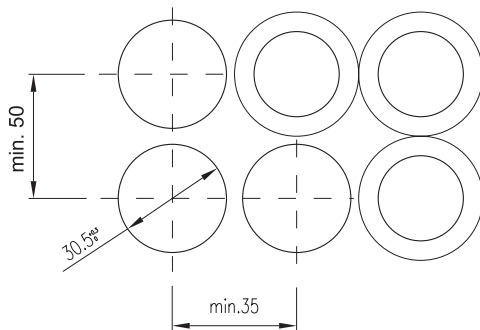
04 Cut-outs, Raised Mounting

(All but long lever)

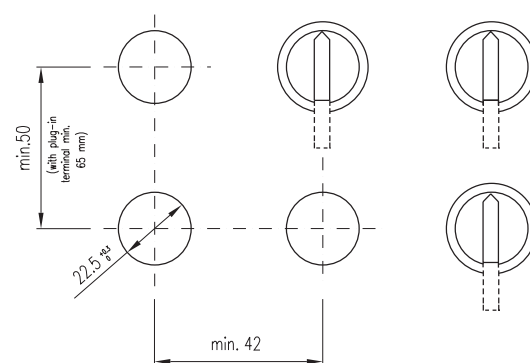


04 Cut-outs, Flush Mounting

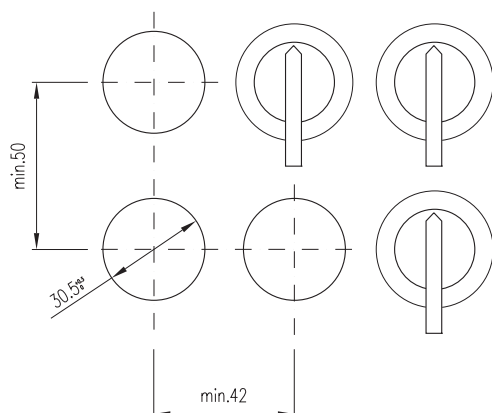
(All but long lever)



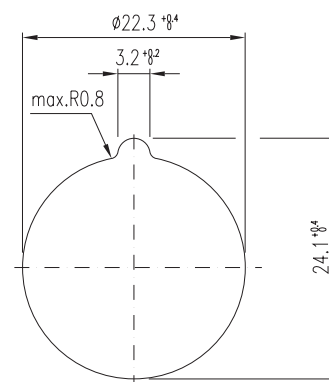
04 Long Lever Cut-outs, Raised Mounting



04 Long Lever Cut-outs, Flush Mounting

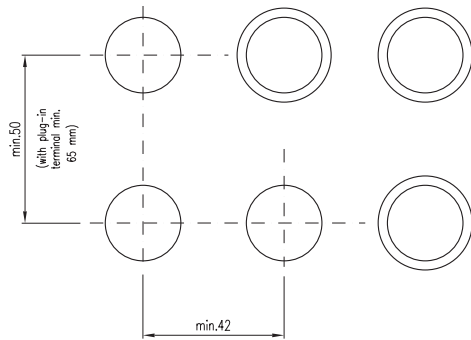


04 E-Stop EN418 Cut-outs

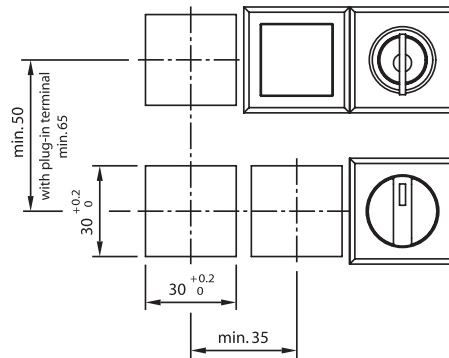


04 E-Stop Mushroom Cut-outs

Pushbutton Mushroom

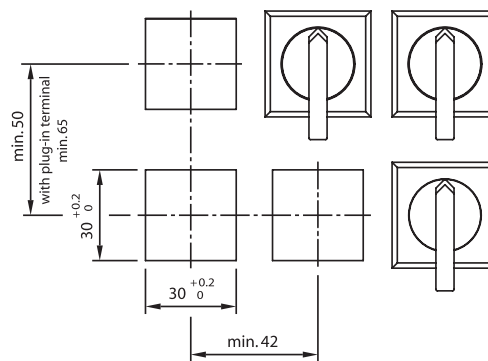
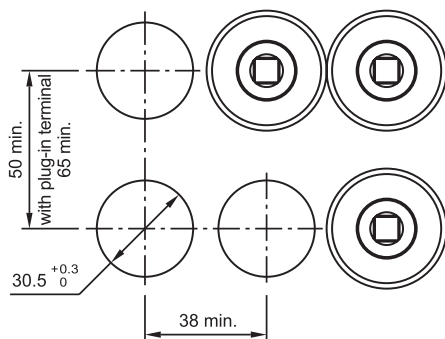


04 Cut-outs, Square, Flush Mounting

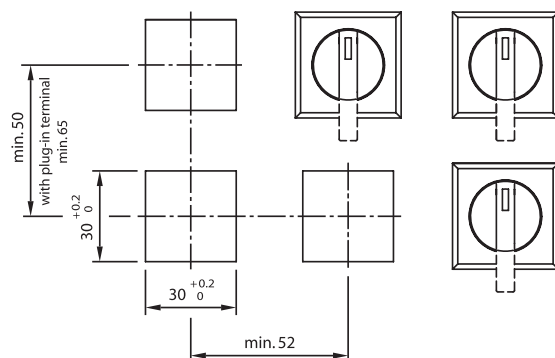


Indicator-, pushbutton-, keylock switch-, selector switch actuator short lever

04 Key Insert Cut-outs, Flush Mounting

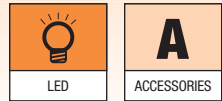


Selector switch actuator long lever



Multi position rotary selector switch actuator

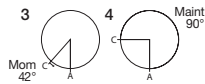
Choose one component from each of the coloured sections to assemble a complete switch.
For other options or further information please contact your local sales office.



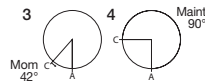
Selector switch



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



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



Buzzer



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

Drawing	Part No.	Momentary/Maintained	Contact type
3	14-501.0252	Momentary	1NC/1NO
4	14-506.0252	Maintained	1NC/1NO

Drawing	Part No.	Momentary/Maintained	Contact type
3	14-551.0252	Momentary	1NO/1NC
4	14-556.0252	Maintained	1NO/1NC

Part No.	Product description
14-810.002	Black plastic
14-810.902	Chromium-plate

For flush mount order bezel 704.955.1

For complete switch also order **A**

For complete switch also order **A**

Buzzer



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

LED



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



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

Part No.	Front finish
14-810.910	Black plastic
14-810.918	Chromium-plated

Colour	Part No.	Voltage
Red	10-2106.3142	6VDC/15mA
Yellow	10-2106.3144	6VDC/15mA
Green	10-2106.3145	6VDC/7mA
Blue	10-2106.3146	6VDC/15mA
White	10-2106.3149	6VDC/15mA
Red	10-2109.1062	12VAC/DC, 7/14mA
Yellow	10-2109.1064	12VAC/DC, 7/14mA
Green	10-2109.1065	12VAC/DC, 7/14mA
Blue	10-2109.1066	12VAC/DC, 4/7mA
White	10-2109.1069	12VAC/DC, 7/14mA

Colour	Part No.	Voltage
Red	10-2112.1062	24VAC/DC, 7/14mA
Yellow	10-2112.1064	24VAC/DC, 7/14mA
Green	10-2112.1065	24VAC/DC, 4/7mA
Blue	10-2112.1066	24VAC/DC, 7/14mA
White	10-2112.1069	24VAC/DC, 7/14mA
Red	10-2113.1062	28VAC/DC, 7/14mA
Yellow	10-2113.1064	28VAC/DC, 7/14mA
Green	10-2113.1065	28VAC/DC, 4/7mA
Blue	10-2113.1066	28VAC/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

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



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

A Accessories



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 48)



Lens cap, round, 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	Window for illumination
Black	704.601.0	
Black	704.601.01	Window for illumination

Also available in stainless steel

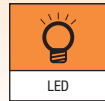
Complete switch



Features

- IP67, sealed from the front
- Intensive LED illumination
- Low mounting depth
- Good low travel, snap action tactile feel
- Easy mounting
- Aluminium lens options for applications requiring vandal resistance
- Raised or flush mount
- Legend options
- Flying lead connector for easy plug and play solution
- Low switch rating options
- World wide approvals

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



Aluminium raised bezel, grey plastic raised bezel and flush mount aluminium bezel



Protective cover, raised pushbutton



Aluminium protective cover for flush mount pushbutton with fitted spring, closed

Type	Part No.	Product description	Part No.	Part No.
1	704.600.1	Aluminium raised bezel	704.925.0	● Red 704.928.12
2	704.600.0	Black plastic bezel		● Yellow 704.928.14
2	704.600.6	Grey plastic bezel		● Blue 704.928.16
3	704.955.0	Flush mount aluminium black bezel		○ Natural 704.928.18
3	704.955.1	Flush mount aluminium bezel		
3	704.955.9	Flush mount stainless steel bezel		

A Accessories



Aluminium protective cover for flush mount selector switch short lever with fitted spring, closed



Aluminium protective cover for flush mount selector switch, lockable



Protective front ring with silicon membrane for raised or flush mount pushbutton

Part No.	Part No.	Part No.	Size
○ Natural 704.928.28	○ Natural 704.928.38	704.600.3	29mm diameter for raised pushbutton
		704.955.3	35mm diameter for flush mount pushbutton



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

Part No.	Mounting hole
704.960.7	22.5mm Ø
704.964.8	30.5mm Ø



LED and lens remover

Image	Part No.	Product description
1	61-9740.0	LED remover
2	700.006.0	Lens remover



Diffuser for raised indicator, diffuser for flat lens indicator and pushbutton

Image	Part No.	Product description
1	704.608.9	Diffuser for raised indicator
2	704.609.9	Diffuser for flat lens

A Accessories



Legend plate, adhesive, natural anodized aluminium finish for raised and flush mount pushbuttons

Image	Part No.	Mounting hole
1	704.968.2	22.5mm
2	704.968.3	30.5mm



Label for front bezel set for 22.5 and 30.5mm flush mount with label support, self adhesive

Image	Part No.
1	704.968.0
2	704.968.1



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 elements 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 contacts

gold-plated silver

Switching element

plug-in/soldering terminal
diallylphthalate DAP, polyamide 66, polysulfone, heat-resistant and self-extinguishing
soldering terminal: PA 6.6 Ultramid

Actuator case

polyamide

Mechanical characteristics

Connection method

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 mm

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: 2 wires of 1 mm

max. wire cross-section of stranded cable: 2 x 0.75 mm or 1 x 1.0 mm

Actuating torque

measured at the key or lever of the keylock- or selector switch: 2.5-5.5 Ncm

Actuating force

3.5-5.5 N, depending on the number of switching elements

Actuating travel

illuminated pushbutton: 3mm

switch actuator with 2 positions:

1 x ca. 42° deflection momentary action

1 x ca. 90° deflection maintained action

switch actuator with 3 positions:

2 x ca. 42° deflection momentary action

2 x ca. 90° deflection maintained action

Resistance to climate

standard condition as per IEC 68-2-3 and 2-30

changing condition as per IEC 68-2-14 and 2-33

Storage temperature

-40°C to + 85°C (as per DIN IEC 68-)

Mechanical life

momentary action 2 million cycles of operation

maintained action 1 million cycles of operation

Rebound time

<= 5ms

Resistance to shock

(single impacts, semi-sinusoidal)

15 g for 11 ms as per IEC 512-4-3, IEC 68-2-27

Degree of protection

front as per IEC 529: IP 67

Resistance to vibration

(sinussoidal)

10 g at 10-2000 Hz, amplitude 1.5 mm as per IEC 68-2-6

Ambient air temperature

-25°C to + 55°C

for indicators and illuminated pushbuttons mounted as a block, make sure the heat can escape freely (as per DIN IEC 68-)

Electrical characteristics

Rated insulation voltage

250 VAC/DC as per VDE 0110, group B

Rated current

5 A

Contact resistance

starting value (initial) <= 50 mΩ

Electrostatic breakdown value

<= 15 KV (keylock switch)

Continuous thermal current I_{th2}

5 A

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

Switch rating

250 VAC/5 A (cos φ 1)

250 VAC/3 A (cos φ 0.3)

switch rating AC, cos φ 0.7:

voltage	125 V	250 V
current	3 A	2 A

switch rating DC (inductive), L:R = 30 ms:

voltage	24 V	60 V	110 V	220 V
current	2 A	0.7 A	0.2 A	0.1 A

switch rating DC (inductive), L:R = 30 ms:

voltage	24 V	60 V	110 V	220 V
current	2 A	0.7 A	0.2 A	0.1 A

switch rating DC (inductive), L:R = 30 ms:

voltage	24 V	60 V	110 V	220 V
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 IC 512-2-11.

Rules

EN 61 058

Approvals

- CSA 300 VAC

- UL

- German Lloyd

- German Navy

- CB

- ENEC

- CE (declaration of conformity)

Buzzer system

System

Piezo disc

Material

Alarm buzzer case

polyamide

Front cap

plastic: polyamide

metal: nickel-plated brass sea-water proof

Mechanical characteristics

Connection method

plug-in terminal 2.8 x 0.5 mm

Storage temperature

-25°C to + 50°C

(as per DIN IEC 68-)

Degree of protection

IP 40 as per IEC 529 (flush mounting)

IP 65 (raised fitting) as per IEC 529

Ambient air temperature

-25°C to + 50°C (as per DIN IEC 68-)

Electrical characteristics

Frequency (tone)

ca. 2.8 kHz continuous tone only

Sound pressure

95 db (A) ± 8 at a distance of 0.1 m

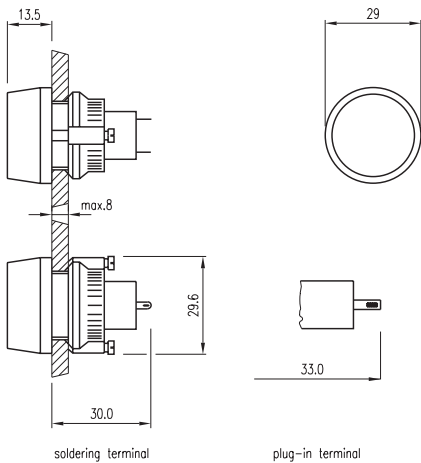
Operation voltage/current

operation voltage: 24 VDC ± 10%

operation current: ≤ 25 mA

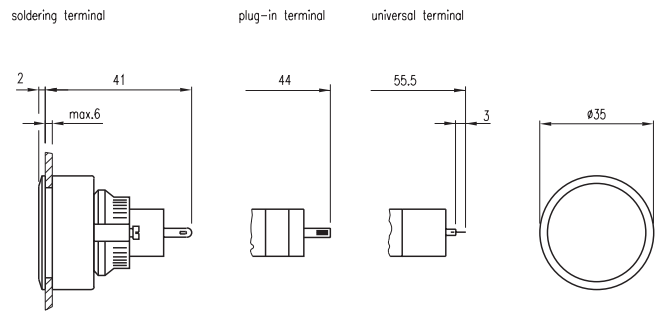
14 Indicator

Raised



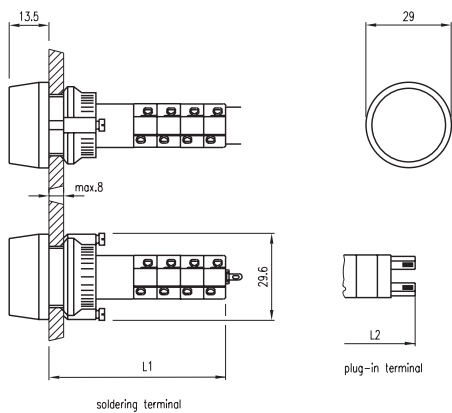
14 Indicator

Flush



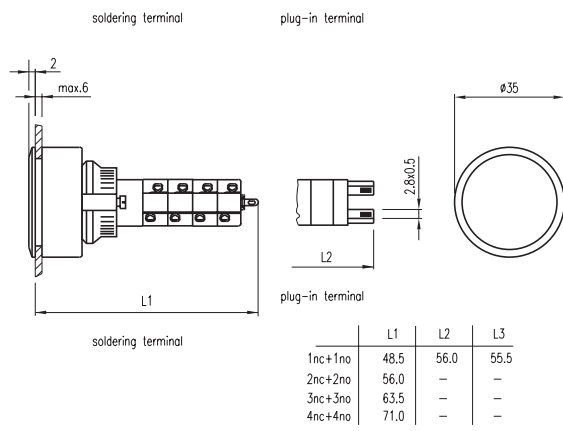
14 Pushbutton

Illuminated, Raised Solder



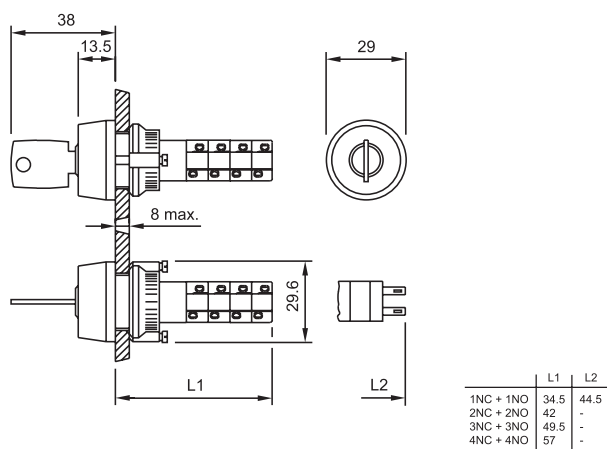
14 Pushbutton

Illuminated, Flush Solder, QC Terminals



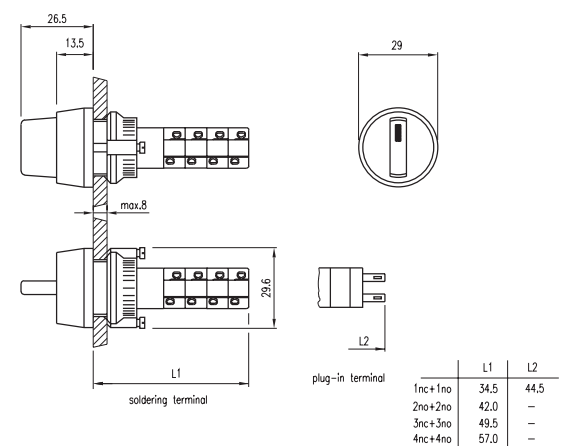
14 Keylock

2-Position



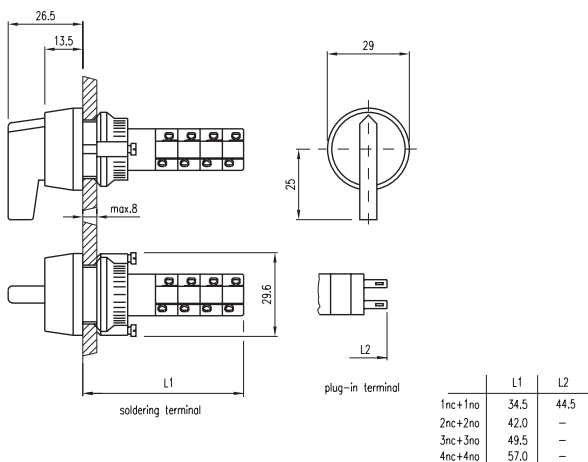
14 Selector, Short Lever

2-Position



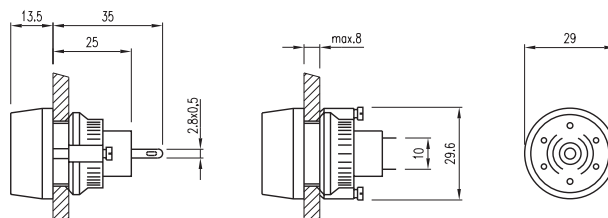
14 Selector, Long Lever

2-Position



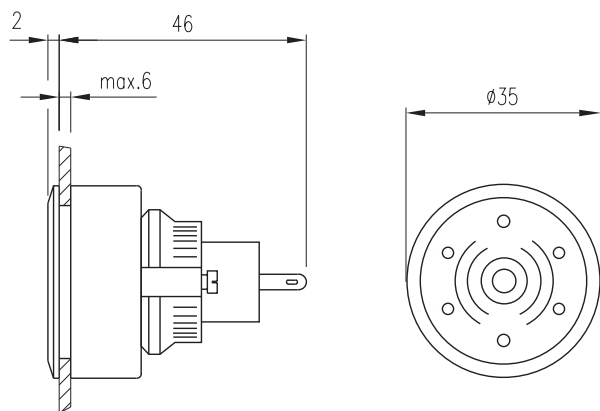
14 Buzzer

Raised



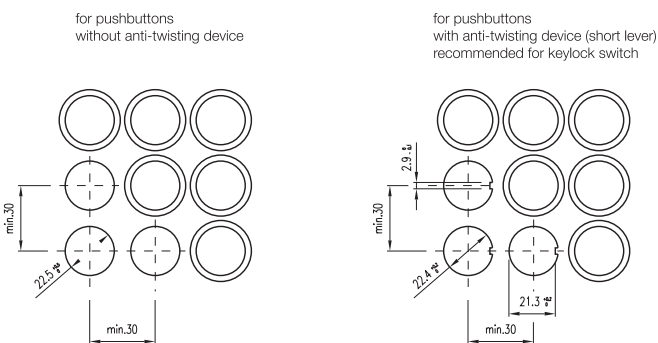
14 Buzzer

Flush



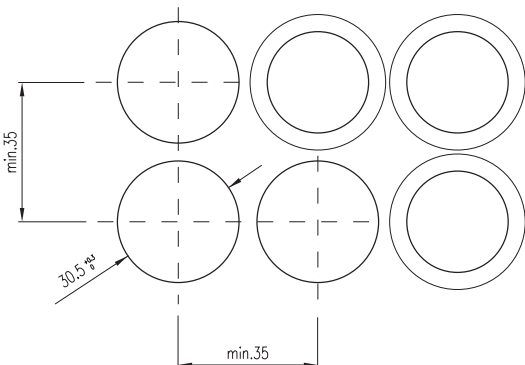
14 Cut-outs

Raised, Pushbuttons, Indicators, Keylocks, Short Lever



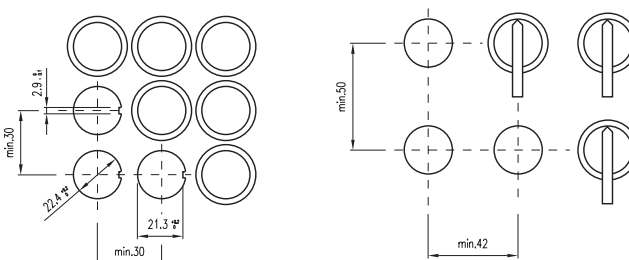
14 Cut-outs

Flush, Buzzer, Pushbutton, Indicator



14 Cut-outs

2-Position, Long, Lever Raised



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 18

16mm 15.8 x 15.8mm IP40 100mA 42VAC



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 18 is a range of small switches with low back panel depth profile and includes pushbuttons and indicators.

Options include round, square and rectangular front shape and flush mount options.

Technical data see page 60
Technical drawings see pages 61-62

- IP40 Protection
- Switch Rating, 100mA, 42VAC
- Raised Mounting into 8mm cut out
- Flush Mounting into 16mm or 15.8mm x 15.8mm cut out
- Illumination using Integral LED's
- Solder/Plug-in terminals
- Low back Panel depth
- Adapters available for PCB mounting

Indicator



Indicator, square, flush mount, black plastic bezel, 15.8mm x 15.8mm mounting

Colour	Part No.	Voltage
Red	18-080.0052	2.2VDC, 20mA
Yellow	18-080.0054	2.2VDC, 20mA
Green	18-080.0055	2.2VDC, 20mA
Red	18-081.0052	12VDC, 20mA
Yellow	18-081.0054	12VDC, 20mA
Green	18-081.0055	12VDC, 20mA
Red	18-082.0052	24VDC, 20mA
Yellow	18-082.0054	24VDC, 20mA
Green	18-082.0055	24VDC, 20mA



Indicator, round, flush mount, black plastic bezel, 15.8mm x 15.8mm or 16mm mounting

Colour	Part No.	Voltage
Red	18-060.0052	2.2VDC, 20mA
Yellow	18-060.0054	2.2VDC, 20mA
Green	18-060.0055	2.2VDC, 20mA
Red	18-061.0052	12VDC, 20mA
Yellow	18-061.0054	12VDC, 20mA
Green	18-061.0055	12VDC, 20mA
Red	18-062.0052	24VDC, 20mA
Yellow	18-062.0054	24VDC, 20mA
Green	18-062.0055	24VDC, 20mA

Illuminated pushbutton



Illuminated pushbutton actuator, square for flush mount, black plastic bezel, 15.8mm x 15.8mm mounting

Part No.	Momentary/Maintained	Contact type
18-187.035	Momentary	1NO
18-287.035	Maintained	1NO



Illuminated pushbutton actuator, round for flush mount, black plastic bezel, 15.8mm x 15.8mm or 16mm mounting

Part No.	Momentary/Maintained	Contact type
18-167.035	Momentary	1NO
18-267.035	Maintained	1NO

A Accessories



Lens, square, plastic, overhanging with 2.2VDC LED for flush mount, without built in resistor, flat, translucent/matt

Colour	Part No.
Red	18-981.2
Yellow	18-981.4
Green	18-981.5

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, round, plastic, overhanging with 2.2VDC LED for flush mount, without built in resistor, flat, translucent/matt

Colour	Part No.
Red	18-961.2
Yellow	18-961.4
Green	18-961.5



Front bezel-set flush mount for overhanging lenses, black plastic

Part No.	Size	Product description
18-920.1	19 x 19mm	For lens square
18-920.2	19 x 19mm	For lens round
18-920.3	19mm Ø	For lens round



PCB plug-in base for solder terminal

Part No.	Orientated
18-946	Right-angled
18-945	Axial

A Accessories



Mounting tool for tightening (or loosening) fixing nuts, starting torque fixing nut max. 20 Ncm

Part No.
19-905

Complete switch



Features

- IP40 protection
- Raised or flush mount options
- Low back panel depth
- Good snap action tactile feel
- Non reflective, matt front lenses
- Intensive LED illumination
- Solder or plug in terminals
- Good range of accessories
- Symbol options
- World wide approvals



Actuator with snap-action switching element

Switching system

Switching system

The snap-action switching system was designed for switching lowpowers in electronic circuits.

Single-break snap-action contact.

Material

Lens

polymethylacrylate PMMA, polycarbonate PC

Material of contacts

gold contact on nickel plating

Actuator case

polyamide; colour black

Mechanical characteristics

Connection method

The terminals can be used as soldering terminals.

max.wire diameter: 2 of 0.5 mm²

max.wire cross-section of stranded cable: 1 x 0.75 mm²

wire cross-section of terminal: 1.6 x 0.4 mm

Torque

for fixing nut max. 20 Ncm

Actuating force

1.4 N

Storage temperature

-40°C to + 80°C

(as per DIN IEC 68-)

Mechanical life

as per IEC 512-5, test 9a

momentary action 2 million cycles of operation

maintained action 1 million cycles of operation

Rebound time

<= 2.5 ms

Travel

2.2 mm ± 0.2 mm

Resistance to shock

(single impacts, semi-sinusoidal)

50 g for 11 ms as per IEC/EN 60529

Degree of protection

front as per IEC/EN 60529: IP 40

Resistance to vibration

(sinusoidal) 10 g at 10-2000 Hz, amplitude 0.75 mm

as per IEC/EN 60512-4-4

Ambient air temperature

-25°C to + 65°C

Electrical characteristics

Contact resistance

<= 100 mΩ starting value (initial)

IEC 512-2, Test 2 b

Electrical life

>= 500.000 cycles of operation at 30 VDC/100 mA to IEC 512-5, Test 9c

Switch rating

10 μA/100 μV to 100 mA at 42 VAC/VDC

Electric strength

500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC

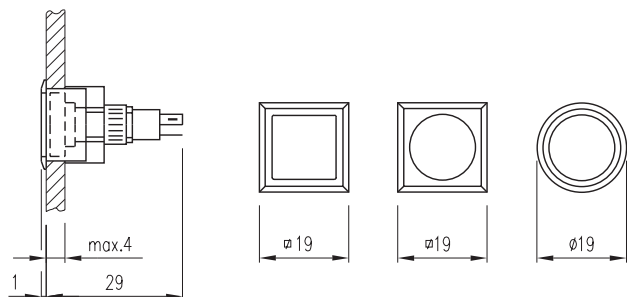
512-2-11

Power consumption for LED

20 mA

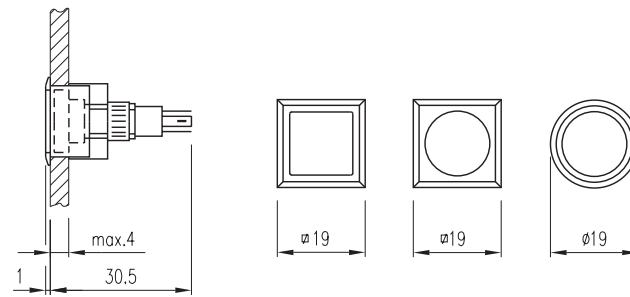
18 Indicator

Square or Round, Flush



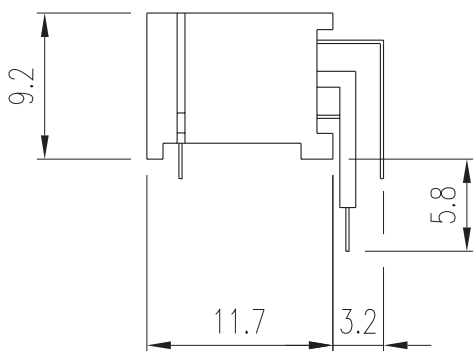
18 Pushbutton

Illuminated, Square or Round, Flush



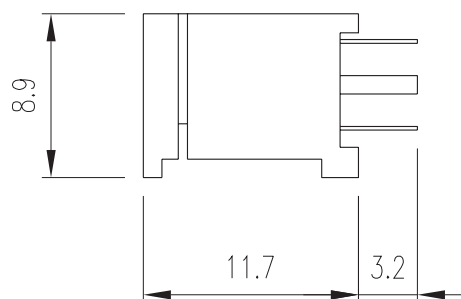
18 PCB

Plug-in base, right angle



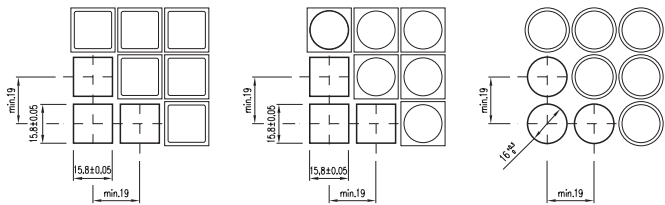
18 PCB

Plug-in base

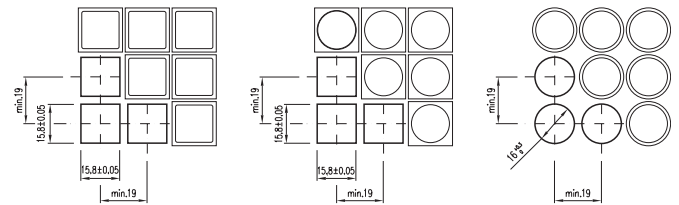


18 Indicator and Pushbutton Cut-outs

Square or round, Illuminated, Flush

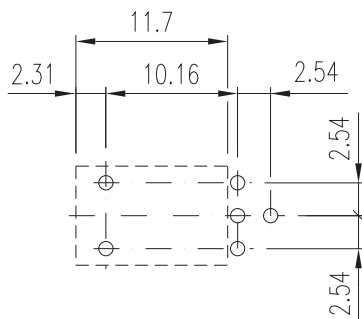


18 Front Bezel Set Cut-outs

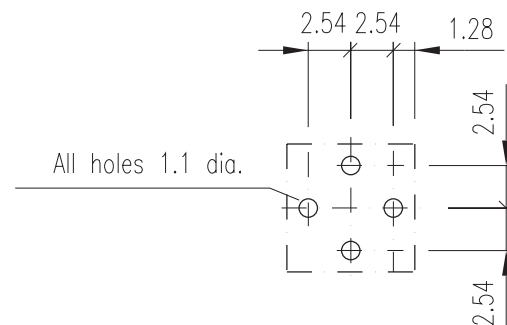


18 PCB Cut-outs

Plug-in base, right angle

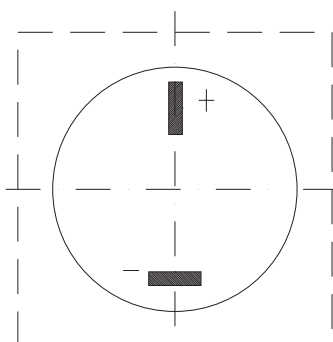


18 PCB Cut-outs



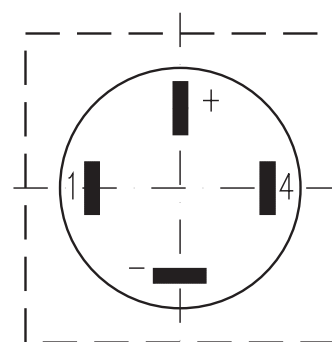
18 Indicator Terminal-layouts

Square or round, Flush



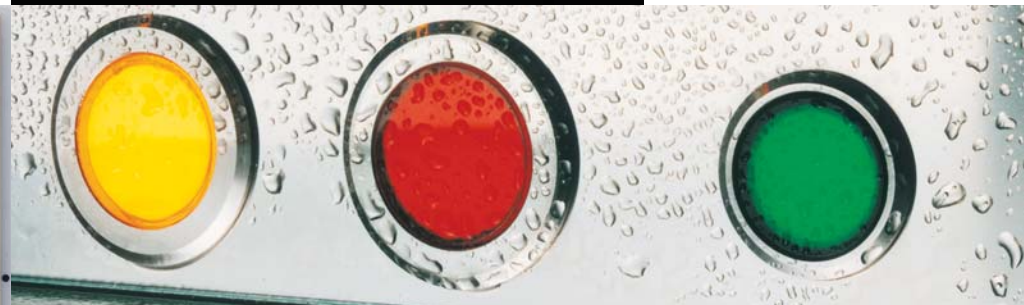
18 Pushbutton Terminal-layouts

Square or round, Illuminated, Flush



Advantages of LED Illumination

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.



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 67
Technical drawings see page 68

Options include:

- IP65 Protection
- Switch Rating, 10A, 400VAC
- Self cleaning snap-action switching elements
- Mounting into 22 x 30mm cut out
- Illumination using T1³/₄ 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

Part No.
22-040.001

For complete switch also order **A**

Illuminated pushbutton



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

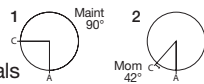
Part No.	Momentary/Maintained	Contact type
22-211.011	Momentary	1NO
22-212.011	Momentary	1NC
22-213.011	Momentary	2NO
22-214.011	Momentary	2NC
22-215.011	Momentary	1NO/1NC
22-221.011	Maintained	1NO
22-222.011	Maintained	1NC
22-223.011	Maintained	2NO
22-224.011	Maintained	2NC
22-225.011	Maintained	1NO/1NC

For complete switch also order **A**

Keylock switch



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



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

For complete switch also order **A**

LED



LED, T1 ³/₄ MG, single chip, 12 Volt and 28 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, 4/7mA
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, 4/7mA
Blue	10-2J13.1066	28VAC/DC, 7/14mA
White	10-2J13.1069	28VAC/DC, 7/14mA

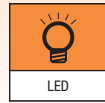
Accessories



Lens, front translucent/rear translucent for rectangular indicator and pushbutton bodies

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

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 bodies, not for illumination

Colour	Part No.
● Grey	22-901.8
● Black	22-901.0



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

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 pushbutton bodies

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



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	51-996	LED remover



Complete switch



Features

- IP65 protection from the front, IP20 finger guard protection
- Robust, compact design
- Intensive LED illumination
- Symbol options
- Double brake snap action contacts for good tactile feel
- Screw in plug and terminal options
- Good range of accessories
- Easy mounting and assembly
- World wide approvals

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

polymethylmethacrylat PMMA, polycarbonate PC

Front bezel

polyphenylenoxide PPO

Material of contacts

hard silver

Actuator case

polyamide PA, polytherimide PEI

Mechanical characteristics

Connection method

screw terminal (with self-lifting clip):

max. wire cross-section: 2 x 2.5 mm

max. wire cross-section of stranded cable: 2 x 1.5 mm

plug-in terminal 6.3 x 0.8 mm

Actuating force

with 1 switching element 3.6 ± 0.3 N

with 2 switching elements 6.8 ± 0.3 N

Actuating travel

5.5 ± 0.2 mm

Storage temperature

-40°C to + 95°C (as per DIN IEC 68-)

Mechanical life

as per IEC 163-1

illuminated pushbuttons: 2 million operations

keylock switch: 40.000 operations

Rebound time

≤ 3 ms

Travel

3 mm

Resistance to shock

50 g for 11 ms as per IEC 512-4-3

Degree of protection

terminal/case: IP 20

front as per IEC 529: IP 65

Resistance to vibration

(sinusoidal) 10 g at 10-2000 Hz, amplitude 0.75 mm as per IEC 512-4-4

Ambient air temperature

-25°C to + 85°C (as per DIN IEC 68-)

Electrical characteristics

Contact resistance

starting value ≤ 50 mΩ as per IEC 512-2-4

Insulation resistance

≥ 100 mΩ between all contacts at 100 VDC as per IEC 512-2-10

Switch rating

power rating

min. 12 VAC, 50 mA

max. 400 VAC, 10 A

switch rating AC, cos φ 0.7 as per AC 11 (IEC 337):

voltage	125 V	250 V	380 V
---------	-------	-------	-------

current	8 A	5 A	3 A
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operations > 100.000

switch rating DC (inductive), L:R=30 ms as per DC 11 (IEC 337):

voltage	24 V	60 V	110 V	220 V
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current	6 A	1.5 A	0.4 A	0.2 A
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operations > 100.000

Electric strength

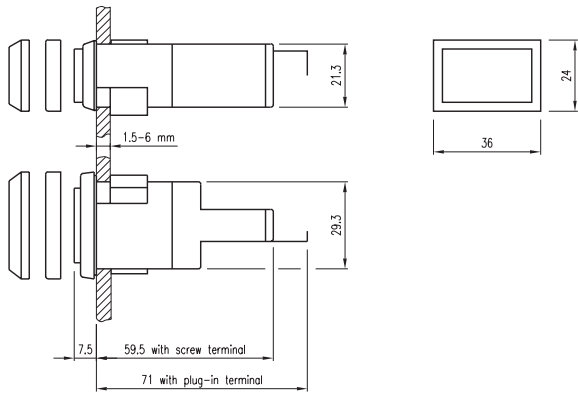
2500 VAC, 50 Hz, 1 min. between all terminals and earth, as per IEC 512-2-11.

Approvals

- CSA 300 VAC
- CE (declaration of conformity)
- UL
- CB
- ENEC

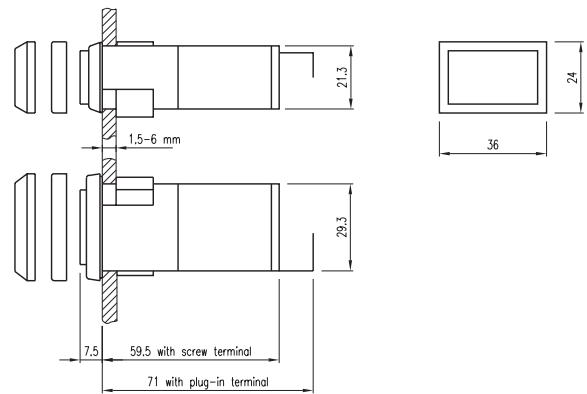
22 Indicator

Raised



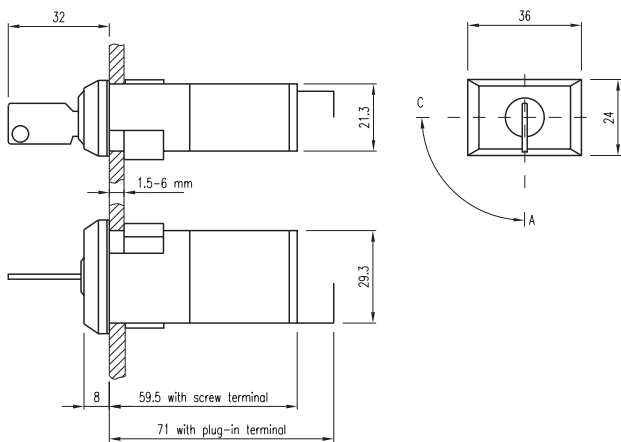
22 Pushbutton

Illuminated, Raised



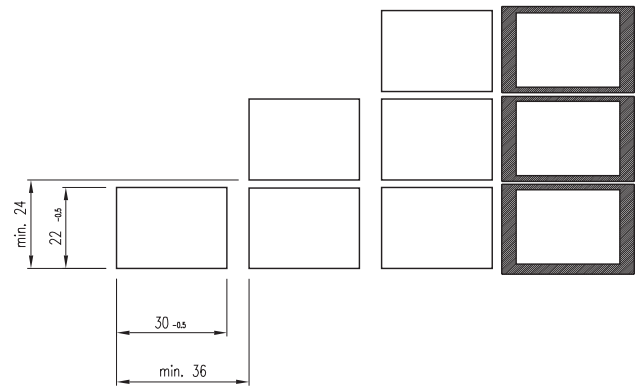
22 Keylock

2-Position, Raised



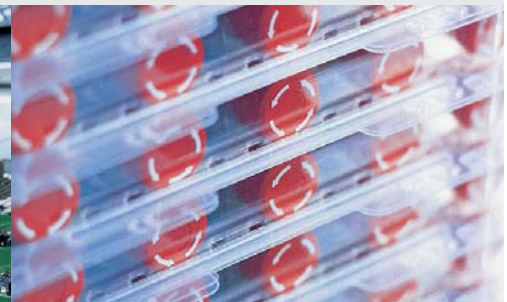
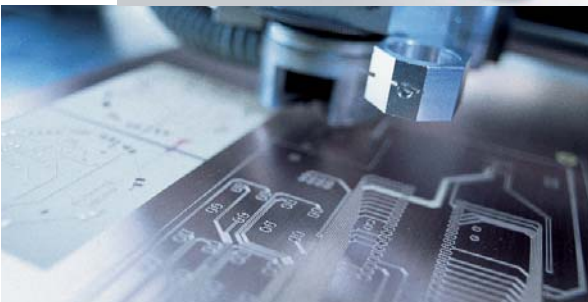
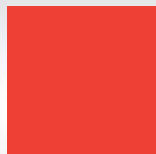
22 Cut-outs

For all Series 22



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 56

IP67 250VDC/1A (non illuminated) 110VDC/0.2A (illuminated)

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 sided pushbuttons, glass mount pushbuttons, raised palm push lenses, raised tactile symbols and Braille front bezels.

Technical data see page 73
Technical drawings see pages 74-77

- IP67 front protection
- Switch Rating:
Minimum: 5VDC, 5mA
Maximum: 137VDC, 200mA
- Electrical Strength:
4000VAC, 50Hz
1 min between all terminals and mounting plate
- 200mm cable standard
- Options for cable length and LED colours
- As standard AMP connector with plug in housing 2.8 x 0.8mm

Double sided pushbutton



Double sided 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 sided pushbutton



Single sided 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 sided pushbutton



Single sided 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
56-030.05.200.00.*	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 sided 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
56-120.22.200.22.05	Red/Green	Natural anodised	Flush metal
56-120.22.200.24.05	Red	Natural anodised	Flush metal
56-120.22.200.21.05	Red/Green	Natural anodised	Flush metal
56-020.05.200.00.05	Without	Natural anodised	Flush metal

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

For complete switch also order **A**



Single sided 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 sided pushbutton



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



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



Single sided 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

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

*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 sided indicator



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

Single sided raised indicator



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

A Accessories



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

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

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

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

*Text on symbol must be specified when ordering

For complete switch also order **A**

For complete switch also order **A**

For complete double sided switch also order Interior Front Bezel



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



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

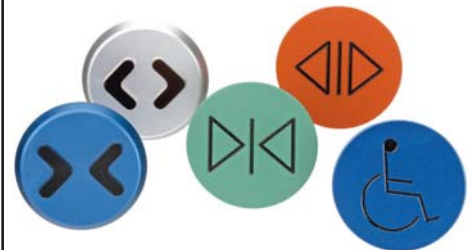
Part No.	LED/Colour	Bezel material
56-5600	Blue RAL 5017	Plastic
56-5800	Dark grey RAL 7043	Plastic
56-5800A	Light Grey RAL 7040	Plastic
56-5500	Green RAL 6024	Plastic
56-5300	Orange RAL 2003	Plastic
56-5200	Red RAL 3020	Plastic
56-5400	Yellow RAL 1023	Plastic
56-7600	Matt Chrome	Metal



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

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

Other square, colour and language options available



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

Marking	Symbol No.
	00.868
	00.869
	00.835
	00.836
	40089

For complete double sided switch also order External Front Bezel

A Accessories



Dismantling tool for front bezel

Part No.
56-998

Complete switch



Features

- IP67 front sealed, IP65 sealed from behind
- Intensive 'Halo' LED illumination
- Raised pressel for palm operation
- Raised or engraved, standard or customised symbols
- Braille options
- Low back panel depth
- Low actuation force, low travel and snap action contacts for good tactile feel for disabled users
- CE (declaration of conformity)

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 thermoplastic
polybutylenterephthalat (PBT), as per UL 94 V0

Front bezel

Zinc matt chromium plated or thermoplastic
polybutylenterephthalat (PBT), as per UL 94 V0

Actuator

Polycarbonate (PC), as per UL 94 V0

Material of contacts

gold-plated silver

Mechanical characteristics

Connection method

Cable 4-poles with plug-in connection 2.8 x 0.8 mm
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 6.3 x 0.8 mm
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 | indicator for standard mounting M4 x 8mm
double pushbutton for glass mounting M4 x 25 mm
single pushbutton for glass mounting M4 x 20 mm
(for glass up to 5 mm)
single pushbutton for glass mounting M4 x 16 (for 4 mm glass)

Tightening torque

Screws at the single pushbutton | indicator for
front panel mounting 80 Ncm..100 Ncm
Screws at the single pushbutton | double pushbutton for
glass mounting 50 Ncm

Actuation force

6 N..12 N

Actuation travel

~0.5 mm

Mechanical life

2 million operations

Key (mounting | dismantling)

hexagon socket wrench size 2.5 mm

Electrical characteristics

Illumination

Ready status, 8 LED green or red or yellow
optical switch on status, 2 LED green or red
(3 LED for special versions)
supply voltage 24/36/48/72/96/110 VDC
tolerance +25%...-30%
Current consumption <50 mA

Switch rating

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

EMC approved, as per

IEC/EN 61000-4-6
IEC/EN 61000-4-3
IEC/EN 61000-4-4
IEC/EN 61000-4-2
IEC/EN 61000-4-5
CISPR 22, EN 55022

Electric strength

4000 VAC, 50 Hz, 1 min, between all terminals and mounting plate

Environmental conditions

Storage temperature

-45 °C...+90 °C

Operating temperature

-40 °C...+80 °C

Protection degree

Front IP 67
Back IP 65

Climate resistance

Damp heat, cyclic:
6 cycles, +25°C...+55°C / 95%...100% relative humidity,
as per IEC 60068-2-30

Damp heat, state:

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

Rapid change of temperature:

100 cycles, -40 °C...+80 °C, as per IEC 60068-2-14

Shock resistance

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

Vibration resistance

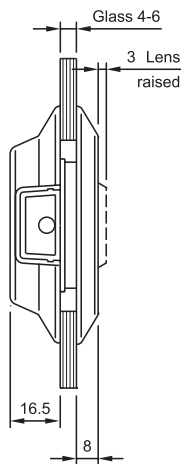
(sinusoidal)
max. 100 m/s² at 10 Hz...2000 Hz, as per IEC 60068-2-6

Approvals

CE (declaration of conformity)

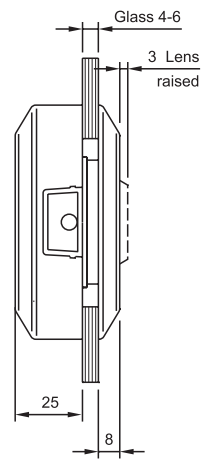
56 Single pushbutton

For glass mounting



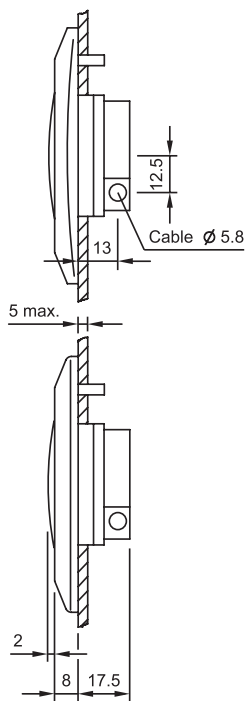
56 Double pushbutton

For glass mounting



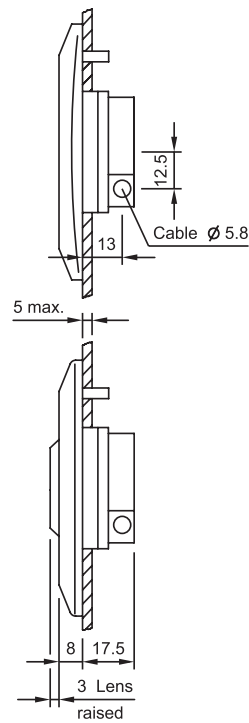
56 Indicator

For front panel mounting standard mounting



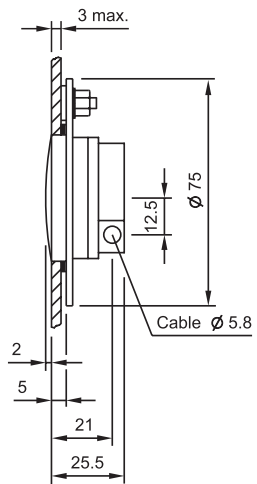
56 Single pushbutton

For front panel mounting standard mounting



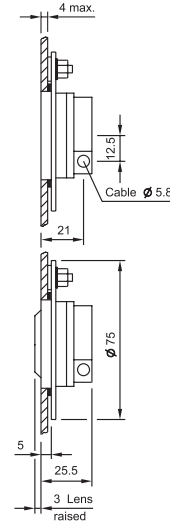
56 Indicator

For front panel mounting flush mounting



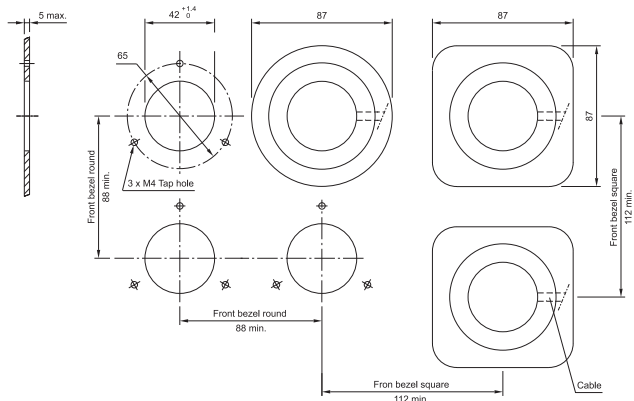
56 Single pushbutton

For front panel mounting flush mounting



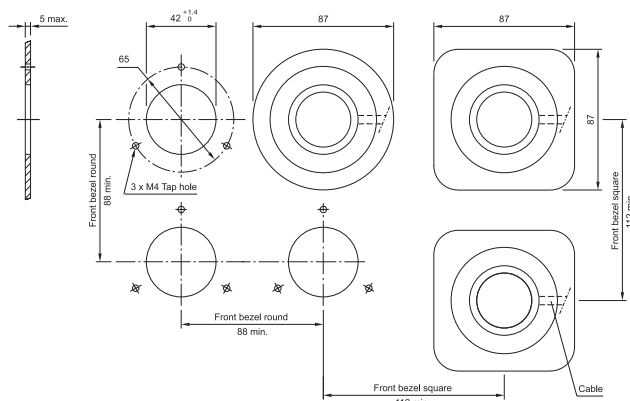
56 Indicator

For front panel mounting



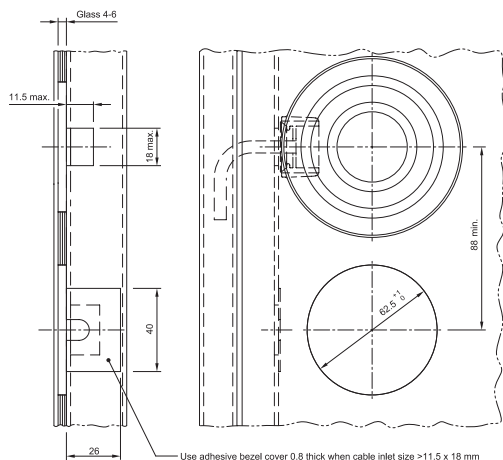
56 Single pushbutton

For front panel mounting



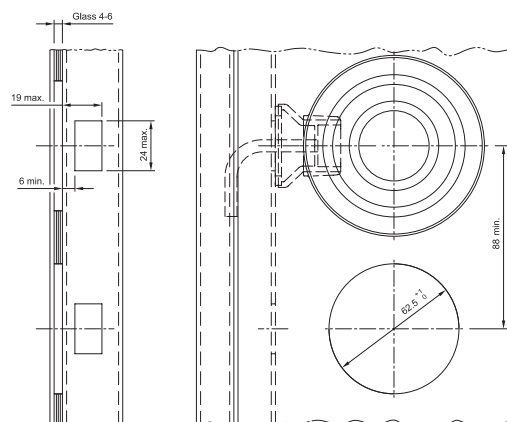
56 Single / Double pushbutton

For glass mounting



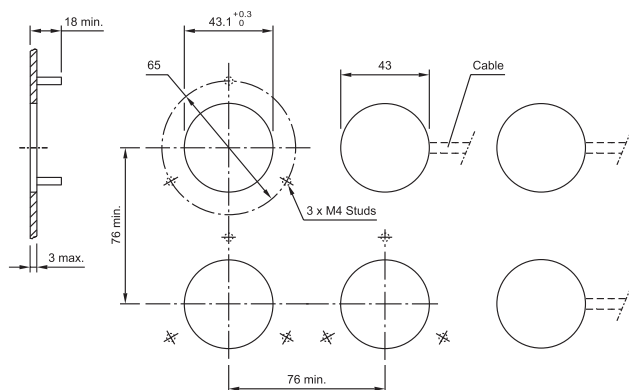
56 Indicator

For front panel mounting flush mounting



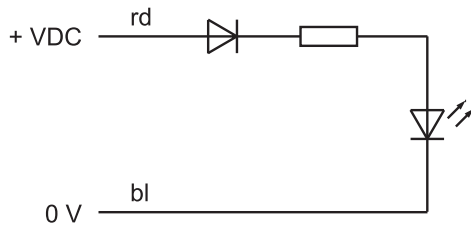
56 Single pushbutton

For front panel mounting flush mounting



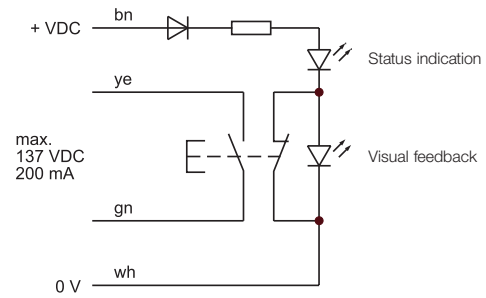
56 Indicator

For front panel mounting standard/flush



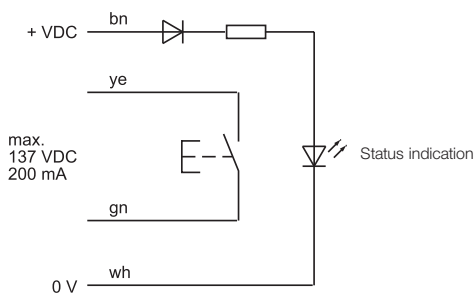
56 Single pushbutton

For front panel mounting



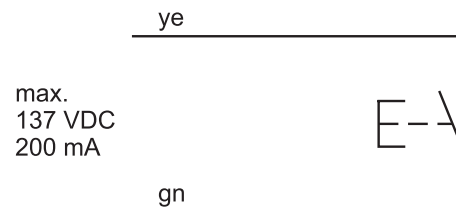
56 Single pushbutton

For front panel mounting/standard mounting



56 Single pushbutton

For front panel mounting/standard mounting, non-illuminated



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 58 is a high quality touch sensitive switch that operates through glass. It is fitted with an electronic switching element and contains no moving parts, so it is incredibly durable and offers a long service life.

It will operate even through 16mm thick double glazing. It was developed for use as a door-opening switch for public transport vehicles fitted with large expanses of glass.

Technical data see page 80
Technical drawings see page 81

- IP65 Protection
- Supply Voltage: 24VDC (+25% / -30%)
- Load Current: 200mA max.
- Illumination:
Ready status – 2 green LEDs per side
Feedback – 2 red LEDs per side
- 200mm cable with cable-end sleeves
- Grey housing RAL 7012
- Many symbols and text options
- 1NO contact
- 25cm² touch pad

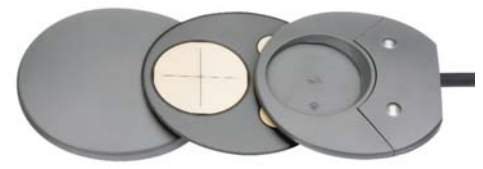
Single side switch



24VDC single sided switch for glass mounting, 2 red/green bi-coloured LED illumination with housing to be mounted on inner and outer side of glass

Part No.	Sensitivity
58-122.11	Higher
58-112.11	Standard

For complete switch also order **T**



24VDC single sided switch for glass mounting, 2 red/green bi-coloured LED illumination with housing to be mounted on inner side of glass and adhesive label to be mounted on outer side of glass

Part No.	Sensitivity
58-121.11	Higher
58-111.11	Standard

For complete switch also order **T**

Double side switch



24VDC double sided switch for glass mounting, 4 red/green bi-coloured LED illumination with housing to be mounted on inner and outer side of glass

Part No.	Sensitivity
58-222.12	Higher*
58-212.12	Standard**

*Higher = Double glazing **Standard = Single glazing

For complete switch also order **T**



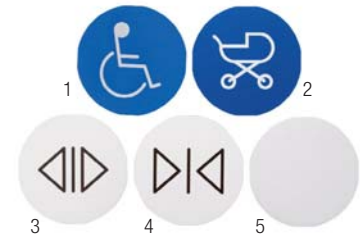
24VDC double sided switch for glass mounting, 4 red/green bi-coloured LED illumination with housing to be mounted on inner side of glass and adhesive label to be mounted on outer side of glass

Part No.	Sensitivity
58-221.12	Higher*
58-211.12	Standard**

*Higher = Double glazing **Standard = Single glazing

For complete switch also order **T**

T Touchplate



Touchplate 0.3mm aluminium anodised, adhesive

Image	Part No.	Colour	Symbol
1	58-43694	Blue RAL 5017	Wheelchair
2	58-43693	Blue RAL 5017	Pushchair
3	58-43891	Natural	Open arrows
4	58-43892	Natural	Close arrows
5	58-43800	Natural	Without

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.

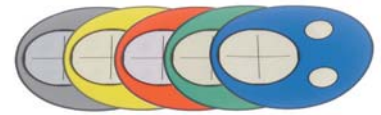
A Accessories



Housing plastic for the inner side of the glass



Outer housing plastic



Outer plastic adhesive label

Part No.	Sensitivity	Actuator
58-100.11*		Single sided (inside)
58-110.11*	Standard	Single sided (outside)
58-120.11*	Higher	Single sided (outside)
58-210.11*	Standard	Double sided (inside/outside)
58-220.11*	Higher	Double sided (inside/outside)
*Above mentioned part numbers are for grey switching unit only. For other colour options add 2 = red, 3 = orange, 4 = yellow, 5 = green, 6 = blue		

Part No.	Colour
58-66000	Grey RAL 7012
58-66000.4	Yellow RAL 1023
58-66000.2	Red RAL 3020
58-66000.5	Green RAL 6024
58-66000.6	Blue RAL 5017

Part No.	Colour
58-77000	Grey RAL 7012
58-77000.4	Yellow RAL 1023
58-77000.2	Red RAL 3020
58-77000.5	Green RAL 6024
58-77000.6	Blue RAL 5017



Switching unit

Switching system

Switching element

Touch-sensitive (electronic, capacitive)

Material

Connection cable

Halogen free polyolefine mixture

Inner and outer housing

Thermoplastic Acrylate Styrene Acrylonitrile / Polycarbonate (ASA+PC), as per UL 94 V0

Adhesive surface

3 M™ VHB™ - adhesive transfer tape

Touch-plate

Aluminium anodized

Electrode

Stainless steel

Mechanical characteristics

Connection method

Cable 3-poles with cable-end sleeves

Wire cross-section

0.25 mm²

Electrical characteristics

Power supply

Operation voltage: 24 VDC +25%...-30%

Output

Short circuit and overload protected

I_{max.} = 200 mA

Display

Ready status: 2 green LED's each side

Feedback: 2 red LED's, light up while touching

EMC approved, as per

EN 50081-1

EN 50082-1

EN 50082-2

EN 50121-3-2

EN 50155

Environmental conditions

Storage temperature

-45°C...+90°C

Operating temperature

-40°C...+80°C

Protection degree

IP 65

Climate resistance

Damp heat, cyclic:

6 cycles, +25°C...+55°C / 95%...100% relative humidity, as per IEC 60068-2-30

Damp heat, state:

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

Rapid change of temperature:

100 cycles, -40°C...+80°C, as per IEC 60068-2-14

Shock resistance

(semi-sinusoidal)

max. 250 m/s², pulse width 11 ms, as per IEC 60068-2-27

Vibration resistance

(sinusoidal)

max. 100 m/s² at 10 Hz...2000 Hz, as per IEC 60068-2-6

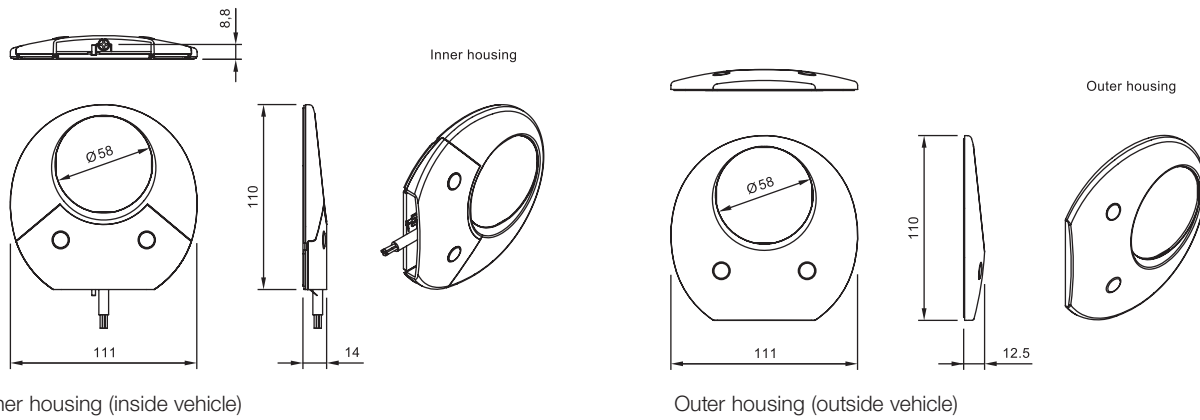
Approvals

CE compliant

e1 type-approval

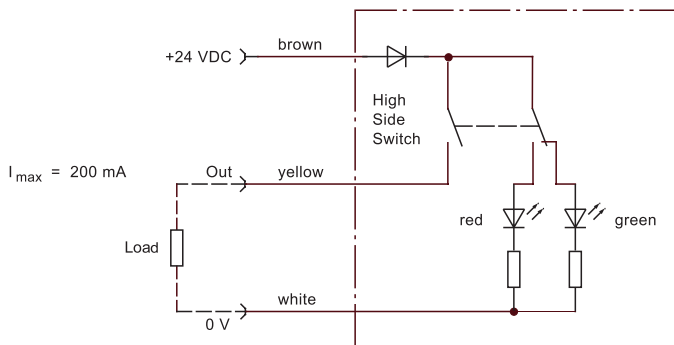
58 Single side switch

For glass mounting / double side switch for glass mounting



58 Single / double side switch

For glass mounting



Series 61

16mm 22.5mm 21 x 21mm 21 x 27mm 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 pages 89-91

Technical drawings see pages 92-93

- IP65 Protection
- Switch Rating, 5A, 250VAC
- Raised Mounting into 16mm cut out
- Flush Mounting into 22.5mm, 21x21mm and 21x27mm 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



A guide to ordering parts - 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



Contact block



LED



Accessories



Accessories

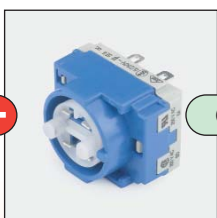


For a complete illuminated pushbutton you will need to order the appropriate contact block, LED, lens and bezel (for flush mount only)

Keylock switch

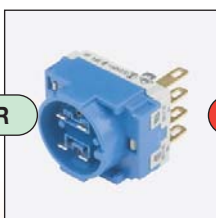


Contact block

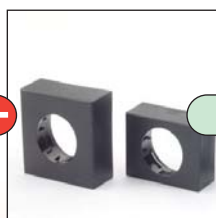


OR

Contact block



Accessories



OR

Accessories



Accessories

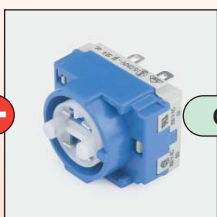


For a complete keylock switch you will need to order the appropriate contact block and bezel (for flush mount only)

Selector switch

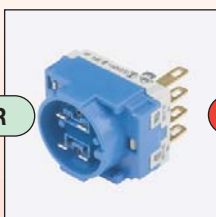


Contact block



OR

Contact block



LED



Accessories

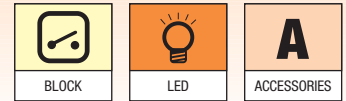


Accessories



For a complete selector switch you will need to order the appropriate contact block, LED, lever and bezel (for flush mount only)

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 bodies, raised, round, square and rectangular, black plastic, 16mm mounting

Image	Part No.	Size
1	61-0050.02	24 x 24mm
2	61-0030.02	18 x 24mm
3	61-0020.02	18 x 18mm
4	61-0010.02	18mm Ø

For complete switch also order **A**

Illuminated pushbutton



Indicator body for flush mount, black plastic

Part No.
61-0000.02

For complete switch also order **A**



Illuminated pushbutton actuator, raised, round, square and rectangular, black plastic, 16mm mounting

Image	Part No.	Momentary/Maintained	Size
1	61-1150.0	Momentary	24 x 24mm
1	61-1250.0	Maintained	24 x 24mm
2	61-1130.0	Momentary	18 x 24mm
2	61-1230.0	Maintained	18 x 24mm
3	61-1120.0	Momentary	18 x 18mm
3	61-1220.0	Maintained	18 x 18mm
4	61-1110.0	Momentary	18mm Ø
4	61-1210.0	Maintained	18mm Ø

For complete switch also order **A**

Illuminated pushbutton



Illuminated flush mount pushbutton actuator, round, black plastic

Part No.	Momentary/Maintained
61-1100.0	Momentary
61-1200.0	Maintained

For complete switch also order **A**

Complete switch

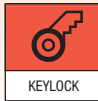
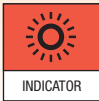


Features

- IP65 front sealed for spray water protection
- Modular switching system
- Intensive LED illumination
- Raised or flush mount
- Options for engraving
- Good choice of mounting sizes
- Good snap action tactile feel
- Solder or plug in terminals
- 135 different key options available for keylock switches
- World wide approvals

Series 61

16mm 22.5mm 21 x 21mm 21 x 27mm 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.

Emergency-stop switch



Emergency-stop, twist release and key release, 27mm diameter for 16mm mounting, foolproof to EN 60947-5-5 and EN 418

Part No.	Product reference
61-3440.4/1	Twist release
61-5441.4/K	Key release

For complete switch also order **A**

Keylock switch



Keylock switch, actuator, 2 position for raised and flush mount

Drawing	Part No.	Momentary/Maintained	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

For complete switch also order **A**

Keylock switch



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

Drawing	Part No.	Momentary/Maintained	Key rem.
3	61-2501.0/D	Momentary/Momentary	A
4	61-2601.0/D	Maintained/Maintained	A
4	61-2602.0/D	Maintained/Maintained	B
4	61-2603.0/D	Maintained/Maintained	C
4	61-2604.0/D	Maintained/Maintained	A+B
4	61-2605.0/D	Maintained/Maintained	C+A
4	61-2606.0/D	Maintained/Maintained	C+B
4	61-2607.0/D	Maintained/Maintained	C+A+B

For complete switch also order **A**



Keylock switch



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

Drawing	Part No.	Momentary/Maintained	Key rem.
6	61-2701.0/D	Maintained/Momentary	A
6	61-2703.0/D	Maintained/Momentary	C
6	61-2705.0/D	Maintained/Momentary	C+A
5	61-2801.0/D	Momentary/Maintained	A
5	61-2802.0/D	Momentary/Maintained	B
5	61-2804.0/D	Momentary/Maintained	A+B

For complete switch also order **A**

Selector switch

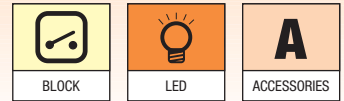


Selector switch, actuator, 2 and 3 position for raised and flush mount

Drawing	Part No.	Momentary/Maintained
7	61-4110.0	Momentary
8	61-4210.0	Maintained
9	61-4510.0	Momentary/Momentary
10	61-4610.0	Maintained/Maintained
11	61-4710.0	Maintained/Momentary
12	61-4810.0	Momentary/Maintained

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.



Contact block



Contact block for pushbuttons and 2 position keylock and selector switches, snap-action

Part No.	Contact type	Contact material
61-8410.12	1NO	Silver
61-8410.22	1NO	Gold
61-8420.12	2NO	Silver
61-8420.22	2NO	Gold
61-8470.12	1NO/1NC	Silver
61-8470.22	1NO/1NC	Gold
61-8490.12	2NO/1NC	Silver
61-8490.22	2NO/1NC	Gold

For complete switch also order ☉ ⚙️ Ⓜ️



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

Image	Part No.	Contact type	Contact material
1	61-8755.11	2NC	Silver
2	61-8755.17	2NC	Silver
1	61-8775.11	1NO/1NC	Silver
2	61-8775.17	1NO/1NC	Silver

For complete switch also order ☉



Contact block, 3 position keylock and selector switch, snap-action

Part No.	Contact type	Contact material
61-8520.12	2NO	Silver
61-8520.22	2NO	Gold

For complete switch also order ⚙️ Ⓜ️

LED



LED, T1 3/4 MG, single chip, 12 Volt and 28 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, 4/7mA
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, 4/7mA
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 bodies

Colour	Part No.	Size
Red	61-9331.2	18 x 24mm
Yellow	61-9331.4	18 x 24mm
Green	61-9331.5	18 x 24mm
Blue	61-9331.6	18 x 24mm
Clear	61-9331.7	18 x 24mm



Lens, plastic for raised, square indicator and pushbutton bodies

Colour	Part No.	Size
Red	61-9351.2	24 x 24mm
Yellow	61-9351.4	24 x 24mm
Green	61-9351.5	24 x 24mm
Blue	61-9351.6	24 x 24mm
Clear	61-9351.7	24 x 24mm

Series 61

16mm 22.5mm 21 x 21mm 21 x 27mm 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 raised, square indicator and pushbutton bodies

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



Lens, plastic for raised, round indicator and pushbutton bodies

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



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

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

A Accessories



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

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



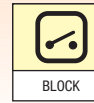
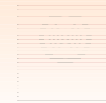
Lens, plastic for flush mount, square indicator and pushbutton bodies

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



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

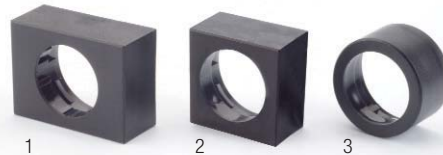


A Accessories



Keylock switch front bezel, raised black plastic

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



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

Image	Part No.	Size
1	61-9931.0	18 x 24mm
2	61-9930.0	18 x 18mm
3	61-9932.0	18mm 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	25mm Ø
2	61-9933.0	Aluminium	25mm Ø
3	61-9931.0	Plastic	24 x 30mm
4	61-9930.0	Plastic	24 x 24mm

A Accessories



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

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



Flap guard, raised and flush mount

Image	Part No.	Size	Raised/Flush mount
1	61-9922.0	24 x 30mm	Flush
2	61-9921.0	24 x 24mm	Flush
3	61-9924.0	25mm Ø	Flush
4	61-9920.0	24 x 24mm	Raised
5	51-925	18 x 24mm	Raised
6	51-920	18 x 18mm	Raised



Blanking plate

Image	Part No.	Size	Mounting hole
1	61-9450.0	24 x 24mm	16mm Ø
2	61-9452.0	24 x 30mm	21 x 27mm
3	61-9451.0	24 x 24mm	21 x 21mm
4	51-947.0	18 x 24mm	16mm Ø
5	51-948.0	18 x 18mm	16mm Ø
6	51-949.0	18mm Ø	16mm Ø
(see p95)	61-9453.0	25mm Ø	22.5mm Ø

Series 61

16mm 22.5mm 21 x 21mm 21 x 27mm 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



Cable shoe for plug-in terminal size 2.8 x 0.5mm and insulation socket



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



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

Image	Part No.	Part No.	Part No.	Markings
1	31-929	61-9965	61-9970.0	No markings
2	31-946		61-9970.2	Emergency Stop
			61-9970.1	Not Aus
			61-9970.3	Arret D'urgence

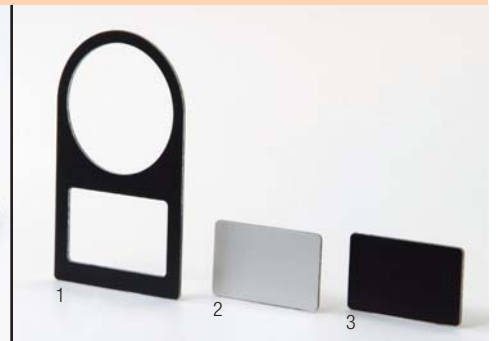
A Accessories



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



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



Legend plate, adhesive, natural anodised aluminium finish for flush mount round pushbuttons, 22.5mm mounting hole

Image	Part No.	Image	Part No.	Product description	Image	Part No.
1	61-9480.5	1	61-9730.0	Lens remover for flush mount	1	61-9980.0
2	61-9481.6	2	01-907	Mounting tool	2	704.968.0
		3	02-905	Lens remover for raised	3	704.968.1
		4	61-9711.0	Contact block remover		
		5	61-9740.0	LED remover		

Actuator with snap-action switching element

Switching system

Self-cleaning, double-break snap-action switching system with contact opening width 2 x 0.5 mm (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. 2 NC or 2 NO 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

	solder 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

	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

$U_e = 250$ VAC, 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 60947-1

Contact resistance

new state with silver contact : ≤ 100 m Ω
 as per DIN IEC 60512-2-4, measured at 100 mA, 10 V
 new state with gold plated contact : ≤ 50 m Ω
 as per DIN IEC 60512-2-3, measured at 20 mV, 10 mA

Electrical life

≥ 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

$I_{th} = 5$ 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 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 IP 65 | backside IP 40

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

CE (Declaration of conformity)
 CB (IEC 60947)
 CB (IEC 61058)
 CCA-NTR (EN 60947)
 CSA
 ENEC (EN 61058)
 GOST
 UL
 VDE
 German Lloyd
 RoHS compliant

Actuator with slow-make switching element

Switching system

double-break slow-make system, contact opening width 2 x 1.5 mm, with 2 x 2 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
 e-stop switch : max. 65 N

Actuating travel

pushbutton : 3 mm
 e-stop switch : 10 mm

	2 positions	3 positions
selector-/ keylock switch		
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 and contact breaking 2 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, EN IEC 60947-5-5 (Emergency-stop)

Electrical life

≥50.000 cycles of operation at 250 VAC, 5 A, cos φ 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, 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 60947-1

Contact resistance

new state : ≤50 mΩ 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, service category AC-15, as per EN IEC 60947-5-1

125 VAC, 2.5 A | 250 VAC, 2 A

switch rating with silver contact, service category DC-13, as per EN IEC 60947-5-1

250 VDC, 0.15 A

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

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

Electrical characteristics for gold contacts

Rated operational voltage

$U_e = 50$ VAC/DC, as per EN IEC 60947-5-1

Rated insulation voltage

$U_i = 320$ VAC, as per EN IEC 60947-5-1

Rated impulse withstand voltage

$U_{imp} = 0.8$ kV, as per EN IEC 60947-1

Contact resistance

new state : ≤ 50 m Ω as per DIN IEC 60512-2-4, measured at 20 mV, 10 mA

Conventional free air thermal current

$I_{th} = 3$ 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 gold contact, service category AC-15, as per EN IEC 60947-5-1

voltage : 50 VAC

current : 0.5 A

switch rating with gold contact, service category DC-13, as per EN IEC 60947-5-1

voltage : 50 VDC

current : 0.1 A

Recommended minimum operational data

voltage : 10 mVAC/DC

current : 2 mA

Recommended operational data

voltage : 5 VDC	12 VDC	24 V DC
current : 10 ... 20 mA	5 ... 10 mA	3 ... 5 mA

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +55 °C

Protection degree

as per EN IEC 60529

frontside IP 65 | backside IP 40

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

CE (Declaration of conformity)

CB (IEC 60947)

CB (IEC 61058)

CCA-NTR (EN 60947)

ENEC (EN 61058)

GOST

SEV

UL

VDE

German Lloyd

RoHS compliant

Actuator with flasher element

Material

Lens

raised mounting Polymethylmethacrylat PMMA, as per UL 94 HB, flush mounting Polycarbonat (PC), as per UL 94 V0

Actuator housing

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

Flasher element

polyetherimide (PEI), as per UL 94 V0

Mechanical characteristics

Terminals

soldering terminal

Electrical characteristics

Illumination

filament lamp	14 V AC/DC	28 VAC/DC
---------------	------------	-----------

power consumption : 80 mA	44 mA
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single-LED	12 VAC/DC	28 VAC/DC
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power consumption : 15 mA	18 mA
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Flashing frequency

1 Hz \pm 0.25 Hz

Pulse duty factor

approx. 50 %

Operating voltage

12 ... 28 VAC/DC \pm 10 %

Environmental conditions

Operating temperature

0 °C ... +45 °C

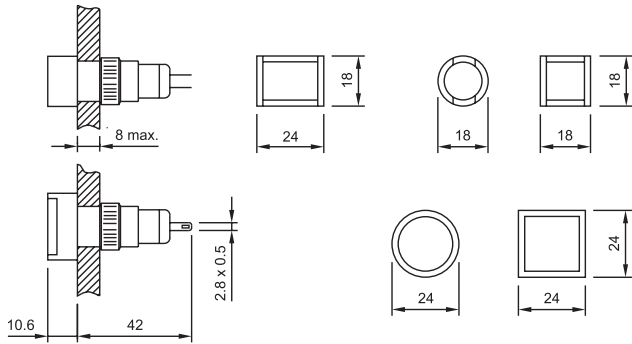
Protection degree

as per EN IEC 60529

frontside IP 65 | backside IP 40

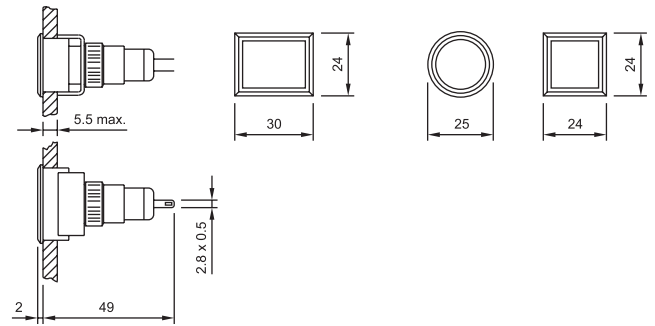
61 Indicator

Raised, Round, Square, Rectangular



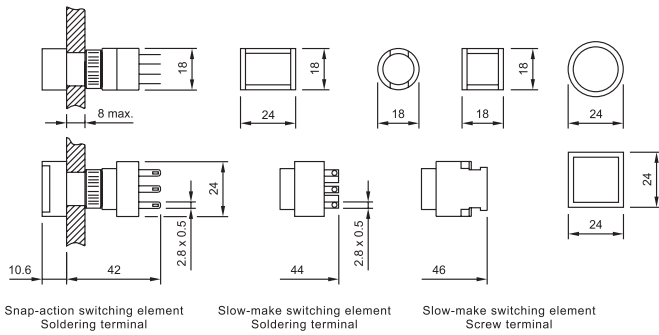
61 Indicator

Flush, Round, Square, Rectangular



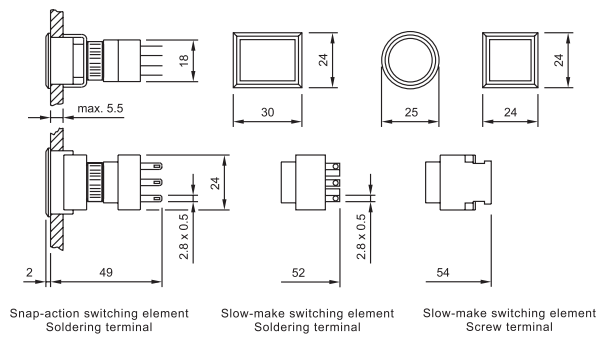
61 Pushbutton

Illuminated, Raised, Round, Square, Rectangular



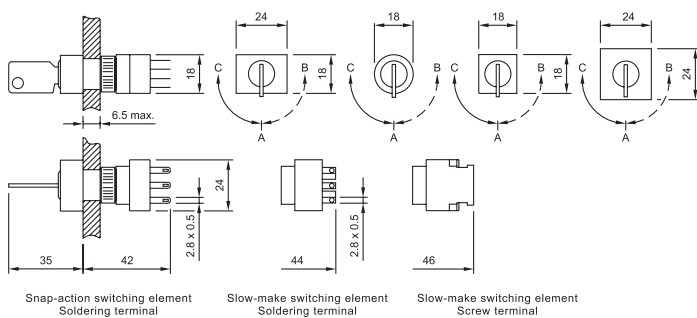
61 Pushbutton

Illuminated, Flush, Round, Square, Rectangular



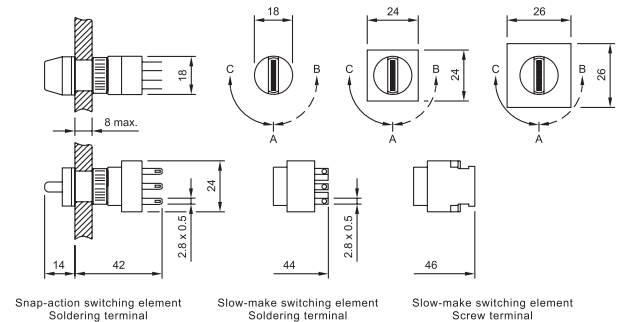
61 Keylock

2 & 3-Position, Round, Square, Rectangular



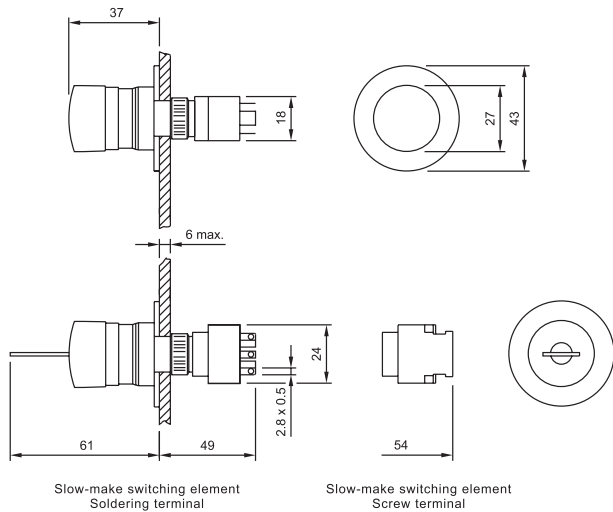
61 Selector

2 & 3-Position, Round, Square, Rectangular



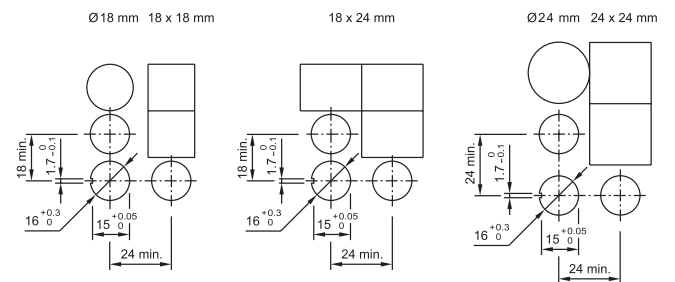
61 E-Stop

EN 418, EN 418 with Key



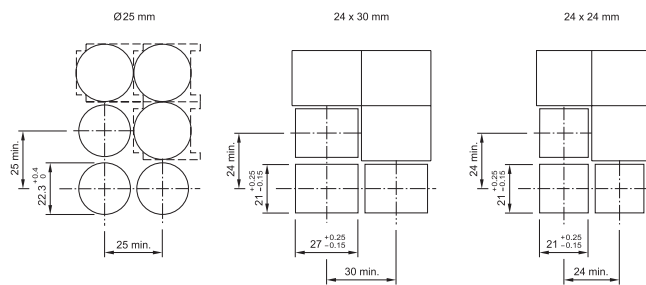
61 Cut-outs

Raised Indicators, Pushbuttons, Keylocks and Selectors



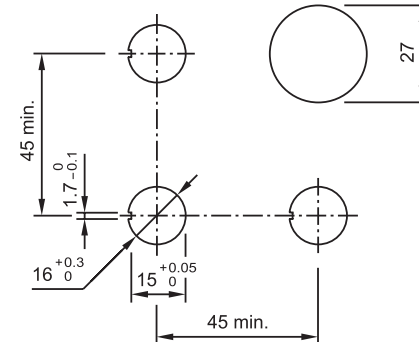
61 Cut-outs

Indicator Flush, Pushbutton Flush



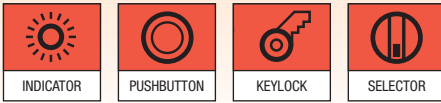
61 E-Stop Cut-outs

EN 418, EN 418 with Key



Series 71

22.5mm 21 x 21mm 21 x 27mm 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.

- IP65 Protection
- Switch Rating, 3A, 250VAC
- Flush Mounting into 22.5mm, 21x21mm and 21x27mm 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

Technical data see page 98

Technical drawings see page 99



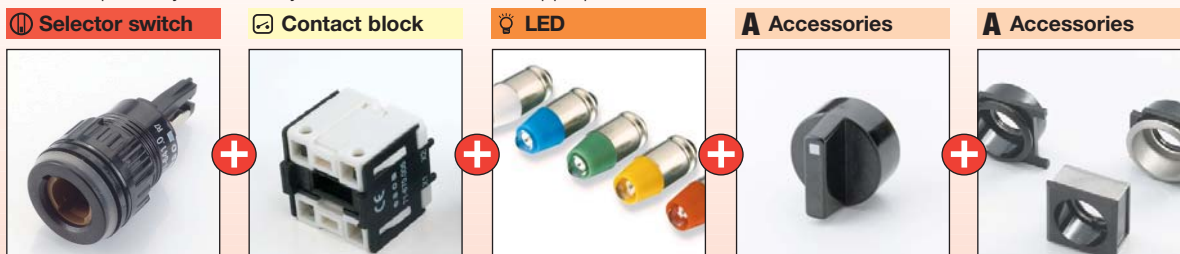
For a complete indicator you will need to order the appropriate contact block, LED, lens and bezel



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



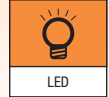
For a complete keylock switch you will need to order the appropriate contact block and bezel



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

A guide to ordering parts - 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

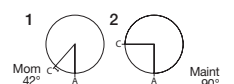
Part No.	Momentary/Maintained
71-611.0	Momentary
71-612.0	Maintained

For complete switch also order **A**

Keylock switch



Keylock switch actuator, 2 position for flush mount



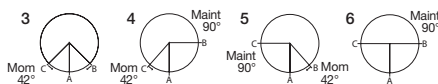
Drawing	Part No.	Momentary/Maintained	Key rem.
1	71-621.0/D	Momentary	A
2	71-622.0/D	Maintained	A
2	71-623.0/D	Maintained	C
2	71-624.0/D	Maintained	A+C

For complete switch also order **A**

Keylock switch



Keylock switch actuator, 3 position for flush mount



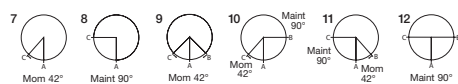
Drawing	Part No.	Momentary/Maintained	Key rem.
3	71-631.0/D	Momentary/Momentary	A
4	71-638.0/D	Momentary/Maintained	A
4	71-639.0/D	Momentary/Maintained	A+B
5	71-636.0/D	Maintained/Momentary	A
5	71-637.0/D	Maintained/Momentary	A+C
6	71-632.0/D	Maintained/Maintained	A
6	71-635.0/D	Maintained/Maintained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



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

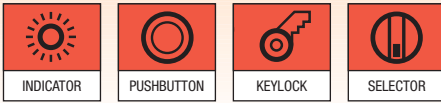
For complete switch also order **A**

Complete switch



Features

- IP65 front sealed
- Modular switching system
- Attractive, compact switching system with low back panel depth
- Intensive LED illumination
- Options for engraving and symbols
- Self cleaning, double-break snap action system for good tactile feel
- Unique PCB assembly system offers a multitude of options
- World wide approvals



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.

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

LED



LED, T1 3/4 MG, 12 Volt and 28 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, 4/7mA
● 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, 4/7mA
● 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 bodies

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

For complete switch also order ☀️ ⦿ ⚙️ ⚡️

A Accessories



Lens, plastic for flush mount round indicator and pushbutton bodies

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



Lens, plastic for flush mount square indicator and pushbutton bodies

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



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

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



Keylock switch front bezel, black plastic

Image	Part No.	Size
1	61-9230.0	24 x 30mm
2	61-9220.0	24 x 24mm
3	61-9210.0	25mm 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	25mm Ø
2	61-9933.0	Aluminium	25mm Ø
3	61-9931.0	Plastic	24 x 30mm
4	61-9930.0	Plastic	24 x 24mm



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

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

A Accessories



Flap guard, flush mount

Image	Part No.	Size
1	61-9922.0	24 x 30mm
2	61-9921.0	24 x 24mm
3	61-9924.0	25mm Ø



Blanking plate

Image	Part No.	Size
1	61-9453.0	25mm Ø
2	61-9452.0	24 x 30mm
3	61-9451.0	24 x 24mm



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**Mechanical characteristics****Actuation torque**

measured on the rotation knob of the selector / keylock switch
2.5 - 10 Ncm, depending on the number of contact elements

Actuation force

measured on the lens of the illuminated pushbutton
2 - 3 N, depending on the number of contact elements

Actuation travel

illuminated pushbutton 3 mm

key-/selector switch	2 positions
deflection momentary	1 x approx. 42°
deflection maintained	1 x approx. 90°

key-/selector switch	3 positions
deflection momentary	2 x approx. 42°
deflection maintained	2 x approx. 90°

Resistance to climate

according to IEC 68-2-3

Storage temperature

-40°C to + 85°C

(as per DIN IEC 68-)

Resistance to heat of soldering

manual with soldering iron: 300°C / 10 sec

avoid flux deposits on contacts

by sucking off flux

flow soldering: 260°C / 5 sec

Mechanical life

illuminated pushbutton	2 million cycles
keylock switch	50'000 cycles
selector switch	100'000 cycles

Rebound time

< 1 ms

Resistance to shock

according to IEC 68-2-27 und 29

Ea 18-300-18/3

Eb 6-250-3000/3

Degree of protection

indicators, illuminated pushbuttons, keylock switches and selector switches, front IP 65

Switching element IP 40 (flux protection according to DIN 41640 section 84)

Resistance to vibration

according IEC 68-2-6

Fc 10/500-0.35/50-30/3

Ambient air temperature

-25°C to + 55°C

(as per DIN IEC 68-)

Electrical characteristics**Contact resistance**

value as new < 50 mΩ

Insulation resistance

$\geq 10^{12} \Omega$

Switch rating

min.	5 VAC / 10 mA
------	---------------

max.	250 VAC / 3 A
------	---------------

AC-Operation $\cos \phi$ 0.7	250 VAC / 3 A
------------------------------	---------------

DC-Operation	250 VDC / 0.5 A
--------------	-----------------

	24 VDC / 3 A
--	--------------

Electric strength

2500 VAC, 50 Hz, 1 min. between all terminals and earth

Approvals

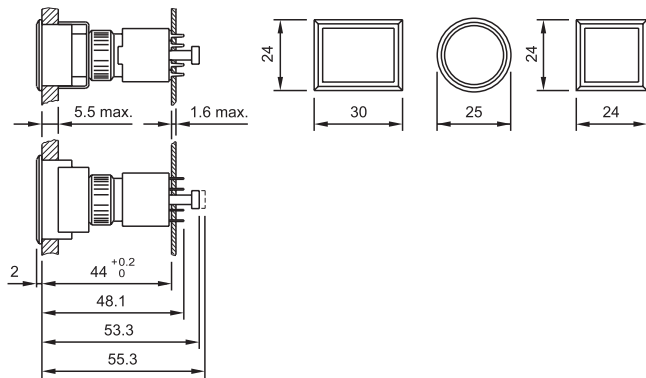
ENEC 61058

UL (ML file E 51383)

CE

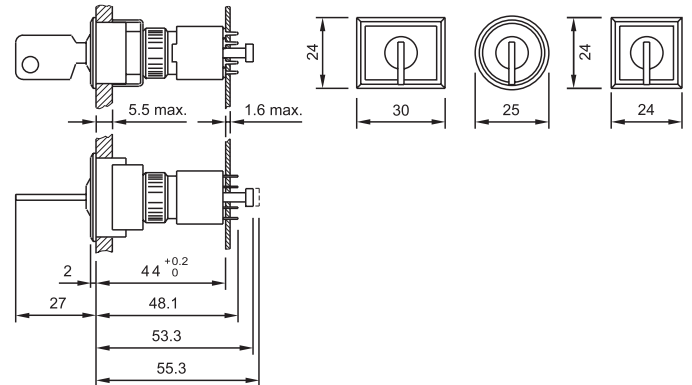
71 Indicator, Pushbutton

Flush, Round, Square, Rectangular



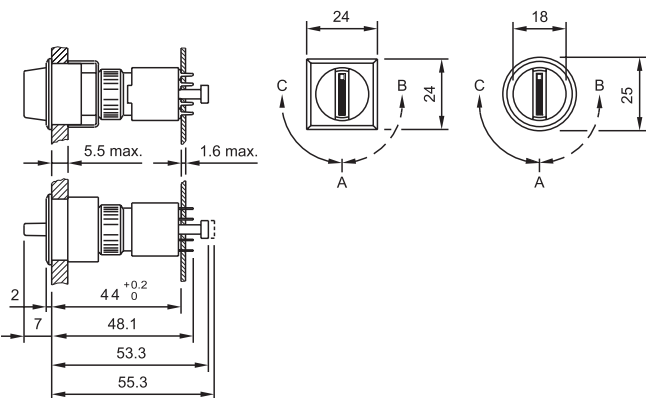
71 Keylock

Flush, Round, Square, Rectangular



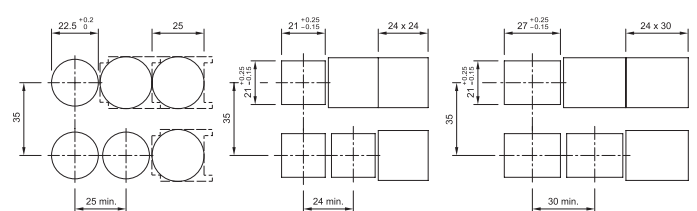
71 Selector

Flush, Round, Square, Rectangular



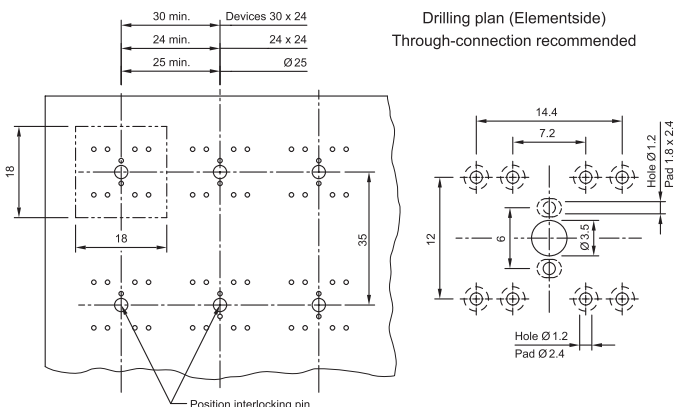
71 Cut-outs

Indicator, Pushbutton Flush, Keylock Flush, Selector Flush



Note:
Pitch of the front plate mounting holes must agree with the printed circuit board holes $\varnothing 3.5$

71 PCB Layout



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



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 pages 103-105

Technical drawings see pages 106-107

- IP67 Protection (Switches and Indicators)
- IP65 Protection (Emergency-stop switches)
- Flush Mounting into 22.5mm cut out
- Illumination using Single or Multi-LED's in red, orange, yellow, green, blue or white
- Switching elements with solder or plug-in terminals or ribbon cable with 300mm length
- Switch Rating for indicator and pushbutton: 10µA - 100mA, 50mVAC/VDC - 42VAC/VDC
- Switch Rating for Emergency-stop switch: 3A/120VAC, 1.5A/240VAC
- LED Voltage for Emergency-stop switch: 5-30VDC
- All standard plastic lenses with the exception of black are transparent with translucent diffuser
- Compact Emergency-stop meets EN 60947-5-1, EN 60947-5-5 and EN 418

Indicator



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

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

For complete indicator order indicator element 84-800X.XXXX

For complete switch also order **A**

Illuminated pushbutton



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

Part No.	Momentary/Maintained	Material
84-1101.0	Momentary	Plastic
84-1201.7	Momentary	Metal

For complete pushbutton order switch element 84-851X.XXXX

For complete switch also order **A**

Illuminated Emergency-stop switch



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

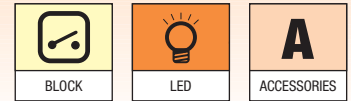
Part No.	Contact type
84-5021.2B20	1NC
84-5041.2B20	2NC
84-5031.2B20	1NC/1NO



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

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



Emergency-stop switch

Indicator element



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



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



Indicator element, 24VDC LED, plug-in terminals

Part No.	Contact type	Part No.	Contact Type	Colour	Part No.	Comment
84-5020.0020	1NC	84-5020.0040	1NC	● Red	84-8002.2620	Multi-chip LED
84-5040.0020	2NC	84-5040.0040	2NC	● Yellow	84-8002.4620	Multi-chip LED
84-5030.0020	1NC/1NO	84-5030.0040	1NC/1NO	● Green	84-8002.5620	Multi-chip LED
				● Blue	84-8001.6620	Single-chip LED
				○ White	84-8001.9620	Single-chip LED

For complete switch also order **A**

Switch element



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



Switching element, 24VDC multi-chip LED, ribbon cable, 1NO

Colour	Part No.	Comment	Colour	Part No.	Comment
● Red	84-8512.2620	Multi-chip LED	● Red	84-8512.2640	Multi-chip LED
● Yellow	84-8512.4620	Multi-chip LED	● Yellow	84-8512.4640	Multi-chip LED
● Green	84-8512.5620	Multi-chip LED	● Green	84-8512.5640	Multi-chip LED
● Blue	84-8511.6620	Single-chip LED	● Blue	84-8511.6640	Single-chip LED
○ White	84-8511.9620	Single-chip LED	○ White	84-8511.9640	Single-chip LED
	84-8510.0020	No LED - switching element only		84-8510.0040	No LED - switching element only

For complete switch also order **A**

For complete switch also order **A**

Complete switch



Features

- IP67 front sealed
- Modular switching system
- Pole mount pushbutton assembly options
- Pole mount housing options
- Intensive LED illumination
- Symbol options
- Ribbon cable or plug in terminal connections
- Short travel switching system for good tactile feel
- Low back panel depth
- World wide approvals



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 bodies

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



Pole mounted housing for stop request pushbutton

Colour	Part No.	Pole Dimension
Yellow	84-9500.4	35mm Ø
Yellow	84-9600.4	38mm Ø
Grey	84-9500.8	35mm Ø
Grey	84-9600.8	38mm Ø

*To reduce pole mounted housing from 35mm to 25mm Ø or 38mm to 35mm Ø please refer to the adaptor in the accessories section.



Wall mounted housing for stop request pushbutton

Colour	Part No.
Yellow	84-9800.4
Grey	84-9800.8

For complete switch also order **A**

A Accessories



Adaptor to reduce pole mounted housing from 35mm to 25mm Ø or 38mm to 35mm Ø

Colour	Part No	Pole dimension reduction
Yellow	84-9300.4	35-25mm Ø
Yellow	84-9700.4	38-35mm Ø
Grey	84-9300.8	35-25mm Ø
Grey	84-9700.8	38-35mm Ø



Lens remover for flush mount, mounting tool and switch element remover

Image	Part No.	Product description
1	61-9730.0	Lens remover for flush mount
2	84-997	Mounting tool
3	84-998	Switch element remover
	84-996	Mounting tool for E-stop



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

Polyvinylchlorid (PVC), operating temperature up to +70 °C.
Degression curve for higher current and temperature on request

Lens

Polybutylenterephthalat (PBT), as per UL94 V0 (red items)

Actuator housing

Polyamid (PA66), as per UL94 V0, Flat ribbon cable cover
Polyamid (PA 6.6), as per UL94 V0

Material of contacts

Silver alloy gold plated

Mechanical characteristics

Mounting hole

22.5 mm dia. as per EN IEC 60947-5-1 with anti-twist device

Terminals

Terminals 2.8 x 0.8 mm (solderable) CuSn6 tin-plated
Flat ribbon cable 2, 4 or 6 wires 0.5mm² (AWG 22)₂

Tightening torque

Fixing nut 80 Ncm

Actuation force

22 N ±4 N

Actuation travel

Approx. 4 mm to release the internal operation part

Mechanical life

≥50.000 cycles of operations

Panel strength

Standard mounting 1-4mm
With protection collar 1-3mm

Electrical characteristics

Standards

The devices comply with: EN IEC 60947-5-1, EN IEC 60947-5-5 (Emergency-stop), EN 418, EN IEC 60204, DIN IEC 60512-2

Illumination

LED red with pole reversal, constant current source

Operation voltage: 5 VDC ... 30 VDC
Current consumption: 11.4 mA ... 12.8 mA

Rated operational voltage

U_e = 250 VAC, as per EN IEC 60947-1

Rated insulation voltage

U_i = 250 V, as per EN IEC 60947-1

Rated impulse withstand voltage

U_{imp} = 2.5 kV, 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 opened contacts at 500 VDC, as per DIN IEC 60512-2-10

Electrical life

Inductive: ≥50.000 cycles of operations, 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

Resistive: >50.000 cycles, reduced load

Voltage: 1 VAC/DC	42 VAC/DC
Current: 100 mA	200 mA

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 (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: 12 VDC	24 VDC	48VDC	60VDC	125VDC	250VDC
Current: 5 A	4 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

500 VAC, 50 Hz, 1 min, as per DIN IEC 60512-2/A1

Rated conditional short-circuit current

1000 A, type of short-circuit unit 6 A gL/gG, as per EN IEC 60947-5-1

Protection class

Class II, as per EN IEC 61058-1

Overvoltage category

Class II, as per EN IEC 60947-1/H.1

Degree of pollution

Class 3, as per EN IEC 60947-1

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25 °C ... +60 °C

Front protection

IP 65, as per EN IEC 60529

Shock resistance

(semi-sinusoidal)

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

(sinusoidal)

max. 100 m/s² at 10 Hz...500 Hz, 10 cycles, 3-axis, as per EN IEC 60068-2-6/Fc**Climate resistance**

Damp heat, cyclic :

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

Damp heat, steady:

58 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 hours, +35°C in chemical solution NaCl, as per EN IEC 60068-2-11

Approvals

CE Declaration of Conformity

UL

SEV

Indicator / Illuminated Pushbutton**Switching element****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**

Polyvinylchlorid (PVC), short-time heat-resistant up to 105°C

Material of contacts

Silver alloy gold plated

Switching element

Thermoplastic polyester (PET, PBT), as per UL94 V0 and Polyacetale (POM), as per UL94 HB

Mechanical characteristics**Terminals**

Plug-in/soldering terminals 2.8 x 0.8 mm (solderable)

Flat ribbon cable 0.5²mm₂

PCB terminal

Actuating force

4.0 N ±0.2 N (measured at the lens)

Actuating travel

~0.5 mm

Rebound time

1 ms

Resistance to heat of soldering

260 °C, 5 s (PCB assembly)

350 °C, 10 s (when using a soldering iron)

as per EN IEC 60068-2-20

Mechanical life

≥1 million cycles of operations

Electrical characteristics**Illumination**

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

Operation voltage: 12 VDC 24 VDC

Current consumption: 40 mA 20 mA

Contact resistance

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

Isolation resistance

≥1 G Ω between all terminals at 100 VDC, 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 cos φ 0,4

250.000 Cycles of operation 42 VAC, 200 mA at cos φ 0,395

1 million Cycles of operation 12 VDC, 250 mA at 48 Ω

1 million Cycles of operation 24 VDC, 50 mA at 480 Ω

1 million Cycles of operation 24 VDC, 100 mA at 240 Ω

5 million Cycles of operation 42 VDC, 25 mA at 1680 Ω

1.5 million Cycles of operation 42 VDC, 50 mA at 840 Ω

100.000 Cycles of operation 42 VDC, 100 mA at 420 Ω

500.000 Cycles of operation 24 VDC, 200 mA at L/R=30 ms

300.000 Cycles of operation 42 VDC, 100 mA at L/R=30 ms

100.000 Cycles of operation 42 VDC, 200 mA at L/R=30 ms

Switch rating

Voltage: 50 mVAC/DC ... 42 VAC/DC

Current: 10 μA...100 mA

Power: max. 2 W

Electric strength

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

Environmental conditions**Storage temperature**

-40 °C ... +85 °C

Operating temperature

-25 °C ... +70 °C

Protection degree

IP 67 or IP 40, as per IEC 60529

Shock resistance

(semi-sinusoidal)

max. 100 m/s², pulse width 11 ms, 3-axis,

as per EN IEC 60068-2-27/Ea

Vibration resistance

(sinusoidal)

max. 100 m/s² at 10 Hz...500 Hz, 10 Zyklen, 3-axis,
as per EN IEC 60068-2-6/Fc

Material

Lens

Polycarbonate (PC), as per UL94 V2 or Aluminium anodised

Actuator housing

Polyetherimid (PEI), as per UL94 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 ±0.2 N (measured at the lens)

Actuating travel

Total switching travel 1.2 mm

Mechanical life

≥1 million cycles of operations

Electrical characteristics

Electrostatic breakdown value

Plastic case: ≥15 kV

Aluminium case: ≥5 kV

as per IEC 61000-4-2, mounted in plastic front panel

Environmental conditions

Storage temperature

-40°C ... +85°C

Operating temperature

-25°C ... +70°C

Front protection

IP 67, IP 65 and IP40, as per EN IEC 60529

Climate resistance

Damp heat, cyclic :

6 cycles, +25°C ... +55°C / 95% ... 100% relative humidity,

as per EN IEC 60068-2-30

Damp heat, state :

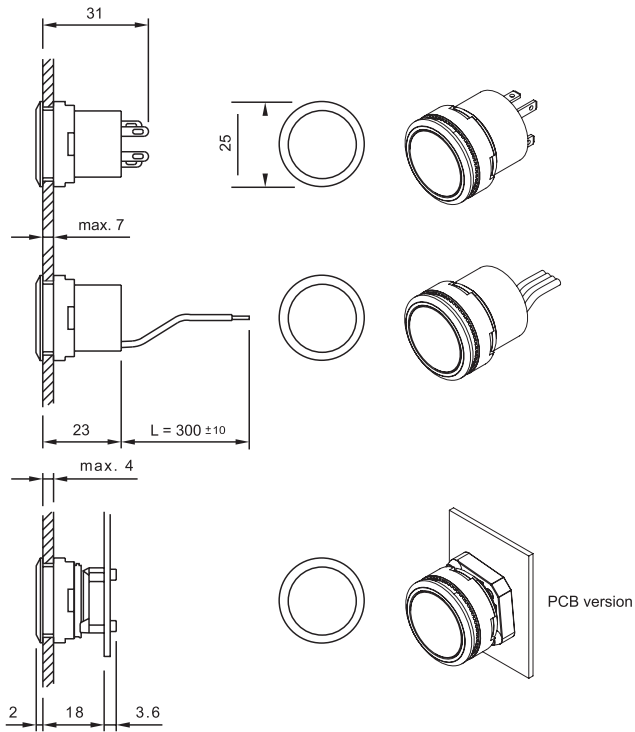
56 days, +40°C / 93% relative humidity, as per EN IEC 60068-2-78

Rapid change of temperature :

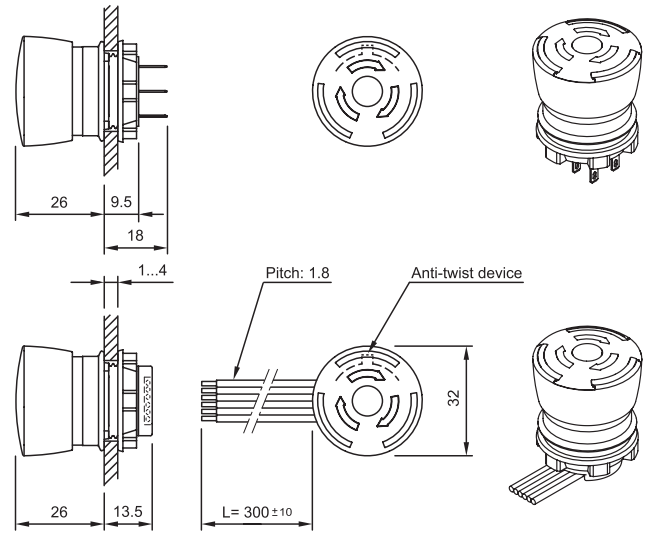
100 cycles, -40°C ... +80°C, as per EN IEC 60068-2-14

84 Complete Indicator, Complete Pushbutton

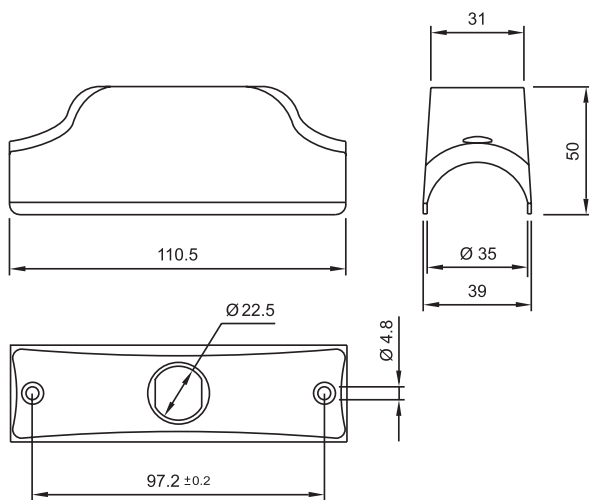
Flush, plug-in terminals



84 E-Stop

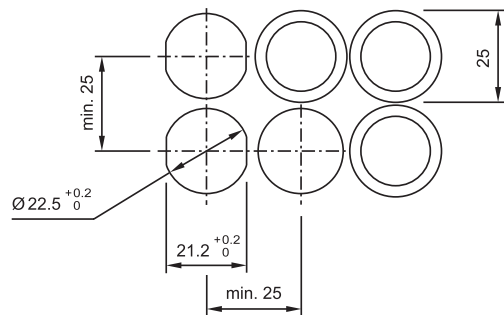


Housing, pole mounting



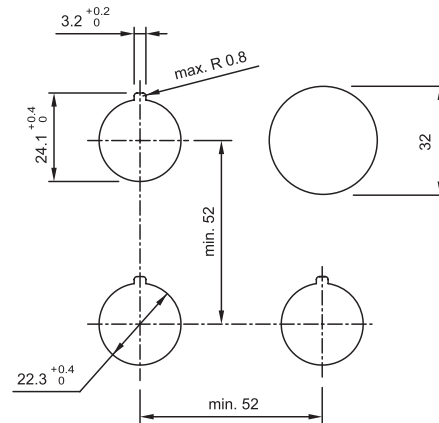
84 Cut-outs

Indicator Housing, Pushbutton Actuator



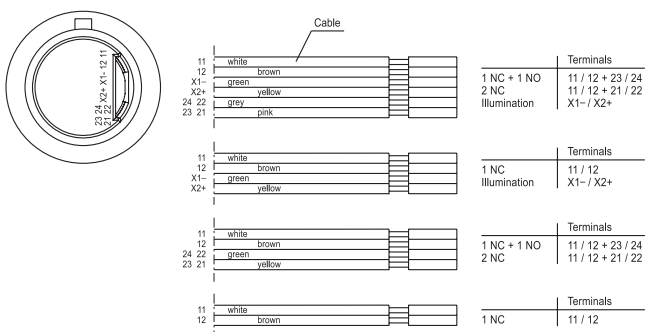
84 Cut-outs

E-Stop, EN 418 Illuminated Ribbon Cable, E-Stop EN 418 Non-Illuminated Ribbon Cable



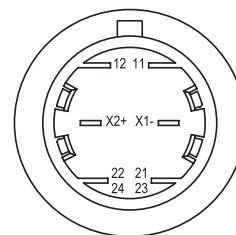
84 E-Stop

Ribbon cable wiring



84 E-Stop

Solder wiring





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 109
 Technical drawings see pages 110-111

- 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 version

Keypad



Non illuminated keypad, 3x4 keys, pin header connection, concave keys

Part No.	Output type	Key shape
A.12150.C01	Matrix	Concave
A.12100.C01	Common point	Concave



Non illuminated keypad, 4x4 keys, pin header connection, concave keys

Part No.	Output type	Key shape
A.16350.C01	Matrix	Concave
A.16300.C01	Common point	Concave

Keypad



Non illuminated keypad, 3x4 keys, pin header connection, flat keys

Part No.	Output type	Key shape
A.12150.P01	Matrix	Flat
A.12100.P01	Common point	Flat



Non illuminated keypad, 4x4 keys, pin header connection, flat keys

Part No.	Output type	Key shape
A.16350.P01	Matrix	Flat
A.16300.P01	Common point	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

4.3 N ±30 %

Actuating travel

1.0 mm ±0.2 mm

Rebound time

≤1 ms

Electrical characteristics

Operating voltage/-current

Nominal 24 V, 50 mA
Maximum voltage 50 V
Minimum voltage 5 V
Minimum current 1 mA

Isolation resistance

≥1000 MΩ at 100 VDC

Contact resistance

1 Ω

Electrical life

≥1 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

Capacity between open terminals

≤1,5 pF at 1 kHz

Environmental conditions

Storage temperature

-40 °C ... +85 °C

Operating temperature

-25°C ... +85°C

Front protection

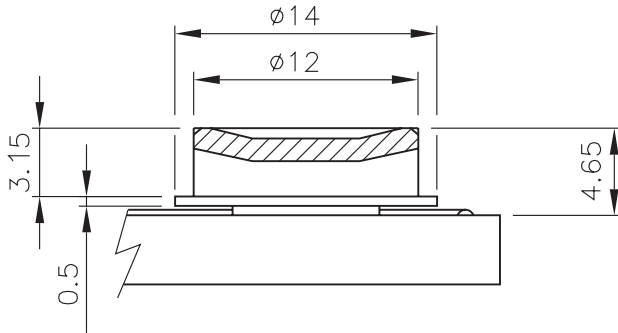
IP 67 as per IEC 60529, when mounted

Climate resistance

as per EN IEC 60512-6
Damp heat : 21 days
Dry heat : 10 days, +85 °C
Saline mist : 48 hours

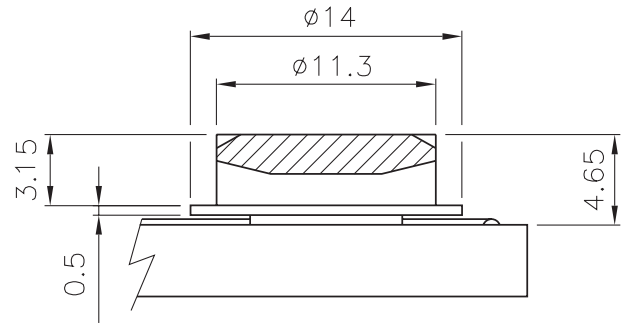
AVME Keypad

Concave key



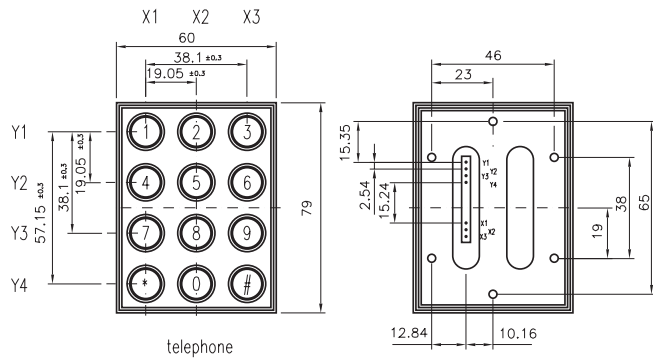
AVME Keypad

Flat key



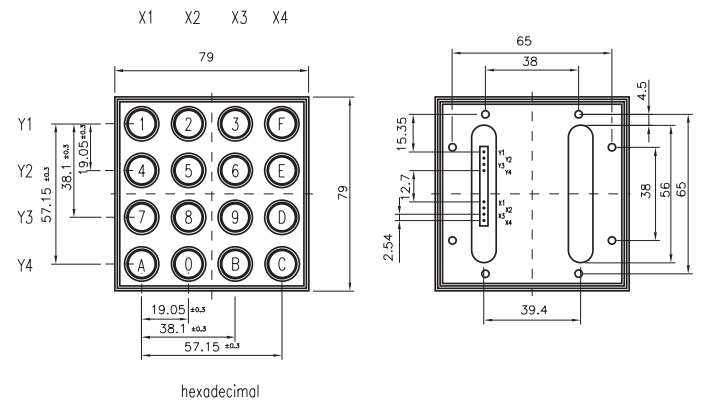
AVME Cut-outs

3x4 keypads



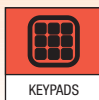
AVME Cut-outs

4x4 keypads



AVME Cut-outs

Contact EAO directly



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 113

Technical drawings see pages 114-115

- 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, 3x4 keys, pin header connection

Part No.	Output type
S.16350.211	Matrix
S.16300.211	Common point



Non illuminated keypad, 4x4 keys, pin header connection

Part No.	Output type
S.16350.001	Matrix
S.16300.001	Common point

Illuminated Keypad



Illuminated keypad, 3x4 keys, pin header connection

LED 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, 4x4 keys, pin header connection

LED colour	Part No.	Output type
Yellow	S.16350.241	Matrix
Yellow	S.16300.241	Common point
Blue	S.16150.211	Matrix
Blue	S.16100.211	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

IP 67 as per IEC 60529, when mounted

Climate resistance

as per EN IEC 60512-6

Damp heat : 21 days

Dry heat : 10 days, +85 °C

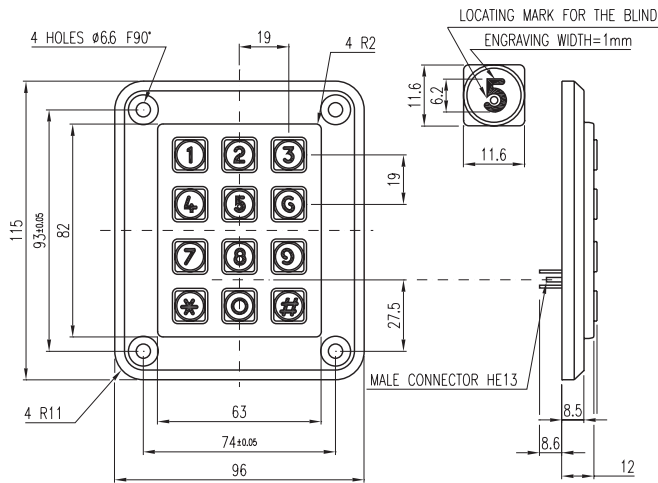
Saline mist : 96 hours

Impact resistance

IK10 (20 J)

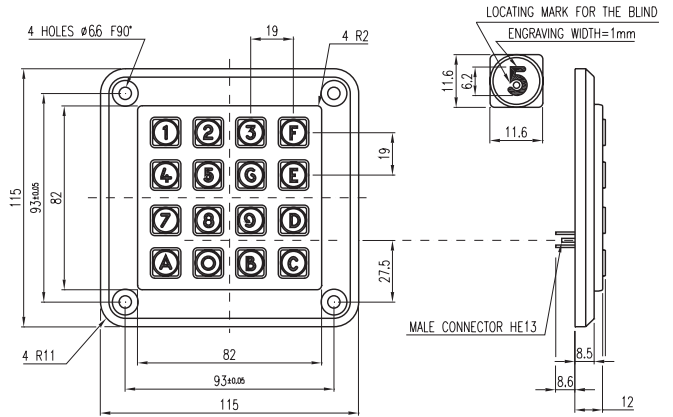
S.series Keypad

3x4 Keypads



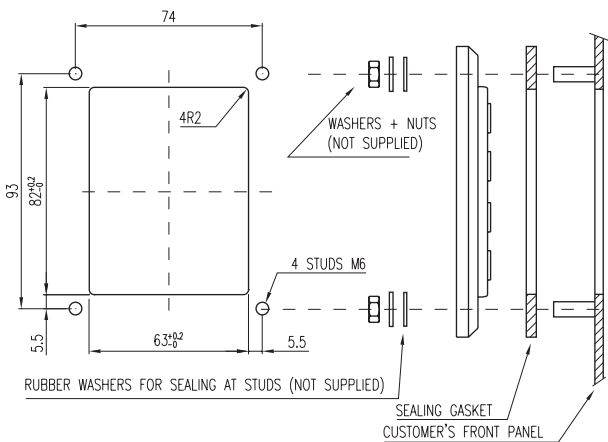
S.series Keypad

4x4 keypads



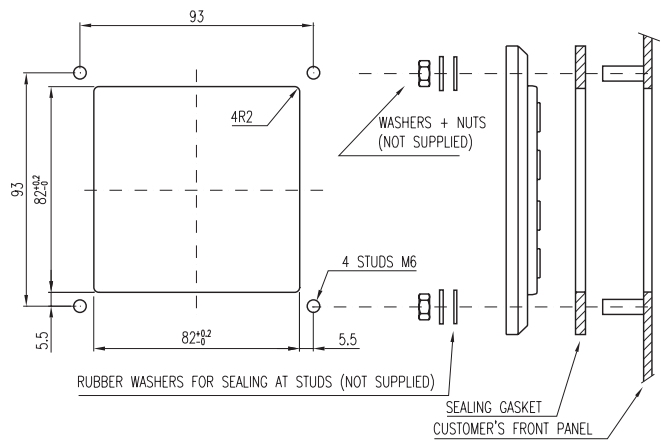
S.series Keypad Cut-outs

3x4 Keypads

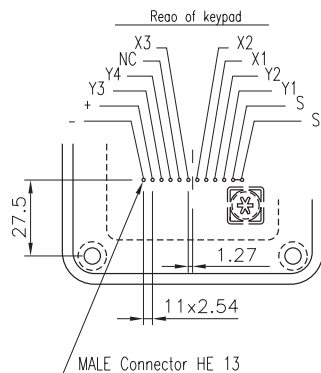
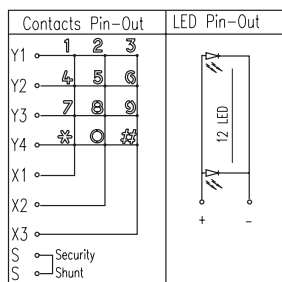


S.series Keypad Cut-outs

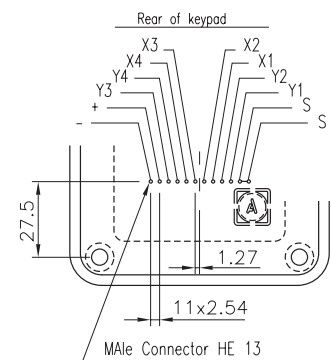
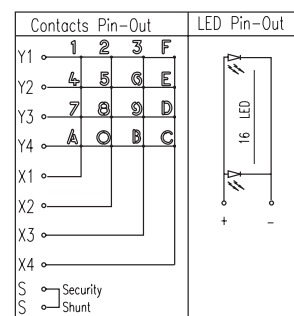
4x4 keypads



S.series 3x4 Illuminated Matrix

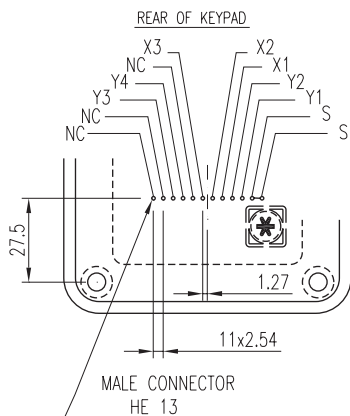


S.series 4x4 Illuminated Matrix



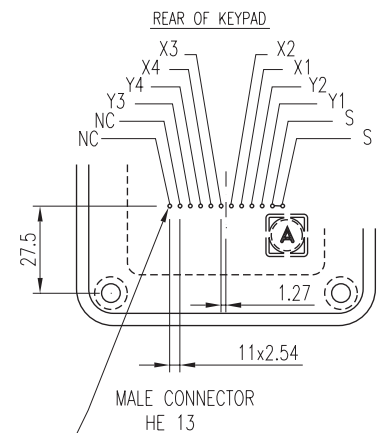
S.series 3x4 Non-Illuminated Matrix

CONTACTS PIN-OUT	
Y1	1 2 3
Y2	4 5 6
Y3	7 8 9
Y4	* 0 #
X1	
X2	
X3	
S	SECURITY SHUNT



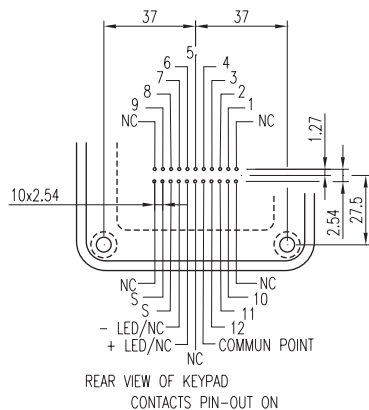
S.series 4x4 Non-Illuminated Matrix

CONTACTS PIN-OUT	
Y1	1 2 3 F
Y2	4 5 6 E
Y3	7 8 9 D
Y4	A 0 B C
X1	
X2	
X3	
S	SECURITY SHUNT



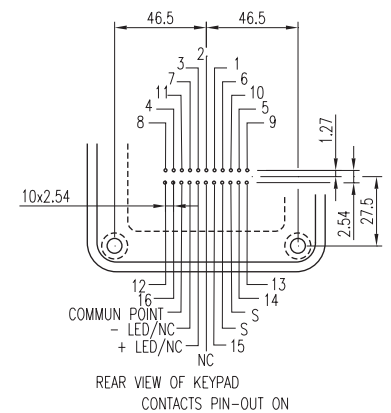
S.series 3x4 Illuminated and Non-Illuminated Common Point

KEY	CONTACTS	PIN - OUT
1		1
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		9
0		10
#		11
S		12
S		SECURITY SHUNT



S.series 4x4 Illuminated and Non-Illuminated Common Point

KEY	CONTACTS	PIN - OUT
1		1
2		2
3		3
F		4
4		5
5		6
6		7
E		8
7		9
8		10
9		11
D		12
A		13
0		14
B		15
C		16
S		SECURITY SHUNT





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 118

Technical drawings see pages 119-120

- 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.	Language	Output type
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.	Language	Output type
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.	Language	Output type
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.	Language	Output type
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.



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 118
 Technical drawings see pages 119-120

- 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 or 16 or 20 key versions
- Illuminated versions available

Rugged keypad



Keypad with 4 blank keys



Keypad, 4 keys engraved with 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



Customised keypad capabilities

Part No.	Contact terminals		
W.0400X.016	Pin Header		

Customisation possible for layouts and key markings.
 For further details please contact your local sales office.

All in series

Material

Front plate

Brushed stainless steel 304 L, brushed grain 220 grade 2B

Keys

Zamak 5 with matt chrome finish

Printed circuit board

Epoxy resin (FR4), as per UL 94 V0

Contacts

Carbon pill

Carbon on Cu tracks

Trackball

Ball diameter 1.5"

Resolution : 800 edges per revolution

Standard (opto-mechanical) : Stainless steel

Housing - 4 key keyboard

Acryl nitril - Butadier - Styrol (ABS) as per UL94V0

Mechanical characteristics

Tightening torque

50 Ncm for studs, front- and back mounting

Actuating force

1 N ... 3 N for single key 12 x 12 mm

3 N ... 4 N for double key 12 x 31 mm

Actuating travel

1.5 mm ±0.3 mm - Keyboards

1.3 mm ±0.3 mm - 4 and 16 key keyboards

Mechanical lifetime (keys)

4 Million cycles of operation per key

Electrical characteristics - keyboards

Operating voltage/-current

Operating voltage : 5 VDC ±5 %

Current rating : 20 mA

Interface

	PS/2	USB
Windows :	Win NT4	
	98SE ME	98SE ME
	2000 Pack II	2000 Pack II
	XP Pro	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

500 VAC, 50 Hz, 1 min.

Electrical characteristics - 4 key and 16 key keyboards

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

≥1000 MΩ at 100 VDC

Contact resistance

≤200Ω

Electrostatic breakdown value

5 kV

Electric strength

1500 V_{rms}, 50 Hz, 1 min., as per EN IEC 60512-2

Environmental conditions - keyboards only

Storage temperature

-40 °C ... +85 °C

Operating temperature

PS/2 : -20 °C ... +80 °C

USB : 0 °C ... +70 °C

Front protection

IP 67

Environmental conditions - keyboard with trackball

Storage temperature

Standard Track ball

PS/2 | USB : -40 °C ... +85 °C

Operating temperature

Standard Track ball

PS/2 : -10 °C ... +70 °C

USB : 0 °C ... +70 °C

Front protection

Standard Track ball : static dynamic

IP 65 IP 54

Environmental conditions - 4 key and 16 key keyboards

Storage temperature

-30 °C ... +85 °C

Operating temperature

-25°C ... +85°C

Impact resistance

IK09 (10 J)

Shock resistance

(semi-sinusoidal)

3 axis, 150 m/s², pulse 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

Dry heat : 10 days, +85°C

Saline mist : 96 hours

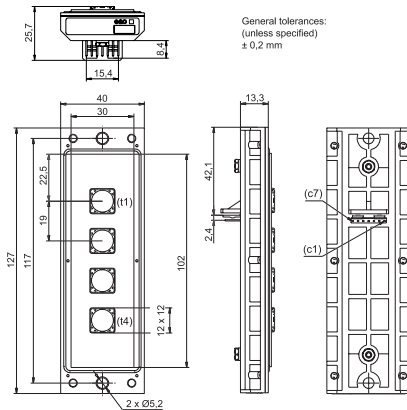
Approvals

CE (Declaration of conformity)

FCC certified - keyboards only

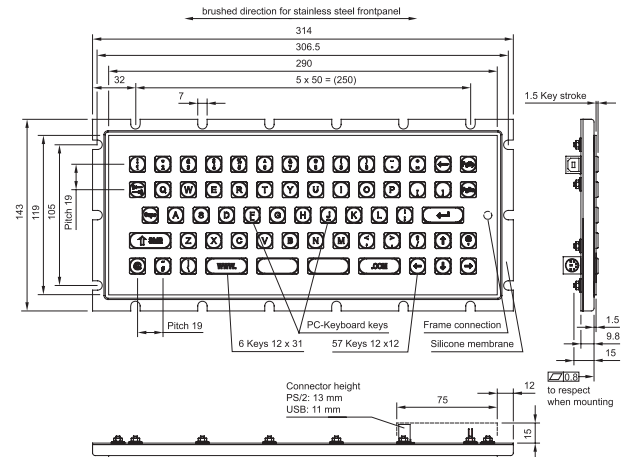
W.series Keypad

Keypad 4 Keys Blank, 4 Keys Arrows, 4 Keys Illuminated A-D



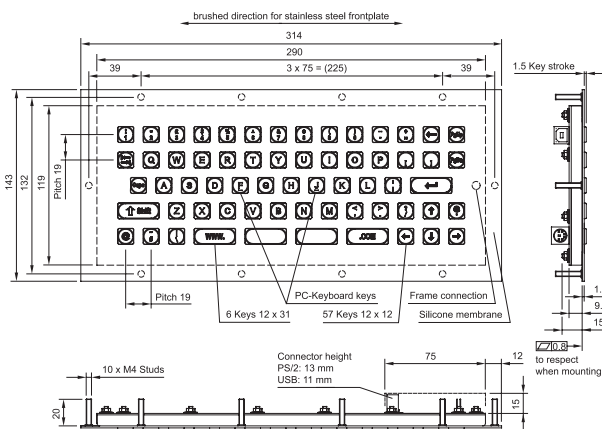
W.series Keyboard

Alphanumeric Mechanical 63 Keys Back Mount



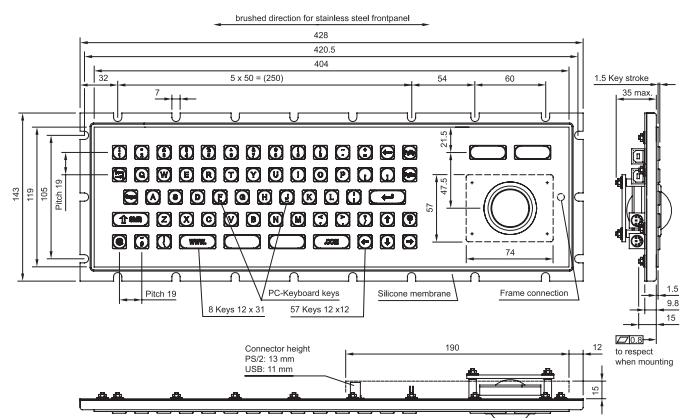
W.series Keyboard

Alphanumeric Mechanical 63 Keys Top Mount



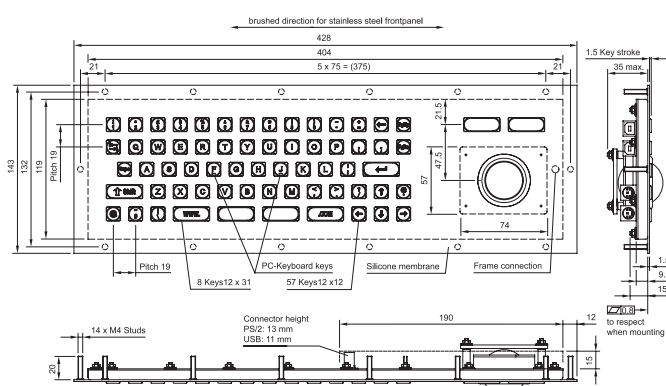
W.series Keyboard

Alphanumeric Mechanical 65 Keys Back Mount



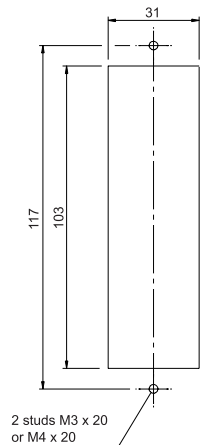
W.series Keyboard

Alphanumeric Mechanical 65 Keys Top Mount



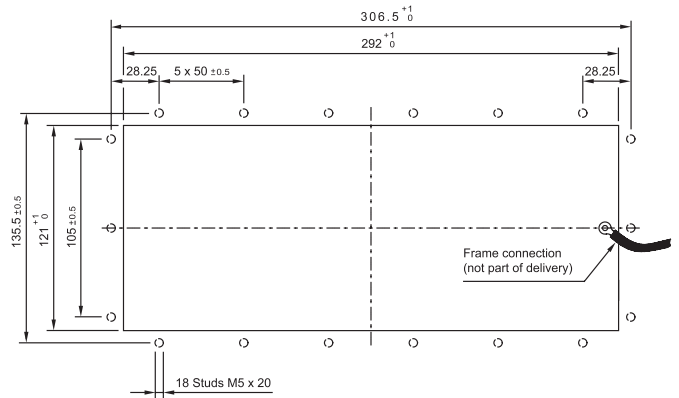
W.series Keypad Cut-outs

1x4 keypad



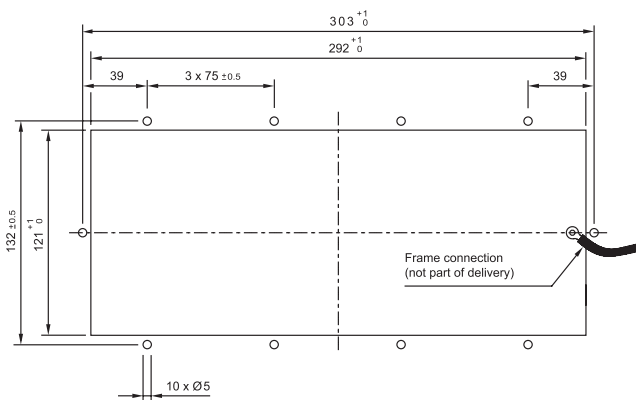
W.series Keyboard Cut-outs

Alphanumeric Mechanical 63 Keys Back Mount



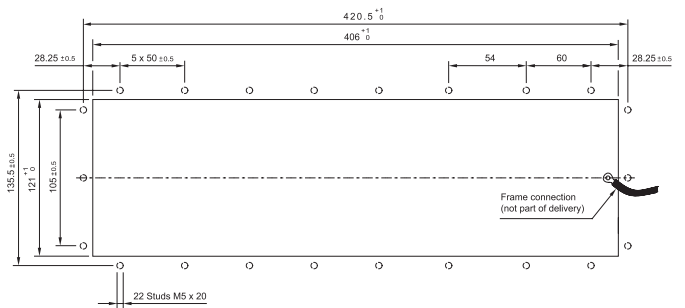
W.series Keyboard Cut-outs

Alphanumeric Mechanical 63 Keys Top Mount



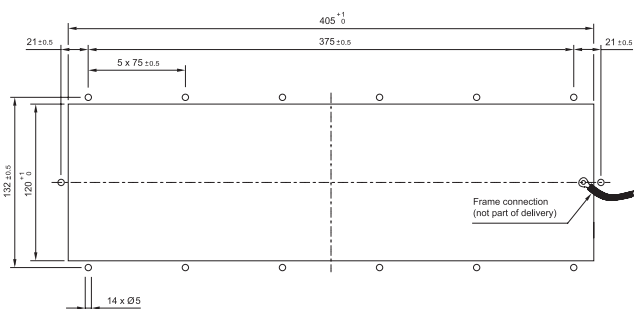
W.series Keyboard Cut-outs

Alphanumeric Mechanical 65 keys Back Mount



W.series Keyboard Cut-outs

Alphanumeric Mechanical 65 keys Top Mount



This glossary contains short explanations of terms used in this catalogue. Definitions are given for these terms and, for some, regulations relating to them.

Actuating force

Force (N) exerted on an Operation part that is necessary for the execution of the required activation

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

Actuation Point

Position of actuator at which contact operation occurs

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 T.1 (VDE 0630 T.1) para. 3.4.8 => 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

Temperature (°C) of the space in which the Switchgear is being operated

Application class (climatic)

Specification in code letters for the climatic stress (DIN 40040)

Arcing

A discharge of electricity (a spark) that can occur when contacts are opened or closed. Arcing can degrade or burn contacts, reducing useful life

AWG

Abbreviation for American wire gauge, a system of indicating wire sizes and dimensions

Behind Panel Depth

Distance from the rear surface of a panel to the far end of the switch mounted on the panel

Bifurcated Contacts

Two part contacts for longer life and higher reliability

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

Break-Before-Make

When moving contacts interrupt one circuit before completing another. Also called non-shorting

Breakdown Voltage

The voltage 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)

Butt Contacts

One movable and one fixed contact which lay against each other when closing a circuit. Used in slow-make/break A.C. switching applications

Buzzer

Acoustic buzzer, piezo technology

Buzzer element

Acoustic indicator (Swisstac)

CE designation

The CE designation 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

Chatter

Rapid opening and closing of contacts, usually exhibited during extreme vibration and/or shock. (See also Bounce)

Clearance

IEC 947-1 para. 2.5.19, DIN EN 61058 T.1 (VDE 0630 T.1) para. 3.1.7 => 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

Connection, connection method (functional designation)

Electrical connection to the external circuit e.g. Soldering/Plug-in terminal, Screw terminal

Contact (of mechanical switchgear)

Conductive part that opens or closes a circuit by being activated

Contact connection (technical component designation)

Designation of the Connection method e.g. Screw terminal

Contact Gap

Open distance between contacts

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

Conventional thermal current I_{th}

IEC 947-1 para. 4.3.2.1 => 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

Current max.

Usually refers to the current handling capability or rating of a switch

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

Degree of pollution

IEC 947-1 para. 5.5.58 / 6.1.3.2 => 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

Detent, 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

Dielectric Strength

DIN EN 61058 T.1 (VDE 0630 T.1) para. 15.1 => Resistance (kOhm, MOhm) between the different poles of a switch (base insulation) and between all parts

Glossary

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 nonconducting material to withstand a maximum voltage

Differential

Distance (or angle) from the operating position to the release position

Diode element with 1 diode

1 blocking diode for free connection e.g. for lamp testing in an element block

Diode element with 2 diodes

2 blocking diodes 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 pushbutton

2 independent pushbuttons in a single switchgear device

Double pushbutton actuator

Front part of a Double pushbutton, without Switching element

Double-Break

A mechanism which breaks the circuit at two points simultaneously

Double-Throw/Changeover switch contact

Contact arrangement that alternately transfers normally open and normally closed circuits. Contact made of a combination of NO (Normally Open) and NC (Normally Closed) contacts, with 3 connections (Break-make contact)

Electrical Life

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

Element block

Unit with integrated function parts e.g. Lamp transformer

EMC

Abbreviation for electromagnetic compatibility

Emergency stop button actuator

Front parts of an Emergency stop button, without switching element

Emergency stop button with key-release

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

Emergency stop button with twist-release

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 switching element

Switching element with a guided NC contact

EMI

Abbreviation for electromagnetic interference

ESD strength

Static electric strength (kV) between operation part and conducting material of the Switchgear (contact, terminal)

Fixing nut

For fastening the device in the front panel

Flashing frequency

Pulses per time unit in Hz

Flashing indicator

Indicator with integrated flashing device

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

IEC 947-1 para. 2.4.10 => Opening movement which ensures that the contacts of a Switchgear have reached the "open position" if the operation part is in the OFF position

Free Position

Initial position of an actuator when there is no external force applied on the actuator and the contacts are in the unoperated condition

Frequency (sound)

Amplitude of oscillation of the sound of an acoustic signaller, expressed in Hz

Front bezel set for flush mounting

Accessory part for "Flush mounting"

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

High Inrush

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

Illuminant

Light source for the illumination of the Lens or Indicator cap e.g. filament lamp, LED, neon lamp

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, neon lamp)

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

Insulation resistance

DIN EN 61058 T1 (VDE 0630 T1) para. 15.1 => Resistance (kOhm, MOhm) 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 nonconducting material to withstand a maximum voltage

Insulation socket

Protection against contact of the live part of the blade terminal socket

Interval frequency

Oscillations per time unit in Hz

Keylock switch

Switch with a key as operation part

Keylock switch actuator

Switch actuator (without contact) with a key as operation part

Knob

Operation part for the activation of the Selector switch

Lamp connection (technical component designation)

Designation of the Connection method e.g. Screw terminal

Lamp 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 230 VAC to 24 VAC)

Leakage path

IEC 947-1 para. 2.5.51, DIN EN 61058 T.1 (VDE 0630 T.1) para. 3.1.8 => 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

Lens

Operation part for the activation of the electrical Contact of a pushbutton

Locking pushbutton actuator

Pushbutton actuator (without contact), which is locked into a position by an additional pushing

Low Level Switching element

4-fold contact (slow-make element) for the switching of low currents and voltages with very high certainty of switching

Maintained Action

The circuit stays open or closed after switch actuation until the next time the switch is actuated

Make-Before-Break

When moving contacts complete one circuit before interrupting another. Also called shorting

Mechanical service life

Wear-resistant property of a switch without electrical load, expressed in number of actuations

Membrane switching

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

NC - Normally Closed

Contact, which is closed in the non-activated position and opens a circuit on activation

NO - Normally Open

Contact, which is open in the non-activated position and closes a circuit on activation

Oil & Watertight Switches

Switches with mechanisms that are sealed to withstand exposure to liquids. Usually are rated to indicate degree of sealing, i.e. NEMA or IP classifications

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 Position

Position of the actuator at which the contact operates

Operating temperature

Permissible temperature range for the operation of a device

Operating part

DIN EN 61058 T.1 (VDE 0630 T.1) para. 3.4.3 => The part (lens, knob, etc.) of a hand-activated switchgear which is used for effecting the contact

Overtravel

Distance from operating position (actuation point) to the end of the actuator's travel

Overvoltage category

IEC 947-1 para. 2.5.19 => Reference number for overvoltages, e.g. by lightning effects or switching processes which can occur at the installation site. There is a classification into 4 grades

Plug-in connection

Connection of the electrical circuit by means of a plugging-in device (connector)

Poles

The number of separate circuits that can be active through a switch at any one time

Pretravel

Distance from free position to operating position

Protection classes

Measure for the protection of the electrical operating material against the penetration of solid bodies and of water, is expressed in IP and figures (DIN VDE 0470 T.1 / EN 60529). The 1st figure defines the solid-body protection, the 2nd figure the water protection

Protective front ring

Prevents the penetration of dust and liquids (series 04, 14, 61)

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 illuminated button

Switch with an Operation part, which is activated by pressing and returns to its initial position by pulling, or vice-versa

Quick Make/Break contacts

Used with D.C. circuits to suppress arcing

Rated constant current

IEC 947-1 para. 4.3.2.4 => Current (A) which a device can conduct in continuous operation (weeks, months, years)

Rated higher current

IEC 947-1 para. 4.3.2.3 => The current (A) which a switchgear can conduct, taking into consideration Rated higher voltage, operating period, service category and Ambient temperature

Rated higher voltage

IEC 947-1 para. 4.3.1.1 => 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 insulation voltage

IEC 947-1 para. 4.3.1.2 => 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 surge voltage resistance

IEC 947-1 para. 4.3.1.3 => Measurement for the strength in the interior of switchgear with regard to rated surge voltage resistance (kV)

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)

Release Position

Position of momentary actuator at which contact resumes normal position

Resistance element

Ohmic resistor in an element block

Resistance to vibration

Property of a Switchgear to withstand undulating movements without a change of operating state and without damage

Resistor-diode element

Combination of blocking diodes and resistor in an element block

Glossary

Safety class

DIN EN 61058 T.1 (VDE 0630 T.1) para. 3.7.6 ff => Designates a classification of Switchgear, in which protection against electric shock is based on the base insulation (e.g. Safety class 0)

Safety low-voltage

DIN EN 61058 T.1 (VDE 0630 T.1) para. 3.2.2 => A voltage (V) not greater than 50 V (effective) between the electrical conductors or between any conductor and earth in a circuit isolated from the mains supply

Screw terminal

Connection of the electrical circuit by means of a screw device

Selector switch

Switch with a knob as operation part

Selector switch actuator

Front part of a Selector switch, without Contacts

Selector switch long knob

Switch with a long knob as operation part

Service category

IEC 947-1 para. 2.1.18 / 4.4 => 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/Break Contacts

Usually used with A.C. circuits, especially emergency stop switches

Slow-make element

Switching element, in which the speed of the moving contacts is dependent on the activation speed

Small contact opening width

DIN EN 61058 T.1 (VDE 0630 T.1) para. 3.4.6 => Minimum contact opening that is sufficient for reliable operation

SMD, SMT

Abbreviations for surface mount device and surface mount technology, respectively

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

Solder heat resistance

Time and temperature unit for the connection of conductors to a solder connection of the Switchgear

Soldering terminal (and similar)

DIN EN 61058 T.1 (VDE 0630 T.1) para. 3.6.14 => 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

Distance between electrically active parts of opposite polarity or to ground

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 VDE

Starting torque

Measurement (Nm) for the turning effect of a force (N) being applied to a turnable body

Stipulations

Components of a standard

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

Switch with small contact separation

Switch with a contact disconnection for small contact opening width

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

Tactile Feel

An indication, usually by touch, that indicates the operating position (actuation point) has been reached

Terminal

The conductive part of a device, that has been provided for electrical connection to an external circuit

Terminal strip

Unit with several screw-type terminals for device connection e.g. with resistors

Throw

Throw is a single movement, controlling one or more contacts

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 an LED

Travel

Travel path of the Operation part until activation of the Contact, expressed in mm

UL

Abbreviation for Underwriters Laboratories, a U.S. rating organization

VDE

Abbreviation for the German Testing Agency, a German rating organization



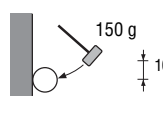
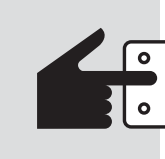
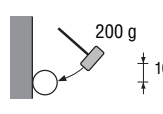
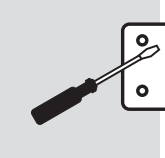
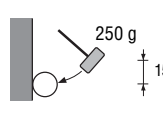

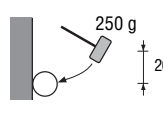

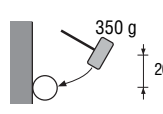

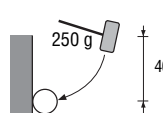
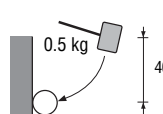
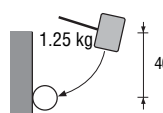
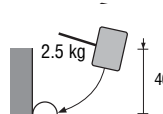
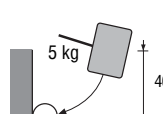
Volume resistivity

Resistance value (mostly in mOhm) between two connections, whose related Contacts in the closed state complete a circuit

Wiping Contacts

Wiping action contacts slide against each other when opening or closing a circuit. This action helps clean the contacts of contamination and keeps contact resistance low

Degrees of protection to IEC 144 (BS 5420)

Protection against touching live parts or ingress of solid objects		Protection against ingress of liquids		Protection against mechanical impacts	
IP	First Figure	Second Figure	IP	Third Figure	IK
No Protection.	0 	0	No Protection.	0	No Protection.
Touching by hand or 50mm dia objects.	1 	1	Vertical water droplets. No harmful ingress.	1 	Impact 0.15 joule.
Touching by finger or 12mm dia objects.	2 	2	Showering at 15° from the vertical. No harmful ingress.	2 	Impact 0.20 joule.
Touching by tools or wire 2.5mm dia or 2.5mm dia objects.	3 	3	Showering at 60° from the vertical. No harmful ingress.	3 	Impact 0.37 joule.
Touching by tools or wire 1mm dia or 1mm dia objects.	4 	4	Splashing from any direction. No harmful ingress.	4 	Impact 0.50 joule.
Total touch protection or no harmful ingress of dust.	5 	5	Water jets from any direction 12.5 l/min. No harmful ingress.	5 	Impact 0.70 joule.
Total touch protection or no ingress of dust.	6 	6	Large volumes of water 100 l/min. No ingress.	6 	Impact 1 joule.
		7	Immersion up to 1 metre deep. No ingress.	7 	Impact 2 joule.
		8	Submersion at specified depths exceeding 1 metre. No ingress.	8 	Impact 5 joule.
				9 	Impact 10 joule.
				10 	Impact 20 joule.

Please contact your local sales office for details of products conforming to country specific standards.

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