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th contact

JOHNSON ELECTRIC

innovating motion

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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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OVERVIEW

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.

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

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.

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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?

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.

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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

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Panel mounted switches for industrial control equipment

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

Reliable operation in public environments demands:

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

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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	TI2	TI5	TI9	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																		●	●
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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 redertermine 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.

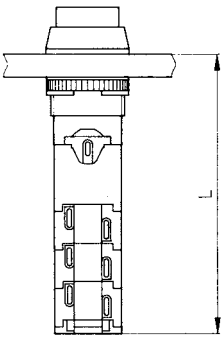
Definition	Protection to IEC 144/855420	Protection to NEMA enclosure type	NEMA Definition
Protection against solid objects greater than 12 mm	IP 20	NEMA 1 (ventilated)	general purpose
Protection against solid objects greater than 2.5 mm	IP 30	NEMA 1	general purpose
Protection against solid objects greater 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	–	–
Dustight and protected against water jets	IP 65	NEMA 12	industrial use dustight & driptight
Dustight and protected against heavy seas	IP 66	NEMA 35	dustight, driptight
Dustight and protected against heavy seas	IP 66	NEMA 4	dustight, watertight
		NEMA 4X	dustight, watertight corrosion resistant
Dustight and protected against water entry at one meter immersion	IP 67		
Dustight and protected against heavy submersion	IP 68	NEMA 6	submersible watertight, dustight sleet (ice) resistant indoor & outdoor
Protection against sleet (ice) not specified by IEC		NEMA 13	oiltight & dustight

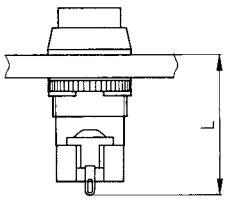
Actuator	TP4	TP5	TP2
Switching mechanism	Heart-shaped switching labyrinth	Heart-shaped switching labyrinth with bi-functional mechanism ☺ (momentary or latching function)	
Actuating force	Approx. 2.5N (with one contact block)		
Fixation	Central with metal fixation nut		
Protective system	IP40, IP65		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 1¾ 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		
Contact block 5 A	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 mm² or strands 4 × 0.75 mm²		Solder terminals for braid wire 1 × 1 mm² or strands 2 × 0.75 mm². 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		
Contact block 6 A **Contact block 16 A**			technical information on page 00

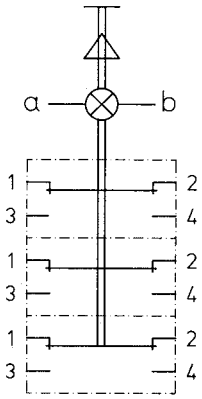
Tightening torques

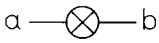
Hexagonal metal nut	M12 × 0.75	max. 100 Ncm
Metal fixation nut	M16 × 1	max. 150 Ncm
Metal fixation nut	M22 × 1	max. 300 Ncm
Contact block screws for	th4, th5	max. 13 Ncm
Pin screws	M2.5 for anti-rotation plates on th25 switch with plastic ring ∅ 25 IP65	max. 30 Ncm
Pin screws	M3 for anti-rotation plates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

th4

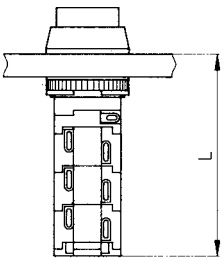


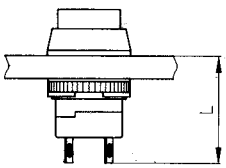


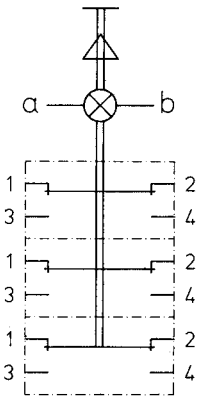




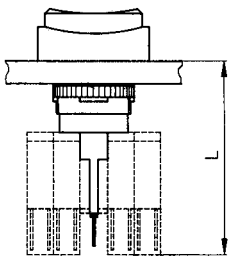
th5

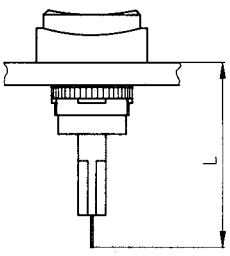


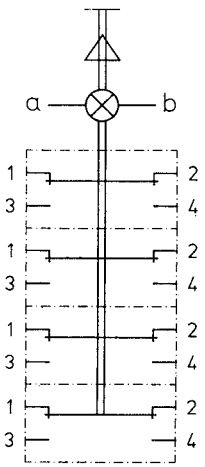




th25

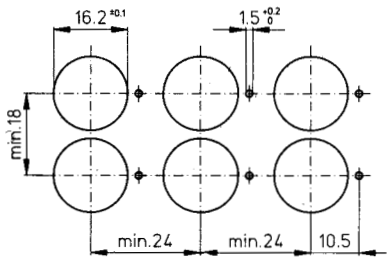






Assembly instructions

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



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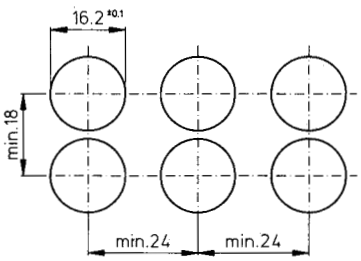
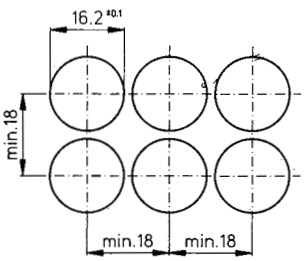
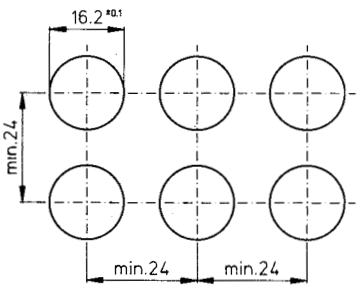


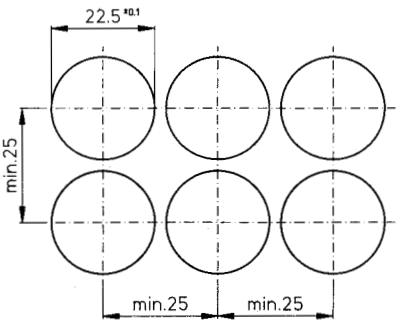
18 x 24 IP67



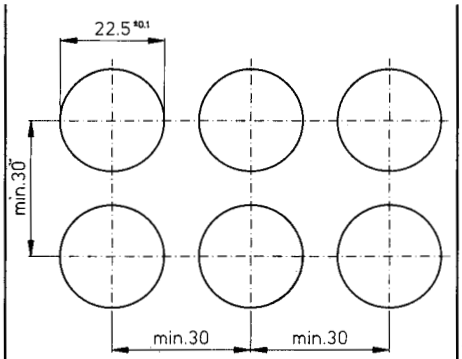
18 x 18 / Ø 18 IP40 / IP67



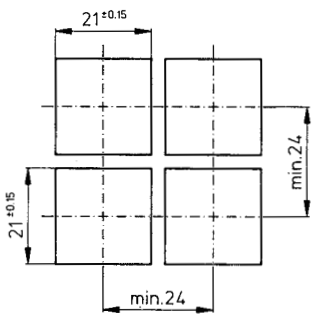
Ø 24 24 x 24 IP40 / IP65



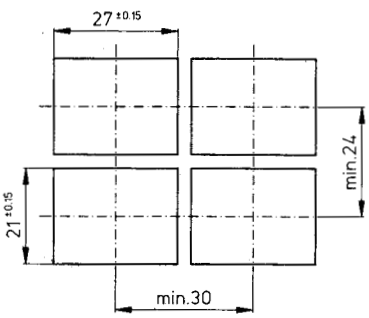
Ø 25 IP40 / IP65 / IP67



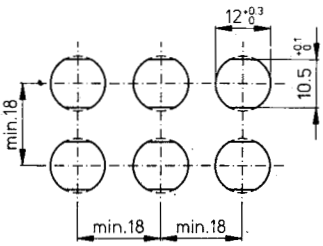
Ø 30 IP65



24 x 24 IP40 / IP67



24 x 30 IP40 / IP67

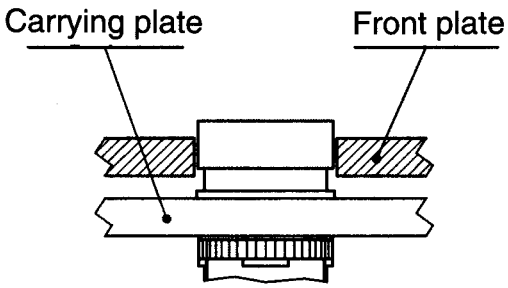


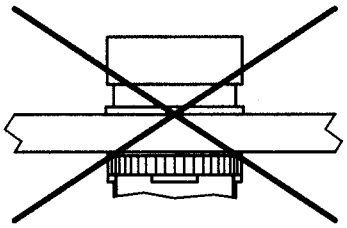
Ø 12 IP40

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

Assembly instructions for switches with concealed plastic bezel for mimic diagrams

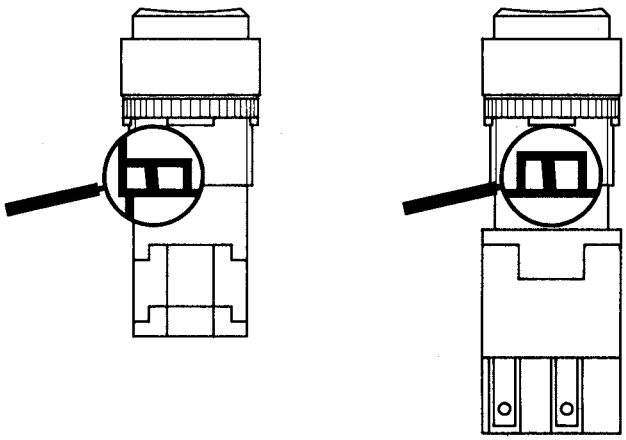
This bezel type has been designed especially for mimic diagrams (for example mosaic panels). Please respect by all means the assembly instructions on the respective catalog pages.



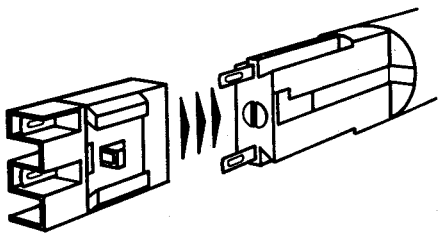


Bi-functional selection
All the latching switches in the th5 and th25 series incorporate a simple selector mechanism for redetermining the function of the switch. These products are marked with a ☺. This mechanism is not supplied in the momentary switch nor in interlocking assemblies.

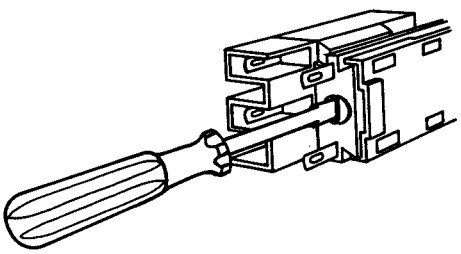
Application:
When the switch is in the "off" position, the selector machenism in the small side opening on the basic element can be shifted to the right to obtain the momentary function (for example with an opened paper clip), or vice versa to return to the latching function.



Assembly of the contact blocks

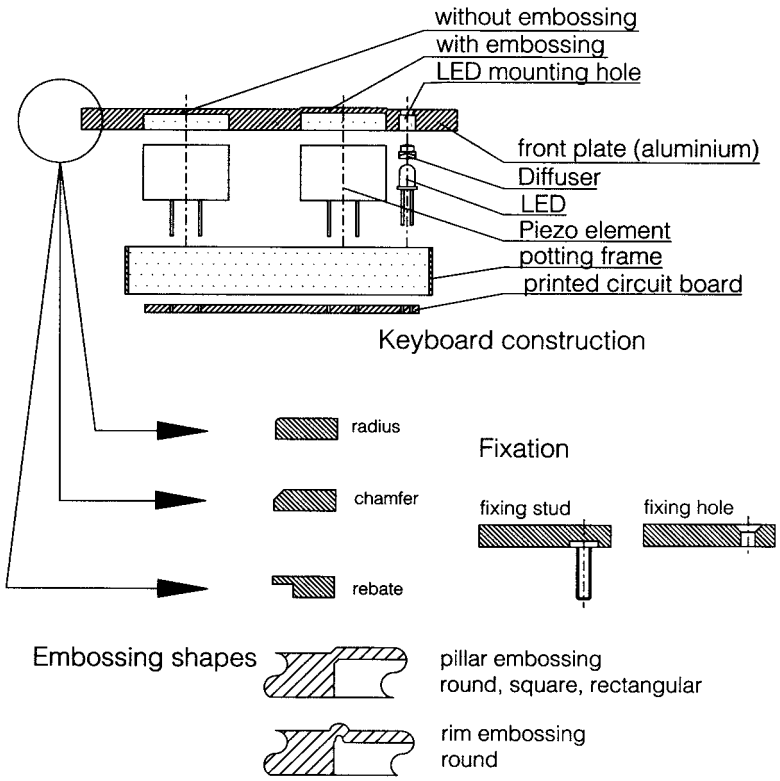


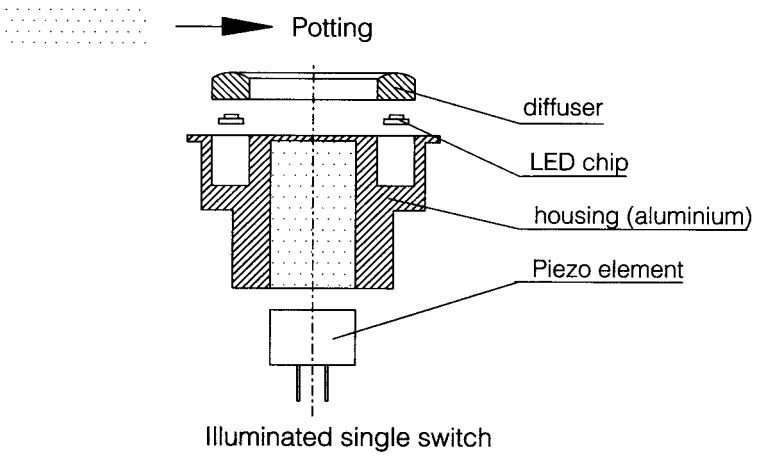
Turn the slot of the red locking pin parallel to the dovetail of the switch body and slide the contact block onto the dovetail.

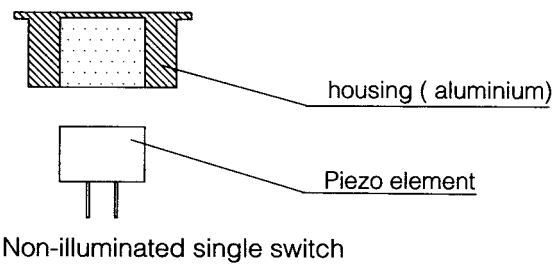


When the switch is in «off» position the contact block must be pushed firmly into position and held there. Secure by turning the red locking pin a quarter turn in an clockwise direction with a suitable screwdriver.

Construction of our Piezo single switches and keyboards

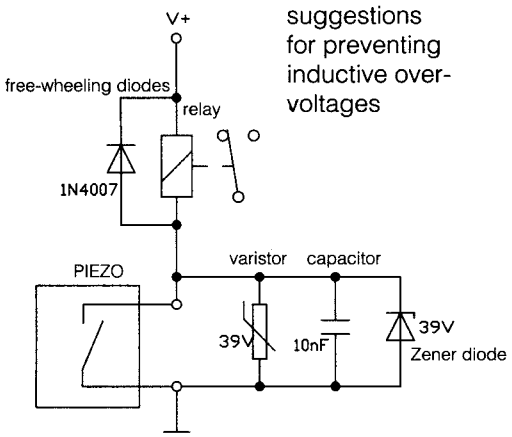




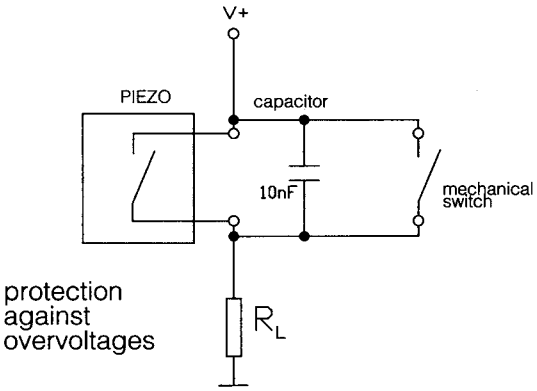


Application hints and typical circuits

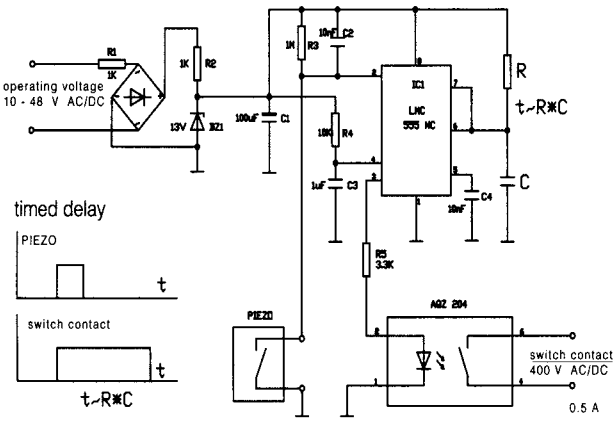
Overvoltage protection



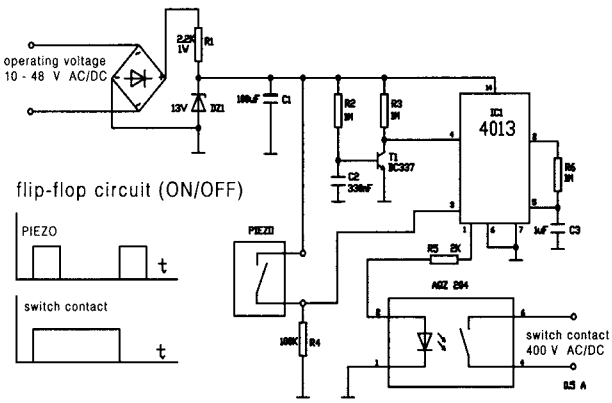
Overvoltage protection



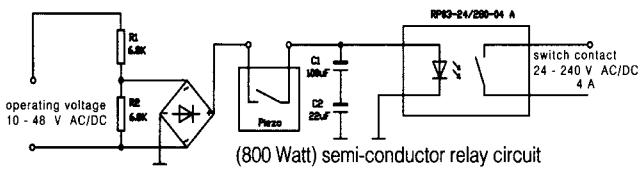
Timed delay circuit



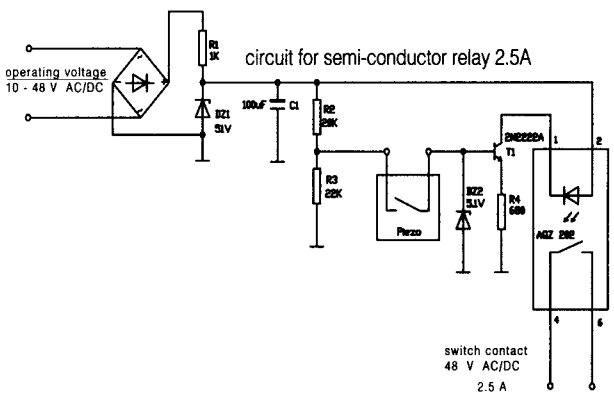
Flip-flop circuit



(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	▪ momentary or latching ▪ sealed IP40, IP65 or IP67 ▪ wide range of bezels ▪ with or without illumination ▪ NO, NC, CO ▪ gold plated single or double pole contact blocks	▪ momentary or latching ▪ sealed IP40 or IP65 ▪ wide range of bezels ▪ shallow mounting depth ▪ with or without illumination ▪ NO, NC ▪ gold plated contact blocks	▪ mushroom ▪ momentary or latching ▪ sealed IP40 or IP65 ▪ wide range of bezels ▪ NO, NC ▪ gold plated contact blocks	▪ momentary ▪ sealed IP67 ▪ round metal bezels ▪ 1NO + 1 NC, 2 NC, 2 NO ▪ gold plated contact block	▪ momentary short stroke switch ▪ sealed IP65 or IP67 ▪ round metal bezels ▪ NO ▪ snap-in mounting option Ø 22.5 mm (IP65 only)
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	▪ lenses in different shapes and colors	▪ lenses in different shapes and colors	▪ mushroom cap in different shapes and colors	▪ button and housing in different colors	▪ button and housing in different colors
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	▪ piezo technology ▪ momentary ▪ sealed IP68 ▪ with or without illumination, two colors ▪ solid state output ▪ NO	▪ meets EN418 directives ▪ sealed IP65 ▪ rotary, reset mechanism ▪ <20 mm behind panel depth ▪ 1NO + 1 NC or 2 NC	▪ meets EN418 directives (Ø 27 mm only) ▪ sealed IP66 or IP67 ▪ rotary pull or key reset ▪ yellow disk bezel (optional) ▪ 1NO + 1 NC or 2 NC	▪ illuminated ▪ sealed IP40, IP65 or IP67 ▪ wide range of bezels ▪ midget grooved lamp/ LED	▪ illuminated ▪ sealed IP40, IP65 or IP67 ▪ wide range of bezels ▪ midget grooved lamp/ LED
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	▪ housing in different colors	▪ red mushroom cap	▪ red mushroom cap (Ø 27 mm only) ▪ reset by KABA key (Ø 40 mm only)	▪ lenses in different shapes and colors	▪ lenses in different shapes and colors
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

Keyswitch

Type	TI9	TK2	E1	M1
Panel cut-out (mm)	Ø 22.5	Ø 16.2/22.5	⍁ 15.1 × 15.1	⍁ 15.1 × 15.1
Characteristics	▪ illuminated ▪ sealed IP67 ▪ round metal bezels ▪ red LED ▪ green LED ▪ red-green LED	▪ 2 and 3 position ▪ sealed IP40 or IP65 ▪ plastic or aluminum bezels ▪ wide range of bezels ▪ NO, NC ▪ gold plated, single or double pole, contact blocks ▪ key trapping options	▪ tamper proof ▪ 2 positions ▪ key trapping options ▪ gold-plated contacts ▪ PCB terminals	▪ double pole change-over or three circuit selector switching functions ▪ key trapping option ▪ two body style options ▪ gold-plated contacts ▪ PCB terminals
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	▪ aluminum housing in different colors	▪ key-KABA MICRO	▪ plastic key	▪ key (common or differs)
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	▪ choice of off-on or change-over center off or spring return options ▪ key trapping option ▪ solder terminals	▪ up to12 contact pairs ▪ 2 security options with key actuation ▪ from 2 to 4 switch positions ▪ key trapping option ▪ solder terminals	▪ high electrical rating ▪ key trapping option ▪ choice of off-on, change-over with spring return or change-over with separate circuits	▪ 2 and 3 position ▪ sealed IP40 or IP65 ▪ plastic or aluminum bezels ▪ NO, NC ▪ gold plated, single or double pole, contact blocks
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	▪ key (common or differs)	▪ key (common or differs)	▪ key (common or differs)	▪ black knob, with white indicating bar
Approvals	UL and CSA	UL (optional)	UL and CSA	UL, CSA, VDE
Page	81	83	86	89

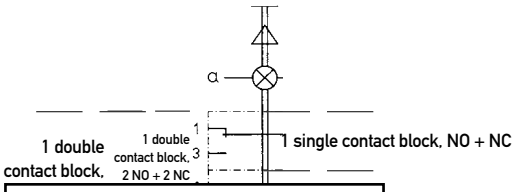
Panel Mount Products

Joystick

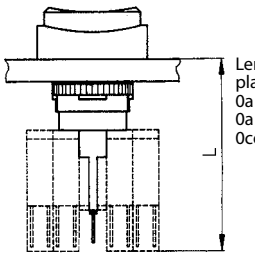
	700	J8
Type		
Panel cut-out (mm)	Ø 22 × 20	Ø 22.5
Characteristics	■ single or double pole ■ choice of directional gating options ■ miniature or subminiature microswitch types	■ choice of directional gating options ■ choice of microswitch functions
Rating	up to 15 A, 250 VAC, miniature microswitches up to 6 A, 250 VAC, subminiature microswitches	up to 16 A, 250 VAC up to 5 A, 250 VAC
Dimensions (mm)	55 × 55 × 57.2 miniature microswitches 41.3 × 41.3 × 57.2 subminiature microswitches	up to 74.5 × 74.5 × 105 up to Ø 60 × 60 × 103.5
Actuator	■ knob	■ knob
Approvals	ENEC, UL and CSA (switch only)	ENEC, UL and CSA (switch only)
Page	92	94

Modular Push Button

Circuit diagram (2 double contact blocks)



Dimension



JOHNSON ELECTRIC

innovating motion

TP2

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ momentary or latching ▪ sealed IP40, IP65 or IP67 ▪ wide range of bezels ▪ with or without illumination ▪ NO, NC, CO ▪ gold plated single or double pole contact blocks
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

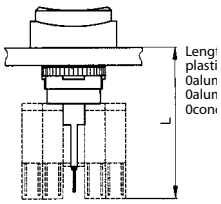
Popular products

Ordering Reference	Panel cut-out	Function	Actuator style	Terminals	Electrical rating
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	10^6 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 mm² (braided), 2 × 0.75 mm (stranded) Faston – 2.8 mm × 0.5 mm
Vibration resistance	1.5 mm pp amplitude at 55 Hz

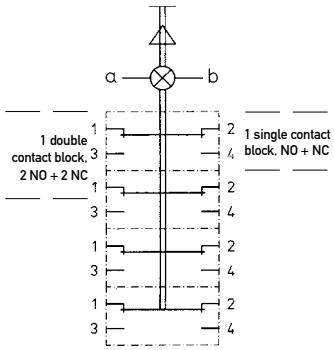
Dimensions



Length in mm (with contact block)

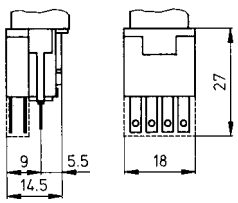
plastic bezels	43.0
aluminum bezels	42.0
aluminum bezels	50.0
concealed mounting	

Circuit diagram (2 double contact blocks)

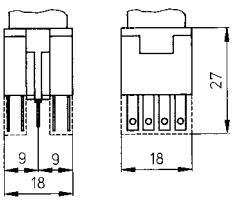


Contact blocks

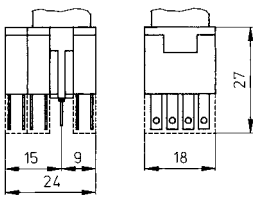
1 single contact block



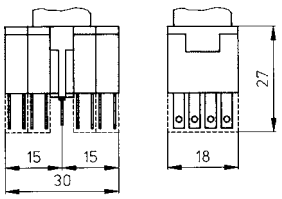
2 single contact blocks



1 single contact block + 1 double contact block



2 double contact blocks

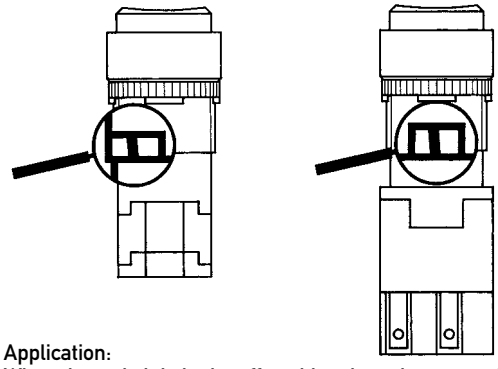


Recommended maximum electrical ratings

Voltage (max) 250 VAC	Resistive load (A) 5.0 (0.7 pf)	Inductive load (A) L/R = 15 ms	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		

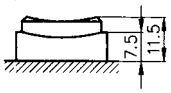
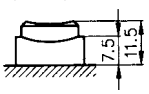
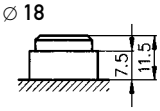
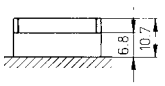
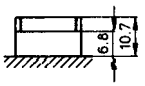
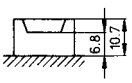
Bi-functional selection

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.

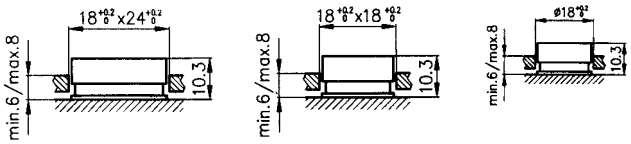


Application:
When the switch is in the off position the selector mechanism can be moved to the right to obtain a momentary function, or to the left to return to a latching function.

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

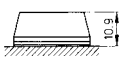
	18 × 24	18 × 18	∅ 18
exposed version IP40			
exposed version IP67			

Panel cut-out exposed version 16.2 ±0.1 mm

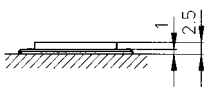


Aluminum bezel ∅ 25 and lens heights in mm (switch off position)

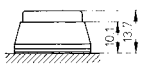
aluminum bezel
without sealing gasket (IP40)



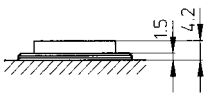
aluminum bezel
countersunk mounting (IP40)



aluminum bezel
with sealing gasket (IP65)



aluminum bezel
countersunk mounting (IP67)



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

Example: TP2 | 1 | MAA | A1 | A1 | A0 | A | N

Basic type: TP2

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

		Terminals	Part No.
XX	No Contact Blocks		
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

		Terminals	Part No.
XX	No Contact Blocks		
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)

		Exposed	Exposed IP40	Exposed IP67	Concealed	Concealed IP 40
A0	White	15 × 21 mm	TH461021000	TH561011000	18 × 24 mm	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
		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

Example: TP2 | 1 | MAD | A1 | A1 | A0 | A | N

Basic type: TP2

Panel cut-out: 1 — Ø 16.2 mm

Switch body (A)

	Function	Actuator	Housing (plastic)	Part No.
MAD	Momentary	18 × 24 mm	Exposed ; IP40; solder	TH501108000
LAD	Latching_	18 × 24 mm	Exposed ; IP40; solder	TH511108000
MAF	Momentary	18 × 24 mm	Exposed ; IP67; solder	TH501115000
LAF	Latching_	18 × 24 mm	Exposed ; IP67; solder	TH511115000
MAE	Momentary	18 × 24 mm	Concealed ; IP40; solder	TH501102000
LAE	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

		Terminals	Part No.
XX	No Contact Blocks		
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

		Terminals	Part No.
XX	No Contact Blocks		
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

		Exposed	Exposed IP40	Exposed IP67	Concealed	Concealed IP 40
For Switch body style (A)						
A0	White	15 × 21 mm	TH461021000	TH561011000	18 × 24 mm	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
		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

Example: TP2 | 2 | MFA | A1 | A1 | E0 | A | N

Basic type: TP2

Panel cut-out: 2 — Ø 22.5 mm

Switch body (A) / (B):

	Function	Actuator	Housing	Part No.
MFA	Momentary	Ø 25	Exposed plastic; IP65; faston	TH505020000
LFA	Latching_	Ø 25	Exposed plastic; IP65; faston	TH515020000
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:

		Terminals	Part No.
XX	No contact blocks		
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:

		Terminals	Part No.
XX	No contact blocks		
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): For Plastic Bezel only IP65

E0	White	Ø 21	TH565024000
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): For Aluminum Bezel only

			IP40/IP65	IP65 with Silion cap	IP67
F0	White	Ø 18	TH465015000	TH465001000	TH565025000
F1	Yellow	Ø 18	TH465115000	TH465101000	TH565125000
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:

		6V, 200 mA	12V, 80 mA	24V, 50 mA	48V, 25 mA
X	Non illuminated				
N	Incandescent lamp	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) / (B)

	Function	Actuator	Housing	Part No.
MFF	Momentary	Ø 25	Exposed plastic; IP65; solder	TH505120000
LFF	Latching	Ø 25	Exposed plastic; IP65; solder	TH515120000
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

		Terminals	Part No.
XX	No Contact Blocks		
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

		Terminals	Part No.
XX	No Contact Blocks		
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
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 Plastic Bezel only IP65

For Switch body style (B)

			IP40/IP65	IP65 with Silion cap	IP67
F0	White	Ø 18	TH465015000	TH465001000	TH565025000
F1	Yellow	Ø 18	TH465115000	TH465101000	TH565125000
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

For Aluminum Bezel only

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
		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

TP5

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ momentary or latching ▪ sealed IP40 or IP65 ▪ wide range of bezels ▪ shallow mounting depth ▪ with or without illumination ▪ NO, NC ▪ gold plated contact blocks
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

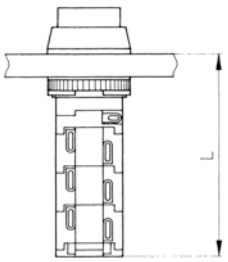
Popular Products

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	10^6 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 mm² (braided), 4 × 0.75 mm (stranded)
Vibration resistance	1.5 mm pp amplitude at 55 Hz

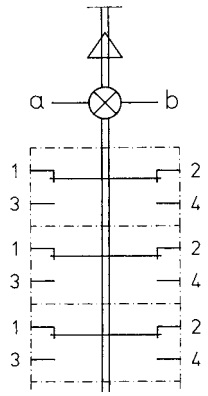
Dimensions



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)



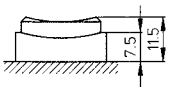
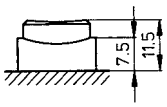
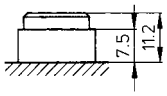
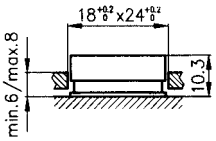
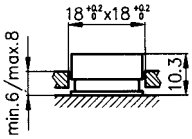
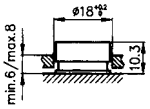
Recommended maximum electrical ratings

Voltage (max) 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

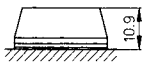
Dimensions

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

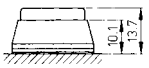
	18 × 24	18 × 18	∅ 18
exposed version Panel cut-out 16.2 ± 0.1 mm			
concealed version Panel cut-out			

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

aluminum bezel
without sealing gasket (IP40)

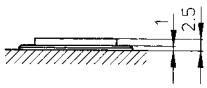


aluminum bezel
with sealing gasket (IP65)



aluminum bezel
countersunk mounting (IP40)

Panel cut-out 22.5 ±0.1 mm

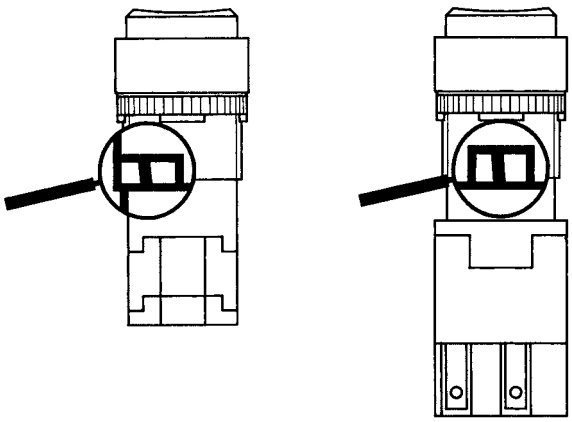


Front panel thickness	plastic bezel	1.0 mm to 5.5 mm
	aluminum bezel	1.0 mm to 5.0 mm
	countersunk mounting	2.0 mm to 20.0 mm

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
Panel cut-out: 1 — Ø 16.2 mm

Example: TP5 | 1 | MAA0 | A0 | A | N

Switch body (A)

	Function	Actuator	Housing (plastic)	Contact blocks	Part No.
MAA0	Momentary	18 × 24 mm	Exposed; IP40; solder	None	TH500008000
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	TH500002000
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)

	Function	Actuator	Housing (plastic)	Contact blocks	Part No.
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)

	Function	Actuator	Housing (plastic)	Contact blocks	Part No.
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
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
		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

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

			IP40/IP65	IP65 with sealing ring
F0	White	Ø 18	TH465015000	TH465001000
F1	Yellow	Ø 18	TH465115000	TH465101000
F2	Green	Ø 18	TH465215000	TH465201000
F3	Blue	Ø 18	TH465315000	TH465301000
F4	Red	Ø 18	TH465415000	TH465401000
F6	Orange	Ø 18	TH465615000	TH465601000

Illumination

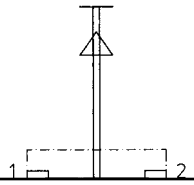
X	Non illuminated
A	6V
B	12V
C	24V
F	48V

Illumination Color

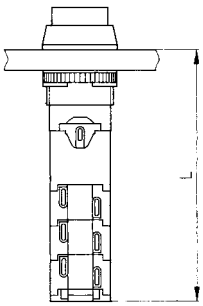
	Non illuminated				
N	Incandescent lamp	6V, 200 mA TH590000000	12V, 80 mA TH59001000	24V, 50 mA TH590006000	48V, 25 mA TH590004000
		6V AC/DC, 45 mA	12V AC/DC, 25 mA	24V AC/DC, 12.5 mA	48V AC/DC, 12.5 mA
1	Yellow LED	TH590231000	TH590234000	TH590237000	TH590240000
2	Green LED	TH590232000	TH590235000	TH590238000	TH590241000
4	Red LED	TH590230000	TH590233000	TH590236000	TH590239000

Assembled Push Button

Circuit diagrams (3 contact blocks)



Dimension



JOHNSON ELECTRIC

innovating motion

TP4

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ mushroom ▪ momentary or latching ▪ sealed IP40 or IP65 ▪ wide range of bezels ▪ NO, NC ▪ gold plated contact blocks
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

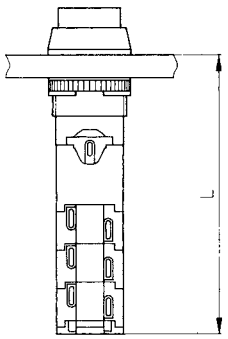
Mechanism	Momentary or latching
Actuating force	Approximately 2.5N – 1 contact block
Mounting	Central fixing with metal lock nut
Protection	IP40, IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Lens material	Polycarbonate – engravable
Illumination	Non-illuminated
Temperature range °C	-30°C to +80°C
Mechanical life	10^6 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^2 (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

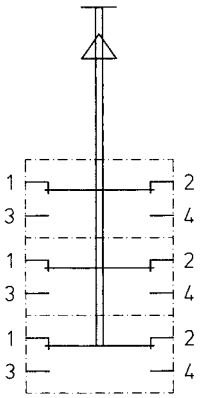
Dimensions



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

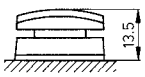
Circuit diagrams (3 contact blocks)



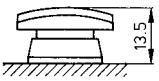
Bezel and lens heights in mm (switch off position)

plastic bezel

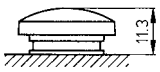
18 × 24



24 × 24

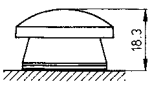


∅ 24



panel cut-out 16.2 ± 0.1 mm

aluminum bezel



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 Panel cut-out 16.2 mm (A)	MAJ0	Momentary	18 × 24 mm	IP40	None	TH400004
	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
	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
Panel cut-out 16.2 mm (B)	MCJ0	Momentary	24 × 24 mm	IP40	None	TH402004
	MCJ1	Momentary	24 × 24 mm	IP40	1NO + 1NC	TH402104
	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 16.2 mm (C)	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
	LEJ2	Latching	Ø 24	IP40	2 NO + 2 NC	TH414204
	LEJ3	Latching	Ø 24	IP40	3 NO + 3 NC	TH414304
Panel cut-out 22.5 mm	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
	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

Panel cut out 16.2 Actuator color For Switch body (A)	A0	White	18 × 24 mm	Mushroom	THXXXXX WHT
	A1	Yellow	18 × 24 mm	Mushroom	THXXXXX YEL
	A2	Green	18 × 24 mm	Mushroom	THXXXXX GRN
	A3	Blue	18 × 24 mm	Mushroom	THXXXXX BLU
	A4	Red	18 × 24 mm	Mushroom	THXXXXX RED
	A5	Black	18 × 24 mm	Mushroom	THXXXXX BLK
For Switch body style (B)	C0	White	24 × 24 mm	Mushroom	THXXXXX WHT
	C1	Yellow	24 × 24 mm	Mushroom	THXXXXX YEL
	C2	Green	24 × 24 mm	Mushroom	THXXXXX GRN
	C3	Blue	24 × 24 mm	Mushroom	THXXXXX BLU
	C4	Red	24 × 24 mm	Mushroom	THXXXXX RED
	C5	Black	24 × 24 mm	Mushroom	THXXXXX BLK
For Switch body style (C)	E0	White	Ø 24 mm	Mushroom	THXXXXX WHT
	E1	Yellow	Ø 24 mm	Mushroom	THXXXXX YEL
	E2	Green	Ø 24 mm	Mushroom	THXXXXX GRN
	E3	Blue	Ø 24 mm	Mushroom	THXXXXX BLU
	E4	Red	Ø 24 mm	Mushroom	THXXXXX RED
	E5	Black	Ø 24 mm	Mushroom	THXXXXX BLK
Panel cut-out 22.5	H0	White	Ø 30 mm	Mushroom	THXXXXX WHT
	H1	Yellow	Ø 30 mm	Mushroom	THXXXXX YEL
	H2	Green	Ø 30 mm	Mushroom	THXXXXX GRN
	H3	Blue	Ø 30 mm	Mushroom	THXXXXX BLU
	H4	Red	Ø 30 mm	Mushroom	THXXXXX RED
	H5	Black	Ø 30 mm	Mushroom	THXXXXX BLK

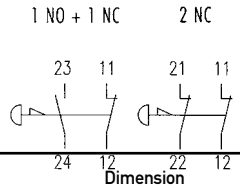
Housing Color: N — Natural

Illumination: X — Non illuminated

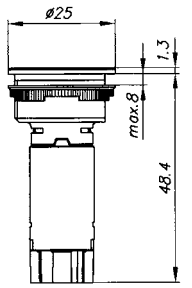
Illumination color: X — Non illuminated

Assembled Push Button

Circuit diagram



Dimension



JOHNSON ELECTRIC

innovating motion

TP8

Panel cut-out (mm)	Ø 22.5
Characteristics	▪ momentary ▪ sealed IP67 ▪ round metal bezels ▪ 1 NO + 1 NC, 2 NC, 2 NO ▪ gold plated contact block
Rating	230 VAC, 6 A
Dimensions (mm)	Ø 25
Actuator	▪ button and housing in different colors
Approvals	none

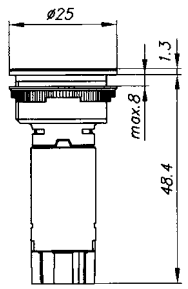
Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator style	Terminals (mm)	Electrical rating
TP82MD0A30	Ø 22.5	Momentary	Non-illuminated Natural Aluminum	2.8 × 0.5 Faston	230 VAC 6 A

Specifications

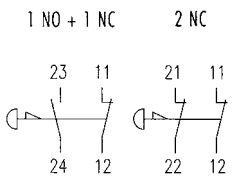
Mechanism	Momentary positive action with wiping contacts
Contact gap	>3 mm
Actuating force	Approximately 6.0N
Mounting	Central fixing with metal lock nut
Protection	IP67
Housing and actuator material	Anodised aluminum or stainless steel (upon request) Non-illuminated
Temperature range °C	-25°C to +55°C
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 N0 (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)	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		

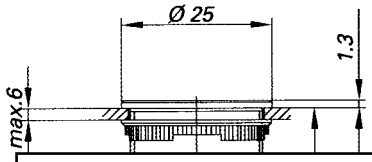
Ordering Reference

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			TH80750		X		00 X
	MD1A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum yellow; faston 2.8 mm × 0.5 mm			TH80750		X		10 X
	MD2A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum green; faston 2.8 mm × 0.5 mm			TH80750		X		20 X
	MD4A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum red; faston 2.8 mm × 0.5 mm			TH80750		X		40 X
	MD5A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum black; faston 2.8 mm × 0.5 mm			TH80750		X		50 X
	MD8A	Ø 25 mm Momentary switch IP67; 1NO; Flush Aluminum dark blue; faston 2.8 mm × 0.5 mm			TH80750		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							

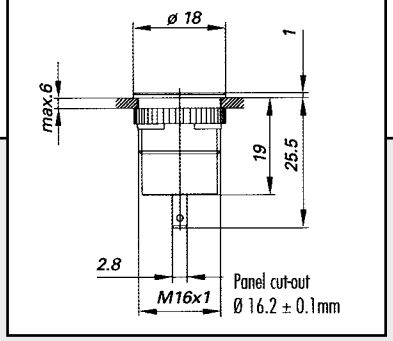
Note: Stainless steel versions available upon request.

Short stroke Push Button

Locknut mounting



Dimension



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TP9

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ momentary short stroke switch ▪ sealed IP65 or IP67 ▪ round metal bezels ▪ NO ▪ snap-in mounting option Ø 22.5 mm (IP65 only)
Rating	50 VAC/VDC, 50 mA
Dimensions (mm)	Ø 18 Ø 25
Actuator	▪ button and housing in different colors
Approvals	none

Popular products

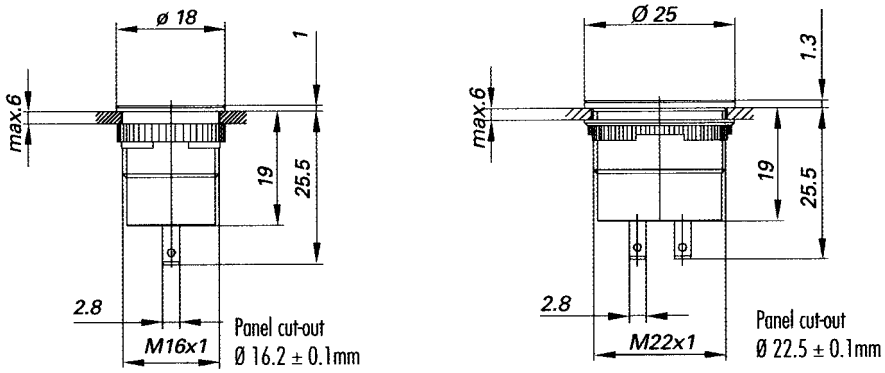
Ordering Reference	Panel cut-out (mm)	Function	Actuator size (mm)	Actuator style	Environmental protection	Terminals (mm)	Electrical rating
TP92MF0A000	∅ 22.5	Momentary 1NO	∅ 25	Non-illuminated natural aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA
TP92MF0A002	∅ 22.5	Momentary 1NO	∅ 25	Non-illuminated green anodised aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA
TP92MF0A004	∅ 22.5	Momentary 1NO	∅ 25	Non-illuminated red anodised aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA
TP92MF0A005	∅ 22.5	Momentary 1NO	∅ 25	Non-illuminated black anodised aluminum	IP67	2.8 × 0.5 faston	50 VAC/VDC, 50 mA

Specifications

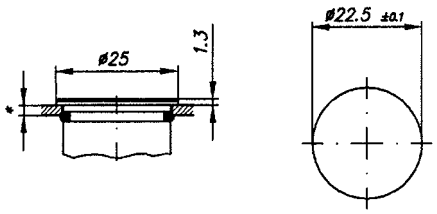
Mechanism	Momentary with 1mm short-stroke action
Actuating force	3.5N maximum
Mounting	Central fixing with metal lock nut or front assembly snap-in
Protection	IP65 (snap-in) or IP67 (lock nut)
Housing and actuator material	Anodised aluminum or stainless steel (upon request)
Illumination	Non-illuminated 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

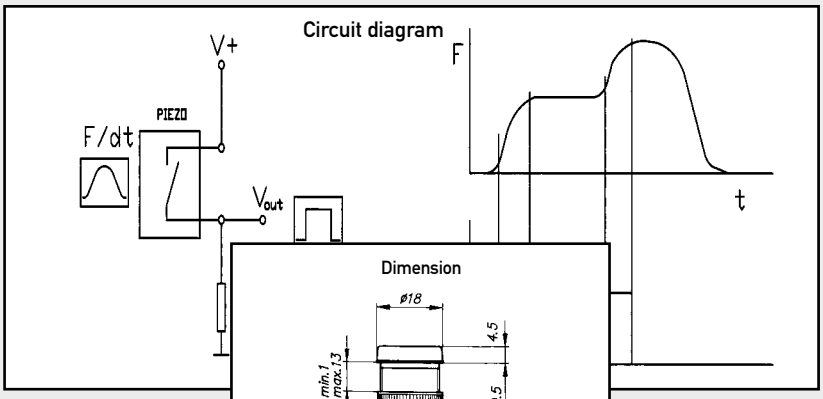
Stainless steel actuator and body styles, available upon request.

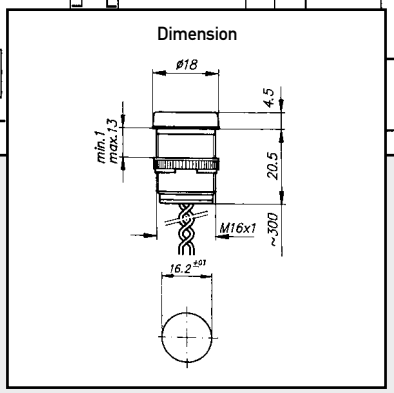
Ordering Reference

			Example: TP9	2	MF0A	0	00
Basic type	TP9						
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





JOHNSON ELECTRIC

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TP7

Panel cut-out (mm)	Ø 16.2, Ø 22.5, Ø 30.3, Ø 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)	Ø 18 Ø 25 Ø 36 Ø 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	Ø 16.2	Momentary 1NO	Ø 18	Non-illuminated, red anodised aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP71MD1B02XX	Ø 16.2	Momentary 1NO	Ø 18	Non-illuminated, green anodised aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP71MD1B05XX	Ø 16.2	Momentary 1NO	Ø 18	Non-illuminated, black anodised aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP71MD1B00XX	Ø 16.2	Momentary 1NO	Ø 18	Non-illuminated, natural aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP72MF1B00XX	Ø 22.5	Momentary 1NO	Ø 25	Non-illuminated, natural aluminum	IP68	Prewired	35 VAC/VDC max, 200 mA
TP72MG4B00C2	Ø 22.5	Momentary 1NO	Ø 25	Green illumination natural aluminum	IP68	Molex style 5 pin	35 VAC/VDC max, 200 mA
TP72MG2B00C4	Ø 22.5	Momentary 1NO	Ø 25	Red illumination natural aluminum	IP68	Molex style 5 pin	35 VAC/VDC max, 200 mA

Specifications

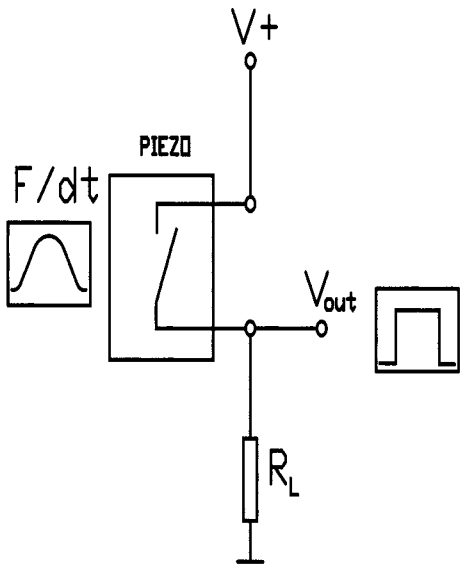
Mechanism	Piezo electronic, without auxilliary energy
Actuating force	5N maximum at an actuating speed 500 to 1500 mm/s
Closing impulse duration	10 to 1000 m/s - dependent on force and speed of actuation
Mounting	Central fixing from the rear with metal lock nut
Protection	IP68 (after installation)
Housing 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 × 10^6 cycles
Contact resistance	<10 Ohm (on)
Insulation resistance	>5MOhm (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

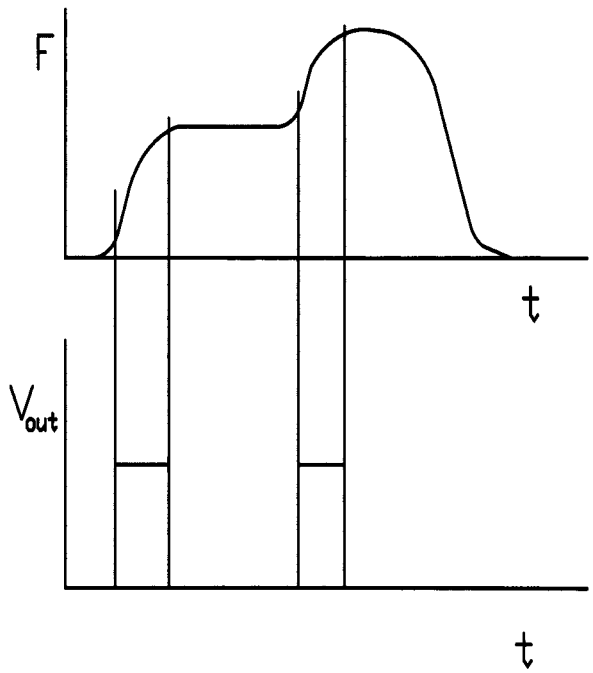
Technical information

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:

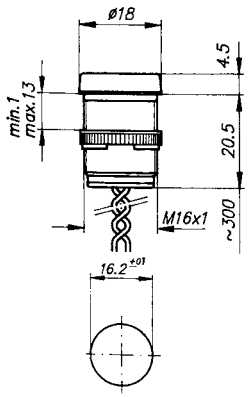




Recommended maximum electrical ratings

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

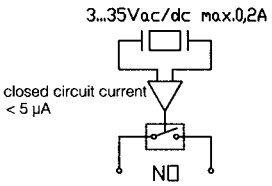
Dimensions **Non-illuminated**

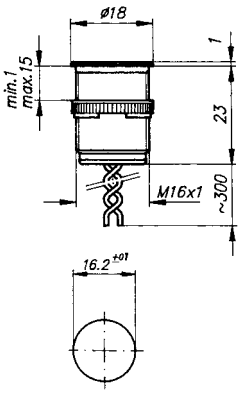


Ø 18, raised housing, prewired

Circuit diagram

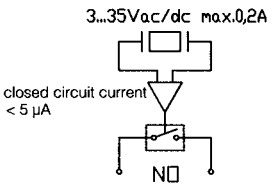
circuit 129

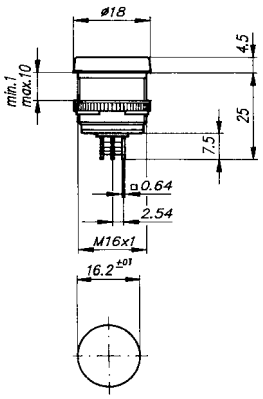




Ø 18, flush housing, prewired

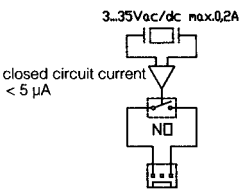
circuit 129

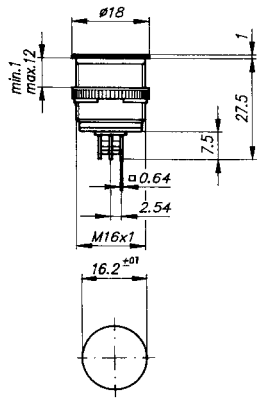




Ø 18, raised housing, Molex-style 3 pin

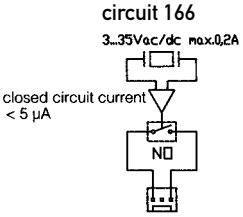
circuit 166





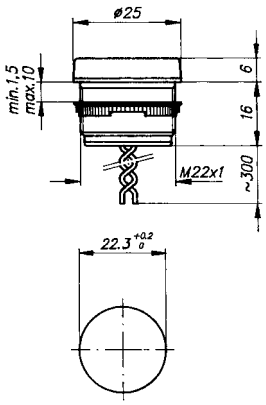
Ø 18, flush housing, Molex-style 3 pin

circuit 166

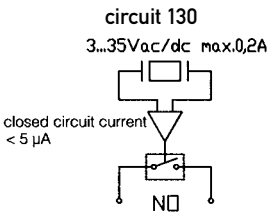


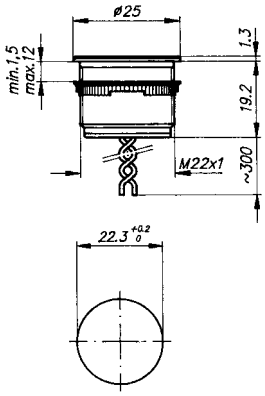
Dimensions **Non-illuminated**

Circuit diagram

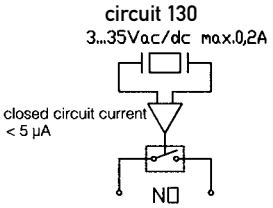


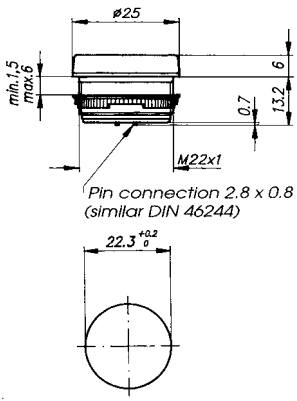
Ø 25, raised housing, prewired



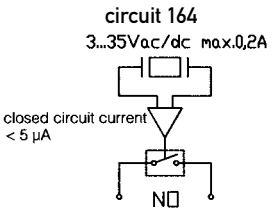


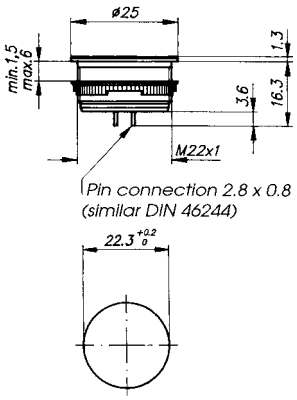
Ø 25, flush housing, prewired



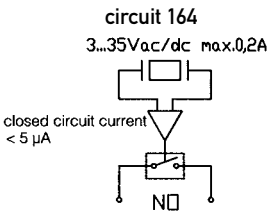


Ø 25, raised housing, solder connections 2.8 × 0.8



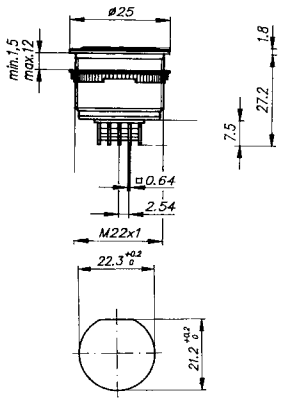


Ø 25, raised housing, solder connections 2.8 × 0.8

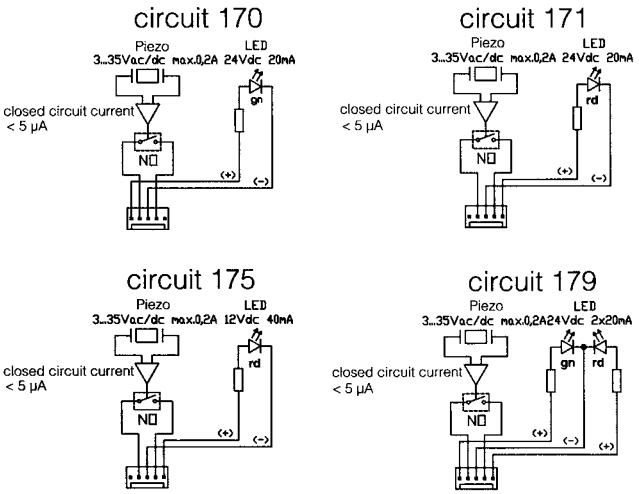


Dimensions **Illuminated**

∅ 25, flush housing, Molex-style 5 pin

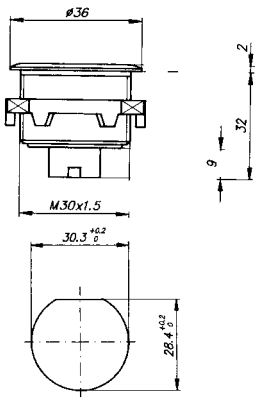


Circuit diagram

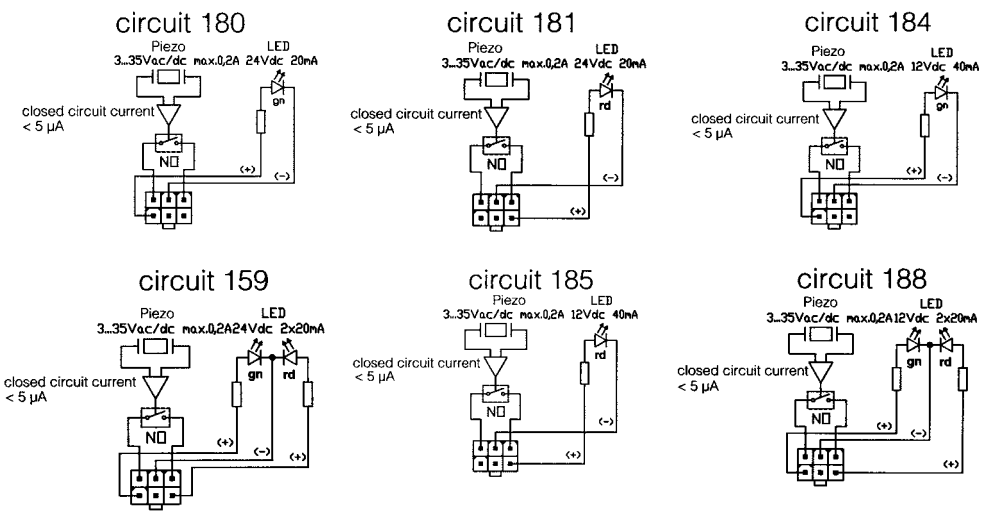


∅ 36, flush housing, Molex-style 6 pin

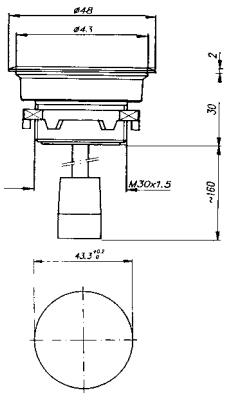
Circuit diagram



Circuit diagrams



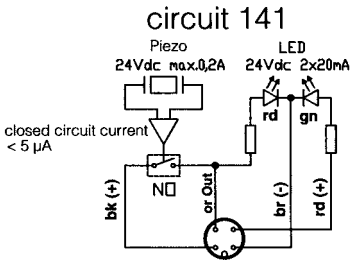
Dimensions **Illuminated**



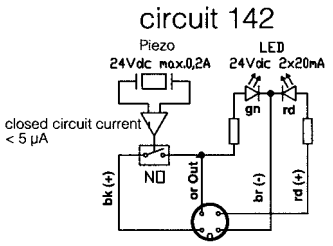
∅ 48, flush housing, wired with round connector AMP-style 4 pin

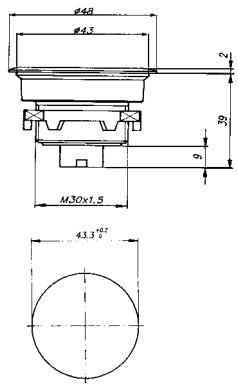
Internally wired visual indicator, red

Circuit diagram



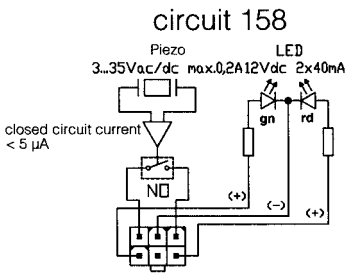
Internally wired visual indicator, green

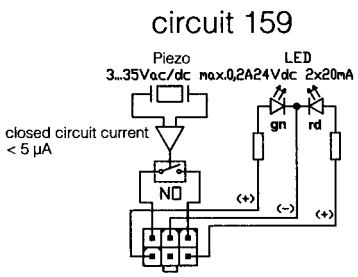




∅ 48, flush housing, Molex-style 6 pin

Circuit diagram





Ordering Reference

Example: TP7 | 1 | MD1A | 00 | B | 2

Basic type: TP7

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
- 01 — Yellow
- 02 — Green
- 04 — Red
- 05 — Black
- 08 — Dark Blue

Please select appropriate color code reference to complete the switch part no, eg. TH702004129

Illumination:
- X — Non-illuminated
- B — 12V (for illuminated switch bodies only)
- C — 24V (for illuminated switch bodies only)

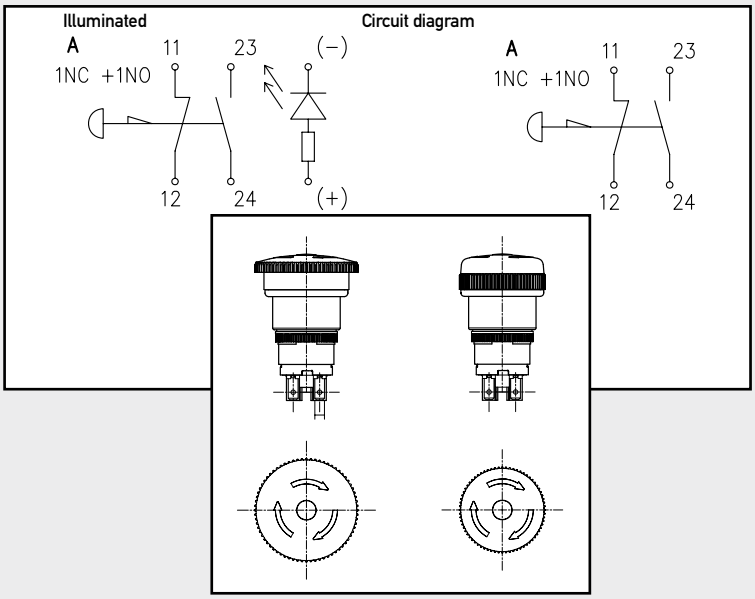
Illumination color:
- X — Non-illuminated
- 2 — Green LED (for illuminated switch bodies only)
- 4 — Red LED (for illuminated switch bodies only)
- 9 — Red/Green LED (for illuminated switch bodies only)

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						
	01	Yellow						
	02	Green						
	04	Red						
	05	Black						
	08	Dark Blue						
		Please select appropriate color code reference to complete the switch part no, above eg. TH706502185						
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



JOHNSON ELECTRIC
innovating motion

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) Button	Ø 25/Ø 30 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)

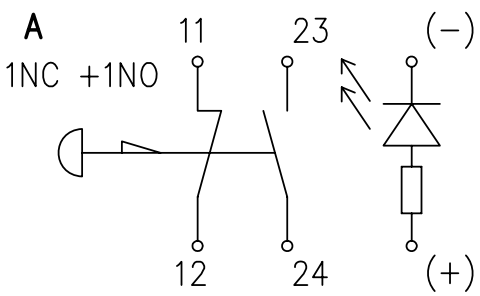
Recommended maximum electrical ratings

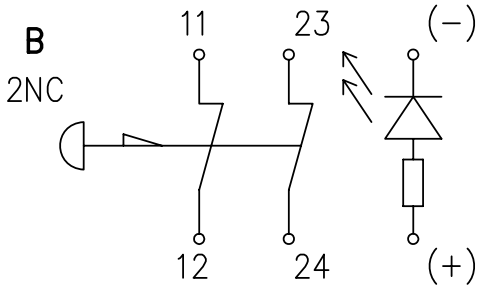
Voltage (max)	Resistive load (A)	Approval
250 VAC	2.0	EN 60947

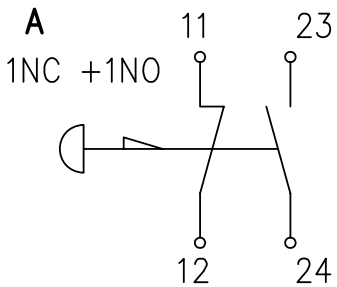
Electrical life	6,050 cycles at 2A, 250V, AC15
Mechanical life	30,000 cycles

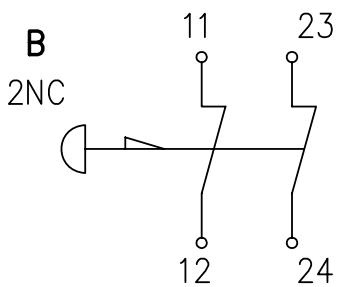
Circuit diagram

Illuminated

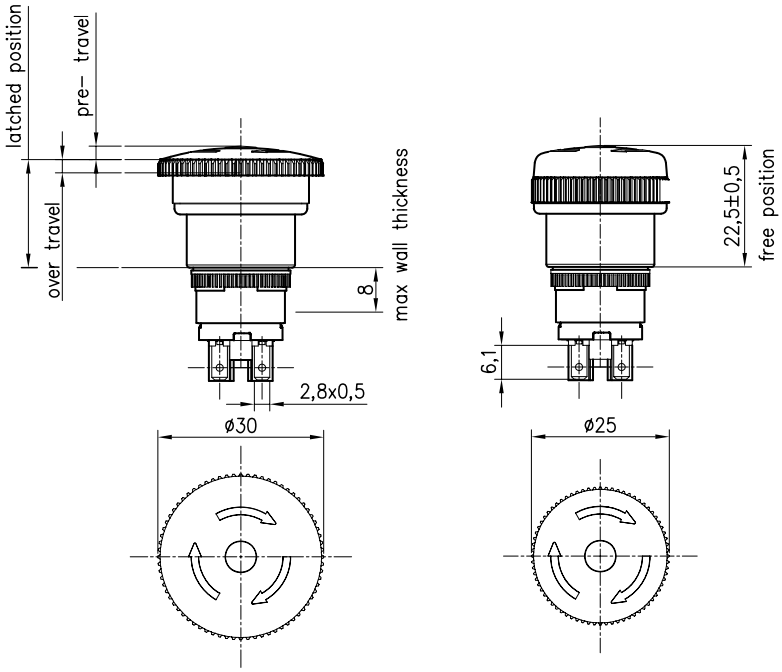




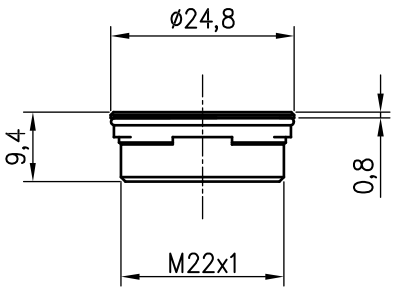




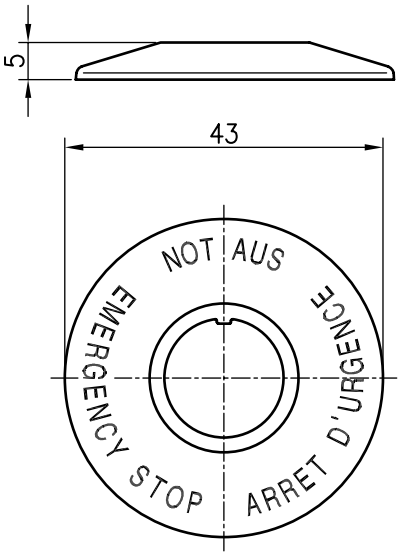
Dimensions



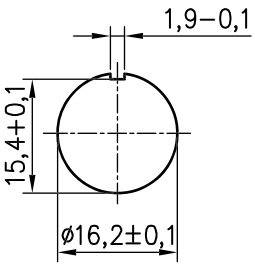
Adapter set



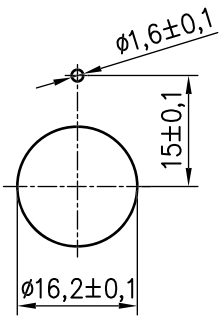
Yellow plastic disc ∅43 mm with printing



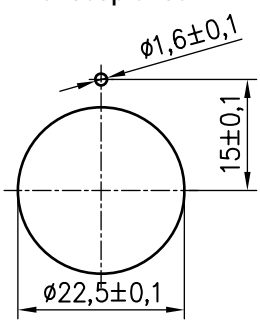
for backround decal



for backround disc



for adapter set



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	For 16.2 mm panel cut-out
	TH893011000	Yellow self-adhesive label Ø 43 mm with printing	For 16.2 mm panel cut-out
	TH893000000	Yellow plastic adaptor Ø 43 mm with printing	For 22.5 mm panel cut-out
	TH880200029	Adapter set 22.5 mm	For 22.5 mm panel cut-out

TE8

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ meets EN418 directives (Ø 27 mm only) ▪ sealed IP66 or IP67 ▪ rotary, pull or key reset ▪ yellow disk bezel (optional) ▪ 1NO + 1 NC or 2 NC
Rating	250 VAC, 6 A
Dimensions (mm)	Ø 27 Ø 40
Actuator	▪ red mushroom cap (Ø 27 mm) ▪ reset by KABA key (Ø 40 mm)
Approvals	IEC 947-5-1/947-5-5 (Ø 27 mm only)

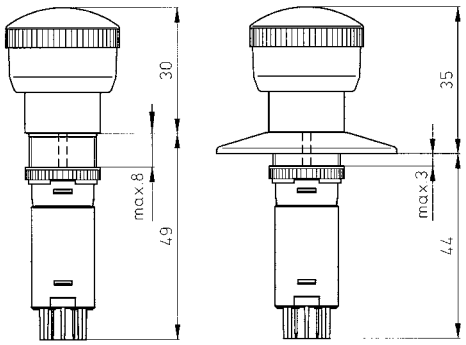
Popular products

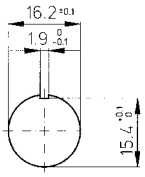
Ordering Reference	Panel cut-out (mm)	Function	Actuator style (mm)	Environmental protection	Terminals (mm)	Electrical rating
TE82KJB1XX	Ø 22.5	Key release 1NO + 1NC	Ø 40	IP40	2.8 × 0.5 faston	250 VAC, 6A
TE81RGP2A1	Ø 16.2	Rotary release 2NC	Ø 27	IP67	2.8 × 0.5 faston	250 VAC, 6A

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

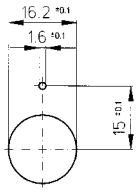
Dimensions — Emergency stop switches according to EN 418 — IP66/IP67 — Circuit diagram





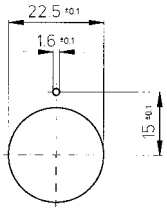
for back-ground decal

for panel cut-out
Ø 16.2 mm



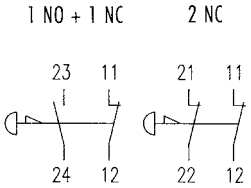
for back-ground disc

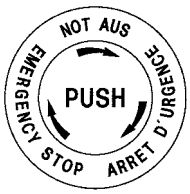
for panel cut-out
Ø 16.2 mm



for adapter set

for panel cut-out
Ø 16.2 mm





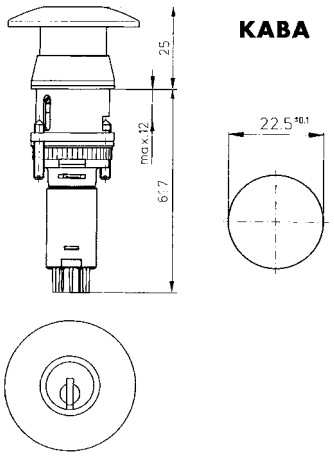
mushroom cap × 27 mm, red
disc bezel, yellow plastic, × 43 mm

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

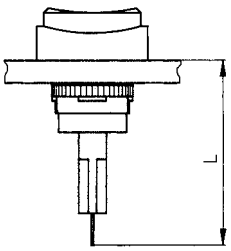
Disk bezel

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



JOHNSON ELECTRIC

innovating motion

TI2

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ illuminated ▪ sealed IP40, IP65 or IP67 ▪ wide range of bezels ▪ midget grooved lamp/LED
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

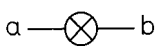
Popular products

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

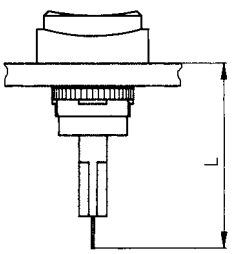
Specifications

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 mm² (braided), 2 × 0.75 mm (stranded) Faston – 2.8 mm × 0.5 mm
Vibration resistance	1.5 mm pp amplitude at 55 Hz

Circuit diagram

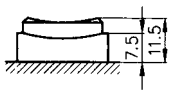
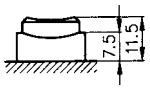
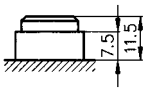
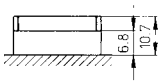
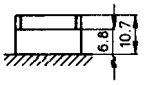
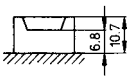


Dimensions



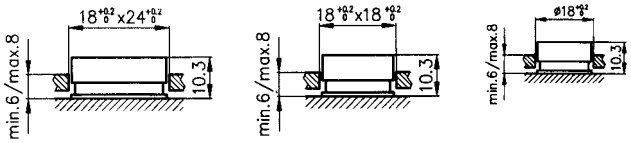
Length in mm	
plastic bezels	38 mm
countersunk mounting bezels	40 mm
aluminum bezels	48 mm
countersunk mounting	

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

	18 × 24	18 × 18	∅ 18
exposed version IP40			
exposed version IP67			

panel cut-out 16.2 ±0.1 mm

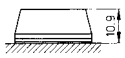
concealed version IP40



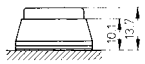
Dimensions

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

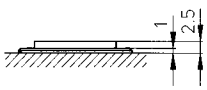
aluminum bezel
without sealing gasket (IP40)



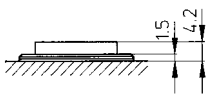
aluminum bezel
with sealing gasket (IP65)



aluminum bezel
countersunk mounting (IP40)



aluminum bezel
countersunk mounting (IP67)



panel cut-out 22.5 ±0.1 mm

front panel thickness	plastic bezel 1	1.0 to 6.5 mm, 1.0 to 5.0 mm
	aluminum bezel	1.0 to 5.0 mm
	countersunk mounting	2.0 to 15.0 mm

Ordering Reference

Basic type: TI2 — Example: TI2 | 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	∅ 18	Exposed, IP40; faston	TH555008000
VCL	Visual	∅ 18	Exposed, IP40; solder	TH555108000
VCC	Visual	∅ 18	Exposed, IP67; faston	TH555015000
VCN	Visual	∅ 18	Exposed, IP67; solder	TH555115000
VCB	Visual	∅ 18	Concealed, IP40; faston	TH555002000
VCM	Visual	∅ 18	Concealed, IP40; solder	TH555102000

Lens transparent

		For body style VAA/VAL (IP40)	For body style VAB/VAM (IP40)	For body style 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 VBA/VBL (IP40)	For body style VBB/VBM (IP40)	For body style 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 VCA/VCL (IP40)	For body style VCB/VCM (IP40)	For body style 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

		6V	12V	24V	48V
N	Incandescent lamp	6V, 200 mA TH590000000	12V, 80 mA TH590001000	24V, 50 mA TH590006000	48V, 25 mA 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	T H590236000	TH590239000

Acoustic versions available upon request

Ordering Reference

Example: TI2 | 2 | VFA | F0 | A | N

Basic type: TI2

Panel cut-out: 2 — Ø 22.5 mm

Switch body

	Function	Actuator style	Housing	Part No.
VFA	Visual	Ø 25	Exposed plastic; IP65; faston	TH555020000
VFB	Visual	Ø 25	Exposed plastic; IP65; solder	TH555120000
VFC	Visual	Ø 25	Exposed aluminum; IP40/IP65*; faston	TH555018000
VFD	Visual	Ø 25	Exposed aluminum; IP40/IP65*; solder	TH555118000
VFE	Visual	Ø 25	Exposed aluminum; IP65 with silicon cap; faston	TH555033000
VFF	Visual	Ø 25	Exposed aluminum; IP65 with silicon cap; solder	TH555133000
VFG	Visual	Ø 25	Flush-aluminum; IP40; faston	TH555050000
VFH	Visual	Ø 25	Flush-aluminum; IP40; solder	TH555150000
VFJ	Visual	Ø 25	Flush-aluminum; IP67; faston	TH555051000
VFK	Visual	Ø 25	Flush-aluminum; IP67; solder	TH555151000

Lens transparent

		For body style VFA/VFB (IP65)	VFC/VFD VFG/VFH (IP40/IP65)	With sealing ring 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

		6V, 200 mA 6V AC/DC, 45 mA	12V, 80 mA 12V AC/DC, 25 mA	24V, 50 mA 24V AC/DC, 12.5 mA	48V, 25 mA 48V AC/DC, 12.5 mA
N	Incandescent lamp	TH590000000	TH590001000	TH590006000	TH590004000
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

TI5

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ illuminated ▪ sealed IP40 or IP65 ▪ wide range of bezels ▪ midget grooved lamp/LED
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

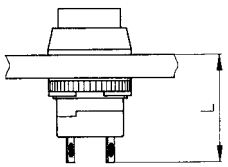
Popular products

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

Specifications

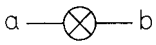
Mounting	Central fixing with metal lock nut
Protection	IP40, IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Lens material	Polycarbonate – engravable
Illumination	T1 ¾ midget grooved lamps – incandescent lamps , LEDs, multi LEDs 60 V, 1.2 W maximum Lamp contact a = anode (+), b = cathode (-) Appropriate safety regulations should be respected when using the indicator light.
Temperature range °C	-25°C to +85°C
Terminal material	Silver alloy with 2 µm silver plating, 4 µm gold plating
Terminals	Patented flexible solder - suitable for wire diameter 2 × 1.00 mm² (braided), 4 × 0.75 mm (stranded)
Vibration resistance	1.5 mm pp amplitude at 55 Hz

Dimensions

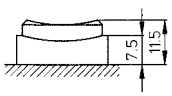
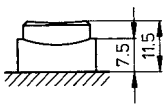
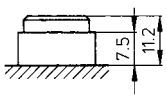
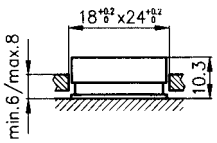
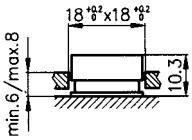
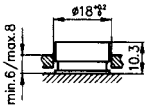


Length in mm	
plastic bezels	23.5
countersunk mounting bezels	22.5
aluminum bezels	32.0
countersunk mounting	

Circuit diagram



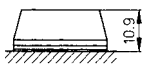
Plastic bezel and lens heights in mm (switch off position)

	18 × 24	18 × 18	∅ 18
exposed version IP 40			
concealed version IP40			

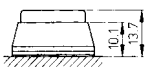
panel cut-out 16.2 ±0.1 mm

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 (Ø 25 mm)	2.0 to 15.0 mm

Ordering Reference

Basic type: TI5 — Example: TI5 | 1 | VAL | A0 | A | N

Panel cut-out: 1 — Ø 16.2 mm

		Function	Actuator style	Housing (plastic)	Part No.
Switch body (A)	VAL	Visual	18 × 24 mm	Exposed; IP40; solder	TH550008000
	VAM	Visual	18 × 24 mm	Concealed; IP40; solder	TH550037000
(B)	VBL	Visual	18 × 18 mm	Exposed; IP40; solder	TH552008000
	VBM	Visual	18 × 18 mm	Concealed; IP40; solder	TH552037000
(C)	VDL	Visual	Ø 18 mm	Exposed; IP40; solder	TH554008000
	VDM	Visual	Ø 18 mm	Concealed; IP40; solder	TH554037000

			Exposed	Exposed	Concealed	Concealed
Lens, transparent 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

		6V, 200 mA	12V, 80 mA	24V, 50 mA	48V, 25 mA
X	Non illuminated	TH590000000	TH590001000	TH590006000	TH590004000
N	Incandescent lamp	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

Ordering Reference

Example: TI5 | 2 | VFP | F0 | A | N

Basic type: TI5

Panel cut-out: 2 — Ø 22.5 mm

Switch body

		Function	Actuator style	Housing (Aluminum)	Part No.
VFP	Visual	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

			Exposed IP40/IP65 Flush IP40	Exposed IP65 with sealing ring
F0	White	Ø 18	TH465015000	TH465001000
F1	Yellow	Ø 18	TH465115000	TH465101000
F2	Green	Ø 18	TH465215000	TH465201000
F3	Blue	Ø 18	TH465315000	TH465301000
F4	Red	Ø 18	TH465415000	TH465401000
F6	Orange	Ø 18	TH465615000	TH465601000

Illumination

X	Non illuminated
A	6V
B	12V
C	24V
F	48V

Illumination color

		6V, 200 mA	12V, 80 mA	24V, 50 mA	48V, 25 mA
X	Non illuminated				
N	Incandescent lamp	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

TI9

Panel cut-out (mm)	Ø 22.5
Characteristics	▪ illuminated ▪ sealed IP67 ▪ round metal bezels ▪ red LED ▪ green LED ▪ red-green LED
Rating	24 VDC 20 mA
Dimensions (mm)	Ø 25
Actuator	▪ aluminum housing in different colors
Approvals	none

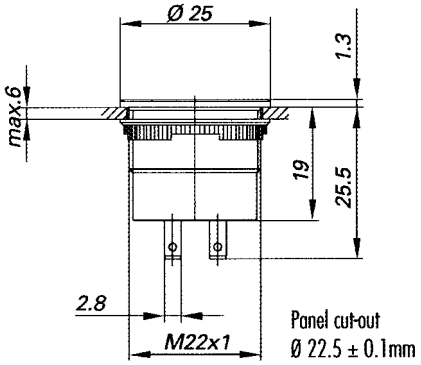
Popular products

Ordering Reference	Panel cut-out (mm)	Function	Actuator style (mm)	Environmental Protection
TI92VF0A500	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



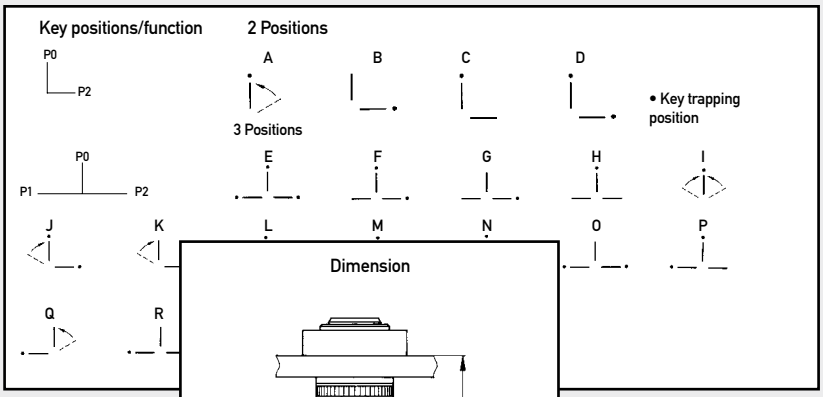
Ordering Reference

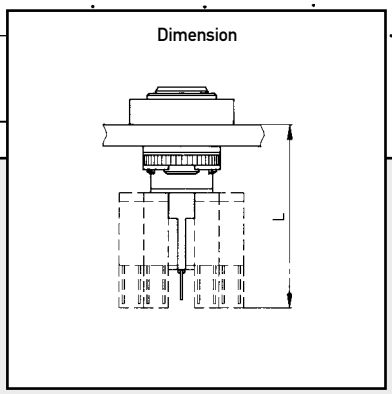
Example: TI9 | 2 | VF0A | 504

Basic type	TI9		
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





JOHNSON ELECTRIC

innovating motion

TK2

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	▪ 2 or 3 position ▪ sealed IP40 or IP65 ▪ plastic or aluminum bezels ▪ wide range of bezels ▪ NO, NC ▪ gold plated, single or double pole, contact blocks ▪ key trapping options
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	10^6 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 mm² (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.

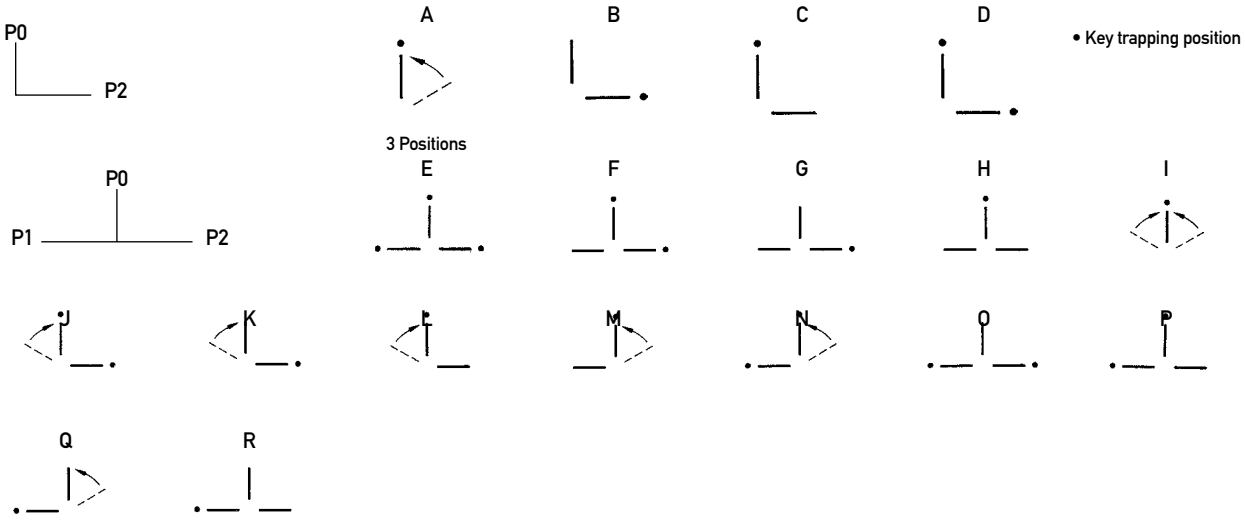
Recommended maximum electrical ratings

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		

Modular Keyswitch

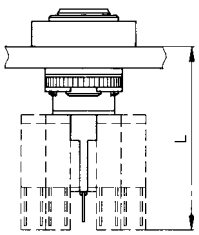
Key positions/ function

2 Positions



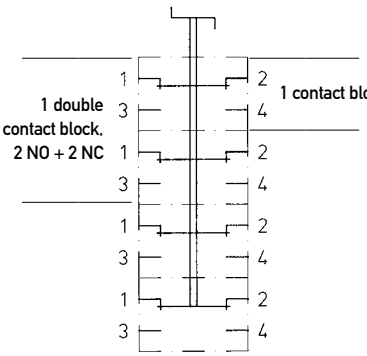
• Key trapping position

Dimensions



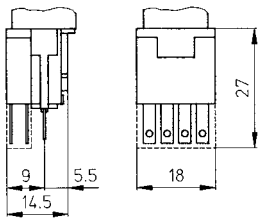
Length in mm (with contact block)
plastic bezels 43
aluminum bezels 42

Circuit diagram (2 double contact blocks)

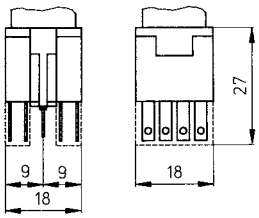


Contact blocks

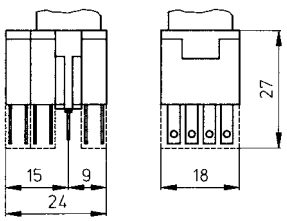
1 contact block



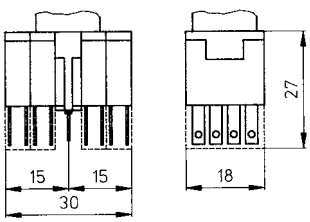
2 contact blocks



1 contact block +
1 double contact block

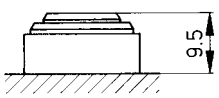


2 double contact blocks

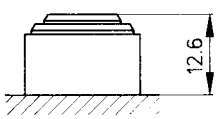


Cylinder height

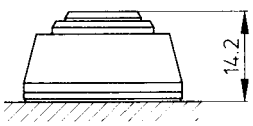
plastic bezel IP40



plastic bezel IP65
Panel cut-out
16,2 mm ± 0,1 mm



aluminum bezel 2 position key
Panel cut-out
22,5 mm ± 0,1 mm



Panel cut-out 22.5 ± 0.1 mm

Front panel thickness	plastic bezel IP40	2.0 to 5.0 mm
	plastic bezel IP65	2.0 to 6.5 mm
	aluminum bezel	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 16.2 mm cut-out	A2A	2 Positions; IP40; Kaba Micro; Key removable P0						Momentary P2	TH548032XXX					
	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				
			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 (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

Example: TK2 | 1 | E3A | 001 | A1 | A1 | A

Basic type	TK2				
Panel cut-out	1	Ø 16.2 mm			
Key position / function	E3A	3 Position; IP40; Kaba Micro; Key removable P0 + P1 + P2	Latching P1 + P2	TH548050XXX	
	F3A	3 Position; IP40; Kaba Micro; Key removable P0 + 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 P0	Latching P1 + P2	TH548053XXX	
	I3A	3 Position; IP40; Kaba Micro; Key removable P0	Momentary P1 + P2	TH548054XXX	
	J3A	3 Position; IP40; Kaba Micro; Key removable P0 + 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 P0	Momentary P1 + Latching P2	TH548057XXX	
	M3A	3 Position; IP40; Kaba Micro; Key removable P0	Latching P1 + Momentary P2	TH548058XXX	
	N3A	3 Position; IP40; Kaba Micro; Key removable P0 + 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 P0 + 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 P0 + P1 + P2	Latching P1 + P2	TH548150XXX	
	F3B	3 Position; IP65; Kaba Micro; Key removable P0 + 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 P0	Latching P1 + P2	TH548153XXX	
	I3B	3 Position; IP65; Kaba Micro; Key removable P0	Momentary P1 + P2	TH548154XXX	
	J3B	3 Position; IP65; Kaba Micro; Key removable P0 + 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 P0	Momentary P1 + Latching P2	TH548157XXX	
	M3B	3 Position; IP65; Kaba Micro; Key removable P0	Latching P1 + Momentary P2	TH548158XXX	
	N3B	3 Position; IP65; Kaba Micro; Key removable P0 + 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 P0 + 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			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

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	∅ 25 mm (Factory fitted)									

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

E1

Panel cut-out (mm)	⍁ 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

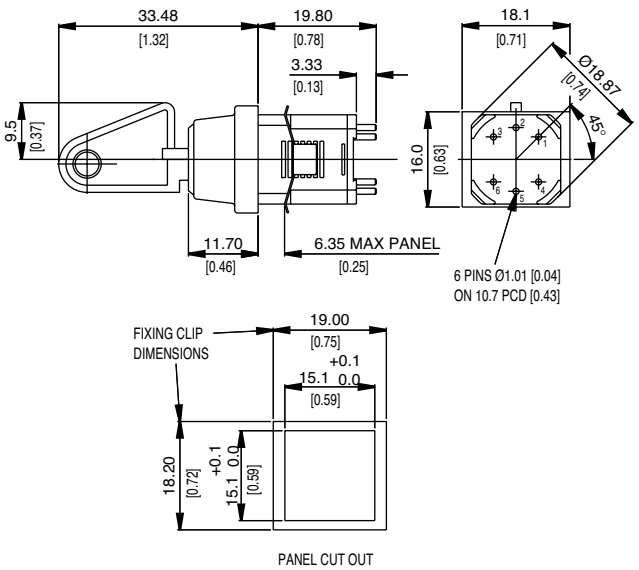
Preferred Range

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°

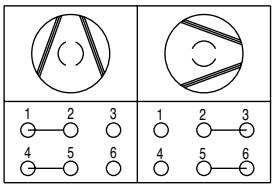
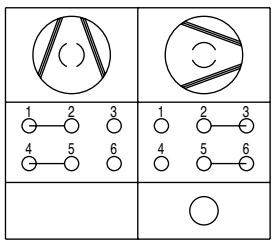
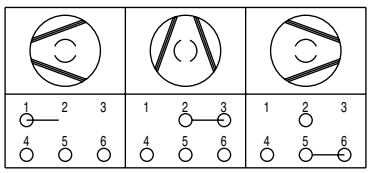
Dimensions



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 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

			Example: E1	A	A	A	A	A	E
Basic type	E1								
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

Panel cut-out (mm)	⍁ 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

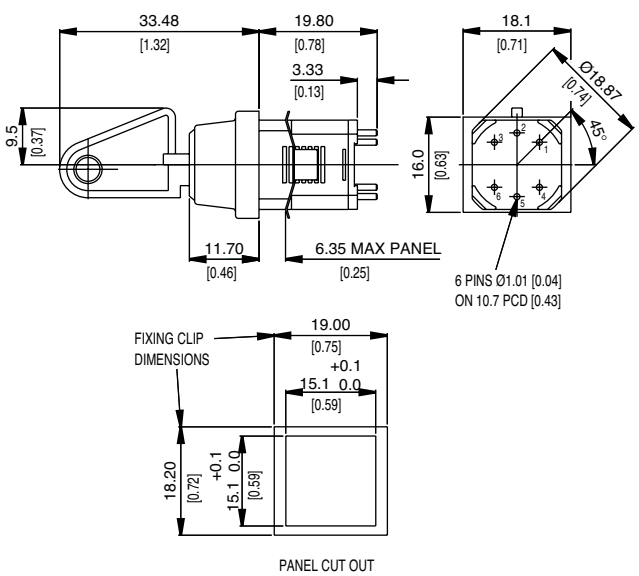
Preferred Range

Ordering Reference	Terminal	Circuit	Actuator	Contacts	Electrical rating
M1HAAAAE	Pins	2 pole CO	Key	Gold-plated	250 VAC, 100 mA
M1HAEAAE	Pins	2 pole CO	Key	Gold-plated	250 VAC, 100 mA
M1HAAAAJ	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°

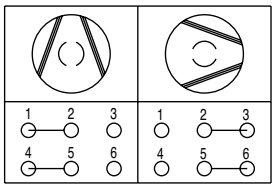
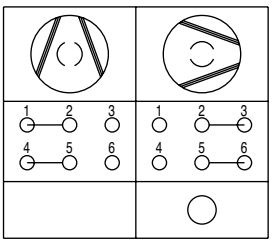
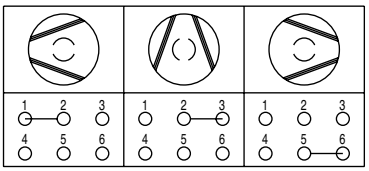
Dimensions



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 Type	Actuator Code	Body style (mm)	Key trapping	Diagram
Double pole change-over	M1BAAAAE	Key	001	A - 18 × 16	No	
	M1HAAAAE	Key	007	A - 18 × 16	No	
	M1HAEAAE	Key	007	E - 18 × 18	No	
	M1MAAAAE	Key	Production run key coding	A - 18 × 16	No	
	M1MAEAAE	Key	Production run key coding	E - 18 × 18	No	
Double pole change-over	M1MCAAAE	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	
	M1HAEAAJ	Key	007	E - 18 × 18	No	
	M1MAAAAJ	Key	Production run key coding	A - 18 × 16	No	
	M1MAEAAJ	Key	Production run key coding	E - 18 × 18	No	

Ordering Reference

Example: M1 B A A A A E

Basic type	M1	
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	▪ choice of off-on or change-over center off or spring return options ▪ key trapping option ▪ solder terminals
Rating	up to 250 VAC, 2 A
Dimensions (mm)	Ø 22
Actuator	▪ key (common or differs)
Approvals	UL and CSA

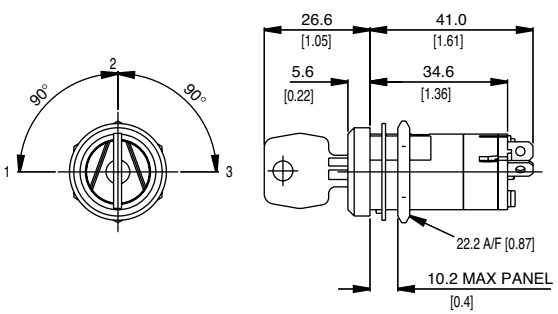
Preferred Range

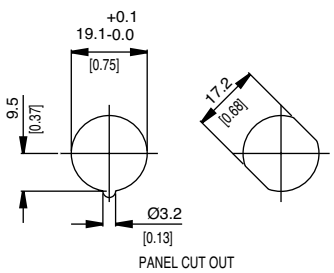
Ordering Reference	Terminal	Circuit	Actuator	Contacts	Electrical rating
K23FBA201	Screws	2 pole off-on	Key	Ag	Up to 250 VAC, 2 A

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

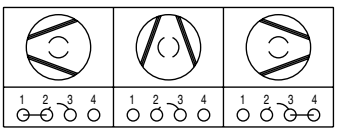
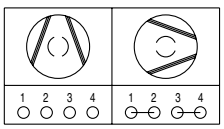




Recommended maximum electrical ratings

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

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)

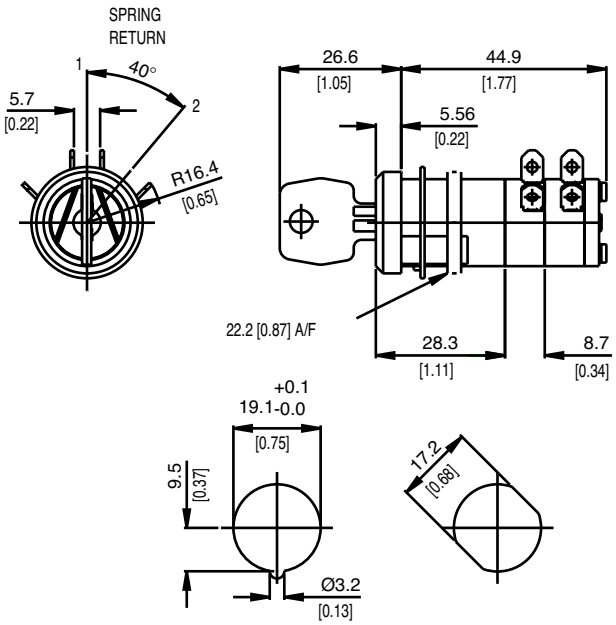
Preferred Range

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°

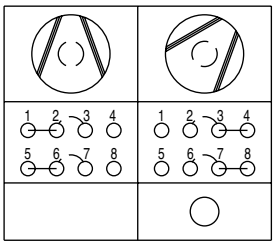
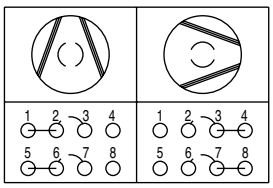
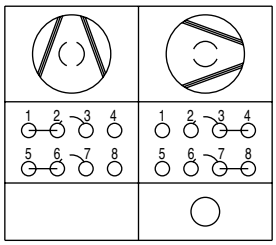
Dimensions



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 Type	Actuator Code	Key trapping	Diagram
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

			Example: P2	3F	B	A	2	06
Basic type	P2							
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

Panel cut-out (mm)	Ø 20.6
Characteristics	■ high electrical rating ■ key trapping option ■ choice of off-on, change-over with spring return or change-over with separate circuits
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

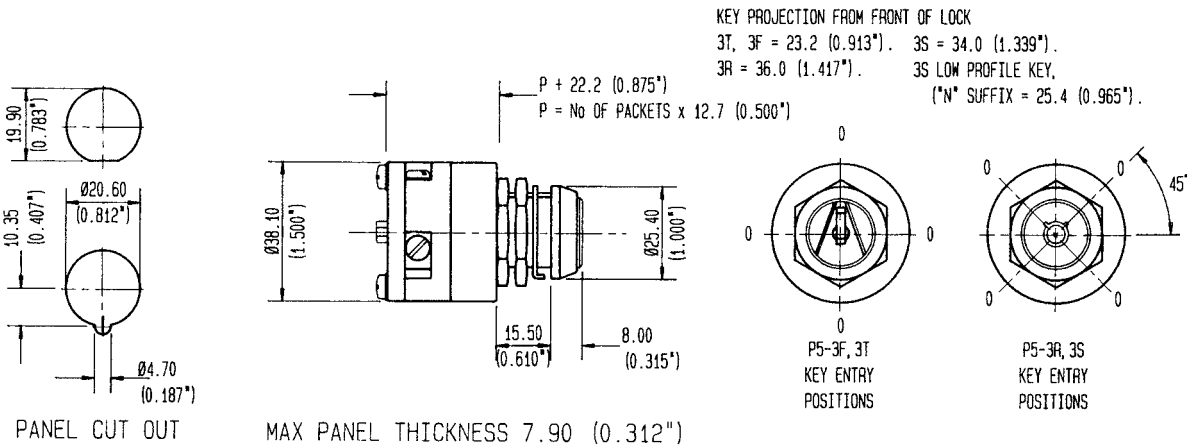
Preferred Range

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°

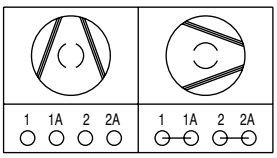
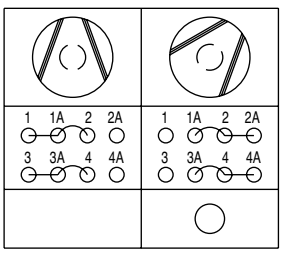
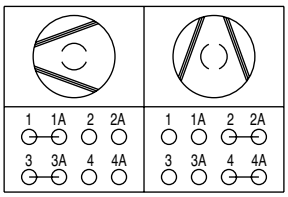
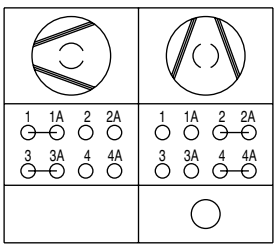
Dimensions



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 Type	Actuator Code	Key trapping	Diagram
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

			Example: P5	3F	B	A	2	01
Basic type	P5							
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

Panel cut-out (mm)	Ø 16.2 or Ø 22.5
Characteristics	■ 2 and 3 position ■ sealed IP40 or IP65 ■ plastic or aluminum bezels ■ NO, NC ■ gold plated, single or double pole, contact blocks ■ key trapping options
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

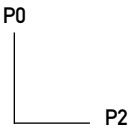
Mechanism	Knob actuated
Mounting	Central fixing with metal lock nut
Protection	IP40 or IP65
Bezel material	Thermoplastic or anodized aluminum alloy
Temperature range °C	-25°C to +85°C
Mechanical life	10^6 cycles
Contact block	Slide-on assembly by the user
Contact block housing	Self-extinguishing duroplastic (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 mm² (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) 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		

Rotary positions/ function

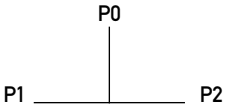
2 Positions



A

B

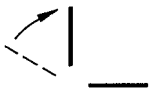
3 Positions



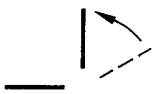
C

D

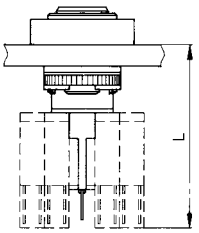
E



F

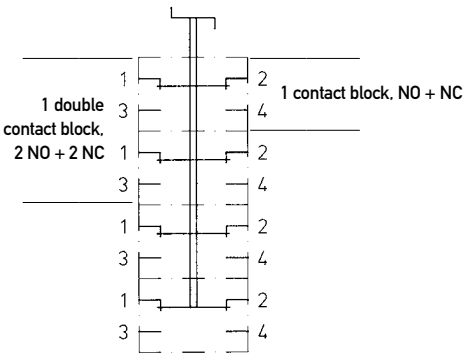


Dimensions



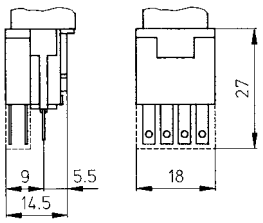
Length in mm (with contact block)
plastic bezels 43
aluminum bezels 42

Circuit diagram (2 double contact blocks)

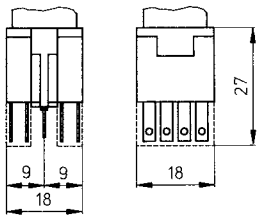


Contact blocks

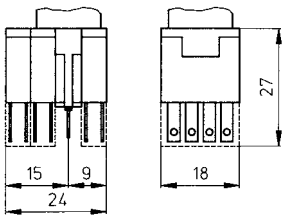
1 contact block



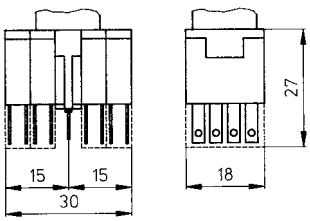
2 contact blocks



1 contact block + 1 double contact block

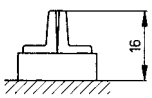


2 double contact blocks

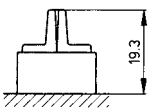


Bezel and rotary knob height

plastic bezel IP40

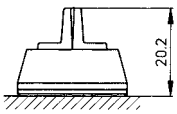


plastic bezel IP65

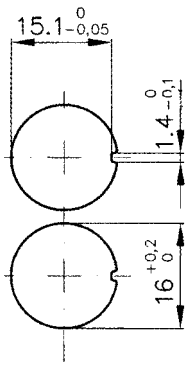


Panel cut-out
16.2 mm ± 0.1 mm
(plastic)

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		

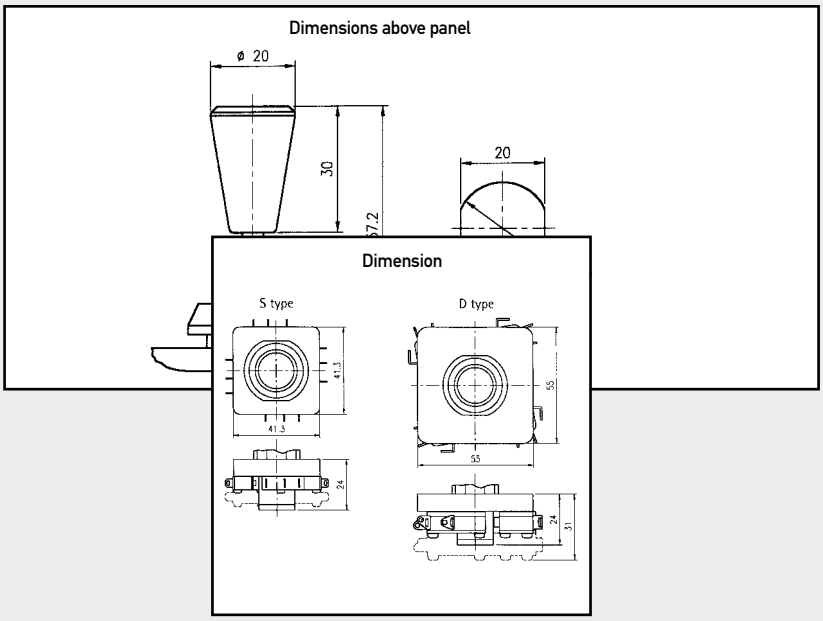
The rotary switch cannot be installed without a bezel. The IP40 bezels are interchangeable before installation.
Once an IP65 bezel has been assembled it cannot be removed.
Contact blocks wil be supplied unassembled.

Ordering Reference

					Example: TR2	1	C2A	C2C	A1	A1	A
Basic type	TR2										
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	C2A	3 Positions; IP40;	Latching P0 + P1 + P2	TH508040000							
	D2A	3 Positions; IP40;	Momentary P1 + P2	TH508041000							
	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				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 wil be supplied unassembled.

Joystick



JOHNSON ELECTRIC

innovating motion

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

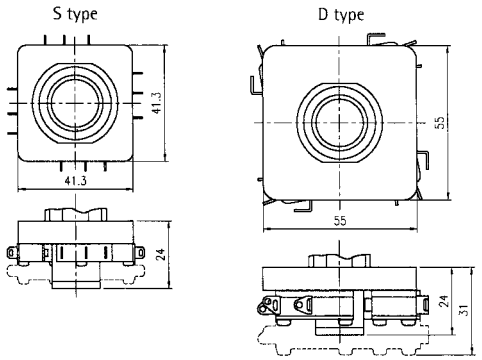
Ordering Reference	Panel cut-out	Dimensions	Directional gating	Number of poles	Switch type	Terminal Type	Electrical rating ENEC	UL/CSA
S 721001	∅22 × 20	41.3 × 41.3 × 81.2	2 way gate at 180°	1 pole	292/20/150	Solder	6 A, 250 VAC, 25E3, T85	6 A, 250 VAC
S 741001	∅22 × 20	41.3 × 41.3 × 81.2	4 way gate at 90°	1 pole	292/20/150	Solder	6 A, 250 VAC, 25E3, T85	6 A, 250 VAC
S 722001	∅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	∅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	∅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	∅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	∅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	∅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

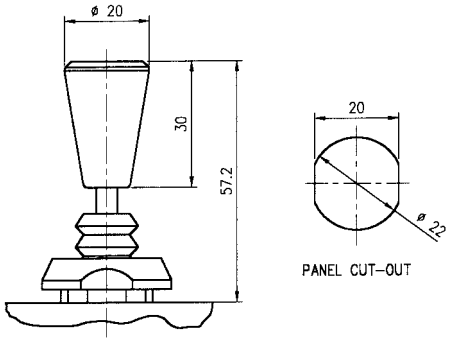
Switch	380 series miniature snap-action microswitches (D type below) or 290 series subminiature snap-action microswitches (S type below)
Body and fixing nut	Nylon 6.6
Spindle	Nylon 6.6 reinforced with stainless steel
Sealing cowl	Neoprene
Knob	Phenolic
Spring	Spring steel

Dimensions

Dimensions belons panel



Dimensions above panel



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

Example: S 7 1 1 0 0 1

Switch	S	290 Series subminiature microswitches	
	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		S Type (290)	D Type (380)
	0	292 (solder)	382 (solder)
	1	291 (2.8 × 0.5 faston)	383 (6.35 × 0.8 faston)
	2	294 – PCB – LH faston	385 (4.8 × 0.5 mm faston)
Cowl fitted	1	Standard	

Joystick

J8

Panel cut-out (mm)	Ø 22.5
Characteristics	▪ choice of directional gating options ▪ choice of microswitch functions
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

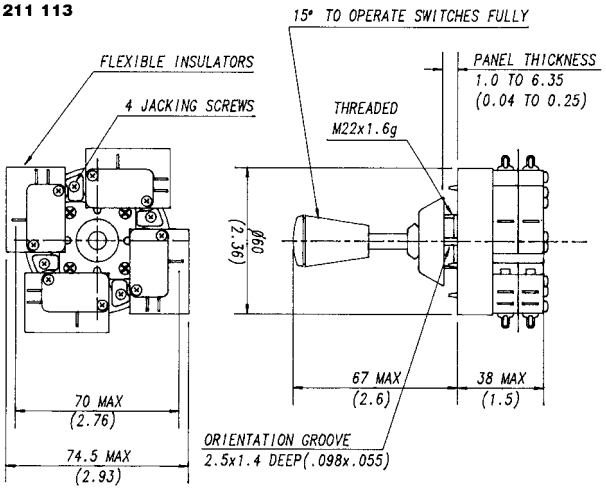
Specifications

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 × 10^5 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 (o.89 in) dia
Insert switches	V4NCT7 – Sub-miniature XG03-88 – Miniature (Other types may be possible please consult TH-Contact Electronics)

Dimensions

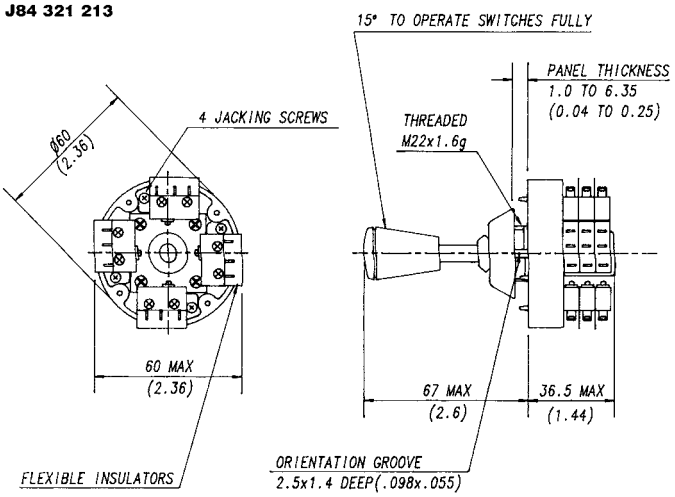
Dimensions bellow panel

J84 211 113



Dimensions above panel

J84 321 213



Joystick

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 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

			Example: J8	0	1	1	1	113
Basic type	J8							
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

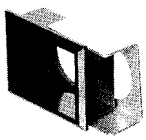
TH493521000	(for 1 contact block)	Pairs of screws for TP4, TP5
TH493522000	(for 2 contact block)	
TH493523000	(for 3 contact block)	

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

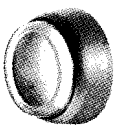


Panel plugs (TP2, TP5)

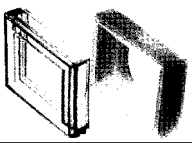
TH493000000	18 × 24, IP40
TH493002000	18 × 18, IP40
TH493004000	∅ 18, IP40

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)



TH493010000	Guard bracket, for switches 18 × 24, anodised aluminum (wide sides raised)

TH493011000	Guard bracket, for switches 18 × 18, anodised aluminum (two sides raised)

TH493012000 Guard bracket, for switches ∅ 18, anodised aluminum

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

TH593032000 Protecting cover with transparent plastic lid, 18 × 18

TH593035000 Protecting cover with transparent plastic lid, 18 × 24

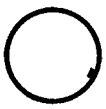
Anti-rotation devices (TK2, TR2, TE8)

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

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

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

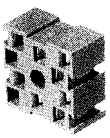
TH060661000 panel cut-out 16.2 mm (TE8)



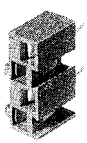
Plug in socket (TP2)

TH593578000 for 1 contact block TP2 with indicator terminals

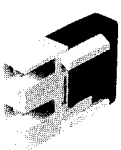
TH593568000 for 2 contact blocks TP2 with indicator terminals



TH593582000 for 1 contact block TP2 without indicator terminals



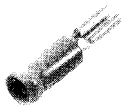
TH593584000 Diode carrier with 2 diodes 1N4007, faston connection without insulation



Extra and spare keys (TK2)

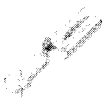
TH493049001 to TH493049020 (KABA MICRO, EB0001 – EB0020)

Faston Connectors (TP2, TK2, TR2, TP8)

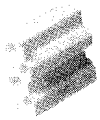


TH593571000 Faston pin, 2.8 × 0.5 mm, insulated, for wires 0.8 – 1.4 mm2 (TP2, TK2, TR2)

TH593572000 Faston pin, 2.8 × 0.5 mm, for wires 0.5 – 1.0 mm2 (TP2, TK2, TR2, TP8)



TH593573000 Faston pin, 2.8 × 0.5 mm, for faston casings, for wires 0.3 – 0.6 mm2 (TP2, TK2, TR2)



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

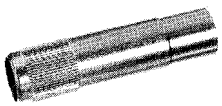
TH593575000 Sleeve and casing for th25 lamp terminals (TP2, TK2, TR2)

Miscellaneous (Lamp extractor, metal and plastic spanners)

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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