

th▶contact



The data used in this Product Overview may be used as a guideline only. Specific operational characteristics of our products may vary according to individual applications. It is strongly recommended that specific operating conditions are clarified with Johnson Electric before application.

Johnson Electric Terms and Conditions of Sale apply.

All data may be subject to change without notice.

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## The Johnson Electric Group is one of the world's largest providers of motion actuators for automotive and industrial applications

Over the years, we have shipped billions of motors to more than thirty countries in over one hundred different motor applications. Johnson Electric has an annual production capacity of one billion motors.

to meet all of our commitments and to support our customers' success. Product reliability and assurance of supply are our commitment.

At the heart of Johnson Electric's success is our commitment to make our customers successful. Our customers include many of the world's leading industrial, consumer and automotive companies. We begin by understanding our customers' business needs, and the product application requirements of the end user of our customers' products. Then we design and deliver innovative motion solutions that help our customers to differentiate their products in the marketplace. Our goal is to be instrumental in the successful launch of our customers' products in their respective marketplaces.

### Our Brand Promise

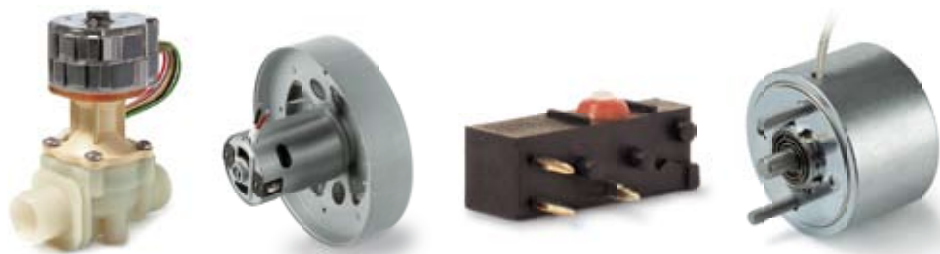
#### **Johnson Electric is the most reliable partner**

Johnson Electric is responsive and flexible; and has the financial stability and organizational integrity

### Johnson Electric delivers competitive advantage

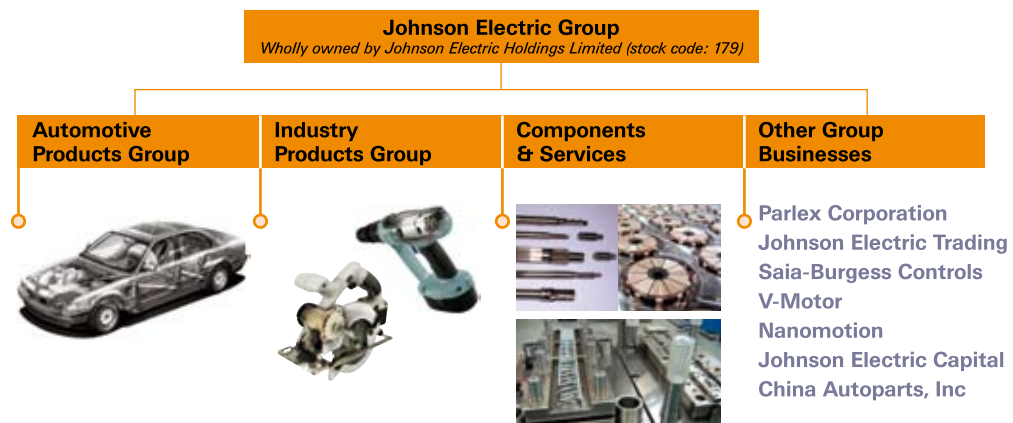
Johnson Electric delivers differentiation and innovation through its motion products – subsystems comprising of Stepper Motors, DC Motors, AC Motors, Piezo-electric Motors, Switches, Solenoids, Flexi Circuits, Motion Control, Precision Plastics and Precision Gears.

Our business growth hinges with leading "branded" goods producers to deliver differentiation and innovation through our motion products. The core platform for delivering these solutions is a highly developed production base and focused customer support teams throughout the world. This combines scale advantages in production and procurement with skilled and dedicated motion application experts.



## HOW WE ARE ORGANIZED

**Johnson Electric Holdings Limited is the parent company of the Johnson Electric Group and has been listed on the Stock Exchange of Hong Kong since 1984. The Group structure consists of a number of operating divisions and business units focused on their particular customer application or product segment**



**The Group's motion systems, motors and switches businesses are managed through two primary operating divisions: Automotive Products Group and Industry Products Group.**

The Automotive Products Group, which consists of Johnson Electric's Automotive Motors Group and the Automotive Division of Saia-Burgess Electronics, is focused on providing customized motion solutions for major automotive application segments that include powertrain, body and chassis.

The Industry Products Group is comprised of business units that provide motion products and solutions for various commercial and industrial application sectors, including home appliances, power tools, business equipment, personal care products, medical equipment and healthcare, building automation and security, audio-visual and other industrial products.

Supporting these two operating divisions is the Group's Components & Services function which produces metal and plastic parts, tooling and production equipment for motor and motion related products. Johnson Electric is a highly vertically integrated business that manufactures an exceptionally wide range of components that form the basis for its final assembled end products. We make magnets, bearings, shafts, housings, laminations, commutators and die cast parts. We also build tools, assembly fixtures, plastic molds as well as armature winding and other production machines.

In addition to motion systems and motors, the Group also consists of a number of complementary manufacturing businesses and other subsidiary companies. These include an innovative provider of flexible printed circuits and interconnect solutions; a successful niche player in the programmable controls industry; and a rapidly growing specialty metals and trading services company.

# Looking for a specialized switching solution?

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## Look no further.

In addition to the wide range of standard products shown in this catalog, we will be happy to work with you to meet your switching needs. If your application requires more than a standard product solution, please consider us early in your design process. Our product development team will be happy to discuss your specification, whether you need a special switch design or a complete value-added assembly.

The images shown give some examples of our capabilities.



# TH-Contact is a leading brand for panel mounted switches

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**Flexibility is the key. Our switches give you customization from modular standard parts. If you need a more specific solution, just give us a call.**

Your customer's first physical contact with your product is often through the switches you choose for the human machine interface. TH-Contact products are uncompromisingly high quality items, capable not only of meeting the switching demands of your application but also of ensuring high levels of perceived quality.

## Flexibility through modularity

At the heart of the TH-Contact concept is modularity. The flexible contact systems allow pushbuttons, key and rotary switches using common platforms to be created, simplifying assembly and service requirements and providing a wide variety of circuit options.

## Aesthetic integrity

All TH-Contact products are designed to complement each other. That's why our switches have matching indicator designs. Combined with a wide range of illumination and actuator options, this ensures that your panel gives a consistent image of quality to your customers – and TH-Contact products feel as good to operate as they look.

## Security guaranteed

Many TH-Contact keyswitches offer Kaba locks for the ultimate in security – as specified by the Swiss banking industry. The vandal-resistant TP8 range guarantees that publicly accessible switches go on working, even in difficult environments.

## Uncompromising reliability

With many UL, CSA and ENEC approvals, the performance of TH-Contact products is globally recognized. Piezo technology in the TP7 range offers an electrical life in excess of 15 million operations coupled with IP68 environmental protection for the ultimate in durability.

## Minimum size

If space behind the panel is an issue for you, the TP2 and TP5 ranges manage to combine the legendary th-contact modularity with a considerably reduced product depth.

## Common pushbutton applications

- Industrial machinery control panels
- Public vehicle access systems
- Ticket machines and parking meters
- Shutter control systems
- ATMs
- Car wash systems
- Vending machines

## Typical Emergency Stop applications

- Alarm systems
- Portable control equipment
- Industrial process control equipment
- Material handling equipment

## Typical keyswitch applications

- Security door systems
- Building automation – elevators & conveyors
- Hydraulic lifting equipment

# Panel mounted switches for industrial control equipment

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Machine and panel builders need a wide range of switch products which give them:

- many actuator styles to complement their designs
- flexibility of circuit configuration
- varied illumination options
- environmental protection as appropriate
- gold-plated contact options for low current switching
- compliance with UL, CSA and ENEC approvals
- reliability throughout the life of the product
- Emergency Stop capability



# Panel mounted switches for transport and building infrastructure

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Reliable operation in public environments demands:

- environmental protection to IP65, IP67 and IP68
- long, reliable product life
- vandal-resistant switches



# Table of typical applications & TH-Contact types

In addition to the products shown in the Product Catalog pages, the Product Mapping table below shows a wide range of switch types for a selection of applications. Also, a TH-Contact switch may be customized to fulfill your specific requirements, please feel free to contact us.

Application & TH-Contact Series	TP2	TP5	TP4	TP8	TP9	TP7	TE1/TE8	T12	T15	T19	TK2	E1	M1	K2	P2	P5	TR2	700	J8	
Commercial Equipment	●	●	●	●		●	●	●		●	●	●		●	●		●	●		
Distribution	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Home Appliances	●		●			●		●						●	●					
HVAC							●					●	●							
Industrial automation	●		●																	
Industry general	●	●	●	●		●	●		●		●	●	●	●	●		●	●	●	
Medical	●	●					●				●	●	●						●	
Military											●									
Public transportation						●														
Safety and Security										●		●	●	●	●					
Specialist vehicles																		●	●	
Page	20	27	33	37	40	44	53	57	61	65	67	73	75	78	80	83	86	92	94	

# Panel Mounted section – Terminology

**Momentary switch** – describes a single operation with a push to engage and an automatic release

**Latching switch** – describes an alternate action with a push to engage and a further push to release

**Panel cut-out** – the location point in the panel to mount the switch

**Lens** – the colored actuator

**Contacts** – the electrical switching element

**NO** – normally open contact which is open in the non actuated position and closes a circuit on actuation

**NC** – normally closed contact which is closed in the non actuated position and opens a circuit on actuation

**Bi-functional selection** – feature to describe all latching pushbutton switches in the TP2 and TP5 series incorporating a simple selector mechanism to re-determine the function of the switch

**Exposed bezel** – where the pushbutton lens fits inside the switch bezel

**Concealed bezel** – where the pushbutton lens fits over the switch bezel

**Flush housing** – for mounting switches with the minimum protrusion above the panel surface

**Raised housing** – for mounting switches with the bezel prominent above the panel surface

**Snap-in mounting** – for mounting switches into a panel from the front without the need of access to the rear of the panel, or without the use locknuts

## Enclosure types

Europe IEC specifications 144 & 529 define the degree of protection provided electrical enclosures to safeguard personnel against electric shock and equipment within the enclosure from environmental contamination such as entry of water. This is expressed by the letters IP followed by two numerals.

In the USA, NEMA and UL have established a rating system for enclosures which provides for different levels of protection. A direct comparison between IEC and NEMA is not possible but the following table gives an approximate guide.

Definition	Protection to IEC 144/855420	Protection to NEMA enclosure type	NEMA Definition
Protection against solid objects greater than 12 mm	IP 20	NEMA 1 (ventilated)	general purpose
Protection against solid objects greater than 2.5 mm	IP 30	NEMA 1	general purpose
Protection against solid objects greater than 12 mm and dripping water	IP 21	NEMA 2 (ventilated)	drip proof
Protection against solid objects greater than 2.5 mm and dripping water	IP 31	NEMA 2	drip proof
Protection against solid objects greater than 12 mm and dripping water	IP 24	NEMA 3R (ventilated)	rain proof, sleet (ice) resistant outdoor use
Protection against solid objects greater than 2.5 mm and dripping water	IP 34	NEMA 3R	rain proof, sleet (ice) resistant outdoor use
Protection against dust and splashing liquids	IP 54	–	–
Dusttight and protected against water jets	IP 65	NEMA 12	industrial use dusttight & driptight
Dusttight and protected against heavy seas	IP 66	NEMA 35	dusttight, driptight
Dusttight and protected against heavy seas	IP 66	NEMA 4	dusttight, watertight
		NEMA 4X	dusttight, watertight corrosion resistant
Dusttight and protected against water entry at one meter immersion	IP 67		
Dusttight and protected against heavy submersion	IP 68	NEMA 6	submersible watertight, dusttight sleet (ice) resistant indoor & outdoor
Protection against sleet (ice) not specified by IEC		NEMA 13	oiltight & dusttight

# Technical information

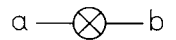
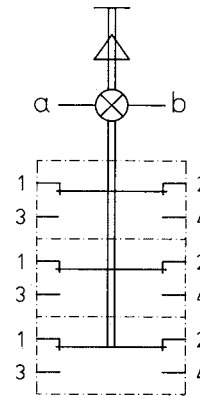
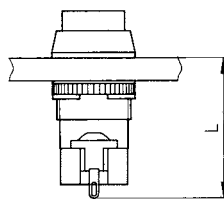
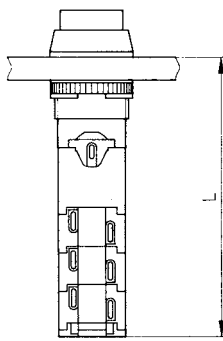
Actuator	TP4	TP5	TP2		
Switching mechanism	Heart-shaped switching labyrinth	Heart-shaped switching labyrinth with bi-functional mechanism ☺ (momentary or latching function)			
Actuating force	Approx. 2.5N (with one contact block)				
Fixation	Central with metal fixation nut				
Protective system	IP40, IP65		IP40, IP65, IP67		
Bezel material	Thermoplast or anodized aluminum alloy				
Lens material	Thermoplast (polycarbonate in different colors) engravable				
Illumination	T5.5 telephone lamps max. 60 V/1.2 W (incandescent lamps, LEDs, Multi-LEDs)	T 1 <sup>3</sup> / <sub>4</sub> midget grooved lamps max. 60 V/1.2 W (incandescent lamps, LEDs, Multi-LEDs)			
		Lamp contact «a» = cathode (-)	Lamp contact «b» = cathode (-)		
	Please respect the safety regulations when using the indicator light				
Ambient temperature	-30° to +80° C Heat congestion should be avoided		-30° to +55° C		
Life expectancy mechanical	1'000'000 operating cycles				
<b>Contact block 5 A</b>	The contact block is factory fitted onto the switch Additional elements can be added by the user		Slide-on assembly by the user		
Contact block casing	Duroplast, self-extinguishing (UL 94 V0)				
Terminal material	Silver contact: silver alloy 2µm silver plated Gold contact: silver alloy 2µm silver plated and 0.4µm gold plated				
Contact resistance	Gold plated contact <30 mOhm, silver plated contact <50 mOhm				
Number of contacts	1NO + 1NC per contact block Max. 3 contact blocks per switch		By choice 1NO or 1NC or 1NO + 1NC or 2NO + 2NC per contact block. Max. 2 double contact blocks per switch		
Terminals	Patented, bendable solder terminals for braid wire 2 × 1 mm <sup>2</sup> or strands 4 × 0.75 mm <sup>2</sup>		Solder terminals for braid wire 1 × 1 mm <sup>2</sup> or strands 2 × 0.75 mm <sup>2</sup> . Faston terminals for faston plugs 2.8 × 0.5 mm		
DC load (resistive load)	5 A/12 V	4 A/24 V 0.5 A/125 V	3 A/36 V 0.3 A/250 V	2 A/48 V	1.5 A/60 V
DC load (inductive load L/R = 15 ms)	3 A/12 V	2 A/24 V 0.3 A/125 V	1.7 A/36 V 0.2 A/250 V	1.5 A/48 V	1.2 A/60 V
Switching capacity	5 A, 250 V AC (cos φ 0.7) max. admissible circuit breaker: type C 6 A				
Life expectancy electrical	70'000 operating cycles 5 A, 250 V AC (cos φ 0.7)				
Vibration	Amplitude 1.5 mm pp at 55 Hz				
<b>Contact block</b>	<b>6 A</b>				technical information on page 00
<b>Contact block</b>	<b>16 A</b>				

# Technical information

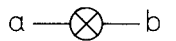
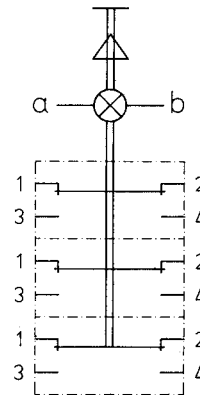
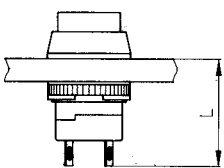
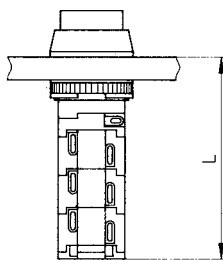
## Tightening torques

Hexagonal metal nut	M12 × 0.75	max. 100 Ncm
Metal fixation nut	M16 × 1	max. 150 Ncm
Metal fixation nut	M22 × 1	max. 300 Ncm
Contact block screws for	th4, th5	max. 13 Ncm
Pin screws	M2.5 for anti-rotation plates on th25 switch with plastic ring Ø 25 IP65	max. 30 Ncm
Pin screws	M3 for anti-rotation plates on th4, th25 key switches and rotary switches	max. 20 Ncm

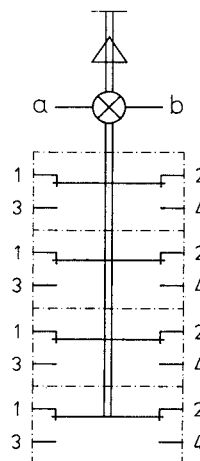
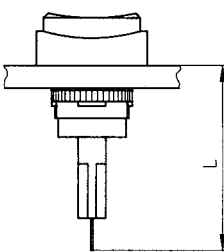
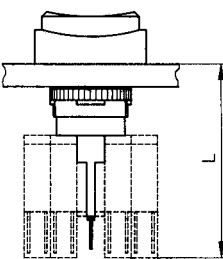
### th4



### th5

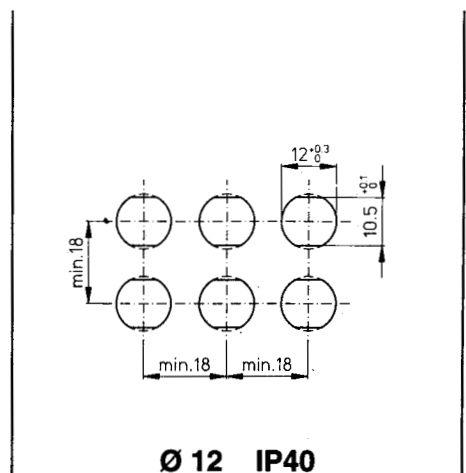
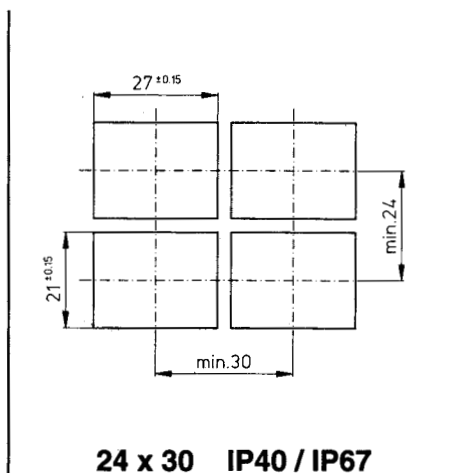
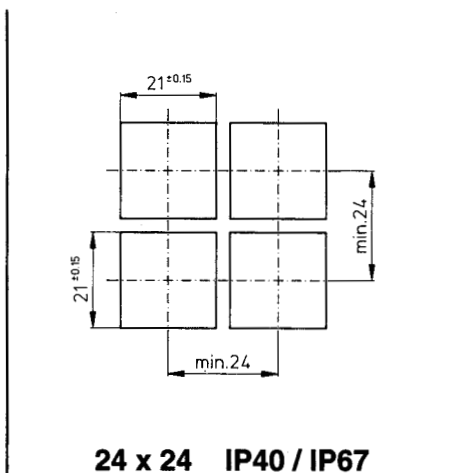
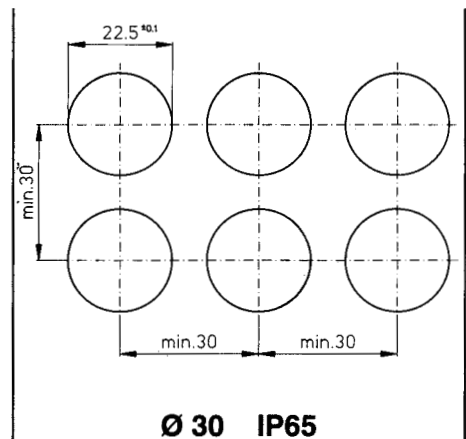
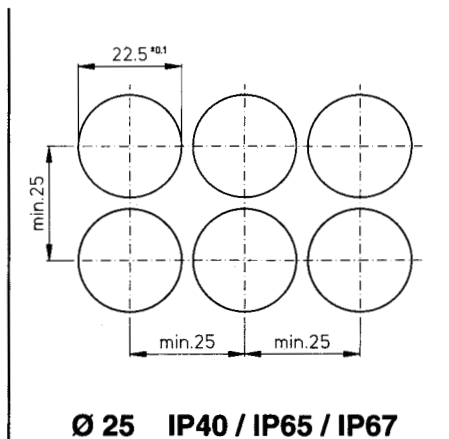
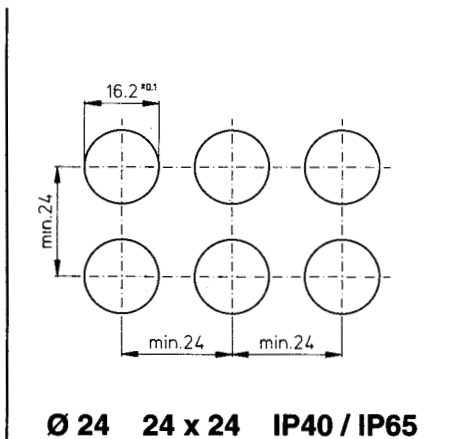
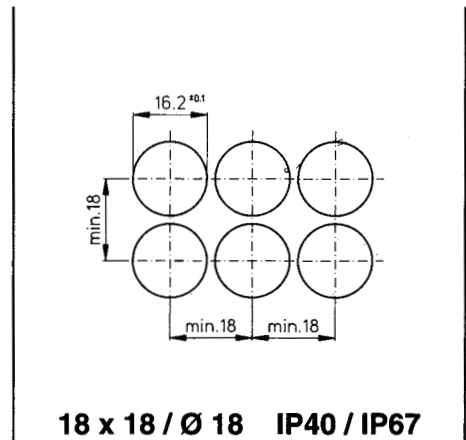
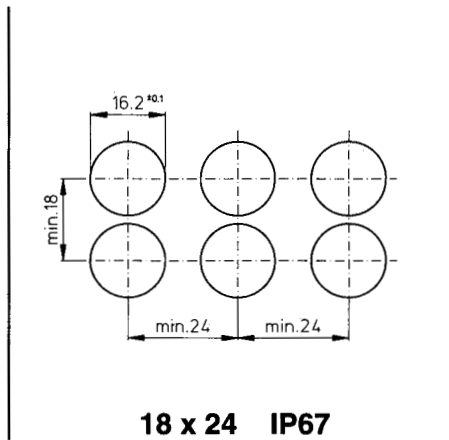
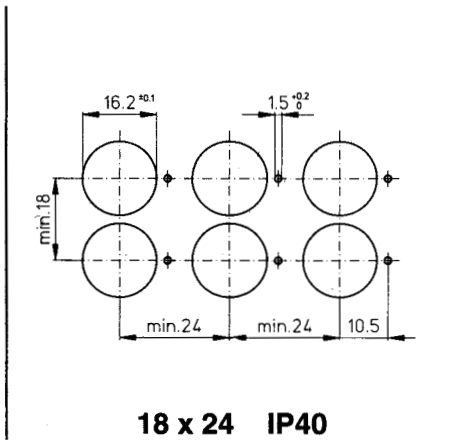


### th25



# Assembly instructions

When assembling contact blocks the minimum panel cut-outs must be adjusted to the dimensions shown on pages 20 and 21.

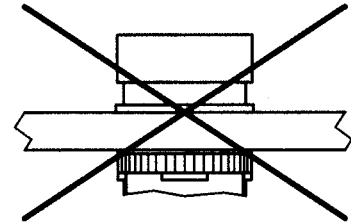
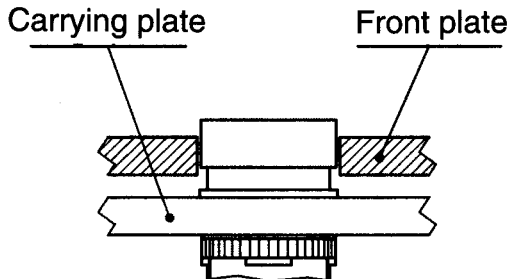


Caution: In interlocking assemblies the panel cut-out tolerances must not accumulate (max. tol.  $\pm 0.1$  mm).

# Assembly instructions

## Assembly instructions for switches with concealed plastic bezel for mimic diagrams

This bezel type has been designed especially for mimic diagrams (for example mosaic panels). Please respect by all means the assembly instructions on the respective catalog pages.

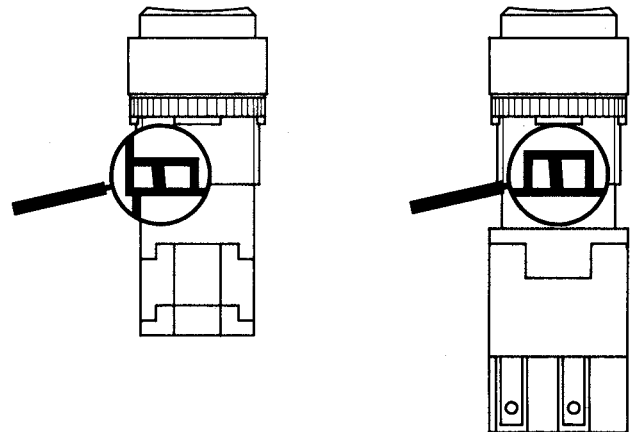


### Bi-functional selection

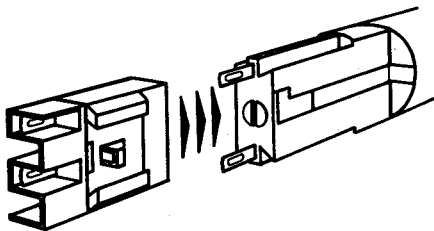
All the latching switches in the th5 and th25 series incorporate a simple selector mechanism for redetermining the function of the switch. These products are marked with a ☺. This mechanism is not supplied in the momentary switch nor in interlocking assemblies.

#### Application:

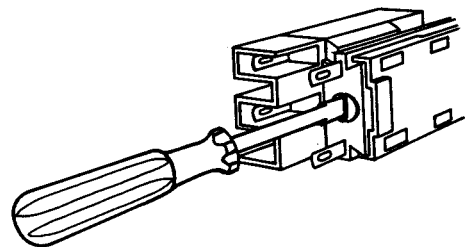
When the switch is in the "off" position, the selector mechanism in the small side opening on the basic element can be shifted to the right to obtain the momentary function (for example with an opened paper clip), or vice versa to return to the latching function.



### Assembly of the contact blocks



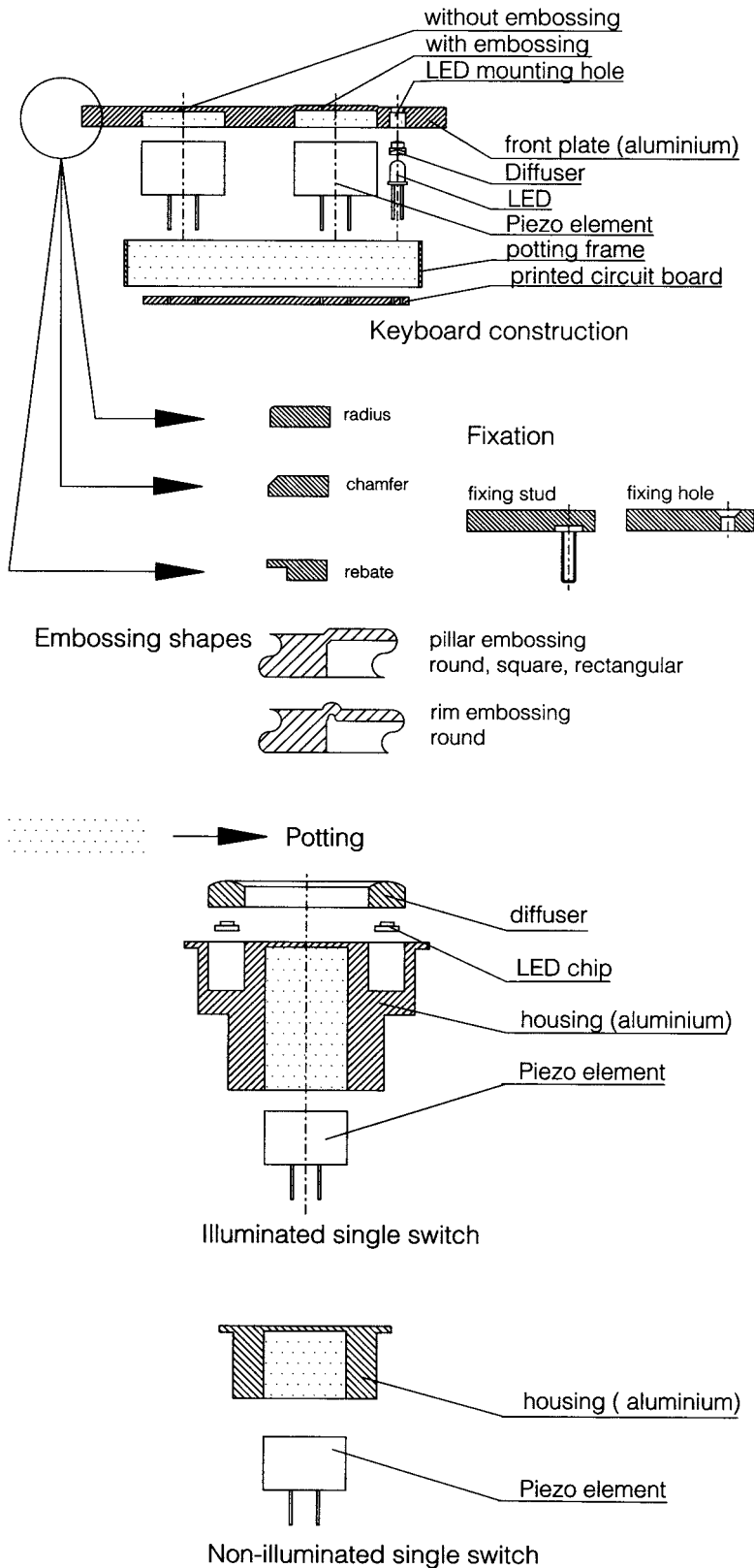
Turn the slot of the red locking pin parallel to the dovetail of the switch body and slide the contact block onto the dovetail.



When the switch is in «off» position the contact block must be pushed firmly into position and held there. Secure by turning the red locking pin a quarter turn in an clockwise direction with a suitable screwdriver.

# Piezo Switches

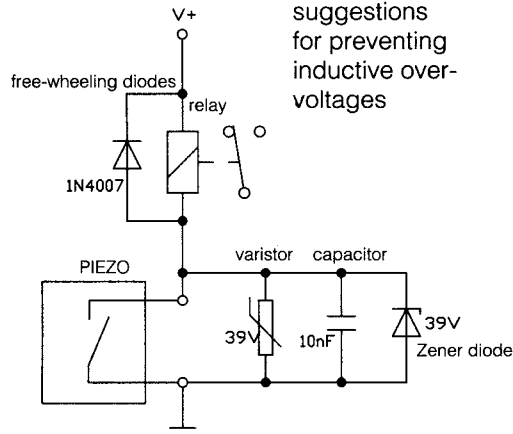
## Construction of our Piezo single switches and keyboards



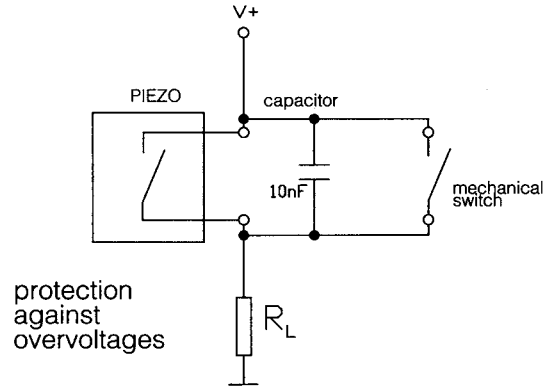
# Piezo Switches

## Application hints and typical circuits

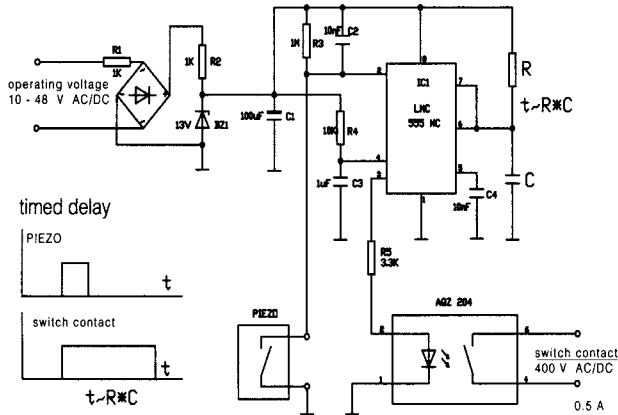
### Overvoltage protection



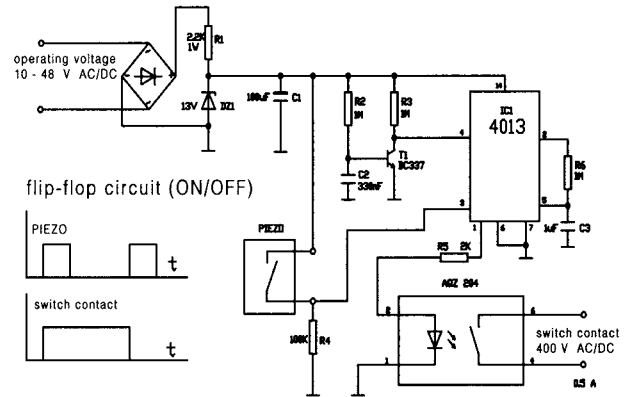
### Overvoltage protection



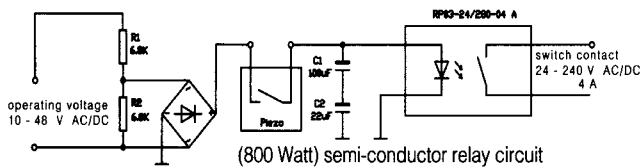
### Timed delay circuit



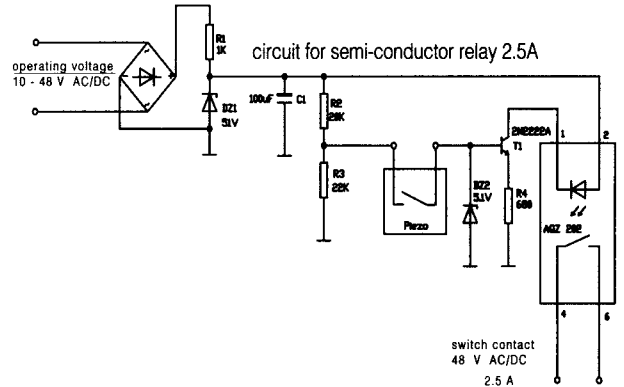
### Flip-flop circuit



### (800 Watt) semi-conductor relay circuit



### (100 Watt) semi-conductor relay circuit







# Panel Mounted Products

## Push Button



Type	TP2	TP5	TP4	TP8	TP9
Panel cut-out (mm)	Ø 16.2/22.5	Ø 16.2/22.5	Ø 16.2/22.5	Ø 22.5	Ø 16.2/22.5
Characteristics	<ul style="list-style-type: none"> <li>momentary or latching</li> <li>sealed IP40, IP65 or IP67</li> <li>wide range of bezels</li> <li>with or without illumination</li> <li>NO, NC, CO</li> <li>gold plated single or double pole contact blocks</li> </ul>	<ul style="list-style-type: none"> <li>momentary or latching</li> <li>sealed IP40 or IP65</li> <li>wide range of bezels</li> <li>shallow mounting depth</li> <li>with or without illumination</li> <li>NO, NC</li> <li>gold plated contact blocks</li> </ul>	<ul style="list-style-type: none"> <li>mushroom</li> <li>momentary or latching</li> <li>sealed IP40 or IP65</li> <li>wide range of bezels</li> <li>NO, NC</li> <li>gold plated contact blocks</li> </ul>	<ul style="list-style-type: none"> <li>momentary</li> <li>sealed IP67</li> <li>round metal bezels</li> <li>1NO + 1 NC, 2 NC, 2 NO</li> <li>gold plated contact block</li> </ul>	<ul style="list-style-type: none"> <li>momentary short stroke switch</li> <li>sealed IP65 or IP67</li> <li>round metal bezels</li> <li>NO</li> <li>snap-in mounting option Ø 22.5 mm (IP65 only)</li> </ul>
Rating	250 VAC, 5 A	250 VAC, 5 A	250 VAC, 5 A	230 VAC, 6 A	50 VAC/VDC, 50 mA
Dimensions (mm)	18 × 24 18 × 18 Ø 18 Ø 25	18 × 24 18 × 18 Ø 18 Ø 25	18 × 24 24 × 24 Ø 24 Ø 30	Ø 25	Ø 18 Ø 25
Actuator	<ul style="list-style-type: none"> <li>lenses in different shapes and colors</li> </ul>	<ul style="list-style-type: none"> <li>lenses in different shapes and colors</li> </ul>	<ul style="list-style-type: none"> <li>mushroom cap in different shapes and colors</li> </ul>	<ul style="list-style-type: none"> <li>button and housing in different colors</li> </ul>	<ul style="list-style-type: none"> <li>button and housing in different colors</li> </ul>
Approvals	UL, CSA, VDE	UL, CSA, VDE	UL, CSA, VDE	none	none
Page	20	27	33	37	40

## Push Button



## Emergency Stop



## Indicators



Type	TP7	TE1	TE8	TI2	TI5
Panel cut-out (mm)	Ø 16.2/22.5/30.3/43.3	Ø 16.2/22.5	Ø 16.2/22.5	Ø 16.2/22.5	Ø 16.2/22.5
Characteristics	<ul style="list-style-type: none"> <li>piezo technology</li> <li>momentary</li> <li>sealed IP68</li> <li>with or without illumination, two colors</li> <li>solid state output</li> <li>NO</li> </ul>	<ul style="list-style-type: none"> <li>meets EN418 directives</li> <li>sealed IP65</li> <li>rotary, reset mechanism</li> <li>&lt;20 mm behind panel depth</li> <li>1NO + 1 NC or 2 NC</li> </ul>	<ul style="list-style-type: none"> <li>meets EN418 directives (Ø 27 mm only)</li> <li>sealed IP66 or IP67</li> <li>rotary pull or key reset</li> <li>yellow disk bezel (optional)</li> <li>1NO + 1 NC or 2 NC</li> </ul>	<ul style="list-style-type: none"> <li>illuminated</li> <li>sealed IP40, IP65 or IP67</li> <li>wide range of bezels</li> <li>midget grooved lamp/LED</li> </ul>	<ul style="list-style-type: none"> <li>illuminated</li> <li>sealed IP40, IP65 or IP67</li> <li>wide range of bezels</li> <li>midget grooved lamp/LED</li> </ul>
Rating	3 to 35 VAC/VDC, 200 mA	250 VAC, 2 A	250 VAC, 6 A	max. 60 VAC/VDC	max. 60 VAC/VDC
Dimensions (mm)	Ø 18 Ø 25 Ø 36 Ø 48	Ø 25 Ø 30 Ø 40	Ø 27 Ø 40	18 × 24 18 × 18 Ø 18 Ø 25	18 × 24 18 × 18 Ø 18 Ø 25
Actuator	<ul style="list-style-type: none"> <li>housing in different colors</li> </ul>	<ul style="list-style-type: none"> <li>red mushroom cap</li> </ul>	<ul style="list-style-type: none"> <li>red mushroom cap (Ø 27 mm only)</li> <li>reset by KABA key (Ø 40 mm only)</li> </ul>	<ul style="list-style-type: none"> <li>lenses in different shapes and colors</li> </ul>	<ul style="list-style-type: none"> <li>lenses in different shapes and colors</li> </ul>
Approvals	none	IEC 947-5-1/947-5-5	IEC 947-5-1/947-5-5 (Ø 27 mm only)	UL, CSA, VDE	UL, CSA, VDE
Page	44	53	56	60	64

# Panel Mounted Products

## Keyswitch



Type	TI9	TK2	E1	M1
Panel cut-out (mm)	Ø 22.5	Ø 16.2/22.5	Ø 15.1 × 15.1	Ø 15.1 × 15.1
Characteristics	<ul style="list-style-type: none"> <li>illuminated</li> <li>sealed IP67</li> <li>round metal bezels</li> <li>red LED</li> <li>green LED</li> <li>red-green LED</li> </ul>	<ul style="list-style-type: none"> <li>2 and 3 position</li> <li>sealed IP40 or IP65</li> <li>plastic or aluminum bezels</li> <li>wide range of bezels</li> <li>NO, NC</li> <li>gold plated, single or double pole, contact blocks</li> <li>key trapping options</li> </ul>	<ul style="list-style-type: none"> <li>tamper proof</li> <li>2 positions</li> <li>key trapping options</li> <li>gold-plated contacts</li> <li>PCB terminals</li> </ul>	<ul style="list-style-type: none"> <li>double pole change-over or three circuit selector switching functions</li> <li>key trapping option</li> <li>two body style options</li> <li>gold-plated contacts</li> <li>PCB terminals</li> </ul>
Rating	24 VDC, 20 mA	250 VAC, 5 A	250 VAC, 100 mA	250 VAC, 100 mA
Dimensions (mm)	Ø 25	18 × 24 18 × 18 Ø 18 Ø 25	18 × 16	18 × 16 body style A 18 × 18 body style E
Actuator	<ul style="list-style-type: none"> <li>aluminum housing in different colors</li> </ul>	<ul style="list-style-type: none"> <li>key-KABA MICRO</li> </ul>	<ul style="list-style-type: none"> <li>plastic key</li> </ul>	<ul style="list-style-type: none"> <li>key (common or differs)</li> </ul>
Approvals	none	UL, CSA, VDE	none	none
Page	68	70	76	78

## Rotary



Type	K2	P2	P5	TR2
Panel cut-out (mm)	Ø 19.1	Ø 19.1	Ø 20.6	Ø 16.2/22.5
Characteristics	<ul style="list-style-type: none"> <li>choice of off-on or change-over center off or spring return options</li> <li>key trapping option</li> <li>solder terminals</li> </ul>	<ul style="list-style-type: none"> <li>up to 12 contact pairs</li> <li>2 security options with key actuation</li> <li>from 2 to 4 switch positions</li> <li>key trapping option</li> <li>solder terminals</li> </ul>	<ul style="list-style-type: none"> <li>high electrical rating</li> <li>key trapping option</li> <li>choice of off-on, change-over with spring return or change-over with separate circuits</li> </ul>	<ul style="list-style-type: none"> <li>2 and 3 position</li> <li>sealed IP40 or IP65</li> <li>plastic or aluminum bezels</li> <li>NO, NC</li> <li>gold plated, single or double pole, contact blocks</li> </ul>
Rating	up to 250 VAC, 2 A	250 VAC, 2 A	up to 125 VAC, 10 A up to 250 VAC, 5 A	250 VAC, 5 A
Dimensions (mm)	Ø 22	Ø 22	Ø 38.1 × 45.7 off-on Ø 38.1 × 58.4 change-over	18 × 24 18 × 18 Ø 18 Ø 25
Actuator	<ul style="list-style-type: none"> <li>key (common or differs)</li> </ul>	<ul style="list-style-type: none"> <li>key (common or differs)</li> </ul>	<ul style="list-style-type: none"> <li>key (common or differs)</li> </ul>	<ul style="list-style-type: none"> <li>black knob, with white indicating bar</li> </ul>
Approvals	UL and CSA	UL (optional)	UL and CSA	UL, CSA, VDE
Page	81	83	86	89

# Panel Mount Products

## Joystick



Type **700**

**J8**

Panel cut-out (mm)  $\varnothing 22 \times 20$

$\varnothing 22.5$

Characteristics

- single or double pole
- choice of directional gating options
- miniature or subminiature microswitch types

- choice of directional gating options
- choice of microswitch functions

Rating

up to 15 A, 250 VAC, miniature microswitches  
up to 6 A, 250 VAC, subminiature microswitches

up to 16 A, 250 VAC  
up to 5 A, 250 VAC

Dimensions (mm)

$55 \times 55 \times 57.2$  miniature microswitches  
 $41.3 \times 41.3 \times 57.2$  subminiature microswitches

up to  $74.5 \times 74.5 \times 105$   
up to  $\varnothing 60 \times 60 \times 103.5$

Actuator

- knob

- knob

Approvals

ENEC, UL and CSA (switch only)

ENEC, UL and CSA (switch only)

Page

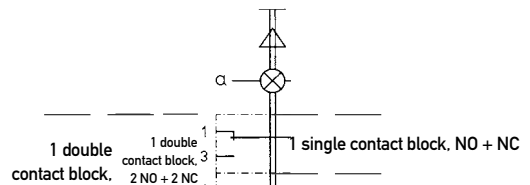
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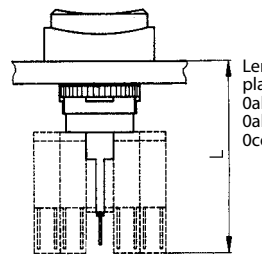
# Modular Push Button



Circuit diagram (2 double contact blocks)



Dimension



# TP2

## TP2

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ momentary or latching</li> <li>■ sealed IP40, IP65 or IP67</li> <li>■ wide range of bezels</li> <li>■ with or without illumination</li> <li>■ NO, NC, CO</li> <li>■ gold plated single or double pole contact blocks</li> </ul>
Rating	250 VAC, 5 A
Dimensions (mm)	18 × 24 18 × 18 Ø 18 Ø 25
Actuator	<ul style="list-style-type: none"> <li>■ lenses in different shapes and colors</li> </ul>
Approvals	UL, CSA, VDE



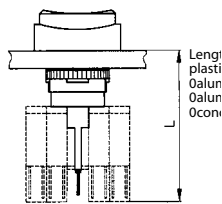
## Popular products

Ordering Reference	Panel cut-out	Function	Actuator style	Terminals	Electrical rating
TP21LAAC1C1A4CN	Ø 16.2 mm	Latching: IP40	18 × 24 mm, red Illumination	2.8 × 0.5 mm faston	250 VAC, 5A
TP21LDAC1C1D4CN	Ø 16.2 mm	Latching: IP40	Ø 18 mm, red Illumination	2.8 × 0.5 mm faston	250 VAC, 5A
TP21MAAC1C1A4CN	Ø 16.2 mm	Momentary: IP40	18 × 24 mm, red Illumination	2.8 × 0.5 mm faston	250 VAC, 5A
TP21MDAC1C1D4CN	Ø 16.2 mm	Momentary: IP40	Ø 18 mm, red Illumination	2.8 × 0.5 mm faston	250 VAC, 5A
TP22LFAC1C1E4CN	Ø 22.5 mm	Latching: IP65	Ø 25 mm, red Illumination	2.8 × 0.5 mm faston	250 VAC, 5A
TP22MFAC1C1E4CN	Ø 22.5 mm	Momentary: IP65	Ø 25 mm, red Illumination	2.8 × 0.5 mm faston	250 VAC, 5A

## Specifications

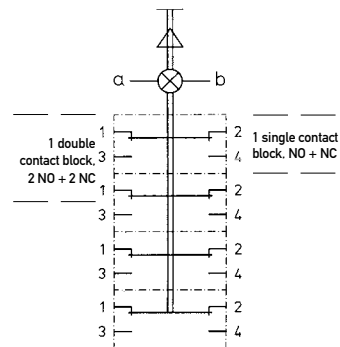
Mechanism	Bi-functional – momentary or latching
Actuating force	Approximately 2.5N – 1 contact block
Mounting	Central fixing with metal lock nut
Protection	IP40, IP65, IP67
Bezel material	Thermoplastic or anodized aluminum alloy
Lens material	Polycarbonate – engravable
Illumination	T1 ¾ midget grooved lamps – incandescent lamps , LEDs, multi LEDs 60 V, 1.2W maximum Lamp contact "b" = cathode (-) Appropriate safety regulations should be respected when using the indicator light.
Temperature range °C	-25°C to +85°C
Mechanical life	10 <sup>6</sup> cycles
Contact block	Slide-on assembly by the user with locking mechanism
Contact block housing	Self-extinguishing duroplastic (UL 94 plus V0)
Terminal material	Silver alloy with 0.2 µm silver plating, 0.4 µm gold plating
Contact resistance	<30 mOhm
Number of contact blocks	User configurable NO or NC types up to a maximum of 2 double contact blocks
Terminals	Solder – suitable for wire diameter 1 × 1.00 mm <sup>2</sup> (braided), 2 × 0.75 mm (stranded) Faston – 2.8 mm × 0.5 mm
Vibration resistance	1.5 mm pp amplitude at 55 Hz

### Dimensions



Length in mm (with contact block)	
plastic bezels	43.0
aluminum bezels	42.0
aluminum bezels concealed mounting	50.0

### Circuit diagram (2 double contact blocks)



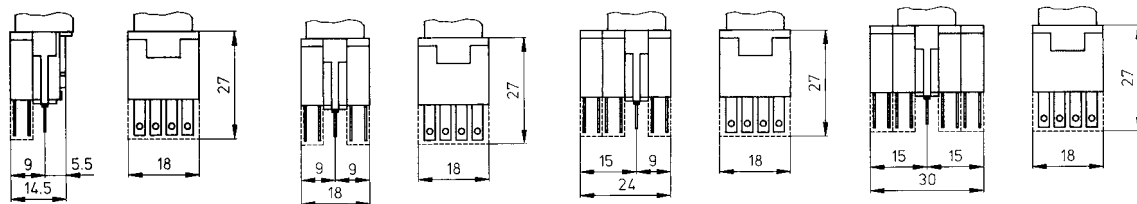
### Contact blocks

1 single contact block

2 single contact blocks

1 single contact block +  
1 double contact block

2 double contact blocks



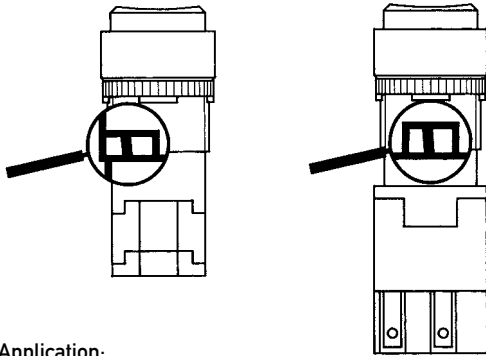
## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load (A)	Approval
250 VAC	5.0 (0.7 pf)	L/R = 15 ms	UL, CSA, VDE - max. admissible circuit breaker C6A
12 VDC	5.0	3.0	General rating
24 VDC	4.0	2.0	General rating
36 VDC	3.0	1.7	General rating
48 VDC	2.0	1.5	General rating
60 VDC	1.5	1.2	General rating
125 VDC	0.5	0.3	General rating
250 VDC	0.3	0.2	General rating

Electrical life 50,000 cycles at 5A, 250 VAC, 0.7 pf

## Bi-functional selection

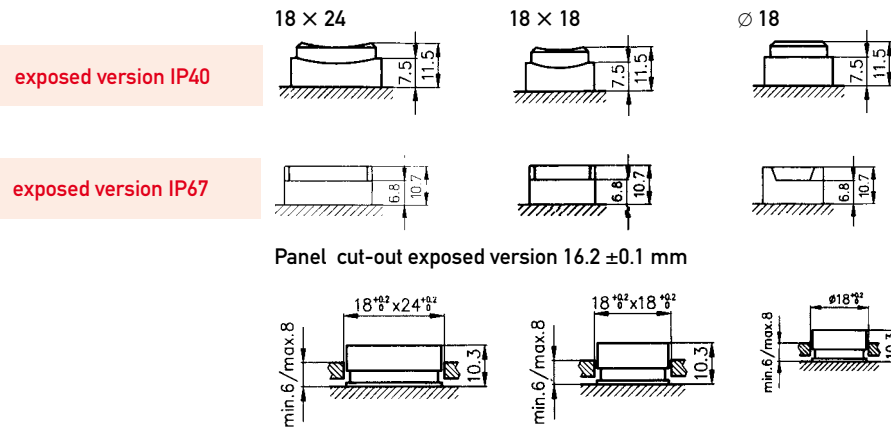
All latching switches in the range incorporate a simple selector mechanism for modifying the function of the switch. This function is not available with momentary switches.



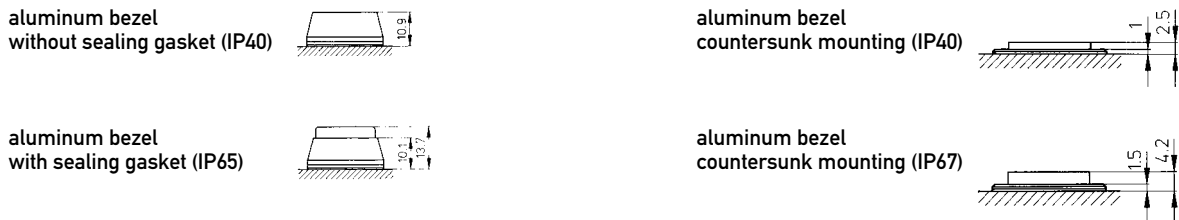
### Application:

When the switch is in the off position the selector mechanism can be moved to the right to obtain a momentary function, or to the left to return to a latching function.

## Plastic bezel and lens heights in mm (switch off position)



## Aluminum bezel ∅ 25 and lens heights in mm (switch off position)



## Panel cut-out 22.5 ±0.1 mm

Front panel thickness	plastic bezel	1.0 mm to 6.5 mm
	aluminum bezel	1.0 mm to 5.0 mm
	countersunk mounting	2.0 mm to 15.0 mm



## Ordering Reference

Basic type	TP2				Example: TP2	1	MAA	A1	A1	A0	A	N
Panel cut-out	1	Ø 16.2 mm										
Switch body (A)		Function	Actuator	Housing (plastic)	Part No.							
	MAA	Momentary	18 × 24 mm	Exposed ; IP40; faston	TH501008000							
	LAA	Latching_	18 × 24 mm	Exposed ; IP40; faston	TH511008000							
	MAC	Momentary	18 × 24 mm	Exposed ; IP67; faston	TH501015000							
	LAC	Latching_	18 × 24 mm	Exposed ; IP67; faston	TH511015000							
	MAB	Momentary	18 × 24 mm	Concealed ; IP40; faston	TH501002000							
	LAB	Latching_	18 × 24 mm	Concealed ; IP40; faston	TH511002000							
	(B)	MBA	Momentary	18 × 18 mm	Exposed ; IP40; faston	TH503008000						
		LBA	Latching_	18 × 18 mm	Exposed ; IP40; faston	TH513008000						
		MBC	Momentary	18 × 18 mm	Exposed ; IP67; faston	TH503015000						
		LBC	Latching_	18 × 18 mm	Exposed ; IP67; faston	TH513015000						
		MBB	Momentary	18 × 18 mm	Concealed ; IP40; faston	TH503002000						
		LBB	Latching_	18 × 18 mm	Concealed ; IP40; faston	TH513002000						
	(C)	MDA	Momentary	Ø 18 mm	Exposed ; IP40; faston	TH505008000						
		LDA	Latching_	Ø 18 mm	Exposed ; IP40; faston	TH515008000						
		MDC	Momentary	Ø 18 mm	Exposed ; IP67; faston	TH505015000						
		LDC	Latching_	Ø 18 mm	Exposed ; IP67; faston	TH515015000						
		MDB	Momentary	Ø 18 mm	Concealed ; IP40; faston	TH505002000						
		LDB	Latching_	Ø 18 mm	Concealed ; IP40; faston	TH515002000						
	Contact block, gold Position 1	XX	No Contact Blocks		Terminals			Part No.				
		A1	NO		2.8 × 0.5mm			TH593566020				
		A9	NO		Insulated faston			TH593560020				
		A8	NO		Solder			TH593561020				
		B1	NC		2.8 × 0.5mm			TH593566050				
B9		NC		Insulated faston			TH593560050					
B8		NC		Solder			TH593561050					
C1		1 NO + 1 NC		2.8 × 0.5mm			TH593566000					
C9		1 NO + 1 NC		Insulated faston			TH593560000					
C8		1 NO + 1 NC		Solder			TH593561000					
D1		2 NO + 2 NC		2.8 × 0.5mm			TH593567000					
D9		2 NO + 2 NC		Insulated faston			TH593563000					
D8		2 NO + 2 NC		Solder			TH593564000					
Contact block, gold Position 2		XX	No Contact Blocks		Terminals			Part No.				
		A1	NO		2.8 × 0.5mm			TH593566020				
		A9	NO		Insulated faston			TH593560020				
	A8	NO		Solder			TH593561020					
	B1	NC		2.8 × 0.5mm			TH593566050					
	B9	NC		Insulated faston			TH593560050					
	B8	NC		Solder			TH593561050					
	C1	1 NO + 1 NC		2.8 × 0.5mm			TH593566000					
	C9	1 NO + 1 NC		Insulated faston			TH593560000					
	C8	1 NO + 1 NC		Solder			TH593561000					
	D1	2 NO + 2 NC		2.8 × 0.5mm			TH593567000					
	D9	2 NO + 2 NC		Insulated faston			TH593563000					
	D8	2 NO + 2 NC		Solder			TH593564000					
	Lens, transparent For Switch body style (A)	A0	White	Exposed 15 × 21 mm	Exposed IP40 TH461021000	Exposed IP67 TH561011000	Concealed 18 × 24 mm	Concealed IP 40 TH461017000				
		A1	Yellow	15 × 21 mm	TH461121000	TH561111000	18 × 24 mm	TH461117000				
		A2	Green	15 × 21 mm	TH461221000	TH561211000	18 × 24 mm	TH461217000				
A3		Blue	15 × 21 mm	TH461321000	TH561311000	18 × 24 mm	TH461317000					
A4		Red	15 × 21 mm	TH461421000	TH561411000	18 × 24 mm	TH461417000					
A6		Orange	15 × 21 mm	TH461621000	TH561611000	18 × 24 mm	TH461617000					
For Switch body style (B)		B0	White	15 × 15 mm	TH463021000	TH563011000	18 × 18 mm	TH463018000				
		B1	Yellow	15 × 15 mm	TH463121000	TH563111000	18 × 18 mm	TH463118000				
		B2	Green	15 × 15 mm	TH463221000	TH563211000	18 × 18 mm	TH463218000				
		B3	Blue	15 × 15 mm	TH463321000	TH563311000	18 × 18 mm	TH463318000				
		B4	Red	15 × 15 mm	TH463421000	TH563411000	18 × 18 mm	TH463418000				
		B6	Orange	15 × 15 mm	TH463621000	TH563611000	18 × 18 mm	TH463618000				
For Switch body style (C)		D0	White	Ø 15 mm	TH465021000	TH565011000	Ø 18 mm	TH465015000				
		D1	Yellow	Ø 15 mm	TH465121000	TH565111000	Ø 18 mm	TH465115000				
		D2	Green	Ø 15 mm	TH465221000	TH565211000	Ø 18 mm	TH465215000				
		D3	Blue	Ø 15 mm	TH465321000	TH565311000	Ø 18 mm	TH465315000				
		D4	Red	Ø 15 mm	TH465421000	TH565411000	Ø 18 mm	TH465415000				
		D6	Orange	Ø 15 mm	TH465621000	TH565611000	Ø 18 mm	TH465615000				
Illumination	X	Non illuminated										
	A	6V										
	B	12V										
	C	24V										
F	48V											
Illumination Color	X	Non illuminated										
	N	Incandescent lamp		6V, 200 mA TH590000000		12V, 80 mA TH590001000		24V, 50 mA TH590006000		48V, 25 mA TH590004000		
	1	Yellow LED		6V AC/DC, 45 mA TH590231000		12V AC/DC, 25 mA TH590234000		24V AC/DC, 12.5 mA TH590237000		48V AC/DC, 12.5 mA TH590240000		
	2	Green LED		TH590232000		TH590235000		TH590238000		TH590241000		
	4	Red LED		TH590230000		TH590233000		TH590236000		TH590239000		

Note: Contact blocks will be supplied unassembled

## Ordering Reference

Basic type		TP2				Example: TP2 1 MAD A1 A1 A0 A N					
Panel cut-out	1	Ø 16.2 mm									
Switch body (A)	MAD	Function	Actuator	Housing (plastic)	Part No.						
	LAD	Momentary	18 × 24 mm	Exposed ; IP40; solder	TH501108000						
	MAF	Latching_	18 × 24 mm	Exposed ; IP40; solder	TH511108000						
	LAF	Momentary	18 × 24 mm	Exposed ; IP67; solder	TH501115000						
	MAE	Latching_	18 × 24 mm	Exposed ; IP67; solder	TH511115000						
	LAE	Momentary	18 × 24 mm	Concealed ; IP40; solder	TH501102000						
		Latching_	18 × 24 mm	Concealed ; IP40; solder	TH511102000						
	(B)	MBD	Momentary	18 × 18 mm	Exposed ; IP40; solder	TH503108000					
		LBD	Latching_	18 × 18 mm	Exposed ; IP40; solder	TH513108000					
		MBF	Momentary	18 × 18 mm	Exposed ; IP67; solder	TH503115000					
		LBF	Latching_	18 × 18 mm	Exposed ; IP67; solder	TH513115000					
		MBE	Momentary	18 × 18 mm	Concealed ; IP40; solder	TH503102000					
		LBE	Latching_	18 × 18 mm	Concealed ; IP40; solder	TH513102000					
	(C)	MDD	Momentary	Ø 18 mm	Exposed ; IP40; solder	TH505108000					
		LDD	Latching_	Ø 18 mm	Exposed ; IP40; solder	TH515108000					
		MDF	Momentary	Ø 18 mm	Exposed ; IP67; solder	TH505115000					
		LDF	Latching_	Ø 18 mm	Exposed ; IP67; solder	TH515115000					
		MDE	Momentary	Ø 18 mm	Concealed ; IP40; solder	TH505102000					
LDE		Latching_	Ø 18 mm	Concealed ; IP40; solder	TH515102000						
Contact block, gold Position 1	XX	No Contact Blocks			Part No.						
	A1	NO	2.8 × 0.5mm		TH593566020						
	A9	NO	Insulated faston		TH593560020						
	A8	NO	Solder		TH593561020						
	B1	NC	2.8 × 0.5mm		TH593566050						
	B9	NC	Insulated faston		TH593560050						
	B8	NC	Solder		TH593561050						
	C1	1 NO + 1 NC	2.8 × 0.5mm		TH593566000						
	C9	1 NO + 1 NC	Insulated faston		TH593560000						
	C8	1 NO + 1 NC	Solder		TH593561000						
	D1	2 NO + 2 NC	2.8 × 0.5mm		TH593567000						
	D9	2 NO + 2 NC	Insulated faston		TH593563000						
	D8	2 NO + 2 NC	Solder		TH593564000						
	Contact block, gold Position 2	XX	No Contact Blocks			Part No.					
A1		NO	2.8 × 0.5mm		TH593566020						
A9		NO	Insulated faston		TH593560020						
A8		NO	Solder		TH593561020						
B1		NC	2.8 × 0.5mm		TH593566050						
B9		NC	Insulated faston		TH593560050						
B8		NC	Solder		TH593561050						
C1		1 NO + 1 NC	2.8 × 0.5mm		TH593566000						
C9		1 NO + 1 NC	Insulated faston		TH593560000						
C8		1 NO + 1 NC	Solder		TH593561000						
D1		2 NO + 2 NC	2.8 × 0.5mm		TH593567000						
D9		2 NO + 2 NC	Insulated faston		TH593563000						
D8		2 NO + 2 NC	Solder		TH593564000						
Lens, transparent For Switch body style (A)		A0	White	Exposed 15 × 21 mm	Exposed IP40 TH461021000	Exposed IP67 TH561011000	Concealed 18 × 24 mm	Concealed IP 40 TH461017000			
	A1	Yellow	15 × 21 mm	TH461121000	TH561111000	18 × 24 mm	TH461117000				
	A2	Green	15 × 21 mm	TH461221000	TH561211000	18 × 24 mm	TH461217000				
	A3	Blue	15 × 21 mm	TH461321000	TH561311000	18 × 24 mm	TH461317000				
	A4	Red	15 × 21 mm	TH461421000	TH561411000	18 × 24 mm	TH461417000				
	A6	Orange	15 × 21 mm	TH461621000	TH561611000	18 × 24 mm	TH461617000				
	For Switch body style (B)	B0	White	15 × 15 mm	TH463021000	TH563011000	18 × 18 mm	TH463018000			
		B1	Yellow	15 × 15 mm	TH463121000	TH563111000	18 × 18 mm	TH463118000			
		B2	Green	15 × 15 mm	TH463221000	TH563211000	18 × 18 mm	TH463218000			
		B3	Blue	15 × 15 mm	TH463321000	TH563311000	18 × 18 mm	TH463318000			
		B4	Red	15 × 15 mm	TH463421000	TH563411000	18 × 18 mm	TH463418000			
		B6	Orange	15 × 15 mm	TH463621000	TH563611000	18 × 18 mm	TH463618000			
	For Switch body style (C)	D0	White	Ø 15 mm	TH465021000	TH565011000	Ø 18 mm	TH465015000			
		D1	Yellow	Ø 15 mm	TH465121000	TH565111000	Ø 18 mm	TH465115000			
		D2	Green	Ø 15 mm	TH465221000	TH565211000	Ø 18 mm	TH465215000			
		D3	Blue	Ø 15 mm	TH465321000	TH565311000	Ø 18 mm	TH465315000			
		D4	Red	Ø 15 mm	TH465421000	TH565411000	Ø 18 mm	TH465415000			
		D6	Orange	Ø 15 mm	TH465621000	TH565611000	Ø 18 mm	TH465615000			
Illumination	X	Non illuminated									
	A	6V									
	B	12V									
	C	24V									
Illumination Color	F	48V									
	X	Non illuminated									
	N	Incandescent lamp	6V, 200 mA TH590000000	12V, 80 mA TH590001000	24V, 50 mA TH590006000	48V, 25 mA TH590004000					
	1	Yellow LED	6V AC/DC, 45 mA TH590231000	12V AC/DC, 25 mA TH590234000	24V AC/DC, 12.5 mA TH590237000	48V AC/DC, 12.5 mA TH590240000					
	2	Green LED	TH590232000	TH590235000	TH590238000	TH590241000					
	4	Red LED	TH590230000	TH590233000	TH590236000	TH590239000					

Note: Contact blocks will be supplied unassembled

## Ordering Reference

Basic type	TP2				Example: TP2	2	MFA	A1	A1	E0	A	N	
Panel cut-out	2				Ø 22.5 mm								
Switch body (A)	Function		Actuator	Housing	Part No.								
	MFA	Momentary	Ø 25	Exposed plastic; IP65; faston	TH505020000								
	LFA	Latching_	Ø 25	Exposed plastic; IP65; faston	TH515020000								
	(B)	MFB	Momentary	Ø 25	Exposed aluminum; IP40 / IP65*; faston	TH505018000							
		LFB	Latching_	Ø 25	Exposed aluminum; IP40 / IP65*; faston	TH515018000							
	MFC	Momentary	Ø 25	Exposed aluminum; IP65* with silicon cap; faston	TH505033000								
	LFC	Latching_	Ø 25	Exposed aluminum; IP65* with silicon cap; faston	TH515033000								
	MFD	Momentary	Ø 25	Flush-aluminum; IP40; faston	TH505050000								
	LFD	Latching_	Ø 25	Flush-aluminum; IP40; faston	TH515050000								
	MFE	Momentary	Ø 25	Flush-aluminum; IP67; faston	TH505051000								
LFE	Latching_	Ø 25	Flush-aluminum; IP67; faston	TH515051000									
Contact block, gold Position 1	XX	No contact blocks		Terminals								Part No.	
	A1	NO		2.8 × 0.5mm								TH593566020	
	A9	NO		Insulated faston								TH593560020	
	A8	NO		Solder								TH593561020	
	B1	NC		2.8 × 0.5mm								TH593566050	
	B9	NC		Insulated faston								TH593560050	
	B8	NC		Solder								TH593561050	
	C1	1 NO + 1 NC		2.8 × 0.5mm								TH593566000	
	C9	1 NO + 1 NC		Insulated faston								TH593560000	
	C8	1 NO + 1 NC		Solder								TH593561000	
	D1	2 NO + 2 NC		2.8 × 0.5mm								TH593569000	
	D9	2 NO + 2 NC		Insulated faston								TH593563000	
	D8	2 NO + 2 NC		Solder								TH593564000	
	Contact block, gold Position 2	XX	No contact blocks		Terminals								Part No.
		A1	NO		2.8 × 0.5mm								TH593566020
A9		NO		Insulated faston								TH593560020	
A8		NO		Solder								TH593561020	
B1		NC		2.8 × 0.5mm								TH593566050	
B9		NC		Insulated faston								TH593560050	
B8		NC		Solder								TH593561050	
C1		1 NO + 1 NC		2.8 × 0.5mm								TH593566000	
C9		1 NO + 1 NC		Insulated faston								TH593560000	
C8		1 NO + 1 NC		Solder								TH593561000	
D1		2 NO + 2 NC		2.8 × 0.5mm								TH593569000	
D9		2 NO + 2 NC		Insulated faston								TH593563000	
D8		2 NO + 2 NC		Solder								TH593564000	
Lens, transparent For Switch body style (A)		E0	White	Ø 21	TH565024000	} For Plastic Bezel only IP65							
		E1	Yellow	Ø 21	TH565124000								
	E2	Green	Ø 21	TH565224000									
	E3	Blue	Ø 21	TH565324000									
	E4	Red	Ø 21	TH565424000									
	E6	Orange	Ø 21	TH565624000									
For Switch body style (B)	F0	White	Ø 18	TH465015000	IP40/IP65	IP65 with Silicon cap	IP67	} For Aluminum Bezel only					
	F1	Yellow	Ø 18	TH465115000	TH465001000	TH465101000	TH565025000						
	F2	Green	Ø 18	TH465215000	TH465201000	TH465225000	TH565125000						
	F3	Blue	Ø 18	TH465315000	TH465301000	TH465325000	TH565225000						
	F4	Red	Ø 18	TH465415000	TH465401000	TH465425000	TH565325000						
	F6	Orange	Ø 18	TH465615000	TH465601000	TH465625000	TH565425000						
													TH565625000
Illumination	X	Non illuminated											
	A	6V											
	B	12V											
	C	24V											
	F	48V											
Illumination Color	X	Non illuminated											
	N	Incandescent lamp		6V, 200 mA	12V, 80 mA	24V, 50 mA	48V, 25 mA						
				TH590000000	TH590001000	TH590006000	TH590004000						
				6V AC/DC, 45 mA	12V AC/DC, 25 mA	24V AC/DC, 12.5 mA	48V AC/DC, 12.5 mA						
	1	Yellow LED		TH590231000	TH590234000	TH590237000	TH590240000						
	2	Green LED		TH590232000	TH590235000	TH590238000	TH590241000						
	4	Red LED		TH590230000	TH590233000	TH590236000	TH590239000						

Note: Contact blocks will be supplied unassembled

## Ordering Reference

Basic type	TP2			Example: TP2	2	MFF	A1	A1	E0	A	N	
Panel cut-out	2			Ø 22.5 mm								
Switch body (A)		Function	Actuator	Housing	Part No.							
	MFF	Momentary	Ø 25	Exposed plastic; IP65; solder	TH505120000							
	LFF	Latching	Ø 25	Exposed plastic; IP65; solder	TH515120000							
	(B)	MFG	Momentary	Ø 25	Exposed aluminum; IP40 / IP65*; solder	TH505118000						
		LFG	Latching	Ø 25	Exposed aluminum; IP40 / IP65*; solder	TH515118000						
	MFH	Momentary	Ø 25	Exposed aluminum; IP65* with silicon cap; solder	TH505133000							
	LFH	Latching	Ø 25	Exposed aluminum; IP65* with silicon cap; solder	TH515133000							
	MFJ	Momentary	Ø 25	Flush-aluminum; IP40; solder	TH505150000							
	LFJ	Latching	Ø 25	Flush-aluminum; IP40; solder	TH515150000							
	MFK	Momentary	Ø 25	Flush-aluminum; IP67; solder	TH505151000							
	LFK	Latching	Ø 25	Flush-aluminum; IP67; solder	TH515151000							
	Contact block, gold Position 1	XX	No Contact Blocks		Terminals			Part No.				
A1		NO		2.8 × 0.5mm			TH593566020					
A9		NO		Insulated faston			TH593560020					
A8		NO		Solder			TH593561020					
B1		NC		2.8 × 0.5mm			TH593566050					
B9		NC		Insulated faston			TH593560050					
B8		NC		Solder			TH593561050					
C1		1 NO + 1 NC		2.8 × 0.5mm			TH593566000					
C9		1 NO + 1 NC		Insulated faston			TH593560000					
C8		1 NO + 1 NC		Solder			TH593561000					
D1		2 NO + 2 NC		2.8 × 0.5mm			TH593567000					
D9		2 NO + 2 NC		Insulated faston			TH593563000					
D8		2 NO + 2 NC		Solder			TH593564000					
Contact block, gold Position 2		XX	No Contact Blocks		Terminals			Part No.				
		A1	NO		2.8 × 0.5mm			TH593566020				
		A9	NO		Insulated faston			TH593560020				
	A8	NO		Solder			TH593561020					
	B1	NC		2.8 × 0.5mm			TH593566050					
	B8	NC		Solder			TH593561050					
	C1	1 NO + 1 NC		2.8 × 0.5mm			TH593566000					
	C9	1 NO + 1 NC		Insulated faston			TH593560000					
	C8	1 NO + 1 NC		Solder			TH593561000					
	D1	2 NO + 2 NC		2.8 × 0.5mm			TH593567000					
	D9	2 NO + 2 NC		Insulated faston			TH593563000					
	D8	2 NO + 2 NC		Solder			TH593564000					
	Lens, transparent For Switch body style (A)	E0	White	Ø 21	TH565024000		} For Plastic Bezel only IP65					
		E1	Yellow	Ø 21	TH565124000							
		E2	Green	Ø 21	TH565224000							
		E3	Blue	Ø 21	TH565324000							
E4		Red	Ø 21	TH565424000								
E6		Orange	Ø 21	TH565624000								
For Switch body style (B)	F0	White	Ø 18	IP40/IP65	IP65 with Silicon cap	IP67	} For Aluminum Bezel only					
	F1	Yellow	Ø 18	TH465015000	TH465001000	TH565025000						
	F2	Green	Ø 18	TH465215000	TH465201000	TH565225000						
	F3	Blue	Ø 18	TH465315000	TH465301000	TH565325000						
	F4	Red	Ø 18	TH465415000	TH465401000	TH565425000						
	F6	Orange	Ø 18	TH465615000	TH465601000	TH565625000						
	Illumination	X	Non illuminated									
A		6V										
B		12V										
C		24V										
F		48V										
Illumination Color	X	Non illuminated										
	N	Incandescent lamp		6V, 200 mA TH590000000		12V, 80 mA TH590001000		24V, 50 mA TH590006000		48V, 25 mA TH590004000		
	1	Yellow LED		6V AC/DC, 45 mA TH590231000		12V AC/DC, 25 mA TH590234000		24V AC/DC, 12.5 mA TH590237000		48V AC/DC, 12.5 mA TH590240000		
	2	Green LED		TH590232000		TH590235000		TH590238000		TH590241000		
	4	Red LED		TH590230000		TH590233000		TH590236000		TH590239000		

Note: Contact blocks will be supplied unassembled

## TP5

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ momentary or latching</li> <li>■ sealed IP40 or IP65</li> <li>■ wide range of bezels</li> <li>■ shallow mounting depth</li> <li>■ with or without illumination</li> <li>■ NO, NC</li> <li>■ gold plated contact blocks</li> </ul>
Rating	250 VAC, 5 A
Dimensions (mm)	18 × 24 18 × 18 Ø 18 Ø 25
Actuator	■ lenses in different shapes and colors
Approvals	UL, CSA, VDE



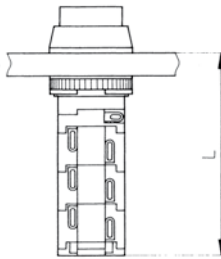
## Popular Products

Ordering Reference	Panel cut-out	Function	Actuator style	Terminals	Electrical rating
TP51LAA2A4CN	Ø 16.2 mm	Latching; IP40	18 × 24 mm, red Illumination	Solder; gold	250 VAC, 5A
TP51LDA2D4CN	Ø 16.2 mm	Latching; IP40	Ø 18 mm, red Illumination	Solder; gold	250 VAC, 5A
TP51MAA2A4CN	Ø 16.2 mm	Momentary; IP40	18 × 24 mm, red Illumination	Solder; gold	250 VAC, 5A
TP51MDA2D4CN	Ø 16.2 mm	Momentary; IP40	Ø 18 mm, red Illumination	Solder; gold	250 VAC, 5A
TP52LFD2F4CN	Ø 22.5 mm	Latching; IP40	Ø 25 mm, red Illumination	Solder; gold	250 VAC, 5A
TP52MFD2F4CN	Ø 22.5 mm	Momentary; IP40	Ø 25 mm, green Illumination	Solder; gold	250 VAC, 5A

## Specifications

Mechanism	Bi-functional – momentary or latching
Actuating force	Approximately 2.5N – 1 contact block
Mounting	Central fixing with metal lock nut
Protection	IP40, IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Lens material	Polycarbonate – engravable
Illumination	T13/4 midget grooved lamps – incandescent lamps , LEDs, multi LEDs 60 V, 1.2 W maximum Lamp contact "a" = cathode (-) Appropriate safety regulations should be respected when using the indicator light.
Temperature range °C	-30°C to +80°C
Mechanical life	10 <sup>6</sup> cycles
Contact block (blocks)	Supplied fitted
Contact block housing	Self-extinguishing duroplastic (UL 94 V0)
Terminal material	Silver alloy with 0.2 µm silver plating plus 0.4 µm gold plating
Contact resistance	< 30mOhm
Number of contact blocks	1 NO + 1 NC per contact block, up to a maximum of 3 contact blocks per switch
Terminals	Patented flexible solder - suitable for wire diameter 2 × 1.00 mm <sup>2</sup> (braided), 4 × 0.75 mm (stranded)
Vibration resistance	1.5 mm pp amplitude at 55 Hz

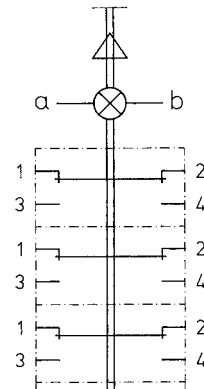
Dimensions



Length in mm (countersunk mounting version)

Panel cut-out		16.2 ±0.1	22.5 ±0.1
N° of contact blocks	1	27.5	26.5 (35.0)
	2	36.0	35.0 (43.5)
	3	44.5	43.5 (52.0)

Circuit diagram (3 contact blocks)

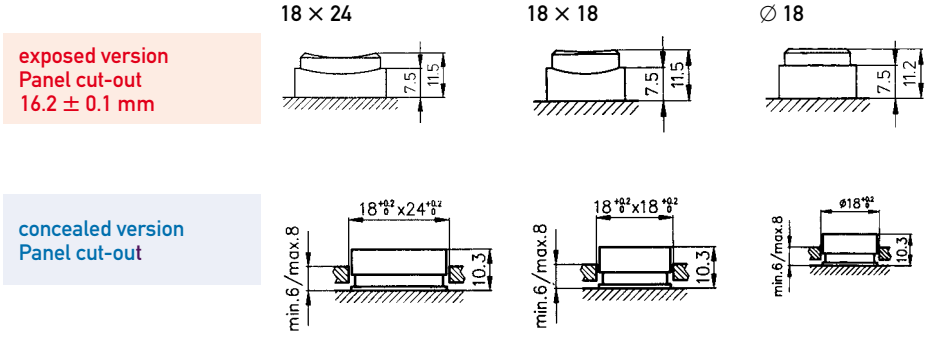


## Recommended maximum electrical ratings

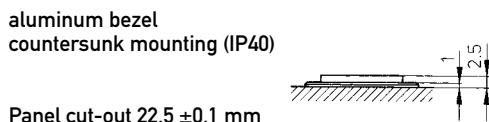
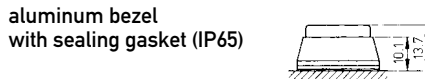
Voltage (max)	Resistive load (A)	Inductive load (A)	Approval
250 VAC	5.0 (0.7 pf)		UL, CSA, VDE - max. admissible circuit breaker C6A
12 VDC	5.0	3.0	General rating
24 VDC	4.0	2.0	General rating
36 VDC	3.0	1.7	General rating
48 VDC	2.0	1.5	General rating
60 VDC	1.5	1.2	General rating
125 VDC	0.5	0.3	General rating
250 VDC	0.3	0.2	General rating

Electrical life 70,000 cycles at 5A, 250 VAC, 0.7 pf

Dimensions Plastic bezel and lens heights in mm (switch off position)



Aluminum bezel ∅ 25 and lens heights in mm (switch off position)



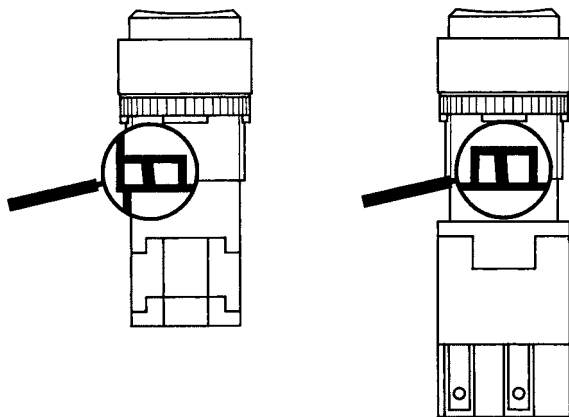
Panel cut-out 22.5 ± 0.1 mm

Front panel thickness	plastic bezel	1.0 mm to 5.5 mm
	aluminum bezel	1.0 mm to 5.0 mm
	countersunk mounting	2.0 mm to 20.0 mm

Bi-functional selection

All latching switches in the range incorporate a simple selector mechanism for modifying the function of the switch.

This function is not available with momentary or interlocking switches.



Application:

When the switch is in the off position the selector mechanism can be moved to the right to obtain a momentary function, or to the left to return to a latching function.

## Ordering Reference

Basic type		TP5				Example: TP5   1   MAA0   A0   A   N		
Panel cut-out		1					Ø 16.2 mm	
Switch body (A)		Function	Actuator	Housing (plastic)	Contact blocks	Part No.		
		MAA0 Momentary	18 × 24 mm	Exposed; IP40; solder	None	TH50008000		
		MAA1 Momentary	18 × 24 mm	Exposed; IP40; solder	1 NO + 1 NC	TH500108000		
		MAA2 Momentary	18 × 24 mm	Exposed; IP40; solder	2 NO + 2 NC	TH500208000		
		MAA3 Momentary	18 × 24 mm	Exposed; IP40; solder	3 NO + 3 NC	TH500308000		
		LAA0 Latching	18 × 24 mm	Exposed; IP40; solder	None	TH510008000		
		LAA1 Latching	18 × 24 mm	Exposed; IP40; solder	1 NO + 1 NC	TH510108000		
		LAA2 Latching	18 × 24 mm	Exposed; IP40; solder	2 NO + 2 NC	TH510208000		
		LAA3 Latching	18 × 24 mm	Exposed; IP40; solder	3 NO + 3 NC	TH510308000		
		MAB0 Momentary	18 × 24 mm	Concealed; IP40; solder	None	TH50002000		
		MAB1 Momentary	18 × 24 mm	Concealed; IP40; solder	1 NO + 1 NC	TH500102000		
		MAB2 Momentary	18 × 24 mm	Concealed; IP40; solder	2 NO + 2 NC	TH500202000		
		MAB3 Momentary	18 × 24 mm	Concealed; IP40; solder	3 NO + 3 NC	TH500302000		
		LAB0 Latching	18 × 24 mm	Concealed; IP40; solder	None	TH510002000		
		LAB1 Latching	18 × 24 mm	Concealed; IP40; solder	1 NO + 1 NC	TH510102000		
		LAB2 Latching	18 × 24 mm	Concealed; IP40; solder	2 NO + 2 NC	TH510202000		
		LAB3 Latching	18 × 24 mm	Concealed; IP40; solder	3 NO + 3 NC	TH510302000		
Switch body (B)		MBA0 Momentary	18 × 18 mm	Exposed; IP40; solder	None	TH502008000		
		MBA1 Momentary	18 × 18 mm	Exposed; IP40; solder	1 NO + 1 NC	TH502108000		
		MBA2 Momentary	18 × 18 mm	Exposed; IP40; solder	2 NO + 2 NC	TH502208000		
		MBA3 Momentary	18 × 18 mm	Exposed; IP40; solder	3 NO + 3 NC	TH502308000		
		LBA0 Latching	18 × 18 mm	Exposed; IP40; solder	None	TH512008000		
		LBA1 Latching	18 × 18 mm	Exposed; IP40; solder	1 NO + 1 NC	TH512108000		
		LBA2 Latching	18 × 18 mm	Exposed; IP40; solder	2 NO + 2 NC	TH512208000		
		LBA3 Latching	18 × 18 mm	Exposed; IP40; solder	3 NO + 3 NC	TH512308000		
		MBB0 Momentary	18 × 18 mm	Concealed; IP40; solder	None	TH502002000		
		MBB1 Momentary	18 × 18 mm	Concealed; IP40; solder	1 NO + 1 NC	TH502102000		
		MBB2 Momentary	18 × 18 mm	Concealed; IP40; solder	2 NO + 2 NC	TH502202000		
		MBB3 Momentary	18 × 18 mm	Concealed; IP40; solder	3 NO + 3 NC	TH502302000		
		LBB0 Latching	18 × 18 mm	Concealed; IP40; solder	None	TH512002000		
		LBB1 Latching	18 × 18 mm	Concealed; IP40; solder	1 NO + 1 NC	TH512102000		
		LBB2 Latching	18 × 18 mm	Concealed; IP40; solder	2 NO + 2 NC	TH512202000		
		LBB3 Latching	18 × 18 mm	Concealed; IP40; solder	3 NO + 3 NC	TH512302000		
Switch body (C)		MDA0 Momentary	Ø 18 mm	Exposed; IP40; solder	None	TH504008000		
		MDA1 Momentary	Ø 18 mm	Exposed; IP40; solder	1 NO + 1 NC	TH504108000		
		MDA2 Momentary	Ø 18 mm	Exposed; IP40; solder	2 NO + 2 NC	TH504208000		
		MDA3 Momentary	Ø 18 mm	Exposed; IP40; solder	3 NO + 3 NC	TH504308000		
		LDA0 Latching	Ø 18 mm	Exposed; IP40; solder	None	TH514008000		
		LDA1 Latching	Ø 18 mm	Exposed; IP40; solder	1 NO + 1 NC	TH514108000		
		LDA2 Latching	Ø 18 mm	Exposed; IP40; solder	2 NO + 2 NC	TH514208000		
		LDA3 Latching	Ø 18 mm	Exposed; IP40; solder	3 NO + 3 NC	TH514308000		
		MDB0 Momentary	Ø 18 mm	Concealed; IP40; solder	None	TH504002000		
		MDB1 Momentary	Ø 18 mm	Concealed; IP40; solder	1 NO + 1 NC	TH504102000		
		MDB2 Momentary	Ø 18 mm	Concealed; IP40; solder	2 NO + 2 NC	TH504202000		
		MDB3 Momentary	Ø 18 mm	Concealed; IP40; solder	3 NO + 3 NC	TH504302000		
		LDB0 Latching	Ø 18 mm	Concealed; IP40; solder	None	TH514002000		
		LDB1 Latching	Ø 18 mm	Concealed; IP40; solder	1 NO + 1 NC	TH514102000		
		LDB2 Latching	Ø 18 mm	Concealed; IP40; solder	2 NO + 2 NC	TH514202000		
		LDB3 Latching	Ø 18 mm	Concealed; IP40; solder	3 NO + 3 NC	TH514302000		
Transparent Lens		Exposed		Exposed	Concealed	Concealed		
For Switch body style (A)		A0 White	15 × 21 mm	TH461021000	18 × 24 mm	TH461017000		
		A1 Yellow	15 × 21 mm	TH461121000	18 × 24 mm	TH461117000		
		A2 Green	15 × 21 mm	TH461221000	18 × 24 mm	TH461217000		
		A3 Blue	15 × 21 mm	TH461321000	18 × 24 mm	TH461317000		
		A4 Red	15 × 21 mm	TH461421000	18 × 24 mm	TH461417000		
		A6 Orange	15 × 21 mm	TH461621000	18 × 24 mm	TH461617000		
For Switch body style (B)		B0 White	15 × 15 mm	TH463021000	18 × 18 mm	TH463018000		
		B1 Yellow	15 × 15 mm	TH463121000	18 × 18 mm	TH463118000		
		B2 Green	15 × 15 mm	TH463221000	18 × 18 mm	TH463218000		
		B3 Blue	15 × 15 mm	TH463321000	18 × 18 mm	TH463318000		
		B4 Red	15 × 15 mm	TH463421000	18 × 18 mm	TH463418000		
		B6 Orange	15 × 15 mm	TH463621000	18 × 18 mm	TH463618000		
For Switch body style (C)		D0 White	Ø 15 mm	TH465021000	Ø 18 mm	TH465015000		
		D1 Yellow	Ø 15 mm	TH465121000	Ø 18 mm	TH465115000		
		D2 Green	Ø 15 mm	TH465221000	Ø 18 mm	TH465215000		
		D3 Blue	Ø 15 mm	TH465321000	Ø 18 mm	TH465315000		
		D4 Red	Ø 15 mm	TH465421000	Ø 18 mm	TH465415000		
		D6 Orange	Ø 15 mm	TH465621000	Ø 18 mm	TH465615000		
Illumination		X Non illuminated						
		A 6V						
		B 12V						
		C 24V						
		F 48V						
Illumination Color		X Non illuminated						
		N Incandescent lamp	6V, 200 mA TH590000000	12V, 80 mA TH590001000	24V, 50 mA TH590006000	48V, 25 mA TH590004000		
		1 Yellow LED	6V AC/DC, 45 mA TH590231000	12V AC/DC, 25 mA TH590234000	24V AC/DC, 12.5 mA TH590237000	48V AC/DC, 12.5 mA TH590240000		
		2 Green LED	TH590232000	TH590235000	TH590238000	TH590241000		
		4 Red LED	TH590230000	TH590233000	TH590236000	TH590239000		



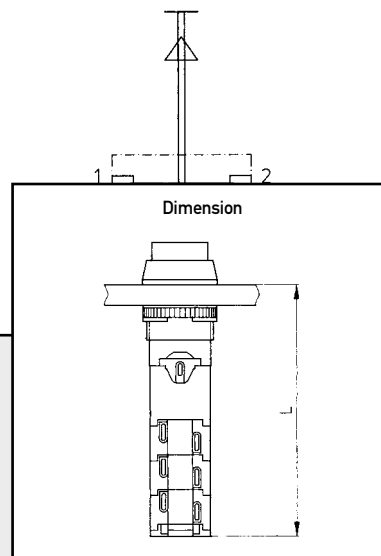
## Ordering Reference

Basic type	TP5				Example: TP5	2	MFC0	F0	A	N	
Panel cut-out	2				Ø 22.5 mm						
Switch body	Function	Actuator	Housing (Aluminum)		Contact blocks	Part No.					
	MFC0 Momentary	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		None	TH504018000					
	MFC1 Momentary	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		1 NO + 1 NC	TH504118000					
	MFC2 Momentary	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		2 NO + 2 NC	TH504218000					
	MFC3 Momentary	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		3 NO + 3 NC	TH504318000					
	LFC0 Latching_	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		None	TH514018000					
	LFC1 Latching_	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		1 NO + 1 NC	TH514118000					
	LFC2 Latching_	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		2 NO + 2 NC	TH514218000					
	LFC3 Latching_	Ø 25 mm	Exposed Aluminum: IP40 / IP65*; solder		3 NO + 3 NC	TH514318000					
	MFD0 Momentary	Ø 25 mm	Flush Aluminum: IP40; solder		None	TH504050000					
	MFD1 Momentary	Ø 25 mm	Flush Aluminum: IP40; solder		1 NO + 1 NC	TH504150000					
	MFD2 Momentary	Ø 25 mm	Flush Aluminum: IP40; solder		2 NO + 2 NC	TH504250000					
	MFD3 Momentary	Ø 25 mm	Flush Aluminum: IP40; solder		3 NO + 3 NC	TH504350000					
	LFD0 Latching_	Ø 25 mm	Flush Aluminum: IP40; solder		None	TH514050000					
	LFD1 Latching_	Ø 25 mm	Flush Aluminum: IP40; solder		1 NO + 1 NC	TH514150000					
	LFD2 Latching_	Ø 25 mm	Flush Aluminum: IP40; solder		2 NO + 2 NC	TH514250000					
	LFD3 Latching_	Ø 25 mm	Flush Aluminum: IP40; solder		3 NO + 3 NC	TH514350000					
	MFK0 Momentary	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		None	TH504033000					
	MFK1 Momentary	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		1 NO + 1 NC	TH504133000					
	MFK2 Momentary	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		2 NO + 2 NC	TH504233000					
	MFK3 Momentary	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		3 NO + 3 NC	TH504333000					
	LFK0 Latching_	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		None	TH514033000					
	LFK1 Latching_	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		1 NO + 1 NC	TH514133000					
	LFK2 Latching_	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		2 NO + 2 NC	TH514233000					
	LFK3 Latching_	Ø 25 mm	Exposed Aluminum with silicon cap:IP65*; solder		3 NO + 3 NC	TH514333000					
	Lens, transparent	F0	White	Ø 18	IP40/IP65	IP65 with sealing ring					
		F1	Yellow	Ø 18	TH465015000	TH465001000					
		F2	Green	Ø 18	TH465115000	TH465101000					
		F3	Blue	Ø 18	TH465215000	TH465201000					
		F4	Red	Ø 18	TH465315000	TH465301000					
		F6	Orange	Ø 18	TH465415000	TH465401000					
	Illumination	X	Non illuminated								
		A	6V								
		B	12V								
		C	24V								
	Illumination Color	N	Non illuminated								
		Incandescent lamp									
			6V, 200 mA	12V, 80 mA	24V, 50 mA	48V, 25 mA					
			TH590000000	TH59001000	TH590006000	TH590004000					
			6V AC/DC, 45 mA	12V AC/DC, 25 mA	24V AC/DC, 12.5 mA	48V AC/DC, 12.5 mA					
			TH590231000	TH590234000	TH590237000	TH590240000					
1		Yellow LED	TH590232000	TH590235000	TH590238000	TH590241000					
2		Green LED	TH590230000	TH590233000	TH590236000	TH590239000					
4		Red LED									

# Assembled Push Button



Circuit diagrams (3 contact blocks)



## TP4

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ mushroom</li> <li>■ momentary or latching</li> <li>■ sealed IP40 or IP65</li> <li>■ wide range of bezels</li> <li>■ NO, NC</li> <li>■ gold plated contact blocks</li> </ul>
Rating	250 VAC, 5 A
Dimensions (mm)	18 × 24 24 × 24 Ø 24 Ø 30
Actuator	■ mushroom cap in different shapes and colors
Approvals	UL, CSA, VDE



## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator size (mm)	Actuator style	Environmental protection	Terminals	Electrical rating
TP41LAJ2A4NXX	Ø 16.2	Latching	18 × 24	mushroom, red	IP40	Solder	250 VAC, 5A
TP41LEJ2E4NXX	Ø 16.2	Latching	Ø 24	mushroom, red	IP40	Solder	250 VAC, 5A
TP41MAJ2A4NXX	Ø 16.2	Momentary	18 × 24	mushroom, red	IP40	Solder	250 VAC, 5A
TP41MEJ2E4NXX	Ø 16.2	Momentary	Ø 24	mushroom, red	IP40	Solder	250 VAC, 5A
TP42LHJ2H4NXX	Ø 22.5	Latching	Ø 30	mushroom, red	IP65	Solder	250 VAC, 5A
TP42MHJ2H4NXX	Ø 22.5	Momentary	Ø 30	mushroom, red	IP65	Solder	250 VAC, 5A

## Specifications

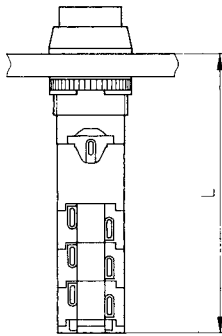
Mechanism	Momentary or latching
Actuating force	Approximately 2.5N – 1 contact block
Mounting	Central fixing with metal lock nut
Protection	IP40, IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Lens material	Polycarbonate – engravable
Illumination	Non-illuminated
Temperature range °C	-30°C to +80°C
Mechanical life	10 <sup>6</sup> cycles
Contact block (blocks)	Supplied fitted
Contact block housing	Self-extinguishing duroplastic (UL 94 V0)
Terminal material	Silver alloy with 0.2 µm silver plating, plus 0.4 µm gold plating
Contact resistance	< 30mOhm
Number of contact blocks	1 NO + 1 NC per contact block, up to a maximum of 3 contact blocks per switch
Terminals	Patented flexible solder - suitable for wire diameter 2 × 1.00 mm <sup>2</sup> (braided), 4 × 0.75 mm (stranded)
Vibration resistance	1.5mm pp amplitude at 55 Hz

## Recommended maximum electrical ratings

Voltage (max) 250 VAC	Resistive load (A) 5.0 (0.7 pf)	Inductive load (A)	Approval UL, CSA, VDE - max. admissible circuit breaker C6A
12 VDC	5.0	3.0	General rating
24 VDC	4.0	2.0	General rating
36 VDC	3.0	1.7	General rating
48 VDC	2.0	1.5	General rating
60 VDC	1.5	1.2	General rating
125 VDC	0.5	0.3	General rating
250 VDC	0.3	0.2	General rating

Electrical life 70,000 cycles at 5A, 250 VAC, 0.7 pf

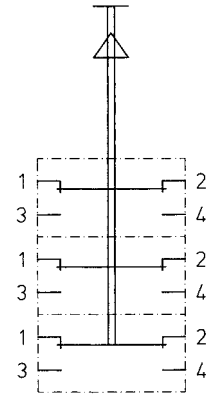
### Dimensions



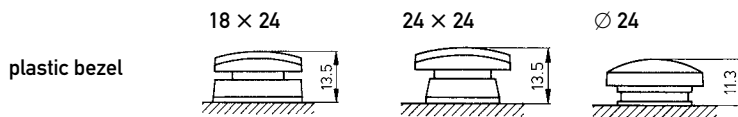
### Length in mm

Panel cut-out	16.2 ± 0.1	22.5 ± 0.1
N° of contact blocks 1	44.5	43.5
2	53.0	52.0
3	61.5	60.5

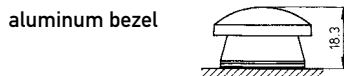
### Circuit diagrams (3 contact blocks)



### Bezel and lens heights in mm (switch off position)



panel cut-out 16.2 ± 0.1 mm



panel cut-out 22.5 mm

Front panel thickness 1.0 mm to 10 mm (Aluminum bezel 1.0 mm to 6.5 mm)

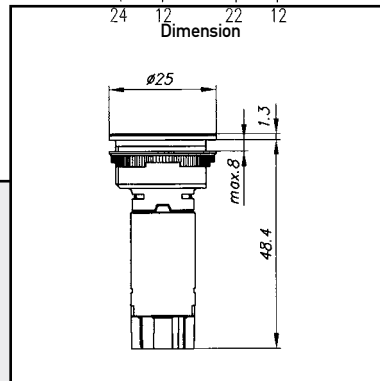
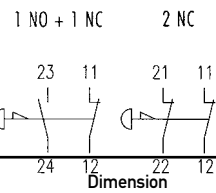
## Ordering Reference

Basic type		TP4				Example: TP4		1	MAJ0	A0	N	X	X
Panel cut-out	1	Ø 16.2 mm	Switch body 18 × 24; 24 × 24; Ø 24										
	2	Ø 22.5 mm	Switch body Ø 30 only										
		Function	Actuator style	Environmental protection	Contact blocks	Part No.							
Switch body	MAJ0	Momentary	18 × 24 mm	IP40	None	TH400004							
Panel cut-out 16.2 mm (A)	MAJ1	Momentary	18 × 24 mm	IP40	1NO + 1NC	TH400104							
	MAJ2	Momentary	18 × 24 mm	IP40	2 NO + 2 NC	TH400204							
	MAJ3	Momentary	18 × 24 mm	IP40	3 NO + 3 NC	TH400304							
Panel cut-out 16.2 mm (B)	LAJ0	Latching	18 × 24 mm	IP40	None	TH410004							
	LAJ1	Latching	18 × 24 mm	IP40	1NO + 1NC	TH410104							
	LAJ2	Latching	18 × 24 mm	IP40	2 NO + 2 NC	TH410204							
	LAJ3	Latching	18 × 24 mm	IP40	3 NO + 3 NC	TH410304							
	MCJ0	Momentary	24 × 24 mm	IP40	None	TH402004							
	MCJ1	Momentary	24 × 24 mm	IP40	1NO + 1NC	TH402104							
Panel cut-out 16.2 mm (C)	MCJ2	Momentary	24 × 24 mm	IP40	2 NO + 2 NC	TH402204							
	MCJ3	Momentary	24 × 24 mm	IP40	3 NO + 3 NC	TH402304							
	LCJ0	Latching	24 × 24 mm	IP40	None	TH412004							
	LCJ1	Latching	24 × 24 mm	IP40	1NO + 1NC	TH412104							
	LCJ2	Latching	24 × 24 mm	IP40	2 NO + 2 NC	TH412204							
	LCJ3	Latching	24 × 24 mm	IP40	3 NO + 3 NC	TH412304							
Panel cut-out 22.5 mm	MEJ0	Momentary	Ø 24	IP40	None	TH404004							
	MEJ1	Momentary	Ø 24	IP40	1NO + 1NC	TH404104							
	MEJ2	Momentary	Ø 24	IP40	2 NO + 2 NC	TH404204							
	MEJ3	Momentary	Ø 24	IP40	3 NO + 3 NC	TH404304							
	LEJ0	Latching	Ø 24	IP40	None	TH414004							
	LEJ1	Latching	Ø 24	IP40	1NO + 1NC	TH414104							
Panel cut-out 22.5 mm	LEJ2	Latching	Ø 24	IP40	2 NO + 2 NC	TH414204							
	LEJ3	Latching	Ø 24	IP40	3 NO + 3 NC	TH414304							
	MHJ0	Momentary	Ø 30	IP65	None	TH404019							
	MHJ1	Momentary	Ø 30	IP65	1NO + 1NC	TH404119							
	MHJ2	Momentary	Ø 30	IP65	2 NO + 2 NC	TH404219							
	MHJ3	Momentary	Ø 30	IP65	3 NO + 3 NC	TH404319							
Panel cut out 16.2 Actuator color For Switch body (A)	LHJ0	Latching	Ø 30	IP65	None	TH414019							
	LHJ1	Latching	Ø 30	IP65	1NO + 1NC	TH414119							
	LHJ2	Latching	Ø 30	IP65	2 NO + 2 NC	TH414219							
	LHJ3	Latching	Ø 30	IP65	3 NO + 3 NC	TH414319							
	For Switch body style (B)	A0	White	18 × 24 mm	Mushroom	THXXXXXX WHT							
		A1	Yellow	18 × 24 mm	Mushroom	THXXXXXX YEL							
A2		Green	18 × 24 mm	Mushroom	THXXXXXX GRN								
A3		Blue	18 × 24 mm	Mushroom	THXXXXXX BLU								
A4		Red	18 × 24 mm	Mushroom	THXXXXXX RED								
A5		Black	18 × 24 mm	Mushroom	THXXXXXX BLK								
For Switch body style (C)	C0	White	24 × 24 mm	Mushroom	THXXXXXX WHT								
	C1	Yellow	24 × 24 mm	Mushroom	THXXXXXX YEL								
	C2	Green	24 × 24 mm	Mushroom	THXXXXXX GRN								
	C3	Blue	24 × 24 mm	Mushroom	THXXXXXX BLU								
	C4	Red	24 × 24 mm	Mushroom	THXXXXXX RED								
	C5	Black	24 × 24 mm	Mushroom	THXXXXXX BLK								
Panel cut-out 22.5	E0	White	Ø 24 mm	Mushroom	THXXXXXX WHT								
	E1	Yellow	Ø 24 mm	Mushroom	THXXXXXX YEL								
	E2	Green	Ø 24 mm	Mushroom	THXXXXXX GRN								
	E3	Blue	Ø 24 mm	Mushroom	THXXXXXX BLU								
	E4	Red	Ø 24 mm	Mushroom	THXXXXXX RED								
	E5	Black	Ø 24 mm	Mushroom	THXXXXXX BLK								
Housing Color	H0	White	Ø 30 mm	Mushroom	THXXXXXX WHT								
	H1	Yellow	Ø 30 mm	Mushroom	THXXXXXX YEL								
	H2	Green	Ø 30 mm	Mushroom	THXXXXXX GRN								
	H3	Blue	Ø 30 mm	Mushroom	THXXXXXX BLU								
	H4	Red	Ø 30 mm	Mushroom	THXXXXXX RED								
	H5	Black	Ø 30 mm	Mushroom	THXXXXXX BLK								
Illumination	N	Natural											
Illumination color	X	Non illuminated											
Illumination	X	Non illuminated											

# Assembled Push Button



Circuit diagram



# TP8

## TP8

Panel cut-out (mm)	Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ momentary</li> <li>■ sealed IP67</li> <li>■ round metal bezels</li> <li>■ 1 NO + 1 NC, 2 NC, 2 NO</li> <li>■ gold plated contact block</li> </ul>
Rating	230 VAC, 6 A
Dimensions (mm)	Ø 25
Actuator	■ button and housing in different colors
Approvals	none



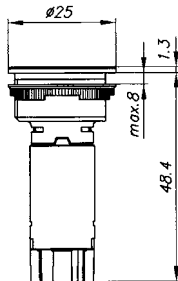
## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator style	Terminals (mm)	Electrical rating
TP82MDOA30	Ø 22.5	Momentary	Non-illuminated Natural Aluminum	2.8 × 0.5 Faston	230 VAC 6 A

## Specifications

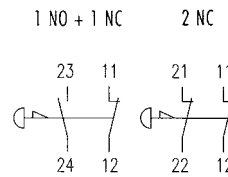
Mechanism	Momentary positive action with wiping contacts
Contact gap	>3 mm
Actuating force	Approximately 6.0N
Mounting	Central fixing with metal lock nut
Protection	IP67
Housing and actuator material	Anodised aluminum or stainless steel (upon request) Non-illuminated
Temperature range °C	-25°C to +55°C
Contact block	Supplied fitted
Contact block housing	Thermoplastic
Terminal material	Silver nickel with 0.4 µm gold plating
Contact resistance	<30mOhm
Number of contact blocks	1 NO + 1 NC or 2 NC or 2 NO (independent circuits)
Terminals	Faston - 2.8 mm × 0.5 mm, to DIN 46247

Dimensions



Panel cut-out 22.5 ± 0.1 mm

Circuit diagram



## Recommended maximum electrical ratings

Voltage (max) 230 VAC	Resistive load (A) 6.0	Inductive load (A)	Approval IEC 947-5-1, AC15 – recommended circuit breaker C6A
Electrical life	20,000 cycles at 10A, 24V, DC13 50,000 cycles at 5A, 24V, DC13 100,000 cycles at 5A, 12V, DC13 50,000 cycles at 6A, 250V, AC12 300,000 cycles at 2.5A, 250V, AC12		

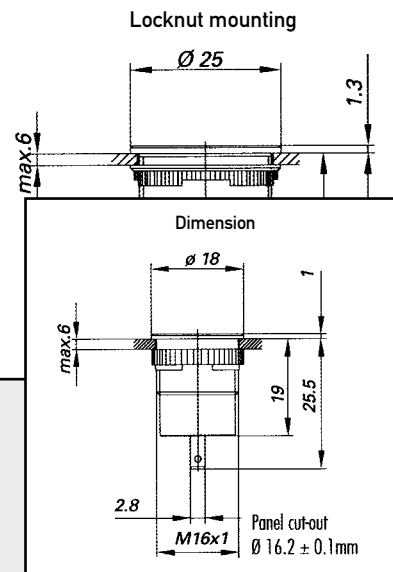
## Ordering Reference

Basic type	TP8	Example: TP8 2 MD0A 3 0		
Panel cut-out	2 Ø 22.5 mm			
Switch body	MD0A Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum natural; faston 2.8 mm × 0.5 mm MD1A Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum yellow; faston 2.8 mm × 0.5 mm MD2A Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum green; faston 2.8 mm × 0.5 mm MD4A Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum red; faston 2.8 mm × 0.5 mm MD5A Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum black; faston 2.8 mm × 0.5 mm MD8A Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum dark blue; faston 2.8 mm × 0.5 mm	TH80750 TH80750 TH80750 TH80750 TH80750 TH80750	X X X X X X	00 X 10 X 20 X 40 X 50 X 80 X
Contact (X)	3 Contact Block 1NO+1NC 4 Contact Block 2NC 5 Contact Block 2NO			
Actuator color (X)	0 Neutral 1 Yellow 2 Green 4 Red 5 Black 8 Dark blue			

Note: Stainless steel versions available upon request.



# Short stroke Push Button



## TP9

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ momentary short stroke switch</li> <li>■ sealed IP65 or IP67</li> <li>■ round metal bezels</li> <li>■ NO</li> <li>■ snap-in mounting option Ø 22.5 mm (IP65 only)</li> </ul>
Rating	50 VAC/VDC, 50 mA
Dimensions (mm)	Ø 18 Ø 25
Actuator	■ button and housing in different colors
Approvals	none



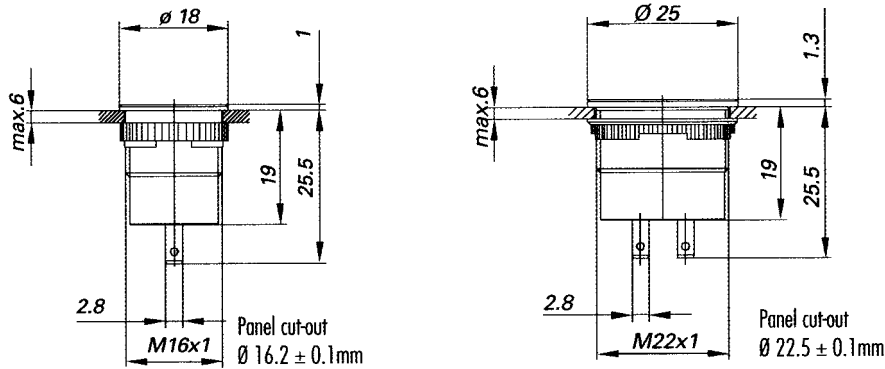
## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator size (mm)	Actuator style	Environmental protection	Terminals (mm)	Electrical rating
TP92MFOA000	Ø 22.5	Momentary 1NO	Ø 25	Non-illuminated natural aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA
TP92MFOA002	Ø 22.5	Momentary 1NO	Ø 25	Non-illuminated green anodised aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA
TP92MFOA004	Ø 22.5	Momentary 1NO	Ø 25	Non-illuminated red anodised aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA
TP92MFOA005	Ø 22.5	Momentary 1NO	Ø 25	Non-illuminated black anodised aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA

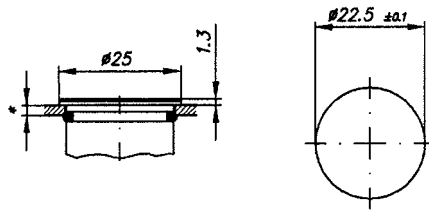
## Specifications

Mechanism	Momentary with 1mm short-stroke action
Actuating force	3.5N maximum
Mounting	Central fixing with metal lock nut or front assembly snap-in
Protection	IP65 (snap-in) or IP67 (lock nut)
Housing and actuator material	Anodised aluminum or stainless steel (upon request)
Illumination	Non-illuminated versions available only
Temperature range °C	-30°C to +70°C
Mechanical life	>200,000 (18 mm switch), >500,000 (25 mm switch)
Number of contact blocks	1 NO
Terminals	Faston – 2.8 mm × 0.5 mm

## Dimensions Locknut mounting



## Snap-in mounting



## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)
50 VAC	50 mA

## Ordering Reference

Basic type	TP9	Example: TP9	1	MD0A	00
Panel cut-out	1	Ø 16.2mm			
Switch body	MD0A	Ø 18 mm Momentary switch IP67; 1NO; Flush Aluminum natural; faston 2.8mm × 0.5mm	TH921000	XX3	
	MD1A	Ø 18 mm Momentary switch IP67; 1NO; Flush Aluminum yellow; faston 2.8mm × 0.5mm	TH921001	XX3	
	MD2A	Ø 18 mm Momentary switch IP67; 1NO; Flush Aluminum green; faston 2.8mm × 0.5mm	TH921002	XX3	
	MD4A	Ø 18 mm Momentary switch IP67; 1NO; Flush Aluminum red; faston 2.8mm × 0.5mm	TH921004	XX3	
	MD5A	Ø 18 mm Momentary switch IP67; 1NO; Flush Aluminum black; faston 2.8mm × 0.5mm	TH921005	XX3	
	MD8A	Ø 18 mm Momentary switch IP67; 1NO; Flush Aluminum dark blue; faston 2.8mm × 0.5mm	TH921008	XX3	
Actuator Color (XX)	00	Neutral			
	01	Yellow			
	02	Green			
	04	Red			
	05	Black			
	08	Dark blue			

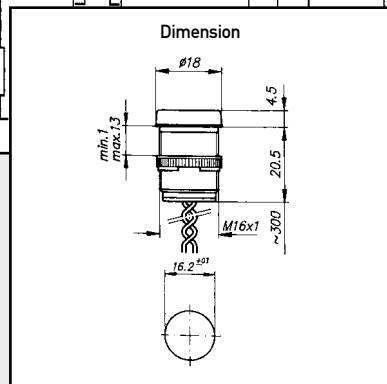
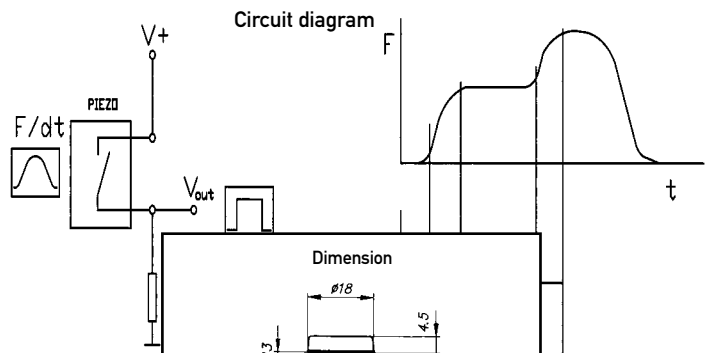
Stainless steel actuator and body styles, available upon request.

## Ordering Reference

Basic type	TP9	Example: TP9	2	MF0A	0	00
Panel cut-out	2	Ø 22.5 mm				
Switch body	MF0A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum natural; faston 2.8mm × 0.5mm	TH920	X00	XX1	
	MF1A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum yellow; faston 2.8mm × 0.5mm	TH920	X01	XX1	
	MF2A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum green; faston 2.8mm × 0.5mm	TH920	X02	XX1	
	MF4A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum red; faston 2.8mm × 0.5mm	TH920	X04	XX1	
	MF5A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum black; faston 2.8mm × 0.5mm	TH920	X05	XX1	
	MF8A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum dark blue; faston 2.8mm × 0.5mm	TH920	X08	XX1	
Mounting (X)	0	Locknut (IP67)				
	4	Snap-in-mounting 1.5mm - 2.0 mm panel thickness IP65 only				
	5	Snap-in-mounting 2.0mm - 2.5 mm panel thickness IP65 only				
	6	Snap-in-mounting 2.5mm - 3.0 mm panel thickness IP65 only				
Actuator color (XX)	00	Neutral				
	01	Yellow				
	02	Green				
	04	Red				
	05	Black				
	08	Dark blue				

Stainless steel actuator and body styles, available upon request.

# Piezo Push Button



## TP7

Panel cut-out (mm)  $\varnothing$  16.2,  $\varnothing$  22.5,  $\varnothing$  30.3,  $\varnothing$  43.3

- Characteristics
- piezo technology
  - momentary
  - sealed IP68
  - with or without illumination, two colors
  - solid state output
  - NO

Rating 3 to 35 VAC/VDC, 200 mA

Dimensions (mm)

- $\varnothing$  18
- $\varnothing$  25
- $\varnothing$  36
- $\varnothing$  48

Actuator ■ housing in different colors

Approvals none



### Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator size (mm)	Actuator style	Environmental protection	Terminals	Electrical rating
TP71MD1B04XX	$\varnothing$ 16.2	Momentary 1NO	$\varnothing$ 18	Non-illuminated, red anodised aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP71MD1B02XX	$\varnothing$ 16.2	Momentary 1NO	$\varnothing$ 18	Non-illuminated, green anodised aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP71MD1B05XX	$\varnothing$ 16.2	Momentary 1NO	$\varnothing$ 18	Non-illuminated, black anodised aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP71MD1B00XX	$\varnothing$ 16.2	Momentary 1NO	$\varnothing$ 18	Non-illuminated, natural aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP72MF1B00XX	$\varnothing$ 22.5	Momentary 1NO	$\varnothing$ 25	Non-illuminated, natural aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP72MG4B00C2	$\varnothing$ 22.5	Momentary 1NO	$\varnothing$ 25	Green illumination natural aluminum	IP68	Molex style 5 pin	35 VAC/VDC max, 200 mA
TP72MG2B00C4	$\varnothing$ 22.5	Momentary 1NO	$\varnothing$ 25	Red illumination natural aluminum	IP68	Molex style 5 pin	35 VAC/VDC max, 200 mA

## Specifications

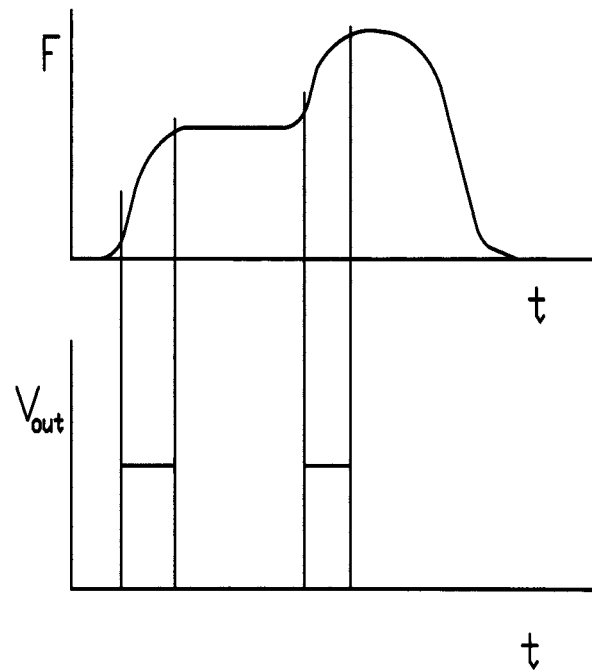
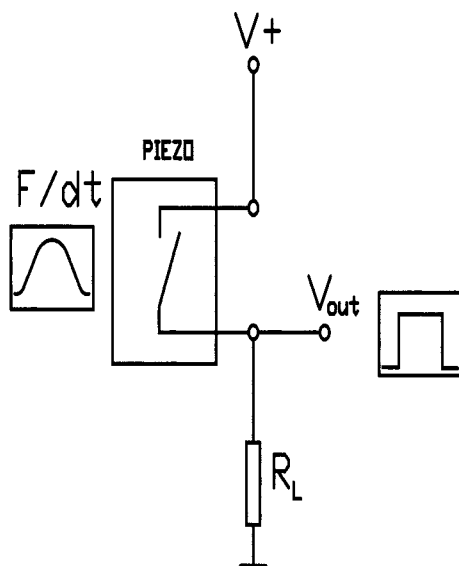
Mechanism	Piezo electronic, without auxilliary energy		
Actuating force	5N maximum at an actuating speed 500 to 1500 mm/s		
Closing impulse duration	10 to 1000 m/s - dependent on force and speed of actuation		
Mounting	Central fixing from the rear with metal lock nut		
Protection	IP68 (after installation)		
Housing and actuator material	Anodised aluminum and stainless steel		
Illumination	LED ( 18mm switch non-illuminated only)		
Temperature range °C	-40°C to +105°C (non-illuminated), -40°C to +85°C (illuminated)		
Life expectancy	>15 × 10 <sup>6</sup> cycles		
Contact resistance	<10 Ohm (on)		
Insulation resistance	>5M0hm (off)		
Terminals	Prewired; 2.8mm × 0.8mm faston; Molex-style 3,5 & 6 pin; AMP-style 4 pin		
Power consumption (illuminated types)	red or green:	12V IP = 40 mA	24V IF = 20 mA
	red/green:	12V IP = 2 × 20 mA	24V IF = 2 × 20 mA

## Technical information

The piezo sensor converts pressure into voltage signals. These analogue voltage signals are then processed within the switch to form switching signals, using field effect transistors (FET).

Due to the internal resistor, the circuit state is dependent upon actuating force and speed, means of operation and the discharge time of the R-C system. Standard digital or relay technology can be employed to create individual timed delay, flip-flop and power amplification circuits.

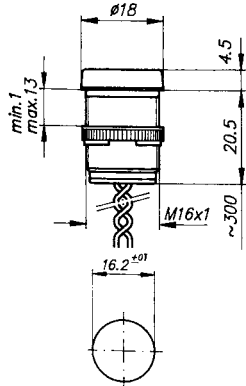
The circuit state diagram shows the approximate relationship between the force/time curve to the voltage circuit state:



## Recommended maximum electrical ratings

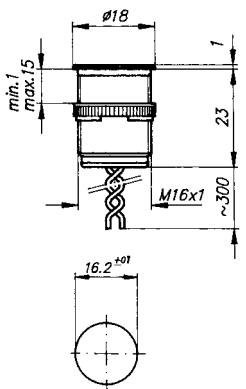
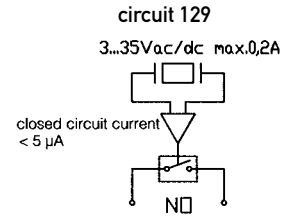
Voltage (max)	Resistive load (A)
3 to 35 VUC	0.2 A (0.7 pf)

Dimensions Non-illuminated

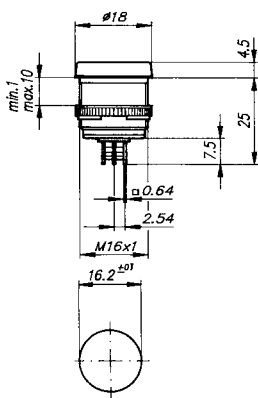
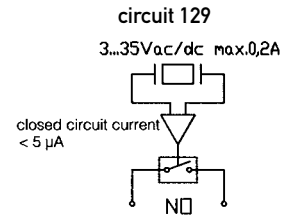


Ø 18, raised housing, prewired

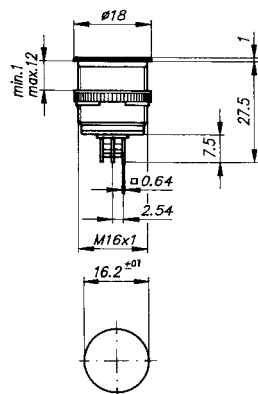
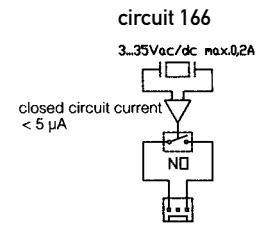
Circuit diagram



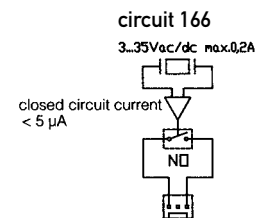
Ø 18, flush housing, prewired



Ø 18, raised housing, Molex-style 3 pin

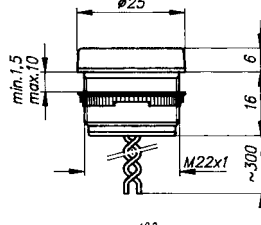


Ø 18, flush housing, Molex-style 3 pin

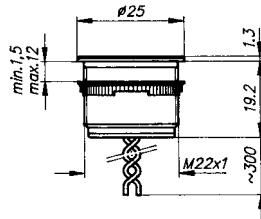
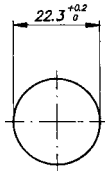




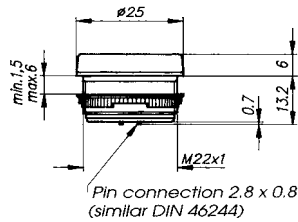
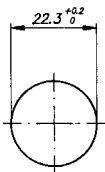
## Dimensions Non-illuminated



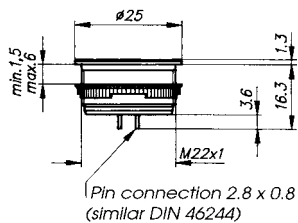
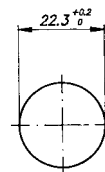
Ø 25, raised housing, prewired



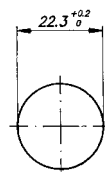
Ø 25, flush housing, prewired



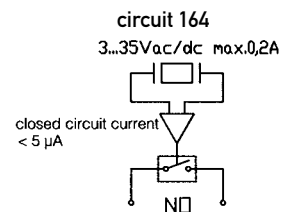
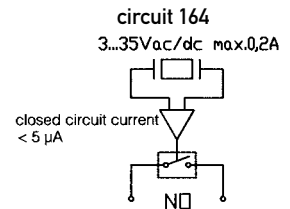
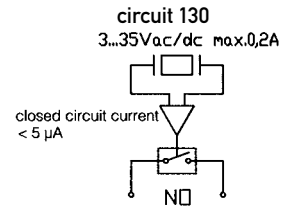
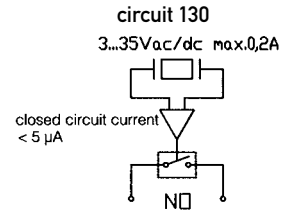
Ø 25, raised housing, solder connections 2.8 × 0.8



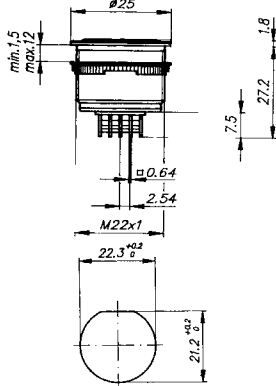
Ø 25, raised housing, solder connections 2.8 × 0.8



## Circuit diagram

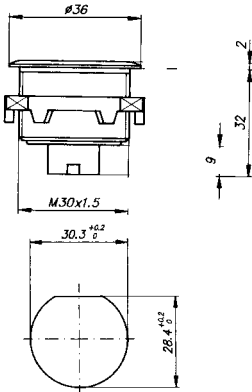
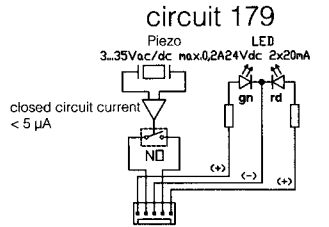
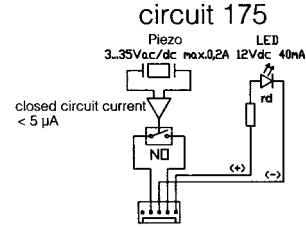
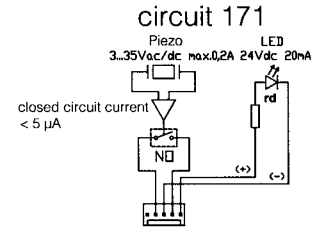
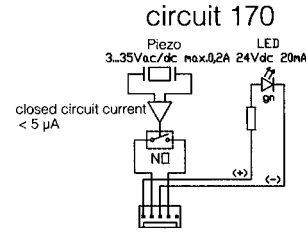
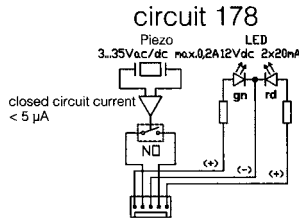
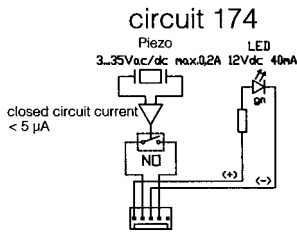


## Dimensions Illuminated



Ø 25. flush housing, Molex-style 5 pin

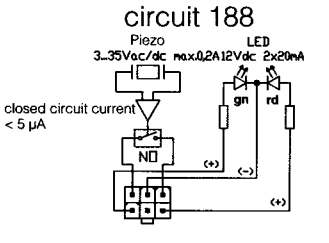
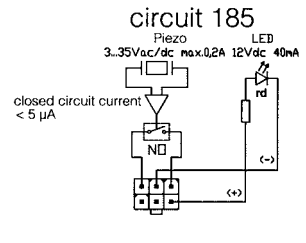
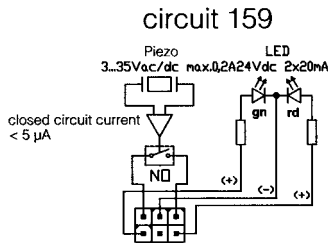
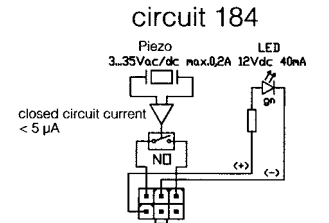
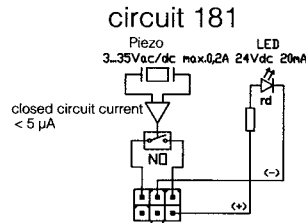
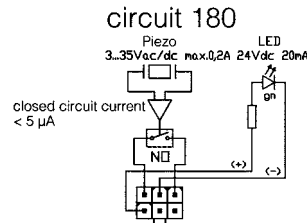
### Circuit diagram



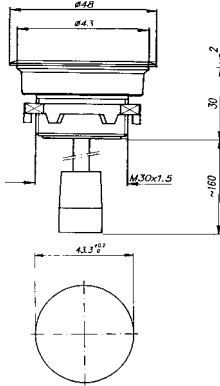
Ø 36. flush housing, Molex-style 6 pin

### Circuit diagram

### Circuit diagrams



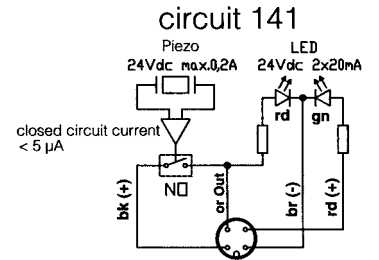
Dimensions Illuminated



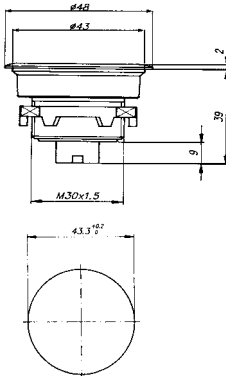
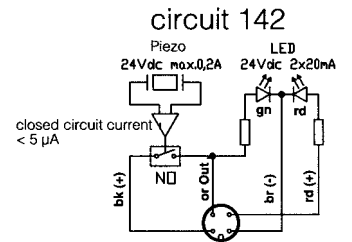
Ø 48, flush housing, wired with round connector  
AMP-style 4 pin

Internally wired visual indicator, red

Circuit diagram

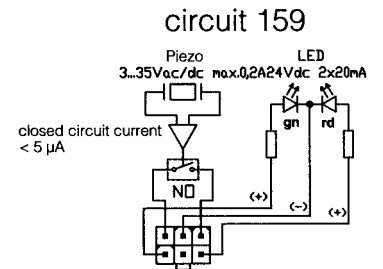
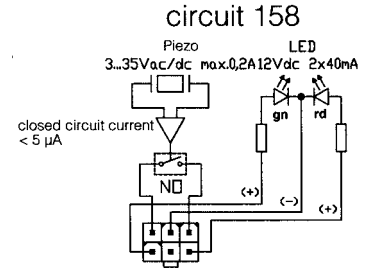


Internally wired visual indicator, green



Ø 48, flush housing, Molex-style 6 pin

Circuit diagram



## Ordering Reference

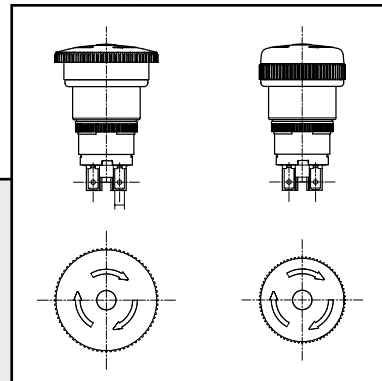
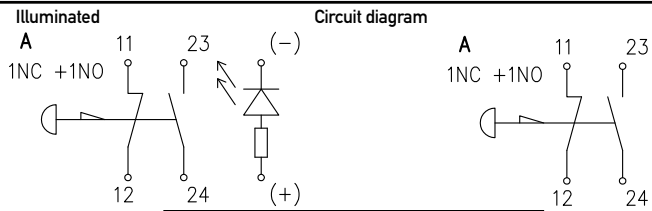
Basic type		TP7						Example: TP7 1 MD1A 00 B 2	
Panel cut-out	1	Ø 16.2 mm (for Actuator Ø 18 mm only)							
	2	Ø 22.5 mm (for Actuator Ø 25 mm only)							
		Function	Actuator	Housing	Connector	Environmental protection	Part No. color (XX)		
Switch body	MD1A	Momentary 1NO: 35V / 0.2A	Ø 18 mm	Raised Aluminum	Prewired	IP68	TH7020XX129		
	MD2A	Momentary 1NO: 35V / 0.2A	Ø 18 mm	Raised Aluminum	3 Pin MOLEX	IP68	TH7025XX166		
	MD1B	Momentary 1NO: 35V / 0.2A	Ø 18 mm	Flush Aluminum	Prewired	IP68	TH7021XX129		
	MD2B	Momentary 1NO: 35V / 0.2A	Ø 18 mm	Flush Aluminum	3 Pin MOLEX	IP68	TH7026XX166		
Non-illuminated	MF1A	Momentary 1NO: 35V / 0.2A	Ø 25 mm	Raised Aluminum	Prewired	IP68	TH7030XX130		
	MF2A	Momentary 1NC: 35V / 0.2A	Ø 25 mm	Raised Aluminum	Prewired	IP68	TH7030XX131		
	MF4A	Momentary 1NO: 35V / 0.2A	Ø 25 mm	Raised Aluminum	2.8 × 0.8 mm	IP68	TH7035XX164		
	MF1B	Momentary 1NO: 35V / 0.2A	Ø 25 mm	Flush Aluminum	Prewired	IP68	TH7031XX130		
	MF2B	Momentary 1NC: 35V / 0.2A	Ø 25 mm	Flush Aluminum	Prewired	IP68	TH7031XX131		
	MF4B	Momentary 1NO: 35V / 0.2A	Ø 25 mm	Flush Aluminum	2.8 × 0.8 mm	IP68	TH7036XX164		
	Illuminated	MG1B	Momentary 1NO: 35V / 0.2A 12V/40mA LED red	Ø 25 mm	Flush Aluminum	5 pin MOLEX	IP68	TH7055XX175	
		MG2B	Momentary 1NO: 35V / 0.2A 24V/20mA LED red	Ø 25 mm	Flush Aluminum	5 pin MOLEX	IP68	TH7055XX171	
MG3B		Momentary 1NO: 35V / 0.2A 12V/40mA LED green	Ø 25 mm	Flush Aluminum	5 pin MOLEX	IP68	TH7055XX174		
MG4B		Momentary 1NO: 35V / 0.2A 24V/20mA LED green	Ø 25 mm	Flush Aluminum	5 pin MOLEX	IP68	TH7055XX170		
MG5B		Momentary 1NO: 35V / 0.2A 12V/40mA LED red/green	Ø 25 mm	Flush Aluminum	5 pin MOLEX	IP68	TH7055XX178		
MG6B		Momentary 1NO: 35V / 0.2A 24V/20mA LED red/green	Ø 25 mm	Flush Aluminum	5 pin MOLEX	IP68	TH7055XX179		
Actuator color (XX)	00	Natural	} Please select appropriate color code reference to complete the switch part no. eg. TH702004129						
	01	Yellow							
	02	Green							
	04	Red							
	05	Black							
	08	Dark Blue							
Illumination	X	Non-illuminated							
	B	12V	(for illuminated switch bodies only)						
	C	24V	(for illuminated switch bodies only)						
Illumination color	X	Non-illuminated							
	2	Green LED	(for illuminated switch bodies only)						
	4	Red LED	(for illuminated switch bodies only)						
	9	Red/Green LED	(for illuminated switch bodies only)						

Stainless steel versions, available upon request.

Basic type	TP7						Example: TP7	3	MH1B	00	B	4
Panel cut-out	3	Ø 30.3 mm (for Actuator Ø 36 mm only)										
	4	Ø 43.3 mm (for Actuator Ø 48 mm only)										
		Function	Actuator	Housing	Connector	Environmental protection	Part No. color (XX)					
Switch body Illuminated	MH1B	Momentary 1NO: 35V / 0.2 A 12V/40mA LED red	Ø 36 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7065XX185					
	MH2B	Momentary 1NO: 35V / 0.2 A 24V/20mA LED red	Ø 36 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7065XX181					
	MH3B	Momentary 1NO: 35V / 0.2 A 12V/40mA LED green	Ø 36 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7065XX184					
	MH4B	Momentary 1NO: 35V / 0.2 A 24V/20mA LED green	Ø 36 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7065XX180					
	MH5B	Momentary 1NO: 35V / 0.2 A 12V/2×20mA LED red/green	Ø 36 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7065XX188					
	MH6B	Momentary 1NO: 35V / 0.2 A 24V/2×20mA LED red/green	Ø 36 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7065XX159					
Illuminated	MJ1B	Momentary 1NO: 35V, 0.2 A 24V, 2×20 mA LED green/red	Ø 48 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7062XX159					
	MJ2B	Momentary 1NO: 35V, 0.2 A 12V, 2×40 mA LED green/red	Ø 48 mm	Flush Aluminum	6 pin MOLEX	IP68	TH7062XX158					
	MJ3B	Momentary 1NO: 24V, 0.2 A 24V, 2×20 mA LED red/green	Ø 48 mm	Flush Aluminum	4 pin AMP	IP68	TH7062XX141					
	MJ4B	Momentary 1NO: 24V, 0.2 A 24V, 2×20 mA LED green/red	Ø 48 mm	Flush Aluminum	4 pin AMP	IP68	TH7062XX142					
Actuator color (XX)	00	Natural	}	Please select appropriate color code reference to complete the switch part no. above eg. TH706502185								
	01	Yellow										
	02	Green										
	04	Red										
	05	Black										
	08	Dark Blue										
Illumination	B	12V										
	C	24 V)										
Illumination color	2	Green LED										
	4	Red LED										
	9	Red/Green LED										

Stainless steel versions, available upon request.

# Emergency Stop



## TE1

Panel cut-out (mm) Ø 16.2 or Ø 22.5 with adapter option

- Characteristics
- NC contact with 3 mm contact gap
  - < 20 mm behind panel depth
  - rotary, reset mechanism
  - sealed IP65
  - 1NC + 1NO or 2 NC circuits

Rating 250 VAC, 2 A

Dimensions (mm) Ø 25/Ø 30

Button Ø 40/on request

Actuator ■ red mushroom cap

Approvals EN 60947-1, EN 60947-5-1, EN 60947-5-5



## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator size (mm)	Illumination	Environmental protection	Terminals (mm)	Electrical rating
TE180203101	Ø 16.2	Rotary reset 1NC + 1NO	Ø 25	Non illuminated	IP65	faston 2.8 × 0.5 (switching circuits)	250 VAC, 2A
TE180203102	Ø 16.2	Rotary reset 1NC + 1NO	Ø 30	Non illuminated	IP65	faston 2.8 × 0.5 (switching circuits)	250 VAC, 2A
TE180203201	Ø 16.2	Rotary reset 1NC + 1NO	Ø 25	Illuminated	IP65	faston 2.8 × 0.5 (switching circuits) pre wired (illumination circuit)	250 VAC, 2A
TE180203202	Ø 16.2	Rotary reset 1NC + 1NO	Ø 30	Illuminated	IP65	faston 2.8 × 0.5 (switching circuits) pre wired (illumination circuit)	250 VAC, 2A
TE180204101	Ø 16.2	Rotary reset 2NC	Ø 25	Non illuminated	IP65	faston 2.8 × 0.5 (switching circuits)	250 VAC, 2A
TE180204102	Ø 16.2	Rotary reset 2NC	Ø 30	Non illuminated	IP65	faston 2.8 × 0.5 (switching circuits)	250 VAC, 2A
TE180204201	Ø 16.2	Rotary reset 2NC	Ø 25	Illuminated	IP65	faston 2.8 × 0.5 (switching circuits) pre wired (illumination circuit)	250 VAC, 2A
TE180204202	Ø 16.2	Rotary reset 2NC	Ø 30	Illuminated	IP65	faston 2.8 × 0.5 (switching circuits) pre wired (illumination circuit)	250 VAC, 2A
TH880200029	Ø 22.5	Adapter set					

## Specifications

Mechanism	Latching positive action
Contact gap	≥3 mm
Actuating force	Approximately 30 N
Mounting	Central fixing with metal lock nut
Protection	IP65 (Pollution degree 3, Overvoltage category III)
Illumination	LED 24V dc, 10 mA
Temperature range °C	-25°C to +55°C
Contact material	Silver nickel with 0.4 µm gold plating
Contact resistance	<30 mOhm (new unused product)
Contact configuration	1 NC + 1 NO or 2 NC independent circuits
Terminals	Faston 4 × 2.8 mm × 0.5 mm (switching circuits) pre wired (illumination circuit)

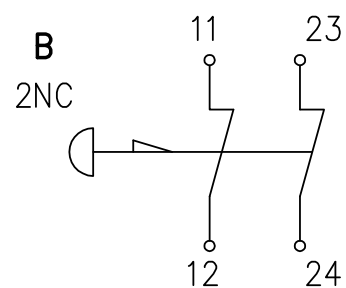
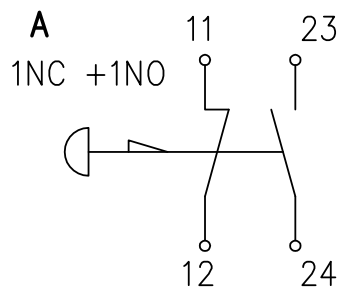
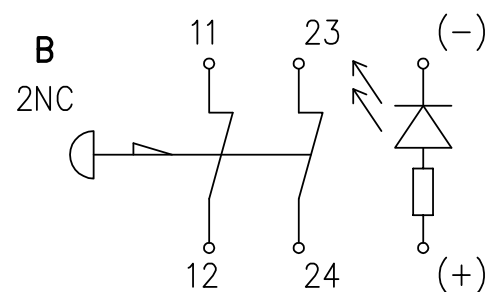
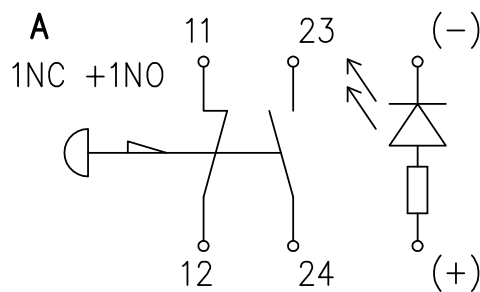
## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Approval
250 VAC	2.0	EN 60947

Electrical life	6,050 cycles at 2A, 250V, AC15
Mechanical life	30,000 cycles

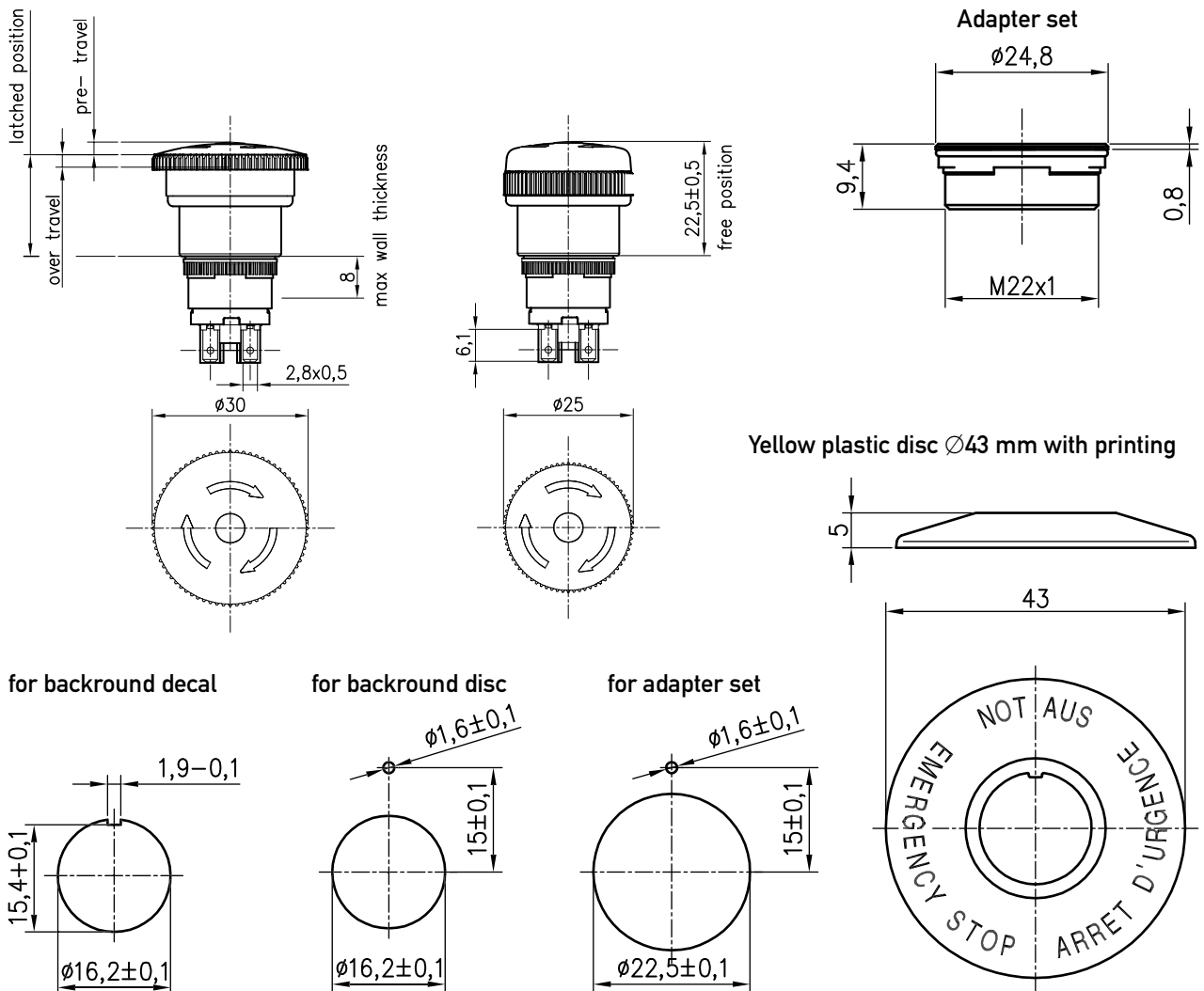
Circuit diagram

Illuminated





## Dimensions



## Ordering Reference

Basic type	TE1	Example: TE1 80 203 1 01		
Reset mechanism	80 Rotary			
Circuit configuration	203 1 normally closed and 1 normally open circuit 204 2 normally closed circuits			
	1 Non-illuminated 2 Illuminated			
Actuator style	01 Ø 25 mm 02 Ø 30 mm			
Accessories	TH893002000 Yellow plastic disc Ø 43 mm with printing TH893011000 Yellow self-adhesive label Ø 43 mm with printing TH893000000 Yellow plastic adaptor Ø 43 mm with printing TH880200029 Adapter set 22.5 mm	For 16.2 mm panel cut-out For 22.5 mm panel cut-out	For 16.2 mm panel cut-out For 22.5 mm panel cut-out	

## TE8

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ meets EN418 directives (Ø 27 mm only)</li> <li>■ sealed IP66 or IP67</li> <li>■ rotary, pull or key reset</li> <li>■ yellow disk bezel (optional)</li> <li>■ 1NO + 1 NC or 2 NC</li> </ul>
Rating	250 VAC, 6 A
Dimensions (mm)	Ø 27 Ø 40
Actuator	<ul style="list-style-type: none"> <li>■ red mushroom cap (Ø 27 mm)</li> <li>■ reset by KABA key (Ø 40 mm)</li> </ul>
Approvals	IEC 947-5-1/947-5-5 (Ø 27 mm only)

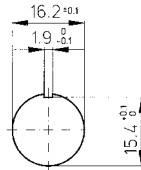
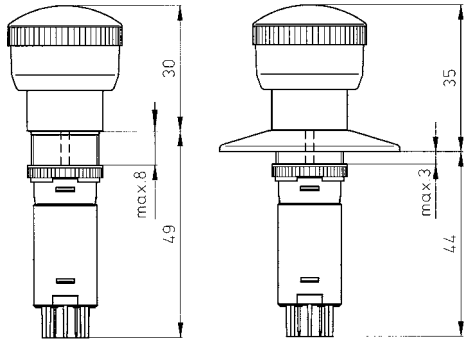


## Popular products

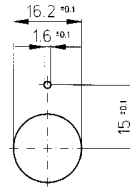
Ordering Reference	Panel cut-out (mm)	Function	Actuator style (mm)	Environmental protection	Terminals (mm)	Electrical rating
TE82KJB1XX	Ø 22.5	Key release 1NO + 1NC	Ø 40	IP40	2.8 × 0.5 faston	250 VAC, 6A
TE81RGP2A1	Ø 16.2	Rotary release 2NC	Ø 27	IP67	2.8 × 0.5 faston	250 VAC, 6A

## Specifications

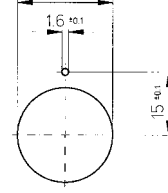
Mechanism	Momentary positive action with wiping contacts
Contact gap	>3 mm
Actuating force	Approximately 25 N
Mounting	Central fixing with metal lock nut (E switch) and Anti-rotation device on key (reset switch)
Protection	IP67
Bezel material	Thermoplastic or nickel-plated brass
Lens material	Polycarbonate
Illumination	Non-illuminated
Temperature range °C	-25°C to +55°C
Contact block	Supplied fitted
Contact block housing	Thermoplastic
Terminal material	Silver nickel with 0.4 µm gold plating
Contact resistance	<30 mOhm
Number of contact blocks	1 NO + 1 NC or 2 NC – independent circuits
Terminals	Faston - 2.8 mm × 0.5 mm, to DIN 46247



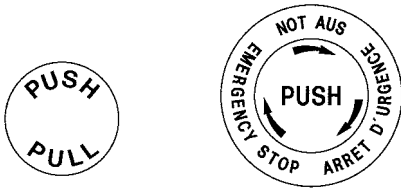
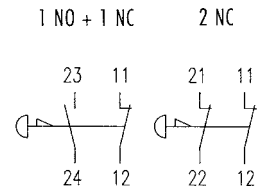
for back-ground decal  
for panel cut-out  
Ø 16.2 mm



for back-ground disc  
for panel cut-out  
Ø 16.2 mm



for adapter set  
for panel cut-out  
Ø 16.2 mm



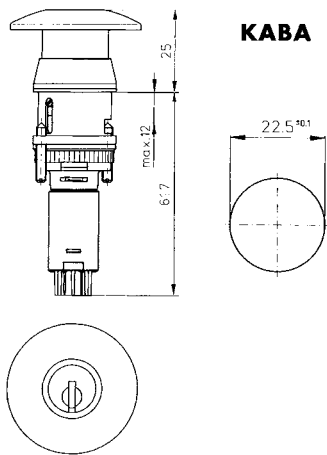
mushroom cap × 27 mm, red  
disc bezel, yellow plastic, × 43 mm

## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load (A)	Approval
230 VAC	6.0		IEC 947-5-1, AC15 - recommended circuit breaker C6A

Electrical life	20,000 cycles at 10A, 24V, DC13
	50,000 cycles at 5A, 24V, DC13
	100,000 cycles at 5A, 12V, DC13
	50,000 cycles at 6A, 250V, AC12
	300,000 cycles at 2.5A, 250V, AC12

## Dimensions Mushroom switches with key reset IP40



mushroom cap × 40 mm, red  
bezel × 29 mm

These switches can be integrated in security key code plans. The following security system are available at a surcharge: KABA 8, KABA 20, KABA STAR. Extra registered keys are only available from the cylinder manufacturer.

model with KABA 8-cylinder  
standard key code 317 000

Cylinder no.  
for key code plans 1063 B

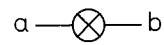
## Ordering Reference

Basic type	TE8			Example: TE8	1	KJB1	A1
Panel cut-out	1	Ø 16.2 mm for E-Stop with rotary and pull reset					
	2	Ø 22.5 mm only for E-Stop with key release					
Switch body	Function	Actuator style	Contact block	Part No.			
	KJB1 E-Stop with key reset: 1NO + 1NC	Ø 40 mm red; IP40; no print	1NO+1NC; 2.8 × 0.5mm	TH885503100			
	KJB2 E-Stop with key reset: 2NC	Ø 40 mm red; IP40; no print	2NC; 2.8 × 0.5mm	TH885504100			
	PGP1 E-Stop with pull reset; conforms to EN 418	Ø 27 mm red; IP67; printed	1NO+1NC; 2.8 × 0.5mm	TH881203000			
	PGP2 E-Stop with pull reset; conforms to EN 418	Ø 27 mm red; IP67; printed	2NC; 2.8 × 0.5mm	TH881204000			
	RGP1 E-Stop with rotary reset; conforms to EN 418	Ø 27 mm red; IP67; printed	1NO+1NC; 2.8 × 0.5mm	TH880203000			
	RGP2 E-Stop with rotary reset; conforms to EN 418	Ø 27 mm red; IP67; printed	2NC; 2.8 × 0.5mm	TH880204000			
Disk bezel	XX	Not available for key reset version					
	A1	Yellow plastic disk Ø 43 mm with printing	For 16.2mm panel cut out	TH893002000			
	B1	Yellow plastic disk Ø 43 mm without printing	For 16.2mm panel cut out	TH893003000			
	C1	Yellow self adhesive label Ø 43 mm with printing	For 16.2mm panel cut out	TH893011000			
	D1	Yellow self adhesive label Ø 43 mm without printing	For 16.2mm panel cut out	TH893010000			
	E1	Yellow plastic adapterset Ø 43 mm with printing	For 22.5mm panel cut out	TH893000000			
	F1	Yellow plastic adapterset Ø 43 mm without printing	For 22.5mm panel cut out	TH893001000			

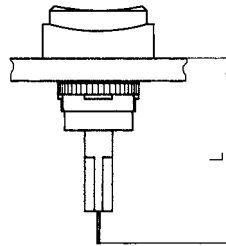
# Indicators



Circuit diagram



Dimension



## TI2

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ illuminated</li> <li>■ sealed IP40, IP65 or IP67</li> <li>■ wide range of bezels</li> <li>■ midget grooved lamp/LED</li> </ul>
Rating	max. 60 VAC / VDC
Dimensions (mm)	18 × 24 18 × 18 Ø 18 Ø 25
Actuator	■ lenses in different shapes and colors
Approvals	UL, CSA, VDE

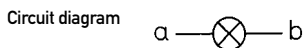


## Popular products

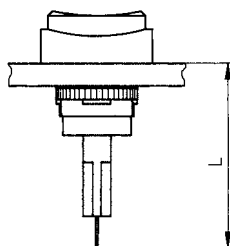
Ordering Reference	Panel cut-out (mm)	Function	Actuator style (mm)	Environmental Protection
TI21VAAF4CN	Ø 16.2	Visual	18 × 24	IP40
TI22VFAF4CN	Ø 22.5	Visual	Ø 25	IP65

## Specifications

Mounting	Central fixing with metal lock nut
Protection	IP40, IP65, IP67
Bezel material	Thermoplastic or anodized aluminum alloy
Lens material	Polycarbonate - engravable
Illumination	T1 ¾ midget grooved lamps - incandescent lamps, LEDs, multi LEDs 60 V, 1.2 W maximum Lamp contact a = anode (+), b = cathode (-) Appropriate safety regulations should be respected when using the indicator light.
Temperature range °C	-25°C to +85°C
Terminals	Solder – suitable for wire diameter 1 × 1.00 mm <sup>2</sup> (braided), 2 × 0.75 mm (stranded) Faston – 2.8 mm × 0.5 mm
Vibration resistance	1.5 mm pp amplitude at 55 Hz



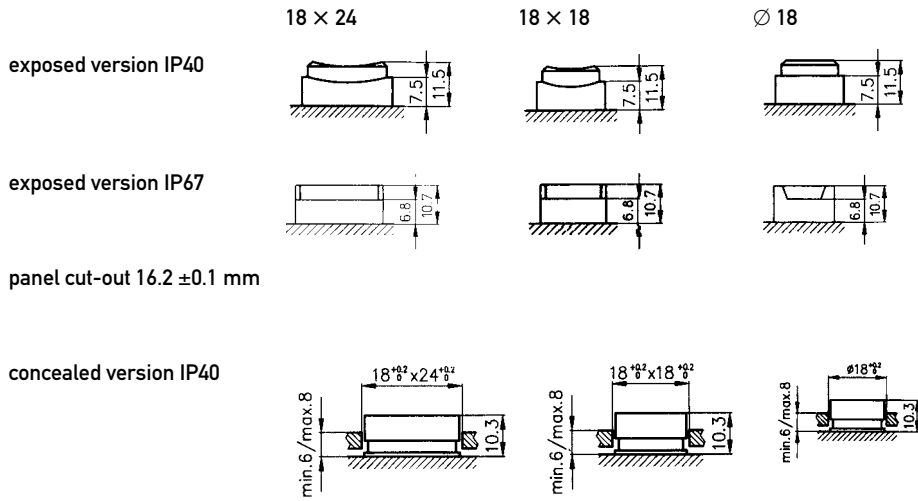
Dimensions



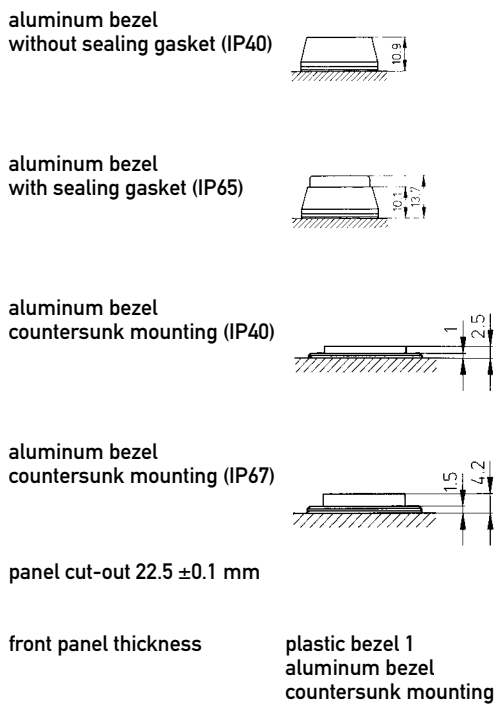
Length in mm
plastic bezels
countersunk mounting bezels
aluminum bezels
countersunk mounting

38 mm  
40 mm  
48 mm

Plastic bezel and lens heights in mm (switch off position)



Dimensions Aluminum bezel ∅ 25, Lens heights in mm (switch off position)



## Ordering Reference

Basic type	T12				Example: T12	1	VAA	F0	A	N
Panel cut-out	1				Ø 16.2 mm					
Switch body	Function	Actuator	Housing (plastic)		Part No.					
	VAA Visual	18 × 24 mm	Exposed: IP40; faston		TH551008000					
	VAL Visual	18 × 24 mm	Exposed: IP40; solder		TH551108000					
	VAD Visual	18 × 24 mm	Exposed: IP67; faston		TH551015000					
	VAO Visual	18 × 24 mm	Exposed: IP67; solder		TH551115000					
	VAB Visual	18 × 24 mm	Concealed: IP40; faston		TH551002000					
	VAM Visual	18 × 24 mm	Concealed: IP40; solder		TH551102000					
	VBA Visual	18 × 18 mm	Exposed: IP40; faston		TH553008000					
	VBL Visual	18 × 18 mm	Exposed: IP40; solder		TH553108000					
	VBC Visual	18 × 18 mm	Exposed: IP67; faston		TH553015000					
	VBN Visual	18 × 18 mm	Exposed: IP67; solder		TH553115000					
	VBB Visual	18 × 18 mm	Concealed: IP40; faston		TH553002000					
	VBM Visual	18 × 18 mm	Concealed: IP40; solder		TH553102000					
	VCA Visual	Ø 18	Exposed, IP40; faston		TH555008000					
	VCL Visual	Ø 18	Exposed, IP40; solder		TH555108000					
	VCC Visual	Ø 18	Exposed, IP67; faston		TH555015000					
	VCN Visual	Ø 18	Exposed, IP67; solder		TH555115000					
	VCB Visual	Ø 18	Concealed, IP40; faston		TH555002000					
	VCM Visual	Ø 18	Concealed, IP40; solder		TH555102000					
	Lens transparent			For body style	For body style	For body style				
		VAA/VAL (IP40)	VAB/VAM (IP40)	VAD/VAO (IP67)						
F0		White	TH461021000	TH461017000	TH561011000					
F1		Yellow	TH461121000	TH461117000	TH561111000					
F2		Green	TH461221000	TH461217000	TH561211000					
F3		Blue	TH461321000	TH461317000	TH561311000					
F4		Red	TH461421000	TH461417000	TH561411000					
F6		Orange	TH461621000	TH461617000	TH561611000					
		For body style	For body style	For body style						
		VBA/VBL (IP40)	VBB/VBM (IP40)	VBC/VBN (IP67)						
F0		White	TH463021000	TH463018000	TH563011000					
F1		Yellow	TH463121000	TH463118000	TH563111000					
F2		Green	TH463221000	TH463218000	TH563211000					
F3		Blue	TH463321000	TH463318000	TH563311000					
F4		Red	TH463421000	TH463418000	TH563411000					
F6		Orange	TH463621000	TH463618000	TH563611000					
		For body style	For body style	For body style						
		VCA/VCL (IP40)	VCB/VCM (IP40)	VCC/VCN (IP67)						
F0	White	TH465021000	TH465015000	TH565011000						
F1	Yellow	TH465121000	TH465115000	TH565111000						
F2	Green	TH465221000	TH465215000	TH565211000						
F3	Blue	TH465321000	TH465315000	TH565311000						
F4	Red	TH465421000	TH465415000	TH565411000						
F6	Orange	TH465621000	TH465615000	TH565611000						
Illumination	A	6V								
	B	12V								
	C	24V								
	F	48V								
Illumination color	N	Incandescent lamp	6V, 200 mA TH590000000	12V, 80 mA TH590001000	24V, 50 mA TH590006000	48V, 25 mA TH590004000				
	1	Yellow LED	6V AC/DC, 45 mA TH590231000	12V AC/DC, 25 mA TH590234000	24V AC/DC, 12.5 mA TH590237000	48V AC/DC, 12.5 mA TH590240000				
	2	Green LED	TH590232000	TH590235000	TH590238000	TH590241000				
	4	Red LED	TH590230000	TH590233000	T H590236000	TH590239000				
	Acoustic versions available upon request									



## Ordering Reference

Basic type	T12				Example: T12	2	VFA	F0	A	N	
Panel cut-out	2				Ø 22.5 mm						
Switch body	VFA	Visual	Function	Actuator style	Housing	Part No.					
	VFB	Visual	Visual	Ø 25	Exposed plastic; IP65; faston	TH555020000					
	VFC	Visual	Visual	Ø 25	Exposed plastic; IP65; solder	TH555120000					
	VFD	Visual	Visual	Ø 25	Exposed aluminum; IP40/IP65*; faston	TH555018000					
	VFE	Visual	Visual	Ø 25	Exposed aluminum; IP40/IP65*; solder	TH555118000					
	VFF	Visual	Visual	Ø 25	Exposed aluminum; IP65 with silicon cap; faston	TH555033000					
	VFG	Visual	Visual	Ø 25	Exposed aluminum; IP65 with silicon cap; solder	TH555133000					
	VFH	Visual	Visual	Ø 25	Flush-aluminum; IP40; faston	TH555050000					
	VFJ	Visual	Visual	Ø 25	Flush-aluminum; IP40; solder	TH555150000					
	VFK	Visual	Visual	Ø 25	Flush-aluminum; IP67; faston	TH555051000					
VFK	Visual	Visual	Ø 25	Flush-aluminum; IP67; solder	TH555151000						
Lens transparent					For body style	VFC/VFD	With sealing ring				
					VFA/VFB (IP65)	VFG/VFH (IP40/IP65)	VFE/VFF (IP65)	VFJ/VFK (IP67)			
	F0	White			TH565024000	TH465015000	TH465001000	TH565025000			
	F1	Yellow			TH565124000	TH465115000	TH465101000	TH565125000			
	F2	Green			TH565224000	TH465215000	TH465201000	TH565225000			
	F3	Blue			TH565324000	TH465315000	TH465301000	TH565325000			
	F4	Red			TH565424000	TH465415000	TH465401000	TH565425000			
F6	Orange			TH565624000	TH465615000	TH465601000	TH565625000				
Illumination	A	6V									
	B	12V									
	C	24V									
	F	48V									
Illumination color	N	Incandescent lamp	6V, 200 mA	12V, 80 mA	24V, 50 mA	48V, 25 mA					
			TH590000000	TH590001000	TH590006000	TH590004000					
			6V AC/DC, 45 mA	12V AC/DC, 25 mA	24V AC/DC, 12.5 mA	48V AC/DC, 12.5 mA					
	1	Yellow LED	TH590231000	TH590234000	TH590237000	TH590240000					
	2	Green LED	TH590232000	TH590235000	TH590238000	TH590241000					
4	Red LED	TH590230000	TH590233000	TH590236000	TH590239000						

Acoustic versions available upon request

# T15

## T15

Panel cut-out (mm)  $\varnothing$  16.2 or  $\varnothing$  22.5

- Characteristics
- illuminated
  - sealed IP40 or IP65
  - wide range of bezels
  - midget grooved lamp/LED

Rating max. 60 VAC/VDC

Dimensions (mm)  $18 \times 24$   
 $18 \times 18$   
 $\varnothing 18$   
 $\varnothing 25$

Actuator ■ lenses in different shapes and colors

Approvals UL, CSA, VDE



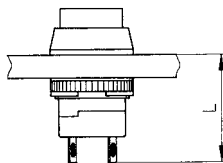
## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator style (mm)	Environmental Protection
TI51VALA4CN	$\varnothing$ 16.2	Visual	$18 \times 24$	IP40
TI52VFSF4CN	$\varnothing$ 22.5	Visual	$\varnothing$ 25	IP65

## Specifications

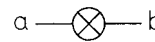
Mounting	Central fixing with metal lock nut
Protection	IP40, IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Lens material	Polycarbonate – engravable
Illumination	T1 ¼ midget grooved lamps – incandescent lamps , LEDs, multi LEDs 60 V, 1.2 W maximum Lamp contact a = anode (+), b = cathode (-) Appropriate safety regulations should be respected when using the indicator light.
Temperature range °C	-25°C to +85°C
Terminal material	Silver alloy with 2 µm silver plating, 4 µm gold plating
Terminals	Patented flexible solder - suitable for wire diameter 2 × 1.00 mm <sup>2</sup> (braided), 4 × 0.75 mm (stranded)
Vibration resistance	1.5 mm pp amplitude at 55 Hz

### Dimensions



Length in mm	
plastic bezels	23.5
countersunk mounting bezels	22.5
aluminum bezels	32.0
countersunk mounting	

### Circuit diagram



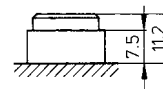
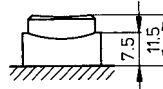
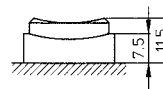
### Plastic bezel and lens heights in mm (switch off position)

18 × 24

18 × 18

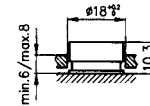
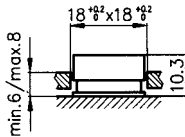
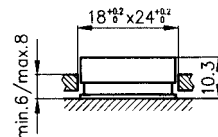
∅ 18

exposed version IP 40



panel cut-out 16.2 ± 0.1 mm

concealed version IP40



### Aluminum bezel ∅ 25 and lens height in mm (switch off position)

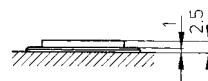
aluminum bezel  
without sealing gasket (IP40)



aluminum bezel  
with sealing gasket (IP65)



aluminum bezel  
countersunk mounting (IP40)



panel cut-out 22.5 ± 0.1 mm

front panel thickness	plastic bezel (∅ 18 mm)	1.0 to 5.5 mm
	aluminum bezel (∅ 25 mm)	1.0 to 5.0 mm
	countersunk mounting (∅ 25 mm)	2.0 to 15.0 mm

## Ordering Reference

Basic type	T15						Example: T15	1	VAL	A0	A	N
Panel cut-out	1						Ø 16.2 mm					
Switch body (A)	VAL	Function	Actuator style	Housing (plastic)	Part No.							
		Visual	18 × 24 mm	Exposed; IP40; solder	TH550008000							
	VAM	Visual	18 × 24 mm	Concealed; IP40; solder	TH550037000							
		VBL	Visual	18 × 18 mm	Exposed; IP40; solder	TH552008000						
	VBM	Visual	18 × 18 mm	Concealed; IP40; solder	TH552037000							
		VDM	Visual	Ø 18 mm	Exposed; IP40; solder	TH554008000						
VDM	Visual		Ø 18 mm	Concealed; IP40; solder	TH554037000							
	Lens, transparent For Switch body style (A)	A0	White	Exposed 15 × 21 mm	Exposed TH461021000	Concealed 18 × 24 mm	Concealed TH461017000					
A1		Yellow	15 × 21 mm	TH461121000	18 × 24 mm	TH461117000						
A2		Green	15 × 21 mm	TH461221000	18 × 24 mm	TH461217000						
A3		Blue	15 × 21 mm	TH461321000	18 × 24 mm	TH461317000						
A4		Red	15 × 21 mm	TH461421000	18 × 24 mm	TH461417000						
A6		Orange	15 × 21 mm	TH461621000	18 × 24 mm	TH461617000						
For Switch body style (B)		B0	White	15 × 15 mm	TH463021000	18 × 18 mm	TH463018000					
	B1	Yellow	15 × 15 mm	TH463121000	18 × 18 mm	TH463118000						
	B2	Green	15 × 15 mm	TH463221000	18 × 18 mm	TH463218000						
	B3	Blue	15 × 15 mm	TH463321000	18 × 18 mm	TH463318000						
	B4	Red	15 × 15 mm	TH463421000	18 × 18 mm	TH463418000						
	B6	Orange	15 × 15 mm	TH463621000	18 × 18 mm	TH463618000						
For Switch body style (C)	D0	White	Ø 15 mm	TH465021000	Ø 18 mm	TH465015000						
	D1	Yellow	Ø 15 mm	TH465121000	Ø 18 mm	TH465115000						
	D2	Green	Ø 15 mm	TH465221000	Ø 18 mm	TH465215000						
	D3	Blue	Ø 15 mm	TH465321000	Ø 18 mm	TH465315000						
	D4	Red	Ø 15 mm	TH465421000	Ø 18 mm	TH465415000						
	D6	Orange	Ø 15 mm	TH465621000	Ø 18 mm	TH465615000						
Illumination	X	Non illuminated										
	A	6V										
	B	12V										
	C	24V										
	F	48V										
Illumination color	X	Non illuminated										
	N	Incandescent lamp										
			6V, 200 mA TH590000000	12V, 80 mA TH590001000	24V, 50 mA TH590006000	48V, 25 mA TH590004000						
	1	Yellow LED	6V AC/DC, 45 mA TH590231000	12V AC/DC, 25 mA TH590234000	24V AC/DC, 12.5 mA TH590237000	48V AC/DC, 12.5 mA TH590240000						
	2	Green LED	TH590232000	TH590235000	TH590238000	TH590241000						
4	Red LED	TH590230000	TH590233000	TH590236000	TH590239000							

Acoustic versions available upon request

## Ordering Reference

Basic type	T15				Example: T15				2	VFP	F0	A	N
Panel cut-out	2 Ø 22.5 mm												
Switch body	VFP Visual	Function	Actuator style	Housing (Aluminum)	Part No.								
		Ø 25 mm	Exposed aluminum; IP40; solder		TH554018000								
	VFQ Visual	Ø 25 mm	Exposed aluminum; IP65; solder		TH554018000								
	VFR Visual	Ø 25 mm	Exposed aluminum; IP65* with silicon cap; solder		TH554033000								
	VFS Visual	Ø 25 mm	Flush-aluminum; IP40; solder		TH554050000								
Lens transparent Only for Visual Indicators	F0	White	Ø 18	Exposed IP40/IP65 Flush IP40				Exposed IP65 with sealing ring					
	F1	Yellow	Ø 18	TH465015000				TH465001000					
	F2	Green	Ø 18	TH465115000				TH465101000					
	F3	Blue	Ø 18	TH465215000				TH465201000					
	F4	Red	Ø 18	TH465315000				TH465301000					
	F5	Orange	Ø 18	TH465415000				TH465401000					
	F6	Orange	Ø 18	TH465615000				TH465601000					
Illumination	X	Non illuminated											
	A	6V											
	B	12V											
	C	24V											
	F	48V											
Illumination color	X	Non illuminated											
	N	Incandescent lamp											
			6V, 200 mA	12V, 80 mA	24V, 50 mA	48V, 25 mA							
			TH590000000	TH590001000	TH590006000	TH590004000							
		1	Yellow LED	6V AC/DC, 45 mA	12V AC/DC, 25 mA	24V AC/DC, 12.5 mA	48V AC/DC, 12.5 mA						
	2	Green LED	TH590231000	TH590234000	TH590237000	TH590240000							
	3	Green LED	TH590232000	TH590235000	TH590238000	TH590241000							
	4	Red LED	TH590230000	TH590233000	TH590236000	TH590239000							

Acoustic versions available upon request

## T19

Panel cut-out (mm)	Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ illuminated</li> <li>■ sealed IP67</li> <li>■ round metal bezels</li> <li>■ red LED</li> <li>■ green LED</li> <li>■ red-green LED</li> </ul>
Rating	24 VDC 20 mA
Dimensions (mm)	Ø 25
Actuator	■ aluminum housing in different colors
Approvals	none



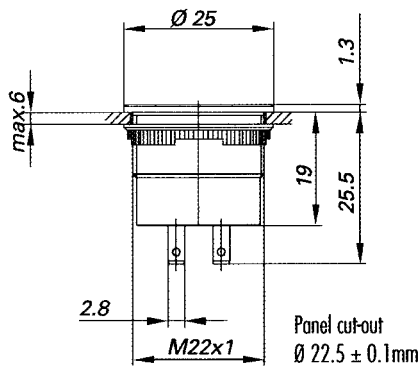
## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator style (mm)	Environmental Protection
TI92VFOA500	Ø 22.5	Visual	Ø 25	IP67

## Specifications

Mounting	Central fixing with metal lock nut
Protection	IP67
Housing and actuator material	Anodised aluminum or stainless steel (upon request)
Temperature range °C	-30°C to +70°C
Terminals	Faston - 2.8mm × 0.5mm

### Dimensions

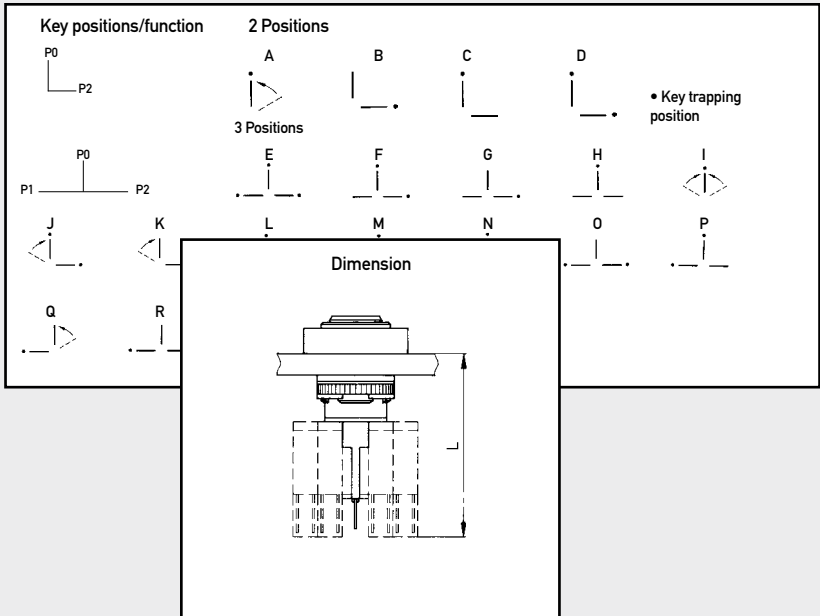


## Ordering Reference

Basic type	T19	Example: T19	2	VF0A	504
Panel cut-out	2	Ø 22.5 mm			
Switch body	VF0A	Ø 25 mm Visual Indicator IP67; 1NO; Flush Aluminum natural; faston 2.8 mm × 0.5 mm		TH920000	XXX
	VF1A	Ø 25 mm Visual Indicator IP67; 1NO; Flush Aluminum yellow; faston 2.8 mm × 0.5 mm		TH920001	XXX
	VF2A	Ø 25 mm Visual Indicator IP67; 1NO; Flush Aluminum green; faston 2.8 mm × 0.5 mm		TH920002	XXX
	VF4A	Ø 25 mm Visual Indicator IP67; 1NO; Flush Aluminum red; faston 2.8 mm × 0.5 mm		TH920004	XXX
	VF5A	Ø 25 mm Visual Indicator IP67; 1NO; Flush Aluminum black; faston 2.8 mm × 0.5 mm		TH920005	XXX
	VF8A	Ø 25 mm Visual Indicator IP67; 1NO; Flush Aluminum dark blue; faston 2.8 mm × 0.5 mm		TH920008	XXX
Illumination (XXX)	504	Red LED: 24 VDC, 20 mA			
	502	Green LED: 24 VDC, 20 mA			
	500	Red/Green LED: 24 VDC, 20 mA			

Stainless steel versions available upon request.

# Modular Keyswitch



# TK2

## TK2

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"><li>■ 2 or 3 position</li><li>■ sealed IP40 or IP65</li><li>■ plastic or aluminum bezels</li><li>■ wide range of bezels</li><li>■ NO, NC</li><li>■ gold plated, single or double pole, contact blocks</li><li>■ key trapping options</li></ul>
Rating	250 VAC, 5 A
Dimensions (mm)	18 × 24 18 × 18 Ø 18 Ø 25
Actuator	■ key-KABA MICRO
Approvals	UL, CSA, VDE



## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator style (mm)	Environmental protection	Terminals (mm)	Electrical rating
TK21B2A001C1C1A	Ø 16.2	2 Position Kaba Micro key	18 × 24	IP40	2.8 × 0.5 faston	250 VAC, 5A
TK22B2E001C1C1E	Ø 22.5	2 Position Kaba Micro key	Ø 25	IP65	2.8 × 0.5 faston	250 VAC, 5A



## Specifications

Mechanism	Key actuated
Mounting	Central fixing with metal lock nut
Protection	IP40 or IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Temperature range °C	-25°C to +85°C
Mechanical life	10 <sup>6</sup> cycles
Contact block	Slide-on assembly by the user
Contact block housing	Self-extinguishing duroplastic (UL 94 V0)
Terminal material	Silver alloy with 0.2 µm silver plating plus 0.4 µm gold plating
Contact resistance	<30 mOhm
Number of contact blocks	User configurable NO or NC types up to a maximum of 2 double contact blocks
Terminals	Patented flexible solder – suitable for wire diameter 1 × 1.00 mm <sup>2</sup> (braided), 2 × 0.75 mm (stranded) Faston - 2.8mm × 0.5mm
Vibration resistance	1.5 mm pp amplitude at 55 Hz

## Cylinder locks

### KABA MICRO

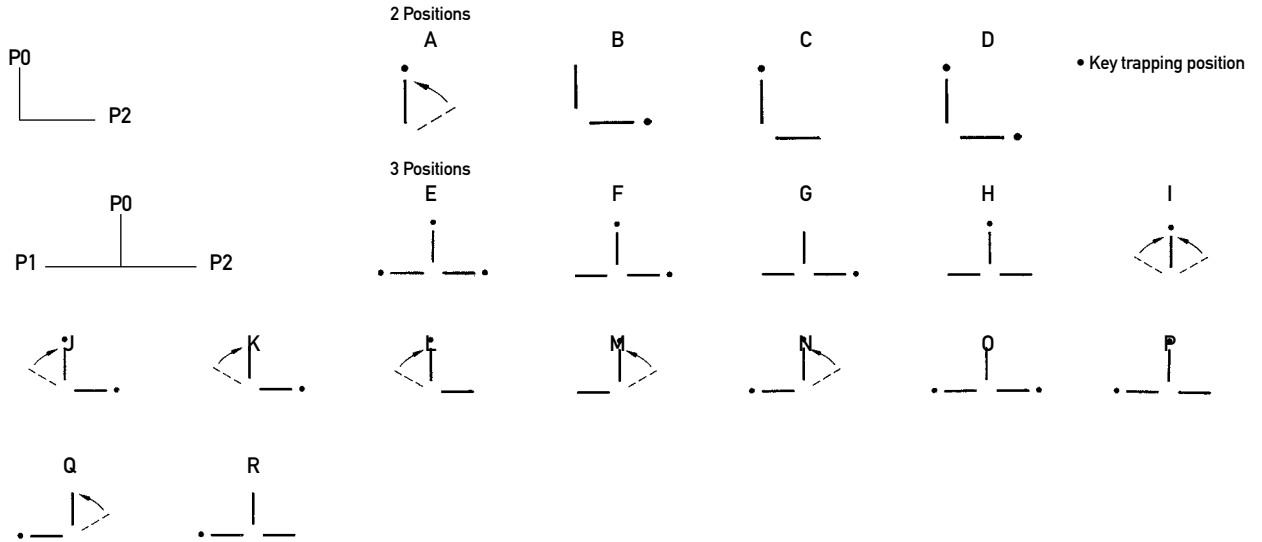
- Compact format
- Key code EB 0001 (standard)
- Key codes EB 0002 - EB 0020 (upon request)
- Over 10'000 different key code variations
- Key lock systems with master keys and central locks
- 2 keys per key switch (additional keys on order)

Destruction of the key or lock must be expected if the level 50 Ncm is exceeded.

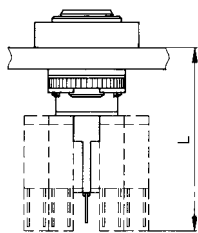
## Recommended maximum electrical ratings

Voltage (max) 250 VAC	Resistive load (A) 5.0 (0.7 pf)	Inductive load (A)	Approval UL, CSA, VDE - max. admissible circuit breaker C6A
12 VDC	5.0	3.0	General rating
24 VDC	4.0	2.0	General rating
36 VDC	3.0	1.7	General rating
48 VDC	2.0	1.5	General rating
60 VDC	1.5	1.2	General rating
125 VDC	0.5	0.3	General rating
250 VDC	0.3	0.2	General rating
Electrical life	50,000 cycles at 5A, 250 VAC, 0.7 pf		

## Key positions/ function

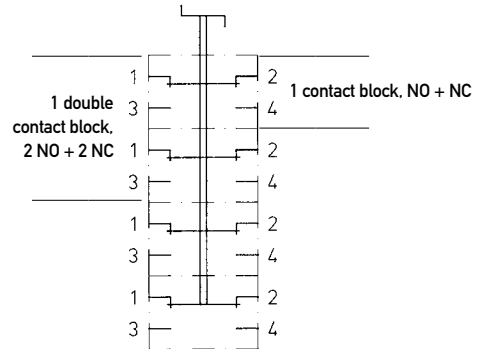


## Dimensions

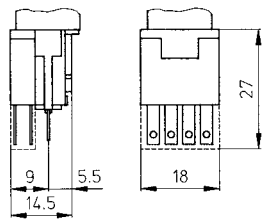


Length in mm (with contact block)  
 plastic bezels 43  
 aluminum bezels 42

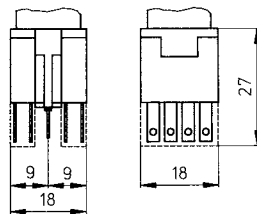
## Circuit diagram (2 double contact blocks)



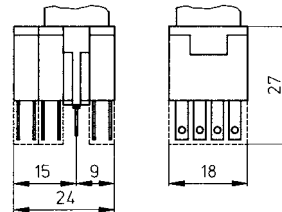
## Contact blocks 1 contact block



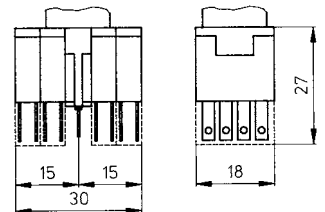
## 2 contact blocks



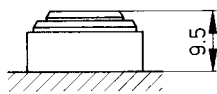
## 1 contact block + 1 double contact block



## 2 double contact blocks



## Cylinder height plastic bezel IP40



Panel cut-out  $22.5 \pm 0.1$  mm

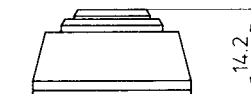
Front panel thickness

## plastic bezel IP65 Panel cut-out $16.2 \text{ mm} \pm 0.1 \text{ mm}$



plastic bezel IP40  
 plastic bezel IP65  
 aluminum bezel

## aluminum bezel 2 position key Panel cut-out $22.5 \text{ mm} \pm 0.1 \text{ mm}$



2.0 to 5.0 mm  
 2.0 to 6.5 mm  
 1.0 to 5.0 mm

## Ordering Reference

Basic type	TK2		Example: TK2		1	A2A	001	A1	A1	A
Panel cut-out	1	Ø 16.2 mm for plastic bezel key switches								
	2	Ø 22.5 mm for Aluminum bezel key switches								
Key position / function	A2A	2 Positions: IP40; Kaba Micro; Key removable P0		Momentary P2	TH548032XXX					
16.2 mm cut-out	B2A	2 Positions: IP40; Kaba Micro; Key removable P2		Latching P2	TH548034XXX					
	C2A	2 Positions: IP40; Kaba Micro; Key removable P0		Latching P2	TH548036XXX					
	D2A	2 Positions: IP40; Kaba Micro; Key removable P0 + P2		Latching P2	TH548038XXX					
	A2C	2 Positions: IP65; Kaba Micro; Key removable P0		Momentary P2	TH548132XXX					
	B2C	2 Positions: IP65; Kaba Micro; Key removable P2		Latching P2	TH548134XXX					
	C2C	2 Positions: IP65; Kaba Micro; Key removable P0		Latching P2	TH548136XXX					
	D2C	2 Positions: IP65; Kaba Micro; Key removable P0 + P2		Latching P2	TH548138XXX					
22.5 mm cut-out	A2E	2 Positions: Ø 25 mm Aluminum bezel IP65; Kaba Micro; Key removable P0		Momentary P2	TH544040XXX					
	B2E	2 Positions: Ø 25 mm Aluminum bezel IP65; Kaba Micro; Key removable P2		Latching P2	TH544041XXX					
	C2E	2 Positions: Ø 25 mm Aluminum bezel IP65; Kaba Micro; Key removable P0		Latching P2	TH544042XXX					
	D2E	2 Positions: Ø 25 mm Aluminum bezel IP65; Kaba Micro; Key removable P0 + P2		Latching P2	TH544043XXX					
Key code number (XXX)	001	Kaba Micro Code EB0001	THXXXXXX	001	012	Kaba Micro Code EB0012	THXXXXXX	012		
	002	Kaba Micro Code EB0002	THXXXXXX	002	013	Kaba Micro Code EB0013	THXXXXXX	013		
	003	Kaba Micro Code EB0003	THXXXXXX	003	014	Kaba Micro Code EB0014	THXXXXXX	014		
	004	Kaba Micro Code EB0004	THXXXXXX	004	015	Kaba Micro Code EB0015	THXXXXXX	015		
	005	Kaba Micro Code EB0005	THXXXXXX	005	016	Kaba Micro Code EB0016	THXXXXXX	016		
	006	Kaba Micro Code EB0006	THXXXXXX	006	017	Kaba Micro Code EB0017	THXXXXXX	017		
	007	Kaba Micro Code EB0007	THXXXXXX	007	018	Kaba Micro Code EB0018	THXXXXXX	018		
	008	Kaba Micro Code EB0008	THXXXXXX	008	019	Kaba Micro Code EB0019	THXXXXXX	019		
	009	Kaba Micro Code EB0009	THXXXXXX	009	020	Kaba Micro Code EB0020	THXXXXXX	020		
	010	Kaba Micro Code EB0010	THXXXXXX	010	999	Mixed differs	THXXXXXX	999		
	011	Kaba Micro Code EB0011	THXXXXXX	011						
Contact block, gold Position 1	XX	No contact block	Terminals			Part No.				
	A1	NO	2.8 × 0.5 mm			TH593566020				
	A9	NO	Insulated faston			TH593560020				
	A8	NO	Solder			TH593561020				
	B1	NC	2.8 × 0.5 mm			TH593566050				
	B9	NC	Insulated faston			TH593560050				
	B8	NC	Solder			TH593561050				
	C1	1 NO + 1 NC	2.8 × 0.5 mm			TH593566000				
	C9	1 NO + 1 NC	Insulated faston			TH593560000				
	C8	1 NO + 1 NC	Solder			TH593561000				
	D1	2 NO + 2 NC	2.8 × 0.5 mm			TH593567000				
	D9	2 NO + 2 NC	Insulated faston			TH593563000				
	D8	2 NO + 2 NC	Solder			TH593564000				
Contact block, gold Position 2	XX	No contact block	Terminals			Part No.				
	A1	NO	2.8 × 0.5 mm			TH593566020				
	A9	NO	Insulated faston			TH593560020				
	A8	NO	Solder			TH593561020				
	B1	NC	2.8 × 0.5 mm			TH593566050				
	B9	NC	Insulated faston			TH593560050				
	B8	NC	Solder			TH593561050				
	C1	1 NO + 1 NC	2.8 × 0.5 mm			TH593566000				
	C9	1 NO + 1 NC	Insulated faston			TH593560000				
	C8	1 NO + 1 NC	Solder			TH593561000				
	D1	2 NO + 2 NC	2.8 × 0.5 mm			TH593567000				
	D9	2 NO + 2 NC	Insulated faston			TH593563000				
	D8	2 NO + 2 NC	Solder			TH593564000				
Bezel	A	18 mm × 24 mm plastic		IP40	TH493060000		IP65	TH593060000		
	B	18 mm × 18 mm plastic			TH493062000			TH593062000		
	D	Ø 18 mm plastic			TH493064000			TH593064000		
	E	Ø 25 mm aluminum (Factory fitted)								

The keyswitch cannot be installed without a bezel. The IP40 bezels are interchangeable before installation. Contact blocks will be supplied unassembled.

## Ordering Reference

Basic type	TK2			Example:	TK2	1	E3A	001	A1	A1	A
Panel cut-out	1	Ø 16.2 mm									
Key position / function	E3A	3 Position; IP40; Kaba Micro; Key removable PO + P1 + P2		Latching P1 + P2			TH548050XXX				
	F3A	3 Position; IP40; Kaba Micro; Key removable PO + P2		Latching P1 + P2			TH548051XXX				
	G3A	3 Position; IP40; Kaba Micro; Key removable P2		Latching P1 + P2			TH548052XXX				
	H3A	3 Position; IP40; Kaba Micro; Key removable PO		Latching P1 + P2			TH548053XXX				
	I3A	3 Position; IP40; Kaba Micro; Key removable PO		Momentary P1 + P2			TH548054XXX				
	J3A	3 Position; IP40; Kaba Micro; Key removable PO + P2		Momentary P1 + Latching P2			TH548055XXX				
	K3A	3 Position; IP40; Kaba Micro; Key removable P2		Momentary P1 + Latching P2			TH548056XXX				
	L3A	3 Position; IP40; Kaba Micro; Key removable PO		Momentary P1 + Latching P2			TH548057XXX				
	M3A	3 Position; IP40; Kaba Micro; Key removable PO		Latching P1 + Momentary P2			TH548058XXX				
	N3A	3 Position; IP40; Kaba Micro; Key removable PO + P1		Latching P1 + Momentary P2			TH548059XXX				
	O3A	3 Position; IP40; Kaba Micro; Key removable P1 + P2		Latching P1 + P2			TH548060XXX				
	P3A	3 Position; IP40; Kaba Micro; Key removable PO + P1		Latching P1 + P2			TH548061XXX				
	Q3A	3 Position; IP40; Kaba Micro; Key removable P1		Latching P1 + Momentary P2			TH548062XXX				
	R3A	3 Position; IP40; Kaba Micro; Key removable P1		Latching P1 + P2			TH548063XXX				
	E3B	3 Position; IP65; Kaba Micro; Key removable PO + P1 + P2		Latching P1 + P2			TH548150XXX				
	F3B	3 Position; IP65; Kaba Micro; Key removable PO + P2		Latching P1 + P2			TH548151XXX				
	G3B	3 Position; IP65; Kaba Micro; Key removable P2		Latching P1 + P2			TH548152XXX				
	H3B	3 Position; IP65; Kaba Micro; Key removable PO		Latching P1 + P2			TH548153XXX				
	I3B	3 Position; IP65; Kaba Micro; Key removable PO		Momentary P1 + P2			TH548154XXX				
	J3B	3 Position; IP65; Kaba Micro; Key removable PO + P2		Momentary P1 + Latching P2			TH548155XXX				
	K3B	3 Position; IP65; Kaba Micro; Key removable P2		Momentary P1 + Latching P2			TH548156XXX				
	L3B	3 Position; IP65; Kaba Micro; Key removable PO		Momentary P1 + Latching P2			TH548157XXX				
	M3B	3 Position; IP65; Kaba Micro; Key removable PO		Latching P1 + Momentary P2			TH548158XXX				
	N3B	3 Position; IP65; Kaba Micro; Key removable PO + P1		Latching P1 + Momentary P2			TH548159XXX				
	O3B	3 Position; IP65; Kaba Micro; Key removable P1 + P2		Latching P1 + P2			TH548160XXX				
	P3B	3 Position; IP65; Kaba Micro; Key removable PO + P1		Latching P1 + P2			TH548161XXX				
	Q3B	3 Position; IP65; Kaba Micro; Key removable P1		Latching P1 + Momentary P2			TH548162XXX				
	R3B	3 Position; IP65; Kaba Micro; Key removable P1		Latching P1 + P2			TH548163XXX				
Key code number	001	Kaba Micro Code	EB0001	THXXXXXX	001	012	Kaba Micro Code	EB0012	THXXXXXX	012	
	002	Kaba Micro Code	EB0002	THXXXXXX	002	013	Kaba Micro Code	EB0013	THXXXXXX	013	
	003	Kaba Micro Code	EB0003	THXXXXXX	003	014	Kaba Micro Code	EB0014	THXXXXXX	014	
	004	Kaba Micro Code	EB0004	THXXXXXX	004	015	Kaba Micro Code	EB0015	THXXXXXX	015	
	005	Kaba Micro Code	EB0005	THXXXXXX	005	016	Kaba Micro Code	EB0016	THXXXXXX	016	
	006	Kaba Micro Code	EB0006	THXXXXXX	006	017	Kaba Micro Code	EB0017	THXXXXXX	017	
	007	Kaba Micro Code	EB0007	THXXXXXX	007	018	Kaba Micro Code	EB0018	THXXXXXX	018	
	008	Kaba Micro Code	EB0008	THXXXXXX	008	019	Kaba Micro Code	EB0019	THXXXXXX	019	
	009	Kaba Micro Code	EB0009	THXXXXXX	009	020	Kaba Micro Code	EB0020	THXXXXXX	020	
	010	Kaba Micro Code	EB0010	THXXXXXX	010	999	Mixed differs	THXXXXXX	999		
	011	Kaba Micro Code	EB0011	THXXXXXX	011						
Contact block, gold Position 1	XX	No contact block		Terminals			Part No.				
	A1	NO		2.8 × 0.5 mm			TH593566020				
	A9	NO		Insulated faston			TH593560020				
	A8	NO		Solder			TH593561020				
	B1	NC		2.8 × 0.5 mm			TH593566050				
	B9	NC		Insulated faston			TH593560050				
	B8	NC		Solder			TH593561050				
	C1	1 NO + 1 NC		2.8 × 0.5 mm			TH593566000				
	C9	1 NO + 1 NC		Insulated faston			TH593560000				
	C8	1 NO + 1 NC		Solder			TH593561000				
	D1	2 NO + 2 NC		2.8 × 0.5 mm			TH593567000				
	D9	2 NO + 2 NC		Insulated faston			TH593563000				
	D8	2 NO + 2 NC		Solder			TH593564000				
Contact block, gold Position 2	XX	No contact block		Terminals			Part No.				
	A1	NO		2.8 × 0.5 mm			TH593566020				
	A9	NO		Insulated faston			TH593560020				
	A8	NO		Solder			TH593561020				
	B1	NC		2.8 × 0.5 mm			TH593566050				
	B9	NC		Insulated faston			TH593560050				
	B8	NC		Solder			TH593561050				
	C1	1 NO + 1 NC		2.8 × 0.5 mm			TH593566000				
	C9	1 NO + 1 NC		Insulated faston			TH593560000				
	C8	1 NO + 1 NC		Solder			TH593561000				
	D1	2 NO + 2 NC		2.8 × 0.5 mm			TH593567000				
	D9	2 NO + 2 NC		Insulated faston			TH593563000				
	D8	2 NO + 2 NC		Solder			TH593564000				
Bezel	A	18 mm × 24 mm plastic		IP40			IP65				
	B	18 mm × 18 mm plastic		TH493060000			TH593060000				
	D	Ø 18 mm plastic		TH493062000			TH593062000				
				TH493064000			TH593064000				

The keyswitch cannot be installed without a bezel. The IP40 bezels are interchangeable before installation. Contact blocks will be supplied unassembled.

## Ordering Reference

Basic type	TK2			Example: TK2	2	E3C	001	A1	A1	E
Panel cut-out	2	Ø 22.5 mm								
Key position / function	E3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0 + P1 + P2		Latching P1 + P2	TH544050XXX					
	F3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0 + P2		Latching P1 + P2	TH544051XXX					
	G3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P2		Latching P1 + P2	TH544052XXX					
	H3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0		Latching P1 + P2	TH544053XXX					
	I3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0		Momentary P1 + P2	TH544054XXX					
	J3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0 + P2		Momentary P1 + Latching P2	TH544055XXX					
	K3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P2		Momentary P1 + Latching P2	TH544056XXX					
	L3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0		Momentary P1 + Latching P2	TH544057XXX					
	M3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0		Latching P1 + Momentary P2	TH544058XXX					
	N3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0 + P1		Latching P1 + Momentary P2	TH544059XXX					
	O3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P1 + P2		Latching P1 + P2	TH544060XXX					
	P3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P0 + P1		Latching P1 + P2	TH544061XXX					
	Q3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P1		Latching P1 + Momentary P2	TH544062XXX					
	R3C	3 Position; Ø 25 mm Alum. bezel IP65; Kaba Micro; Key removable P1		Latching P1 + P2	TH544063XXX					
Key code number (XXX)	001	Kaba Micro Code EB0001			THXXXXXX					001
	002	Kaba Micro Code EB0002			THXXXXXX					002
	003	Kaba Micro Code EB0003			THXXXXXX					003
	004	Kaba Micro Code EB0004			THXXXXXX					004
	005	Kaba Micro Code EB0005			THXXXXXX					005
	006	Kaba Micro Code EB0006			THXXXXXX					006
	007	Kaba Micro Code EB0007			THXXXXXX					007
	008	Kaba Micro Code EB0008			THXXXXXX					008
	009	Kaba Micro Code EB0009			THXXXXXX					009
	010	Kaba Micro Code EB0010			THXXXXXX					010
	011	Kaba Micro Code EB0011			THXXXXXX					011
	012	Kaba Micro Code EB0012			THXXXXXX					012
	013	Kaba Micro Code EB0013			THXXXXXX					013
	014	Kaba Micro Code EB0014			THXXXXXX					014
	015	Kaba Micro Code EB0015			THXXXXXX					015
	016	Kaba Micro Code EB0016			THXXXXXX					016
	017	Kaba Micro Code EB0017			THXXXXXX					017
	018	Kaba Micro Code EB0018			THXXXXXX					018
	019	Kaba Micro Code EB0019			THXXXXXX					019
	020	Kaba Micro Code EB0020			THXXXXXX					020
	999	Mixed differs			THXXXXXX					999
Contact block, gold Position 1	XX	No contact block		Terminals	Part No.					
	A1	NO		2.8 × 0.5 mm	TH593566020					
	A9	NO		Insulated faston	TH593560020					
	A8	NO		Solder	TH593561020					
	B1	NC		2.8 × 0.5 mm	TH593566050					
	B9	NC		Insulated faston	TH593560050					
	B8	NC		Solder	TH593561050					
	C1	1 NO + 1 NC		2.8 × 0.5 mm	TH593566000					
	C9	1 NO + 1 NC		Insulated faston	TH593560000					
	C8	1 NO + 1 NC		Solder	TH593561000					
	D1	2 NO + 2 NC		2.8 × 0.5 mm	TH593567000					
	D9	2 NO + 2 NC		Insulated faston	TH593563000					
	D8	2 NO + 2 NC		Solder	TH593564000					
Contact block, gold Position 2	XX	No contact block		Terminals	Part No.					
	A1	NO		2.8 × 0.5 mm	TH593566020					
	A9	NO		Insulated faston	TH593560020					
	A8	NO		Solder	TH593561020					
	B1	NC		2.8 × 0.5 mm	TH593566050					
	B9	NC		Insulated faston	TH593560050					
	B8	NC		Solder	TH593561050					
	C1	1 NO + 1 NC		2.8 × 0.5 mm	TH593566000					
	C9	1 NO + 1 NC		Insulated faston	TH593560000					
	C8	1 NO + 1 NC		Solder	TH593561000					
	D1	2 NO + 2 NC		2.8 × 0.5 mm	TH593567000					
	D9	2 NO + 2 NC		Insulated faston	TH593563000					
	D8	2 NO + 2 NC		Solder	TH593564000					
Bezel	E	Ø 25 mm (Factory fitted)								

The keyswitch cannot be installed without a bezel. Contact blocks will be supplied unassembled.

# E1

## E1

Panel cut-out (mm)  $\nabla$  15.1 × 15.1

Characteristics

- tamper proof
- 2 positions
- key trapping options
- gold-plated contacts
- PCB Terminals

Rating 250 VAC, 100 mA

Dimensions (mm) 18 × 16

Actuator ■ plastic key

Approvals none

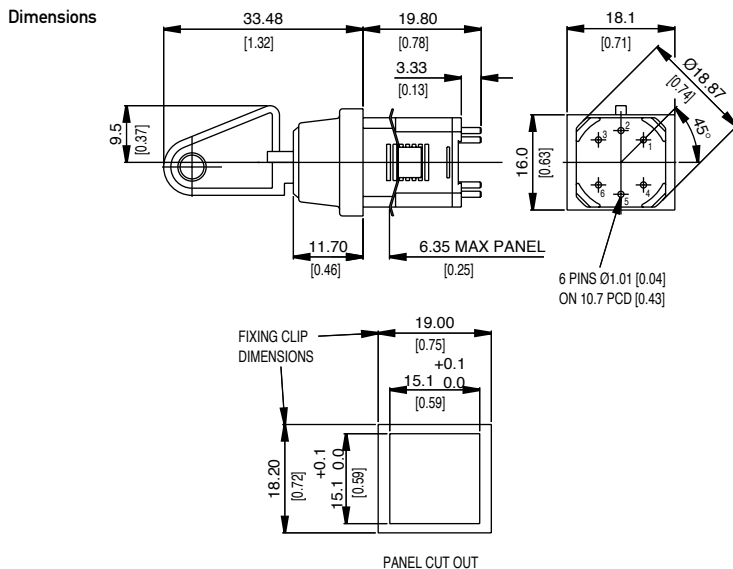


## Preferred Range

Ordering Reference	Terminal	Circuit	Actuator	Contacts	Electrical rating
E1ACAAAE	Pins	2 pole CO	Key	Gold-plated	250 VAC, 100 mA

## Specifications

Key	Glass-fibre reinforced nylon
Body	Glass-fibre reinforced nylon
Springs	Stainless steel
Contacts	Moving - gold-plated phosphor bronze, Fixed - gold-plated brass
Terminals	1.01 mm (0.04 in) dia × 3.3 mm (0.13 in) gold-plated brass
Temperature range °C	-20°C to +60°C
Mechanical life	50,000 operations (minimum)
Mounting	Retaining clip
Actuators	Key
Switching function	Double pole change-over, three circuit selector
Key indexing	90°



## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load	Horsepower	Approval
250 VAC	100 mA	-	-	General rating - 50,000 operations
0-15 VDC	100 mA	-	-	General rating - 50,000 operations
15-30 VDC	100 mA	-	-	General rating - 50,000 operations

## Operating Characteristics

Switching function	Reference	Actuator Type	Body style (mm)	Key trapping	Diagram
Double pole change-over	E1AAAAAE	Key	A - 18 × 16	No	
Double pole change-over	E1ACAAAE	Key	A - 18 × 16	Yes	
Three circuit selector	E1AAAAAJ	Key	A - 18 × 16	No	

## Ordering Reference

Basic type	E1	Example: E1	A	A	A	A	A	E
Key	A	Standard key						
Key trapping	A	Key removable in all positions						
	C	Key trapped horizontally, right						
Body style	A	18.0 mm (0.710 in) × 16.0 mm (0.630 in) rectangular bezel						
Body color	A	Black						
Terminal	A	1.01 mm (0.040 in) dia × 3.30 mm (0.130 in)						
Switching function	E	Double pole change-over						
	J	Three circuit selector						

# M1

## M1

Panel cut-out (mm)  $\varnothing$  15.1 × 15.1

Characteristics

- double pole change-over or three circuit selector switching functions
- key trapping option
- two body style options
- gold-plated contacts
- PCB Terminals

Rating 250 VAC, 100 mA

Dimensions (mm) 18 × 16  
body style A  
18 × 18  
body style E

Actuator

- key (common or differs)

Approvals none



## Preferred Range

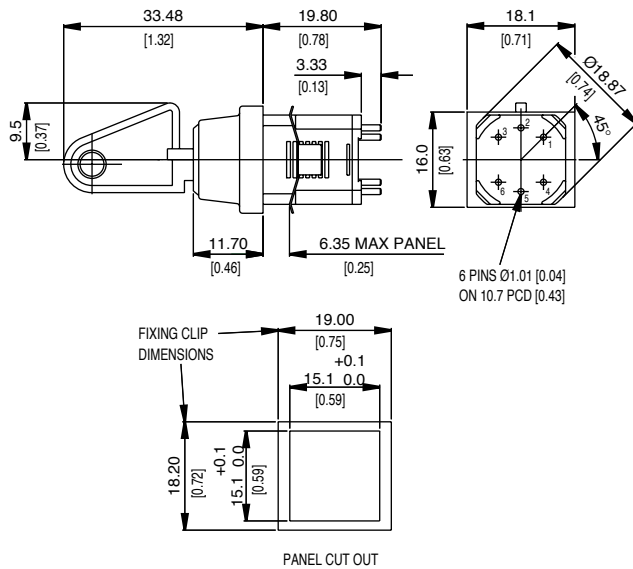
Ordering Reference	Terminal	Circuit	Actuator	Contacts	Electrical rating
M1HAAA AE	Pins	2 pole CO	Key	Gold-plated	250 VAC, 100 mA
M1HAEAA E	Pins	2 pole CO	Key	Gold-plated	250 VAC, 100 mA
M1HAAA AJ	Pins	3 circuit selector	Key	Gold-plated	250 VAC, 100 mA



## Specifications

Key	Nickel silver
Body	Glass-fibre reinforced nylon
Springs	Stainless steel
Contacts	Moving - gold-plated phosphor bronze, Fixed - gold-plated brass
Terminals	1.01 mm (0.04 in) dia × 3.3 mm (0.13 in) gold-plated brass
Temperature range °C	-20°C to +60°C
Mechanical life	50,000 operations (minimum)
Mounting	Retaining clip
Actuators	Key
Switching function	Double pole change-over, three circuit selector
Key indexing	90°

## Dimensions



## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load	Horsepower	Approval
250 VAC	100 mA	-	-	General rating - 50,000 operations
0-15 VDC	100 mA	-	-	General rating - 50,000 operations
15-30 VDC	100 mA	-	-	General rating - 50,000 operations

## Operating Characteristics

Switching function	Reference	Actuator		Body style (mm)	Key trapping	Diagram
		Type	Code			
Double pole change-over	M1BAAAAE	Key	001	A - 18 × 16	No	
	M1HAAAAE	Key	007	A - 18 × 16	No	
	M1HAEEAE	Key	007	E - 18 × 18	No	
	M1MAAAAAE	Key	Production run key coding	A - 18 × 16	No	
	M1MAEEAE	Key	Production run key coding	E - 18 × 18	No	
Double pole change-over	M1MCAAEE	Key	Production run key coding	A - 18 × 16	Yes	
	M1MCEAAE	Key	Production run key coding	E - 18 × 18	Yes	
Three circuit selector	M1HAAAAJ	Key	007	A - 18 × 16	No	
	M1HAEEAJ	Key	007	E - 18 × 18	No	
	M1MAAAAAJ	Key	Production run key coding	A - 18 × 16	No	
	M1MAEEAJ	Key	Production run key coding	E - 18 × 18	No	

## Ordering Reference

Basic type	M1	Example: M1	B	A	A	A	A	E
Keycode	B 001 key H 007 key M Production run key coding							
Key trapping	A Key removable in all positions C Key trapped horizontally, right							
Body style	A 18.0 mm (0.710 in) × 16.0 mm (0.630 in) rectangular bezel E 18.0 mm (0.710 in) square bezel							
Body color	A Black							
Terminal	A 1.01 mm (0.040 in) dia × 3.30 mm (0.130 in)							
Switching function	E Double pole change-over J Three circuit selector							

## K2

Panel cut-out (mm)	Ø 19.1
Characteristics	<ul style="list-style-type: none"> <li>■ choice of off-on or change-over center off or spring return options</li> <li>■ key trapping option</li> <li>■ solder terminals</li> </ul>
Rating	up to 250 VAC, 2 A
Dimensions (mm)	Ø 22
Actuator	■ key (common or differs)
Approvals	UL and CSA



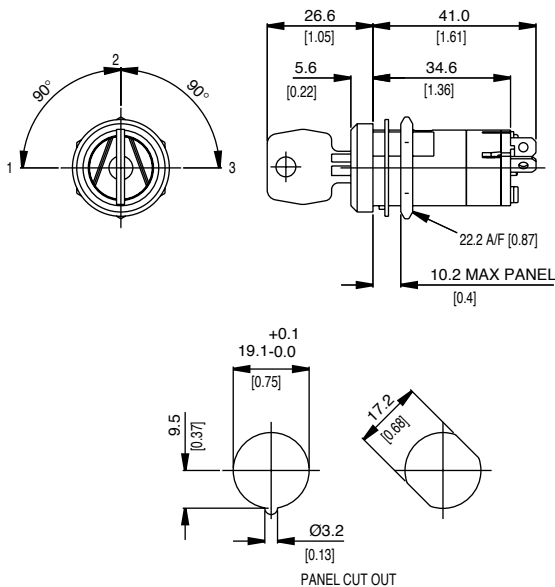
## Preferred Range

Ordering Reference	Terminal	Circuit	Actuator	Contacts	Electrical rating
K23FBA201	Screws	2 pole off-on	Key	Ag	Up to 250 VAC, 2 A

## Specifications

Key	Nickel silver
Body	Glass-fibre reinforced nylon
Springs	Stainless steel
Contacts	Silver
Terminals	4.8 × 0.8 mm (0.19 × 0.032 in) faston (faston) - silver-plated brass
Temperature range °C	-20°C to +85°C
Mechanical life	50,000 operations (minimum)
Mounting	Locknut and washer
Actuators	General duty keylocks
Switching function	Off-on, change-over (center off)
Key indexing	90°

### Dimensions



## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load	Horsepower	Approval
125 VAC	4 (0.75 pf)	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations
250 VAC	2 (0.75 pf)	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations
12 VDC	10	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations

## Operating Characteristics

Switching function	Reference	Actuator		Key trapping	Diagram
		Type	Code		
1 pole change-over with center off	K23FBA123	Key	001	No	
2 pole off-on	K23FBA201	Key	001	No	

## Ordering Reference

Basic type	K2	Example: K2   3F   B   A   2   01			
Actuators	3F Key - general duty				
Keycode	B 001 key				
Key trapping	A Key removable in all positions C Key trapped horizontally; right				
Number of poles	1 1 pole 2 2 poles				
Switching function	01 Off-on 23 Change-over with center off				

# P2

## P2

Panel cut-out (mm) Ø 19.1

- Characteristics
- up to 12 contact pairs
  - 2 security options with key actuation
  - from 2 to 4 switch positions
  - key trapping option
  - solder terminals

Rating 250 VAC, 2 A

Dimensions (mm) Ø 22

Actuator ▪ key (common or differs)

Approvals UL (optional)



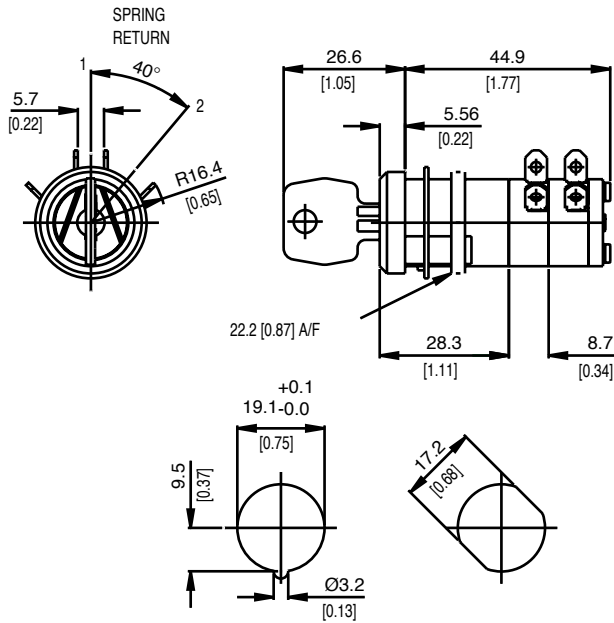
## Preferred Range

Ordering Reference	Terminal	Circuit	Actuator	Contacts	Electrical rating
P23FBA206	Screws	2 pole CO	Key	Ag	Up to 250 VAC, 2 A
P23FBA209	Screws	2 pole CO	Key	Ag	Up to 250 VAC, 2 A
P23FBC209	Screws	2 pole CO	Key	Ag	Up to 250 VAC, 2 A
P23FMA209	Screws	2 pole CO	Key	Ag	Up to 250 VAC, 2 A

## Specifications

Key	Nickel silver
Body	Glass-fibre reinforced nylon
Springs	Stainless steel
Contacts	Silver
Terminals	4.8 × 0.8 mm (0.19 × 0.032 in) faston (faston) - silver-plated brass
Temperature range °C	-20°C to +85°C
Mechanical life	50,000 operations (minimum)
Mounting	Locknut and washer
Actuators	General duty keylocks
Switching function	Change-over (spring return), change-over (separate circuits)
Key indexing	90°

### Dimensions



## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load	Horsepower	Approval
125 VAC	4 (0.75 pf)	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations
250 VAC	2 (0.75 pf)	2	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations
12 VDC	10	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations

## Operating Characteristics

Switching function	Reference	Actuator	Code	Key trapping	Diagram
		Type			
2 pole change-over, spring return	P23FBA206 P23FMA206	Key Key	001 Production run key coding	No No	
2 pole change-over, separate circuits	P23FBA209 P23FMA209	Key Key	001 Production run key coding	No No	
2 pole change-over, separate circuits	P23FBC209 P23DMC209	Key Key - increased security	001 Production run key coding	Yes Yes	

## Ordering Reference

Basic type	P2	Example: P2	3F	B	A	2	06
Actuators	3F Key - general duty						
Keycode	B 001 key M Production run key coding						
Key trapping	A Key removable in all positions C Key trapped horizontally, right						
Number of poles	2 2 poles						
Switching function	06 Change-over with spring return 09 Change-over with separate circuits						

# P5

## P5

Panel cut-out (mm)	Ø 20.6
Characteristics	<ul style="list-style-type: none"><li>■ high electrical rating</li><li>■ key trapping option</li><li>■ choice of off-on, change-over with spring return or change-over with separate circuits</li></ul>
Rating	up to 125 VAC, 10 A up to 250 VAC, 5 A
Dimensions (mm)	Ø 38.1 × 45.7 off-on Ø 38.1 × 58.4 change-over
Actuator	■ key (common or different)
Approvals	UL and CSA



## Preferred Range

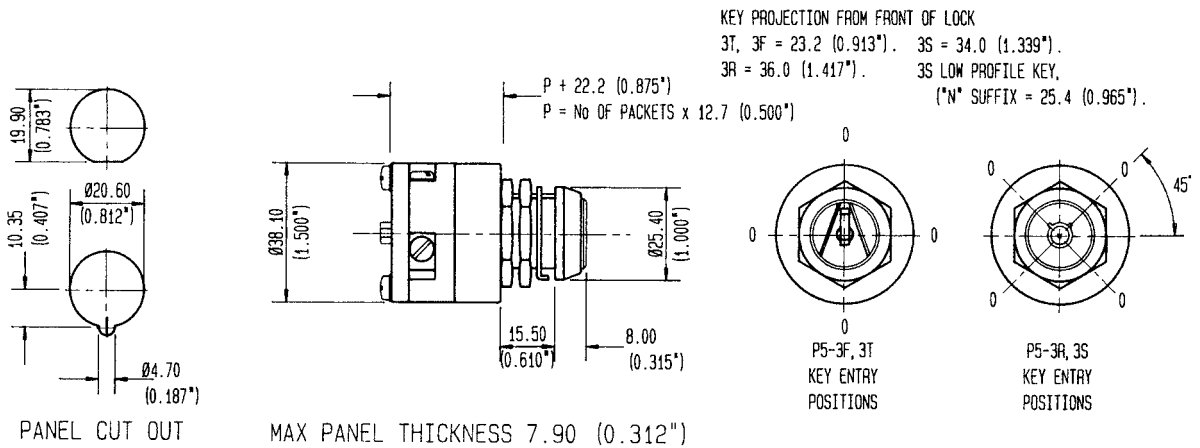
Ordering Reference	Terminal	Circuit	Actuator	Contacts	Electrical rating
P53FBA201	Screws	2 pole off-on	Key	Ag	Up to 125 VAC, 10 A Up to 250 VAC, 5 A



## Specifications

Key	Nickel silver
Body	Phenolic
Springs	Stainless steel
Contacts	Silver
Terminals	4BA screw - silver-plated brass
Temperature range °C	-20°C to +85°C
Mechanical life	25,000 operations (minimum)
Mounting	Locknut and washer
Actuator	Key
Switching function	Off-on, change-over (spring return), change-over (separate circuits)
Key indexing	90°

## Dimensions



## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load	Horsepower	Approval
125 VAC	10 (0.75 pf)	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations
250 VAC	5 (0.75 pf)	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations
24 VDC	15	-	-	UL 1054/CSA 22.2 No. 55 - 6,000 operations

## Operating Characteristics

Switching function	Reference	Actuator		Key trapping	Diagram
		Type	Code		
2 pole off-on	P53FBA201	Key	001	No	
2 pole change-over, spring return	P53FBA206 P53FMA206	Key Key	001 Production run	No No	
2 pole change-over, separate circuits	P53FBA209 P53FMA209	Key Key	001 Production run	No No	
2 pole change-over, separate circuits	P53FBB209 P53FMB209	Key Key	001 Production run	Yes Yes	

## Ordering Reference

Basic type	P5	Example: P5	3F	B	A	2	01
Actuators	3F	Key - general duty					
Keycode	B	001 key					
	M	Production run key coding					
Key trapping	A	Key removable in all positions					
	B	Key trapped vertically, up					
Number of poles	2	2 poles					
Switching function	01	Off-on					
	06	Change-over with spring return					
	09	Change-over with separate circuits					

# TR2

## TR2

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	<ul style="list-style-type: none"><li>▪ 2 and 3 position</li><li>▪ sealed IP40 or IP65</li><li>▪ plastic or aluminum bezels</li><li>▪ NO, NC</li><li>▪ gold plated, single or double pole, contact blocks</li><li>▪ key trapping options</li></ul>
Rating	250 VAC, 5 A
Dimensions (mm)	18 × 24 18 × 18 Ø 18 Ø 25
Actuator	▪ black knob, with white indicating bar
Approvals	UL, CSA, VDE



## Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator size (mm)	Environmental protection
TR21A2AC1C1A	Ø 16.2	2 Position	18 × 24	IP40
TR22A2CC1C1E	Ø 22.5	2 Position	Ø 25	IP65
TR21C2AC1C1A	Ø 16.2	3 Position	18 × 24	IP40
TR22C2CC1C1E	Ø 22.5	3 Position	Ø 25	IP65

## Specifications

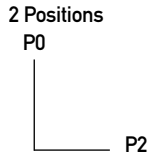
Mechanism	Knob actuated
Mounting	Central fixing with metal lock nut
Protection	IP40 or IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Temperature range °C	-25°C to +85°C
Mechanical life	10 <sup>6</sup> cycles
Contact block	Slide-on assembly by the user
Contact block housing	Self-extinguishing duroplastic (UL 94 V0)
Terminal material	Silver alloy with 0.2 µm silver plating, 0.4 µm gold plating
Contact resistance	<30 mOhm
Number of contact blocks	User configurable NO or NC types up to a maximum of 2 double contact blocks
Terminals	Patented flexible solder – suitable for wire diameter 1 × 1.00 mm <sup>2</sup> (braided), 2 × 0.75 mm (stranded) Faston - 2.8mm × 0.5mm
Vibration resistance	1.5 mm pp amplitude at 55 Hz

## Recommended maximum electrical ratings

Voltage (max)	Resistive load (A)	Inductive load (A)	Approval
250 VAC	5.0 (0.7 pf)		UL, CSA, VDE - max. admissible circuit breaker C6A
12 VDC	5.0	3.0	General rating
24 VDC	4.0	2.0	General rating
36 VDC	3.0	1.7	General rating
48 VDC	2.0	1.5	General rating
60 VDC	1.5	1.2	General rating
125 VDC	0.5	0.3	General rating
250 VDC	0.3	0.2	General rating

Electrical life 50,000 cycles at 5A, 250 VAC, 0.7 pf

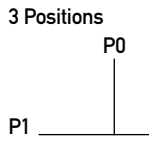
Rotary positions/  
function



A



B



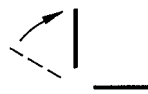
C



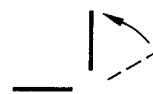
D



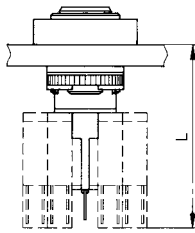
E



F

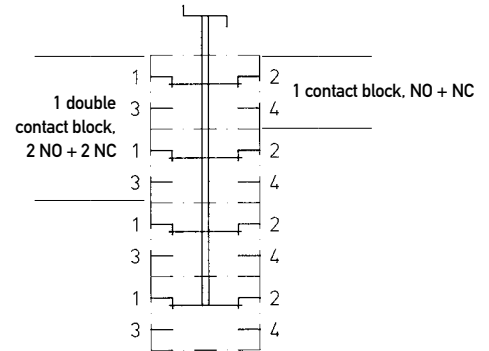


Dimensions



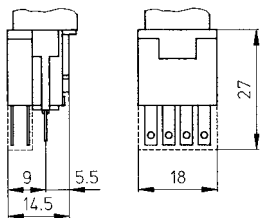
Length in mm (with contact block)  
 plastic bezels 43  
 aluminum bezels 42

Circuit diagram (2 double contact blocks)

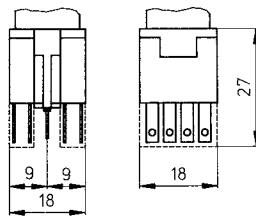


Contact blocks

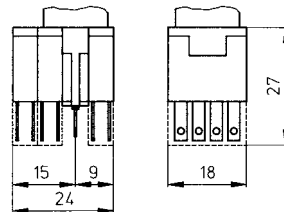
1 contact block



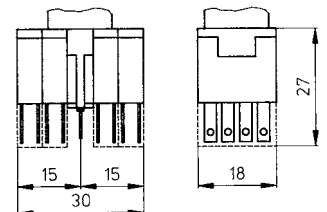
2 contact blocks



1 contact block +  
1 double contact block

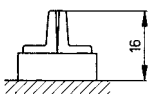


2 double contact blocks

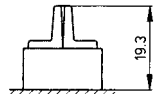


Bezel and rotary knob height

plastic bezel IP40

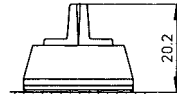


plastic bezel IP65

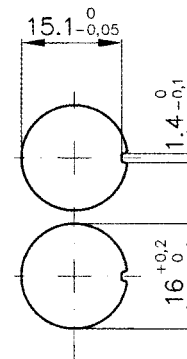


Panel cut-out  
 16.2 mm ± 0.1 mm  
 (plastic)

aluminum bezel



Panel cut-out  
 22.5 mm ± 0.1 mm  
 (aluminum)



## Ordering Reference

Basic type	TR2	Example: TR2			1	A2A	A1	A1	A
Panel cut-out	1	Ø 16.2 mm for plastic bezel rotary switches							
	2	Ø 22.5 mm for Aluminum bezel rotary switches							
Switch body 16.2 mm panel cut-out	A2A	2 Positions; IP40;	Momentary	TH508021000					
	B2A	2 Positions; IP40;	Latching	TH508020000					
	A2B	2 Positions; IP65;	Momentary	TH508026000					
	B2B	2 Positions; IP65;	Latching	TH508025000					
22.5 mm panel cut-out	A2C	2 Positions; Ø 25 mm Aluminum bezel IP65	Momentary	TH508031000					
	B2C	2 Positions; Ø 25 mm Aluminum bezel IP65	Latching	TH508030000					
Contact block, gold Position 1	XX	No contact block							
	A1	NO	2.8 × 0.5 mm	TH593566020					
	A9	NO	Insulated faston	TH593560020					
	A8	NO	Solder	TH593561020					
	B1	NC	2.8 × 0.5 mm	TH593566050					
	B9	NC	Insulated faston	TH593560050					
	B8	NC	Solder	TH593561050					
	C1	1 NO + 1 NC	2.8 × 0.5 mm	TH593566000					
	C9	1 NO + 1 NC	Insulated faston	TH593560000					
	C8	1 NO + 1 NC	Solder	TH593561000					
	D1	2 NO + 2 NC	2.8 × 0.5 mm	TH593567000					
	D9	2 NO + 2 NC	Insulated faston	TH593563000					
	D8	2 NO + 2 NC	Solder	TH593564000					
Contact block, gold Position 2	XX	No contact block							
	A1	NO	2.8 × 0.5 mm	TH593566020					
	A9	NO	Insulated faston	TH593560020					
	A8	NO	Solder	TH593561020					
	B1	NC	2.8 × 0.5 mm	TH593566050					
	B9	NC	Insulated faston	TH593560050					
	B8	NC	Solder	TH593561050					
	C1	1 NO + 1 NC	2.8 × 0.5 mm	TH593566000					
	C9	1 NO + 1 NC	Insulated faston	TH593560000					
	C8	1 NO + 1 NC	Solder	TH593561000					
	D1	2 NO + 2 NC	2.8 × 0.5 mm	TH593567000					
	D9	2 NO + 2 NC	Insulated faston	TH593563000					
	D8	2 NO + 2 NC	Solder	TH593564000					
Bezel			IP40		IP65				
	A	18 mm × 24 mm plastic	TH493060000	TH593060000					
	B	18 mm × 18 mm plastic	TH493062000	TH593062000					
	D	Ø 18 mm plastic	TH493064000	TH593064000					
	E	Ø 25 mm aluminum							

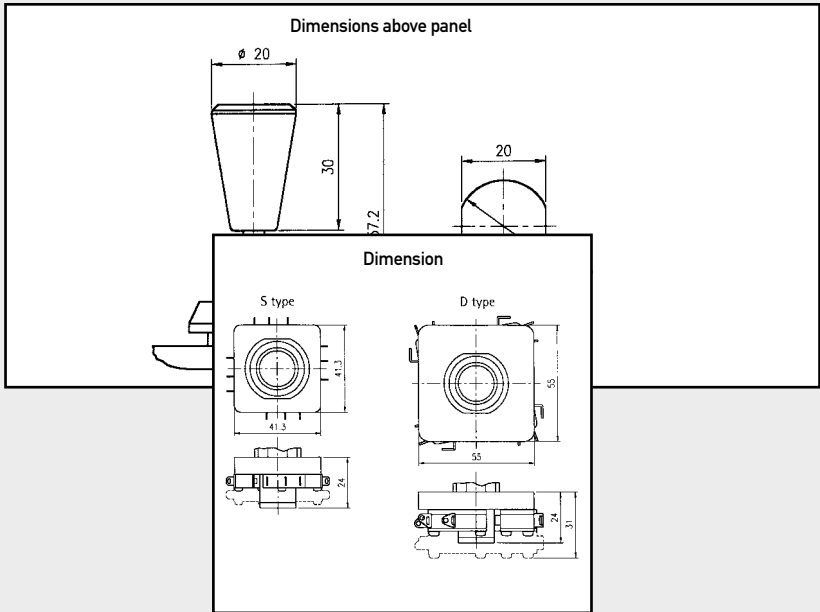
The rotary switch cannot be installed without a bezel. The IP40 bezels are interchangeable before installation. Once an IP65 bezel has been assembled it cannot be removed. Contact blocks will be supplied unassembled.

## Ordering Reference

Basic type	TR2		Example: TR2	1	C2A	C2C	A1	A1	A
Panel cut-out	1	Ø 16.2 mm for plastic bezel rotary switches							
	2	Ø 22.5 mm for Aluminum bezel rotary switches							
Switch body 16.2 mm	C2A	3 Positions; IP40;	Latching P0 + P1 + P2	TH508040000					
	D2A	3 Positions; IP40;	Momentary P1 + P2	TH508041000					
Panel cut-out	E2A	3 Positions; IP40;	Momentary P1 Latching P0 + P2	TH508042000					
	F2A	3 Positions; IP40;	Momentary P2 Latching P0 + P1	TH508043000					
	C2B	3 Positions; IP65;	Latching P0 + P1 + P2	TH508045000					
	D2B	3 Positions; IP65;	Momentary P1 + P2	TH508046000					
	E2B	3 Positions; IP65;	Momentary P1 Latching P0 + P2	TH508047000					
	F2B	3 Positions; IP65;	Momentary P2 Latching P0 + P1	TH508048000					
22.5 mm Panel cut-out	C2C	3 Positions; Ø 25 mm Aluminum bezel IP65	Latching P0 + P1 + P2	TH508060000					
	D2C	3 Positions; Ø 25 mm Aluminum bezel IP65	Momentary P1 + P2	TH508061000					
	E2C	3 Positions; Ø 25 mm Aluminum bezel IP65	Momentary P1 Latching P0 + P2	TH508062000					
	F2C	3 Positions; Ø 25 mm Aluminum bezel IP65	Momentary P2 Latching P0 + P1	TH508063000					
Contact block, gold Position 1	XX	No contact block							
	A1	NO	2.8 × 0.5 mm	TH593566020					
	A9	NO	Insulated faston	TH593560020					
	A8	NO	Solder	TH593561020					
	B1	NC	2.8 × 0.5 mm	TH593566050					
	B9	NC	Insulated faston	TH593560050					
	B8	NC	Solder	TH593561050					
	C1	1 NO + 1 NC	2.8 × 0.5 mm	TH593566000					
	C9	1 NO + 1 NC	Insulated faston	TH593560000					
	C8	1 NO + 1 NC	Solder	TH593561000					
	D1	2 NO + 2 NC	2.8 × 0.5 mm	TH593567000					
	D9	2 NO + 2 NC	Insulated faston	TH593563000					
	D8	2 NO + 2 NC	Solder	TH593564000					
Contact block, gold Position 2	XX	No contact block							
	A1	NO	2.8 × 0.5 mm	TH593566020					
	A9	NO	Insulated faston	TH593560020					
	A8	NO	Solder	TH593561020					
	B1	NC	2.8 × 0.5 mm	TH593566050					
	B9	NC	Insulated faston	TH593560050					
	B8	NC	Solder	TH593561050					
	C1	1 NO + 1 NC	2.8 × 0.5 mm	TH593566000					
	C9	1 NO + 1 NC	Insulated faston	TH593560000					
	C8	1 NO + 1 NC	Solder	TH593561000					
	D1	2 NO + 2 NC	2.8 × 0.5 mm	TH593567000					
	D9	2 NO + 2 NC	Insulated faston	TH593563000					
	D8	2 NO + 2 NC	Solder	TH593564000					
Bezel	A	18 mm × 24 mm plastic		IP40 TH493060000	IP65 TH593060000				
	B	18 mm × 18 mm plastic		TH493062000	TH593062000				
	D	Ø 18 mm plastic		TH493064000	TH593064000				
	E	Ø 25 mm aluminum							

The rotary switch cannot be installed without a bezel. The IP40 bezels are interchangeable before installation. Once an IP65 bezel has been assembled it cannot be removed. Contact blocks will be supplied unassembled.

# Joystick





## 700

Panel cut-out (mm) Ø 22 × 20

Characteristics

- single or double pole
- choice of directional gating options
- miniature or subminiature microswitch types

Rating

up to 15 A, 250 VAC, miniature microswitches (380 series)  
up to 6 A, 250 VAC, subminiature microswitches (290 series)

Dimensions (mm) 55 × 55 × 55.2, miniature microswitches (380 series)  
41.3 × 41.3 × 51.2, subminiature microswitches (290 series)

Actuator

- knob

Approvals

ENEC, UL and CSA (switch only)



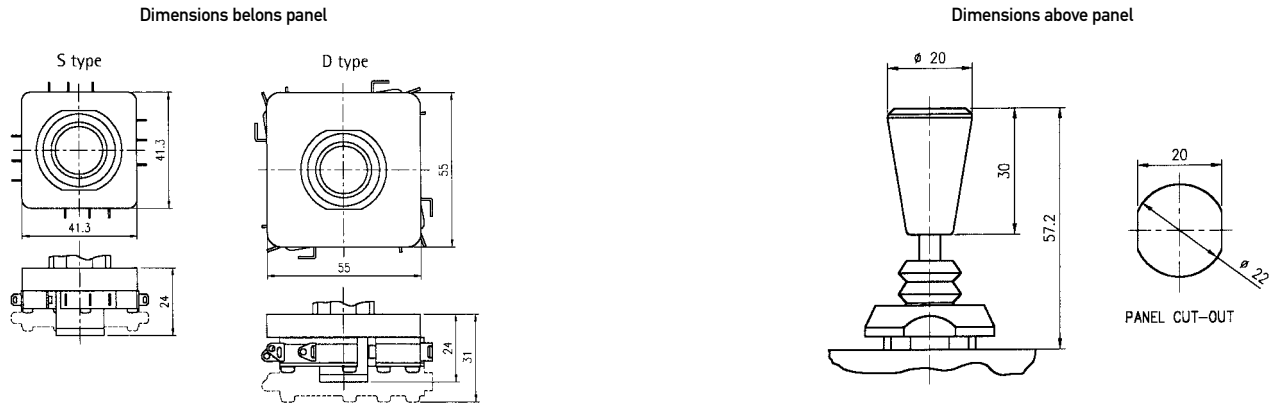
## Popular products

Ordering Reference	Panel cut-out	Dimensions	Directional gating	Number of poles	Switch type	Terminal Type	Electrical rating ENEC	UL/CSA
S 721001	Ø 22 × 20	41.3 × 41.3 × 81.2	2 way gate at 180°	1 pole	292/20/150	Solder	6 A, 250 VAC, 25E3, T85	6 A, 250 VAC
S 741001	Ø 22 × 20	41.3 × 41.3 × 81.2	4 way gate at 90°	1 pole	292/20/150	Solder	6 A, 250 VAC, 25E3, T85	6 A, 250 VAC
S 722001	Ø 22 × 20	41.3 × 41.3 × 81.2	2 way gate at 180°	2 pole	292/20/150	Solder	6 A, 250 VAC, 25E3, T85	6 A, 250 VAC
S 742001	Ø 22 × 20	41.3 × 41.3 × 81.2	4 way gate at 90°	2 pole	292/20/150	Solder	6 A, 250 VAC, 25E3, T85	6 A, 250 VAC
D 721001	Ø 22 × 20	55 × 55 × 88.2	2 way gate at 180°	1 pole	382/25/10	Solder	15 (4) A, 250 VAC, 10E3, T85	15 A, ½HP, 125/250 VAC
D 741001	Ø 22 × 20	55 × 55 × 88.2	4 way gate at 90°	1 pole	382/25/10	Solder	15 (4) A, 250 VAC, 10E3, T85	15 A, ½HP, 125/250 VAC
D 722001	Ø 22 × 20	55 × 55 × 88.2	2 way gate at 180°	2 pole	382/25/10	Solder	15 (4) A, 250 VAC, 10E3, T85	15 A, ½HP, 125/250 VAC
D 742001	Ø 22 × 20	55 × 55 × 88.2	4 way gate at 90°	2 pole	382/25/10	Solder	15 (4) A, 250 VAC, 10E3, T85	15 A, ½HP, 125/250 VAC

## Specifications

Switch	380 series miniature snap-action microswitches (D type below) or 290 series subminiature snap-action microswitches (S type below)
Body and fixing nut	Nylon 6.6
Spindle	Nylon 6.6 reinforced with stainless steel
Sealing cowl	Neoprene
Knob	Phenolic
Spring	Spring steel

## Dimensions



## Recommended maximum electrical ratings

Approvals held	None
Electrical rating	D – 15 A, 250 VAC S – 6 A, 250 VAC
Switch Type	D – 382/25/10 (solder) or 383/25/10 (faston) with gold flashed contacts S – 292/20/150 (solder) or 291/20/150 (faston) with gold flashed contacts
Temperature rating	T85 °C
Insulation resistance	>1250 V
Tracking resistance	PTI KB 250

## Ordering Reference

Switch	S	290 Series subminiature microswitches	Example: S	7	1	1	0	0	1
	D	380 Series miniature microswitches							
Type	7	700 range							
Directional gating	1	Ungated (stirring action)							
	2	2 way gate							
	4	4 way gate							
Number of poles	1	Single pole							
	2	Double pole							
Spring return	0	Standard (momentary)							
Terminal Type	0	S Type (290) 292 (solder)							
	1	291 (2.8 × 0.5 faston)							
	2	294 – PCB – LH faston							
		D Type (380) 382 (solder)							
		383 (6.35 × 0.8 faston)							
		385 (4.8 × 0.5 mm faston)							
Cowl fitted	1	Standard							

## J8

Panel cut-out (mm)	Ø 22.5
Characteristics	<ul style="list-style-type: none"> <li>■ choice of directional gating options</li> <li>■ choice of microswitch functions</li> </ul>
Rating	up to 16 A, 250 VAC up to 5 A, 250 VAC
Dimensions (mm)	up to 74.5 × 74.5 × 105 up to Ø 60 × 60 × 103.5
Actuator	■ knob
Approvals	ENEC, UL and CSA (switch only)



### Popular products

Ordering Reference	Panel cut-out	Dimensions	Directional gating	Number of poles	Actuating modus	Switch type	Terminal Type	Electrical rating ENEC	UL/CSA
J84 111 113	Ø 22.5	74.5 × 74.4 × 94.7	4 way gate at 90°	1 pole	Normal	XG03-88	Solder	16 (6) A, 250 VAC, 5E4, T85	15 A, 250 VAC
J82 111 113	Ø 22.5	74.5 × 74.4 × 94.7	2 way gate at 180°	1 pole	Normal	XG03-88	Solder	16 (6) A, 250 VAC, 5E4, T85	15 A, 250 VAC
J84 112 113	Ø 22.5	74.5 × 74.4 × 94.7	4 way gate at 90°	1 pole	Lift to operate	XG03-88	Solder	16 (6) A, 250 VAC, 5E4, T85	15 A, 250 VAC
J82 112 113	Ø 22.5	74.5 × 74.4 × 94.7	2 way gate at 180°	1 pole	Lift to operate	XG03-88	Solder	16 (6) A, 250 VAC, 5E4, T85	15 A, 250 VAC
J82 211 113	Ø 22.5	74.5 × 74.4 × 105	2 way gate at 180°	2 pole	Normal	XG03-88	Solder	16 (6) A, 250 VAC, 5E4, T85	15 A, 250 VAC
J84 211 113	Ø 22.5	74.5 × 74.4 × 105	4 way gate at 90°	2 pole	Normal	XG03-88	Solder	16 (6) A, 250 VAC, 5E4, T85	15 A, 250 VAC

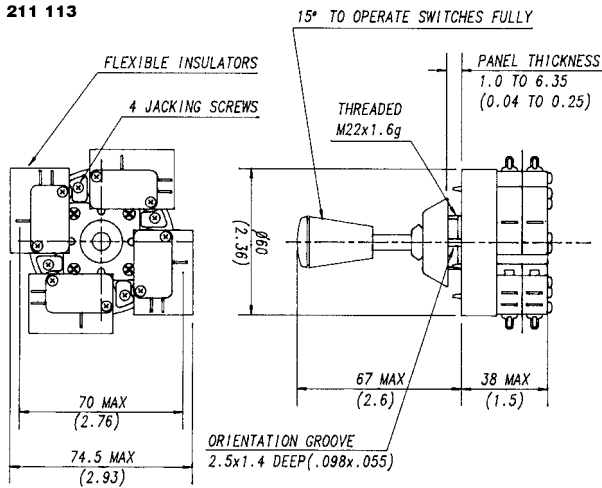
## Specifications

Top plate	Glass fibre reinforced polyamide (PA. 6.6)
Control rod	Steel chrome plated
Bezel/knob	Phenolic
Cowl/'O' ring	Silicon rubber
Temperature range	-40°C to +85°C
Mechanical life	5 × 10 <sup>5</sup> cycles minimum
Type of protection	Cowl and 'O' ring provide front of panel sealing. For details of insert switch protection refer to the appropriate section
Mounting	via single hole 22.5 mm (ø.89 in) dia
Insert switches	V4NCT7 – Sub-miniature XG03-88 – Miniature (Other types may be possible please consult TH-Contact Electronics)

Dimensions

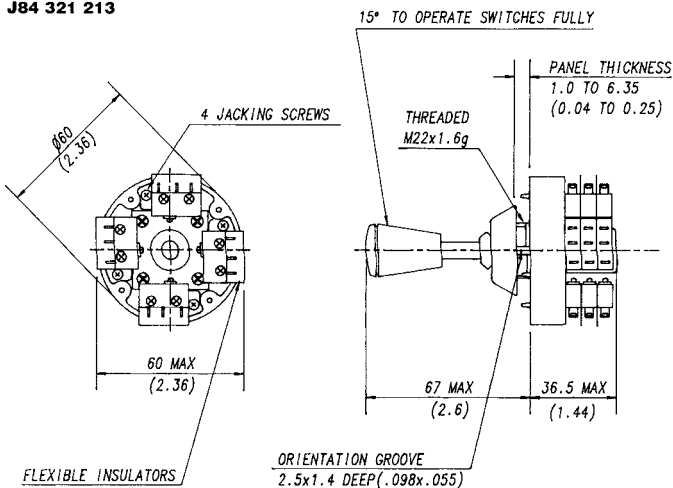
Dimensions below panel

**J84 211 113**



Dimensions above panel

**J84 321 213**



## Recommended maximum electrical ratings

	Voltage	Voltage (V)	Resistive load (A)	Inductive load (A)	
V4NCT7	AC	up to 250	5	2	See pages 52 to 55
	DC	up to 30	5	3	
	DC	up to 50	1	1	
	DC	up to 75	0.75	0.75	
XG03-88	AC	up to 250	16	6	See pages 70 to 73
	DC	up to 30	12	7	
	DC	up to 50	3	1.5	
	DC	up to 75	1	0.6	
	DC	up to 125	0.5	0.3	
	DC	up to 250	0.3	0.2	

## Ordering Reference

Basic type		J8	Example: J8					0	1	1	1	113
Number of gates	0	Ungated (stirring action)										
	2	2 gates at 180°										
	4	4 gates at 90°										
Number of switches mounted per gate	1	1 × V4NCT7 or 2 × XG03-88										
	2	2 × V4NCT7 or 2 × XG03-88										
	3	3 × V4NCT7 only										
Type of action	1	Momentary										
	2	Latching										
	4	Stirring										
Mode of operation	1	Normal (Direct push)										
	2	Lift to operate										
Type of micro switches fitted	113	XG03-88										
	213	V4NCT7										

## Contact blocks

TH593566020	NO	2.8 × 0.5mm	Contact blocks for TP2, TK2, TR2	gold plated
TH593560020	NO	Insulated faston		
TH593561020	NO	Solder		
TH593566050	NC	2.8 × 0.5mm		
TH593560050	NC	Insulated faston		
TH593561050	NC	Solder		
TH593566000	1 NO + 1 NC	2.8 × 0.5mm		
TH593560000	1 NO + 1 NC	Insulated faston		
TH593561000	1 NO + 1 NC	Solder		
TH593569000	2 NO + 2 NC	2.8 × 0.5mm		
TH593563000	2 NO + 2 NC	Insulated faston		
TH593564000	2 NO + 2 NC	Solder		



TH493500000			Contact blocks for TP4, TP5	gold plated
TH493520000	End plate for TP4, TP5			
TH493521000	(for 1 contact block)		Pairs of screws for TP4, TP5	
TH493522000	(for 2 contact blocks)			
TH493523000	(for 3 contact blocks)			

## Mounting nuts (whole range)

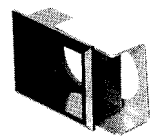
TH593545000	Fixation nuts M16 × 1 (TP2, TP5, TP4)
TH593547000	Fixation nuts M22 × 1 flat (TP2, TP5, TP4)
TH493547000	Fixation nuts M22 × 1 large (TP5, TP4)



## Countersunk mounting bezel sets (TP2, TP5, TI2, TI5)

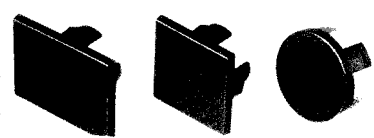
### For concealed versions only

TH593072000	for Switches 18 × 24 mm, IP40
TH593082000	for Switches 18 × 24 mm, IP67
TH593073000	for Switches 18 × 18 mm, IP40
TH593083000	for Switches 18 × 18 mm, IP67



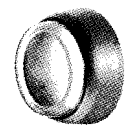
## Panel plugs (TP2, TP5)

TH493000000	18 × 24, IP40
TH493002000	18 × 18, IP40
TH493004000	∅ 18, IP40

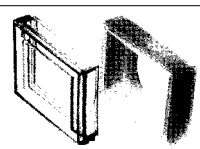


## Protecting covers (TP2, TP5, TP4)

TH493033000	Sealing ring D26, alu natural, silicon cap, IP65 (TP5, TP2, TI5, TI2 22.5 mm)
TH493033001	Sealing ring D25, alu natural, strong pebax cap, IP65 (TP5, TP2, TI5, TI2 22.5 mm)



TH493031000	Splashproof protection (transp. plast. upper part only) for exposed bezel 18 × 24 (TP2, TP5, TP4)
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TH493010000	Guard bracket, for switches 18 × 24, anodised aluminum (wide sides raised)
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TH493011000	Guard bracket, for switches 18 × 18, anodised aluminum (two sides raised)
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TH493012000 Guard bracket, for switches  $\varnothing$  18, anodised aluminum

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TH493020000 Guard bracket, for switches 18 x 24, black plastic (all sides raised)

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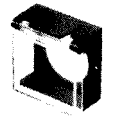


TH593032000 Protecting cover with transparent plastic lid, 18 x 18

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TH593035000 Protecting cover with transparent plastic lid, 18 x 24

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### Anti-rotation devices (TK2, TR2, TE8)

TH053205000 for panel cut-out 16.2 mm (TK2, TR2)

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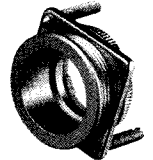
TH493532000 for panel cut-out 22.5 mm (TK2, TR2)

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TH593080000 Adapter set, key- and rotary switches (TK2, TR2)

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TH060661000 panel cut-out 16.2 mm (TE8)

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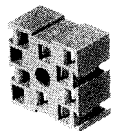
### Plug in socket (TP2)

TH593578000 for 1 contact block TP2 with indicator terminals

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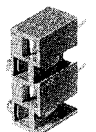
TH593568000 for 2 contact blocks TP2 with indicator terminals

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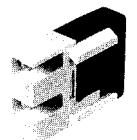
TH593582000 for 1 contact block TP2 without indicator terminals

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TH593584000 Diode carrier with 2 diodes 1N4007, faston connection without insulation

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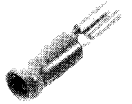
## Extra and spare keys (TK2)

TH493049001 to TH493049020 (KABA MICRO, EB0001 – EB0020)

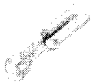
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## Faston Connectors (TP2, TK2, TR2, TP8)

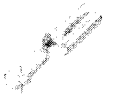
TH593571000 Faston pin, 2.8 × 0.5 mm, insulated, for wires 0.8 – 1.4 mm<sup>2</sup> (TP2, TK2, TR2)



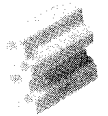
TH593572000 Faston pin, 2.8 × 0.5 mm, for wires 0.5 – 1.0 mm<sup>2</sup> (TP2, TK2, TR2, TP8)



TH593573000 Faston pin, 2.8 × 0.5 mm, for faston casings, for wires 0.3 – 0.6 mm<sup>2</sup> (TP2, TK2, TR2)



TH593574000 Sleeve and casing for th25 contact block 1 NO + 1 NC (TP2, TK2, TR2)



TH593575000 Sleeve and casing for th25 lamp terminals (TP2, TK2, TR2)



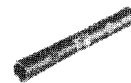


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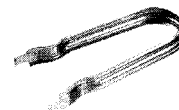
## Miscellaneous (Lamp extractor, metal and plastic spanners)

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TH492000000 Lamp extractor



TH492005000 Lens extractor



TH492100000 Metal box-spanner, fixation nut M16 × 1

TH492105000 Metal box-spanner, fixation nut M22 × 1



## Lamps (TP2, TP5, TI2, TI5)

### Incandescent lamps

TH590000000 6 V

TH590001000 12 V

TH590006000 24 V

TH590004000 48 V

### Midget – grooved Led

TH590231000 Yellow 6 V

TH590234000 Yellow 12 V

TH590237000 Yellow 24V

TH590240000 Yellow 48 V

TH590232000 Green 6 V

TH590235000 Green 12 V

TH590238000 Green 24 V

TH590241000 Green 48 V

TH590230000 Red 6 V

TH590233000 Red 12 V

TH590236000 Red 24 V

TH590239000 Red 48 V

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