

BAR



ERMEC

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**JOHNSON
ELECTRIC**

... innovating motion ...

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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Distribución de componentes eléctricos y electrónicos

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Table of Contents

Johnson Electric Group	2
Group	
Looking for a specialized switch solution	4
Table of typical applications & Bär switch types	6
Terminology	7
Switches	14
Rocker	3670, 3672, 3673, 3680
Auto-Shut-Off	TIPPMATIC®
Push Button	3292, 3293, 3200
Momentary	1427, 1430
Snap-action	1429, XKA
Rotary Switches	4022
Table of preferred products	55

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

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

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

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

Our Brand Promise

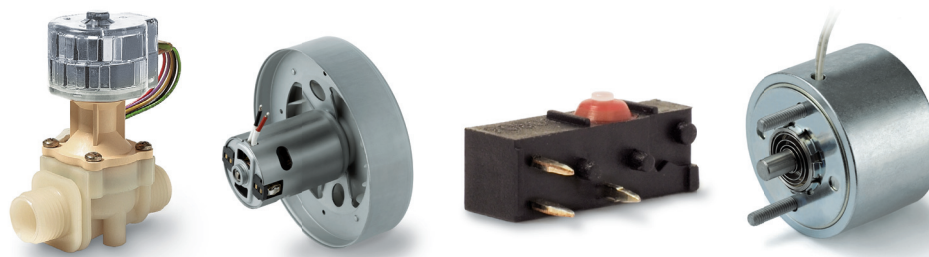
Johnson Electric is the most reliable partner

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

Johnson Electric delivers competitive advantage

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

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



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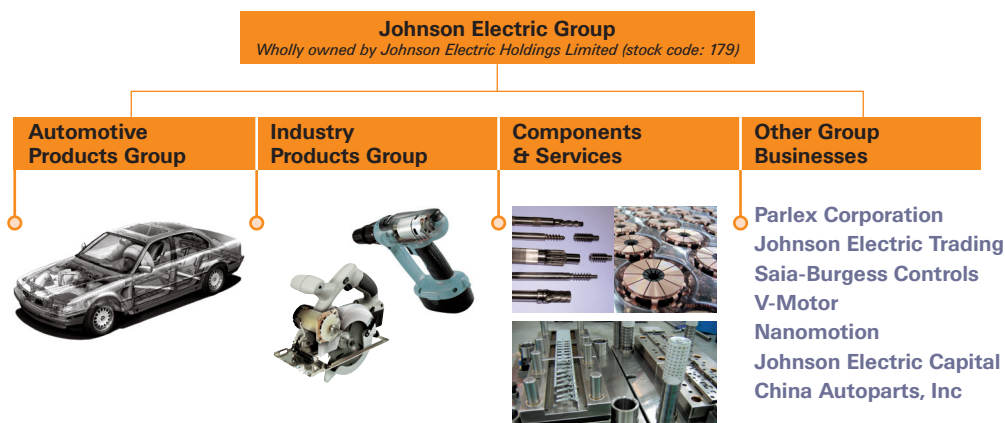
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Johnson Electric Holdings Limited is the parent company of the Johnson Electric Group and has been listed on the Stock Exchange of Hong Kong since 1984. The Group structure consists of a number of operating divisions and business units focused on their 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 switch solution?

Look no further.

We offer the industry's most comprehensive combination of technology, engineering and manufacturing to satisfy all your actuation design needs. From stand-alone push button, rocker and momentary products to complete value-added solutions; we can do it all for you. The images shown are just a few samples that demonstrate our design and value-added assembly capabilities.



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Bär Products – a leading global brand of manually operated switches

We offer the best design resources for switching solutions – whether it's one switch delivered tomorrow morning or a half million delivered just-in-time over the next year.

If the application requires an on-off or sensing function, switches are among the best devices in terms of size, cost, and ease of use.

On the facing page are some of the primary

functions which are ideally suited for Bär products, followed by several pages of actual application examples of our products applied in a wide variety of industries.

Bär is a leading global brand for manually operated switches

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 to fit for the human machine interface. Bär 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 design and quality.

Flexibility through modularity

At the heart of the Bär concept is cover design and modularity. The flexible switch base systems allow rocker, pushbuttons, rotary

switches using common platforms to be created, simplifying assembly and service requirements and providing a wide variety of design options.

Aesthetic integrity

All Bär covers and 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 products gives a consistent image of quality to your customers – and Bär products feel as good to operate as they look.

Uncompromising reliability

With many UL, CSA and ENEC approvals, the performance of Bär products is globally recognized.

Minimum size

If space behind the panel is an issue for you, the rocker and push button ranges manage to combine the legendary Bär modularity with a considerably reduced product depth.

Common pushbutton applications

- Coffee machines
- Vacuum cleaner
- Freezers
- Cooker hood
- Vending machines

Common rocker switch applications

- Coffee machines
- Espresso machines
- Kettles
- Egg cookers
- Freezers
- Cooker hood
- Vending machines

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Table of typical applications & Bär Switch 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 switch may be customized to fulfill your specific requirements, please feel free to contact us.

Application & Switch type	3670	3672	3673	3680	3600	3292	3293	3200	1427	1430	1429	XKA	4022
Commercial Equipment	●	●										●	
Copier & Printer	●	●	●										
Distribution	●	●			●				●	●	●	●	●
Home Appliances	●	●	●	●	●	●	●	●	●	●	●	●	●
HVAC	●					●	●						●
Industrial automation		●							●				
Industry general	●	●			●	●	●			●		●	●
Medical					●	●	●						
Power tools						●							
Specialist vehicles		●						●					
Telecom												●	
Vending / Gaming	●		●			●	●	●				●	
Page	14	18	22	25	29	33	36	39	42	44	46	48	51

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Terminology: Manual operated switches

Definitions of different switch types

Rocker switch

Switch, the actuating member of which is a low profile lever (rocker) which has to be tilted to one or more indexed positions in order to achieve a change in contact state.

Push-button switch

Switch, the actuating member of which is a button which has to be pushed in order to achieve a change in contact state.

Rotary switch

Switch, the actuating member of which is a shaft or a spindle which has to be rotated to one or more indexed positions in order to achieve a change in contact state.

Operating Characteristics

Actuating force

The force which is required to move the actuator and contact system from the free to the operating position

Free position

The position of the actuator when no external force is applied

Operating Position

The position of the actuator when the contact has change over the state take place

Detent position

The position of the actuator when the system is in stable operating position

Overtravel

Movement of the switch beyond the operating position

Release force

The value to which the applied force must be reduced to allow the mechanism to reset after operation

Total Travel

The complete movement of the actuator

Approvals

Almost all of Saia Burgess switches are tested and approved according to EN 61058-1 resp. IEC 61058-1 and UL 1054.

The corresponding certificates are available on request.

Approval marks, certification marks



ENEC – Mark, the switch fulfils European (EN) Standards. The two digits indicates which certification body has issued the ENEC Certificate.



UL UR-Mark recognized component mark for the USA



cULus-Mark for Canada and USA



CE Mark, administration mark

The CE Mark is an administrative mark, which often is mistake as a certification mark.

This mark indicates the conformity of a product with the EC Directives and can be affixed themselves by the manufacture. For almost all of Bär switches the basis for the EC Declaration is the full compliance with the corresponding standard.

To bear the CE- Mark on the component It is not prescribed. Present is the CE Mark on the smallest packing unit.

Explosionsproof IEC60079-15:1987

The switch must withstand an internal explosion without igniting a surrounding gas mixture.

Resistance to tracking

The resistance to tracking (PTI / CTI values) indicates the maximum voltage which a material withstands a definite quantity of drops of test solution without tacking.

Resistance to head and fire

The materials pass the glow-wire test level 3 carried out at 850°C

Electrical rating

The maximum permissible electrical load is specified for the respective switch series. Most of Saia Burgess switches are suitable for both resistive and motor loads. The rated current for the motor load is specified in brackets, e.g. 16 (4) A 250 V ac.

Information about ratings for direct current (DC) will be provided on request.

Type of load: ENEC / IEC

Resistive load; circuit for a substantially load with a power factor of not less than 0,9 Marking for example 16A

Inductive load; circuit for either a resistive load, a inductive (motor) load with a power factor not less than 0,6 or a combination of both.

Marking for example 16(4)A

Lamp Loads; circuit for ordinary tungsten filament lamp load

Marking for example 16[2]A

Type of load: UL

HP load; circuit for a motor load with a power factor not less than 0,4

Marking for example _ HP

EMC (Spurious Radiation / Spurious Emission)

EMC requirements are not applicable for manual operated switch and required only for electronic switches resp. electronic components or electronic circuits.

Please your attention, when installed in other products or as a part of an assembly, the EMC characteristics can be affected and the test must be repeated on the end use product.

Ambient temperature

The marking e.g. T 100 means that the switch is approved by the European approval authorities (according to EN 61058-1 resp. IEC 61058-1) for the max. ambient temperature of 100 °C. The marking T 100/55 means, that the terminal side of the switch is suitable for an ambient temperature of 100 °C and the ambient temperature for an actuating element (e.g. the rocker) reduced is of 55 °C.

For **USA** approved switches the ambient temperature is determined by the RTI (Relative Temperature Index) of the materials used. Temperatures are available on request.

Switch Technology

Clearance Distance

The distance in air between conductive parts or between conductive parts and a surface which can be contacted by persons when the switch is installed.

Creepage Distance

The path along the surface of insulating material between conductive parts or between conductive parts and a surface which can be contacted by persons when the switch is installed

Insulation Resistance

The resistance for reinforced insulation shall be not less than 7 MOhms between all live parts connected together and a metal foil covering to a accessible surface

Functions:

On-off function switch, or momentary

Change over

On-off function in two directions with or without zero position, or momentary Multiple function

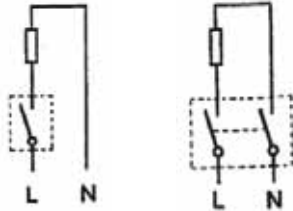
On – step- off function e.g I – II – 0 positions, or momentary

Pole

Part of the switch which exclusively is assigned to an electrically separate conducting path of the switch.

A single-pole switch has only one pole (two terminals) (except with signal indicator)

A double-pole switch has two-poles (four terminals)



Number of cycles:

According to EN 61058-1 normally cycles 10.000 (1E4), frequent operation 50.000 cycles (5E4)

According to UL 1054 normally 6.000 cycles

Contact Materials

Terminals

Copper or and copper alloy

Contact-point

Silver or silver alloy Ag Ni 90/10 are primary contact materials used in Bär manual operated switches

Gold-plated contacts on request

Contact disconnection

The most of the switches have a contact disconnection of ≥ 3 mm.

Switches with a contact disconnection of < 3 mm are marked by the sign μ .

Terminals



Tab terminal



Solder terminal



PCB terminal



bush- terminal

Screw less terminal

Switch Actuation / Design

Customer specified on request

Haptic

Haptic perception contains all aspects of the touch under use of the hands. The surface compositions of the activity elements as well as the haptic re-registration of the contact systems are included. Various sorts of surfaces and switch force characteristics are available.

Switching easily possible with feeling means: Comfortable switch.

Optic

Surfaces and design are the essential distinctive marks of the applications today. Based on standard switches individual designs can be made come true by different actuators. Surfaces can be represented by structures or also painted surfaces.

Signal indicator

The illumination of a switch is a component to indicate the circuit state visually, for which we used glow-lamps or LED's.

There are the rockers in completely transparently or with one special shining window. For this it is important that the lateral shining effect also makes this one a side view possible.

Glow lamp or LED been used for illumination. Customer specified on request. The color is eligible for office according to customer wish.

Environmental Protection

Protection Classifications (IP-Code)

The first figure is the protection against solids
The second figure is the protection against water
For example

IP40

Adequate protection against solids such as probing finger and small wires > 1 mm. Liquids however can again access and, unless externally protection, the switches should be mounted in dry or well-sheltered positions

IP54

Good protection against solid foreign bodies, including dust and water splashing against the enclosure from any direction. Switches may be used out of doors it sheltered from the worst of the elements or on factory machines subjected to normal washing down procedures

IP65

Complete protection against solids, including dust and against low pressure jets of water from all directions

IP67

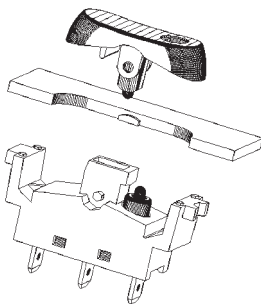
Complete protection against solids including dust and against immersion in water at a specific pressure for a specified time.

Please your attention that information concerning the IP – Code for these products are, if not other specified, only for the actuating side. The sealing between switch and the end use application must be tested by the customer.

EU Directive 2002/95/EC (RoHS)

All switches are free of banned substances

Possible combination / Pre-wiring



Switch drawing

All drawings in this catalog are third angle projection. All dimensions in this catalog are nominal, except where specifically shown.

Health & Safety

Bär has ensured, so far as it is reasonably practicable, that their products as described in this catalog or in other current company publications, or as specified on Bär installation drawings. They have been so designed and constructed as to be safe and without risk to health when installed by suitably qualified personnel in accordance with relevant legislation, codes of practice, regulations (including IEE Wiring Regulations), the installation recommendations offered by the company and the accepted rules of the art. Their usage should be confined within the ratings limitations and parameters of application indicated in this catalog and elsewhere.

Please contact us should you need additional information or guidance.

Service Recommendations

Maintenance

Bär switches are not user-maintainable but they should be kept in a reasonably clean, paint-free condition, especially in the actuator area. Regular checks should be made on mounting security and on the actuating medium to switch actuator relationship.

Lubrication or the use of aqueous or chemical cleaning fluids is not recommended.

Installation Recommendations

The user is responsible for the proper installation under consideration of the respectively valid norms

Safety consideration

Installation should only be carried out by competent personnel

General note

All data specified in this catalog are not binding and we reserve the right to alter a product in accordance with technical improvements without notice. Binding data are available after clarification of all relevant conditions on request.

Rocker



Type **3670**

3672

3673

3680

3600

Characteristics

- single pole
- on/off
- illuminated/non-illum.
- snap-in mounting
- faston
- optional with momentary function
- temp. 100/55°

- single pole
- on/off
- illuminated/non-illum.
- snap-in mounting
- solder terminals
- PCB terminals
- faston
- momentary function
- temp. 85/55°

- single pole
- change-over (with or without "zero-position")
- snap-in mounting
- faston
- µ-gap
- temp. 100/55°

- single pole
- on/off
- illuminated/non-illum.
- snap-in mounting
- faston
- optional with momentary function
- temp. 85/55°

- integral timer function
- different times available
- single pole
- on/off
- illuminated/non-illum.
- snap-in mounting
- temp. 100/55°

Rating

250 VAC, 6 (2) A
250 VAC, 12 (2) A
125 VAC, 12 A

250 VAC, 6 (2) A
125 VAC, 7.5 A

250 VAC, 6 (3) A
125 VAC, 10 A (for version with "zero"-position)

250 VAC, 6 (2) A
125 VAC, 7.5 A

250 VAC, 12 (4) A
125 VAC, 15 A

Dimensions (mm)

various

various

various

various

37.2 × 17 × ~38

Actuator

- rockers in different shapes/colors

- rockers in different shapes/colors

- rockers in different shapes/colors

- rockers in different shapes/colors

- standard rocker 25.4 x 10.7-mm

Approvals

ENEC, cUL

ENEC, UL

ENEC, cUL

ENEC, UL, CSA

ENEC, cUL

Page

14

18

22

25

29

Push Button



Type **3292**

3293

3200

Characteristics

- single/double pole
- on/off
- faston
- PCB terminals
- extended life (5E4)
- customised mounting
- momentary or latching

- single/double pole
- on/off
- faston
- PCB terminals
- customised mounting
- momentary or latching
- µ-gap

- illumination optional
- single pole
- change-over
- customised mounting
- momentary or latching
- PCB terminals
- µ-gap

Rating

250 VAC, 16 (4) A, 1E4, T100
250 VAC, 10 (10) A, 1E4, T100
250 VAC, 8 (8) A, 5E4, T125
125 VAC, 16 A, ¾ hp, T85

250 VAC, 8 (8) A, 1E4, T100
250 VAC, 10 (4) A, 1E4, T100

12 VDC, 2 A

Dimensions (mm)

13.5 × 19

13.5 × 19

12.5 × 12.5 × 19.5

Actuator

- plunger
- square 6 mm

- plunger
- square 6 mm

- square 10.4 mm

Approvals

ENEC, cUL, US

ENEC

none

Page

33

36

39

Switches

Momentary



Snap-action



Type	1427	1430	1429	XKA
Characteristics	■ single pole ■ faston ■ snap-in mounting or center-fixing	■ single pole ■ faston ■ snap-in mounting	■ single pole ■ snap-action function ■ faston ■ snap-in mounting ■ type of protection according to IEC 60079-15:1987	■ long overtravel ■ snap-action C0 ■ snap-in mounting ■ type of protection according to IEC 60079-15:1987
Rating	250 VAC, 0.2 [0.2] A 1E5 250 VAC, 0.25 A	250 VAC, 0.2 [0.2] A 5E4	250 VAC, 0.2 [0.2] A 2E5	250 VAC, 1 (1) A 5E4, T85
Dimensions (mm)	various	various	various	28 × 20 × 15
Actuator	■ plunger	■ lever	■ plunger	■ plain lever ■ round levers
Approvals	ENEC, cUL	ENEC	ENEC	UL, CSA, ENEC
Page	42	44	46	48

Rotary Switches

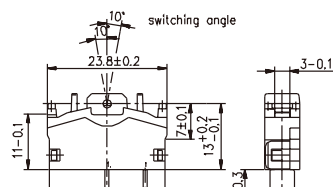


Type	4022
Characteristics	■ single pole with on/off or step function ■ double pole with on/off-function ■ solder, PCB terminals ■ high temp. 100°
Rating	250 VAC, 12 (2) A 125 VAC, 10 A
Dimensions (mm)	30 × 14 × 15.3
Actuator	■ cam ■ square access hole 3.25 mm²
Approvals	ENEC, UL, CSA
Page	51

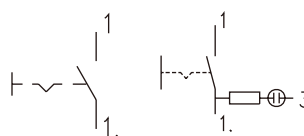
Rocker Switches



Dimensions



Circuit diagram



3670

- Characteristics
- single pole
 - on/off
 - illuminated/non-illum.
 - snap-in mounting
 - faston
 - optional with momentary function
 - temp. 100/55°

Rating

250 VAC, 6 (2) A
250 VAC, 12 (2) A
125 VAC, 12 A

Dimensions (mm)

various

Actuator

■ rockers in different shapes/colors

Approvals

ENEC, cUL



Preferred Range Switch

Ordering Reference	Illumination	Mounting	Rocker	Lens	Approvals ENEC	cUL
3670-201.01 1542	With	Snap-in	Black	Red	250 VAC 6 (2) A	
3670-202.01 1542	With	Snap-in	Red transparency		250 VAC 6 (2) A	
3670-001.01 1555	Without	Frameless	See below, not mounted		250 VAC 6 (2) A	
3670-017.01 1551	Without	Frameless	See below, not mounted		250 VAC 12 (2) A	
3670-010.01 1551	Without	Frameless	See below, not mounted			125 VAC 12 A
3670-004.01 1552	With	Frameless	See below, not mounted		250 VAC 6 (2) A	
3670-013.01 1552	With	Frameless	See below, not mounted		250 VAC 12 (2) A	

Preferred Range Rocker

Ordering Reference	Size (mm)	Color	Form	Lens
136-305.0000	14 × 19,8	White		
136-304.0000	14 × 19,8	Red transparency		
136-301.0000	∅ 20	White	Round	
136-332.0000	∅ 20	Black	Round	
136-326.0000	∅ 20	Black	Round	Red
136-342.0000		Black	Elliptical	Red
136-320.0000	9,7 × 20	Red transparency		

Specifications

Base	PBT
Rocker	PC
Mechanism	Single pole
Functions	ON/OFF
Contacts	Ag/Ni
Protection	IP00
Mounting	Snap-in mounting or customised
Tracking Resistance	PTI 250
Glow-wire	850°C
Switch angle	20°
Contact gap	3 mm

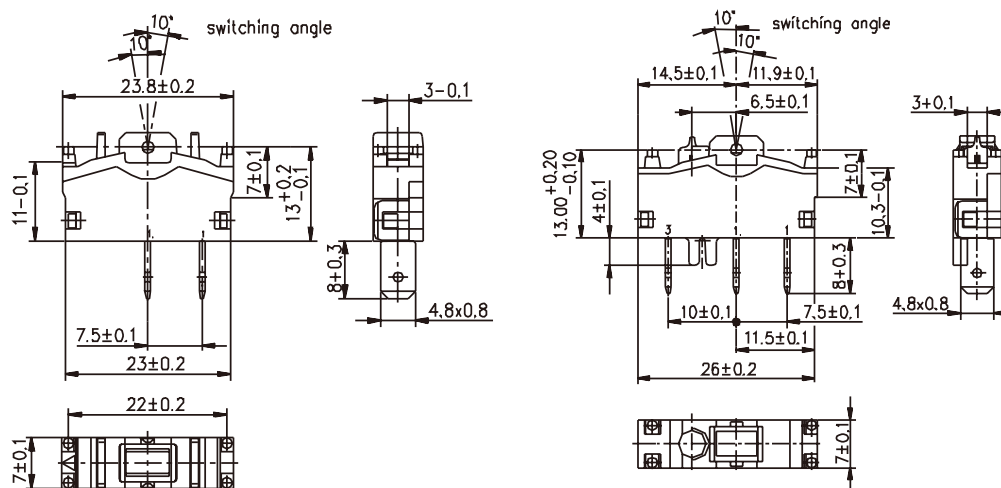
Circuit diagram

circuit diagram

circuit diagram

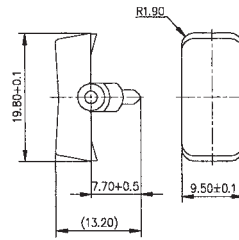
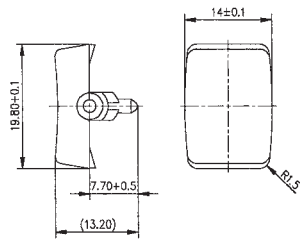


Dimensions

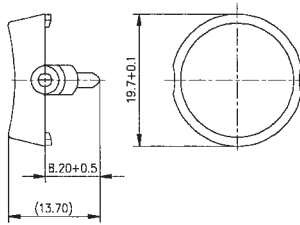


Rocker dimensions

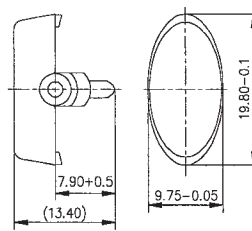
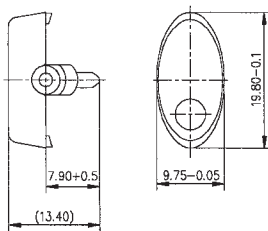
Rocker



Rocker



Rocker



Standard range switches

Ordering Reference	Illumination	Contacts (mm)	Mounting	Rocker	Lens	Rating ENEC	cUL
3670-006.01 1552	With	4,8	Frameless	See below, not mounted			125 VAC 12 A
3670-007.01 1552	With	4,8 / 90°	Frameless	See below, not mounted		250 VAC 6 (2) A	

Standard range rockers

Ordering Reference	Size (mm)	Color	Shape	Lens
136-325.0000	Ø 20	White	Round	Red
136-346.0000		Black	Elliptical	
136-372.0000		Red transparency	Elliptical	
136-341.0000		White	Elliptical	Red
136-312.0000	9,7 × 20 mm	White		

3672

- Characteristics
- single pole
 - on/off
 - illuminated/non-illum.
 - snap-in mounting
 - solder terminals
 - PCB terminals
 - faston
 - momentary function
 - temp. 85/55°

Rating 250 VAC, 6 (2) A
125 VAC, 7.5 A

Dimensions (mm) various

Actuator ■ rockers in different shapes/colors

Approvals ENEC, UL



Preferred Range Switch

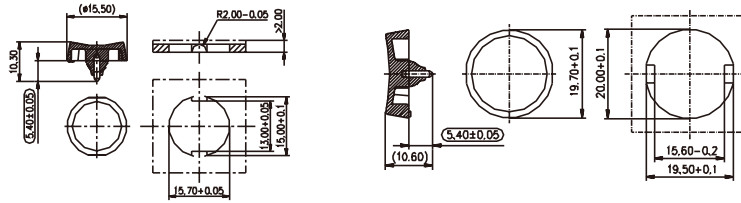
Ordering Reference	Illumination	Terminals	Shape of housing	Approvals (ENEC)
3672-722.01 1541	None	tab 4,8 mm, bent 90°	Small	250 VAC 6 (2) A
3672-727.01 1341	None	Solder, bent 90°	Small	250 VAC 6 (2) A
3672-311.01 1541	None	tab 4,8 mm, bent 90°	Large	250 VAC 6 (2) A
3672-515.01 1542	With	tab 4,8 mm, bent 45°	Large	250 VAC 6 (2) A

Preferred Range Rocker

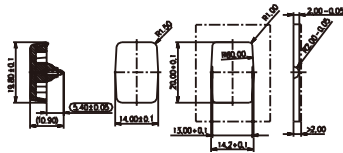
Ordering Reference	Size (mm)	Color	Form	Lens
111-342.0000	Ø 16	Black	Round	
111-337.0000	Ø 16	White	Round	Yellow
111-355.0000	Ø 20	White	Round	
111-327.0000	Ø 20	Black	Round	Red
111-439.0000	14 × 19,8	White	Square	
111-024.0167	Ø 16	Black	Adaptor	
111-026.0167	Ø 20	Black	Adaptor	

Rocker dimensions

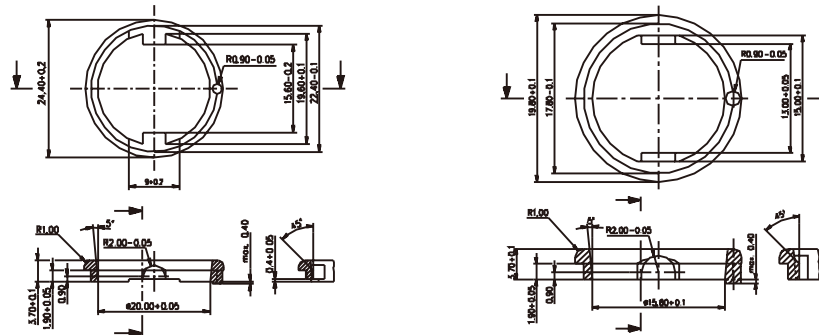
Rocker



Rocker



Adaptor



Standard range switches

Ordering Reference	Illumination	Terminals	Shape of housing	Approvals ENEC	UL
3672-720.01 1341	Without	Solder	Small	250 VAC 6 (2) A	
3672-704.01 1741	Without	Screwless	Small	250 VAC 6 (2) A	
3672-903.01 1541	Without	tab 4,8 mm, bent 90°	Small		125 VAC 7,5 A
3672-513.01 1642	With	tab 6,3 mm, bent 90°	Large	250 VAC 6 (2) A	
3672-726.01 1841	Without	PCB	Small	250 VAC 6 (2) A	

Standard range rockers

Ordering Reference	Size (mm)	Color	Shape	Lens
111-340.0000	Ø 16	White	Round	
111-369.0000	Ø 20	Black		
111-323.0000	Ø 20	White	Round	Red
111-440.0000	14 × 19,8	Black	Square	
111-024.0150	Ø 16	White	Adaptor	
111-024.0198	Ø 16	Red transparency	Adaptor	
111-026.0150	Ø 20	Black	Adaptor	
111-026.0198	Ø 20	Red transparency	Adaptor	

3673

Characteristics	■ single pole
	■ change-over (with or without "zero-position")
	■ snap-in mounting
	■ faston
	■ μ -gap
	■ temp. 100/55°

Rating	250 VAC, 6 (3) A
	125 VAC, 10 A (for version with "zero"-position)

Dimensions (mm)	various
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Actuator	■ rockers in different shapes/colors
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Approvals	ENEC, cUL
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Preferred Range Switch

Ordering Reference	Illumination	Function	Terminals	Mounting	Rocker	Approvals (ENEC)
3673-600.02 4550	None	I-II	tab 4,8 mm	Frameless	See below, not mounted	250 VAC 6 (3) A

Preferred Range Rocker

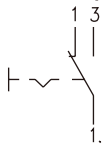
Ordering Reference	Size (mm)	Color	Form
136-305.0000	14 × 19,8	White	Square
136-301.0000	∅ 20	White	Round
136-332.0000	∅ 20	Black	Round

Specifications

Base	PBT
Rocker	PC
Mechanism	Single pole
Functions	Change-over
Contacts	Ag/Ni
Protection	IP00
Mounting	Snap-in mounting or customised
Tracking Resistance	PTI 250
Glow-wire	850°C
Switch angle	20° I-II, 2 × 10° I-O-II
Contact gap	< 3 mm

Circuit diagram

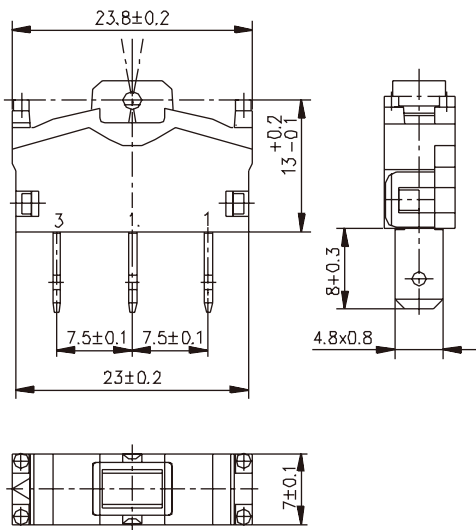
circuit diagram



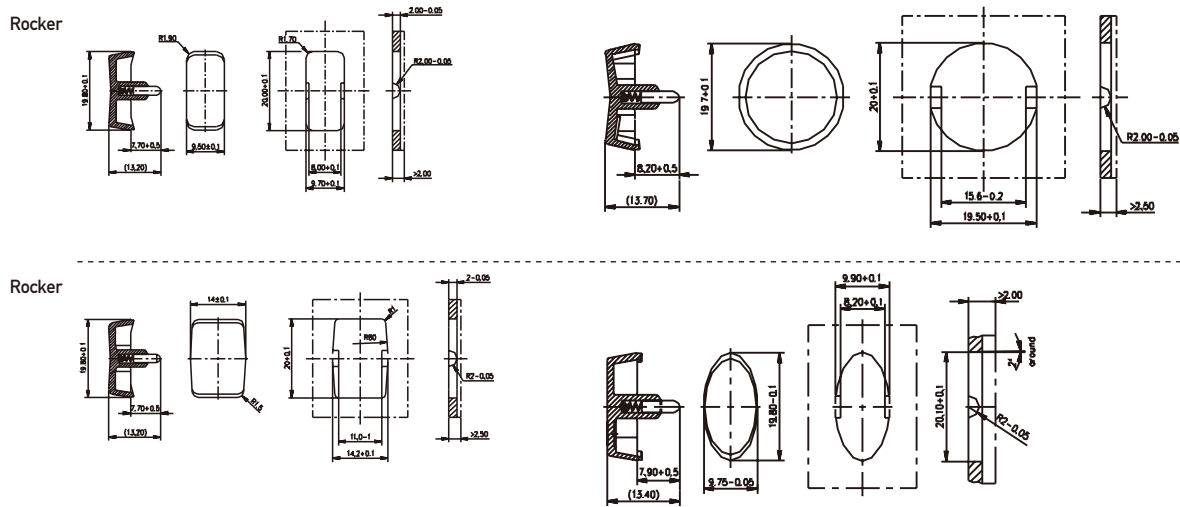
circuit diagram



Dimensions



Rocker dimensions



Standard range switch

Ordering Reference	Illumination	Function	Terminals	Mounting	Rocker	Approvals ENEC	UL
3673-001.01 4551	None	I-0-II	tab 4,8 mm	Snap-in	Black	250 VAC 6 (3) A	
3673-101.01 4551	None	I-0-II	tab 4,8 mm	Snap-in	Black		125 VAC 10 A
3673-502.01 4551	None	I-II	tab 4,8 mm	Snap-in	Black	250 VAC 6 (3) A	
3673-200.01 4550	None	I-0-II	tab 4,8 mm	Frameless	See below, not mounted	250 VAC 6 (3) A	

Standard range rocker

Ordering Reference	Size (mm)	Color	Shape
136-312.0000	9,7 × 20	White	Square
136-346.0000		Black	Elliptical

3680

Characteristics	■ single pole ■ on/off ■ illuminated/non-illum. ■ snap-in mounting ■ faston ■ optional with momentary function ■ temp. 85/55°
Rating	250 VAC, 6 (2) A 125 VAC, 7.5 A
Dimensions (mm)	Various
Actuator	Rockers in different shapes/colors
Approvals	ENEC, UL, CSA



Preferred Range Switch

Ordering Reference	Illumination	Terminals	Mounting	Rocker	Lens	Housing	Approval ENEC	UL
3680-012.01 1651	None	tab 6,3 mm	Snap-in	Black		Black	250 VAC 6 (2) A	
3680-561.01 1552	With	tab 4,8 mm	Snap-in	Black	Red	Black	250 VAC 6 (2) A	
3680-805.01 1552	With	tab 4,8 mm	Snap-in	Black	Red	Black		125 VAC 7,5 A
3680-031.01 1541	None	tab 4,8 mm	Customised	See below, not mounted		White	250 VAC 6 (2) A	
3680-401.01 1542	With	tab 4,8 mm	Customised	See below, not mounted		White	250 VAC 6 (2) A	
3680-402.01 1642	With	tab 6,3 mm	Customised	See below, not mounted		White	250 VAC 6 (2) A	
3680-408.01 1642	With	tab 6,3 mm	Customised	See below, not mounted		White		125 VAC 7,5 A

Preferred Range Rocker

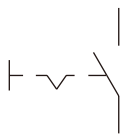
Ordering Reference	Size (mm)	Color	Form	Lens
131-350.0000	9,2 × 25	Black	Square	
131-321.0000	10,5 × 25	Red transparency	Square	
131-455.0000		Black	Elliptical	Red
131-465.0000		Red transparency	Elliptical	

Specifications

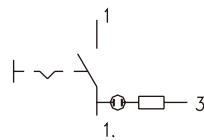
Base	PA
Rocker	PC
Mechanism	Single pole
Functions	ON/OFF
Contacts	Ag/Ni
Terminals	Tab terminals 4.8 mm / 6.3 mm
Temperature range °C	85/55
Mechanical life	10.000 ENEC / 6.000 UL CSA
Protection	IP00
Mounting	Snap-in mounting or customised
Tracking Resistance	PTI 250
Glow-wire	850°C
Switch angle	13°
Contact gap	3 mm

Circuit diagram

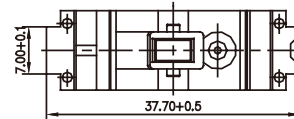
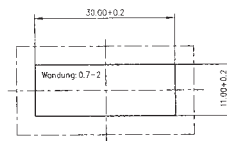
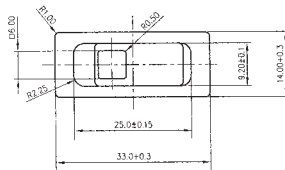
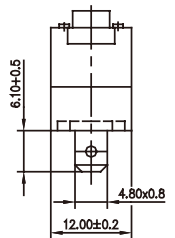
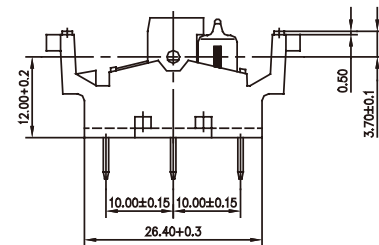
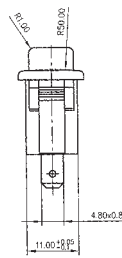
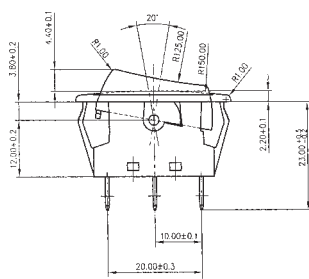
circuit diagram



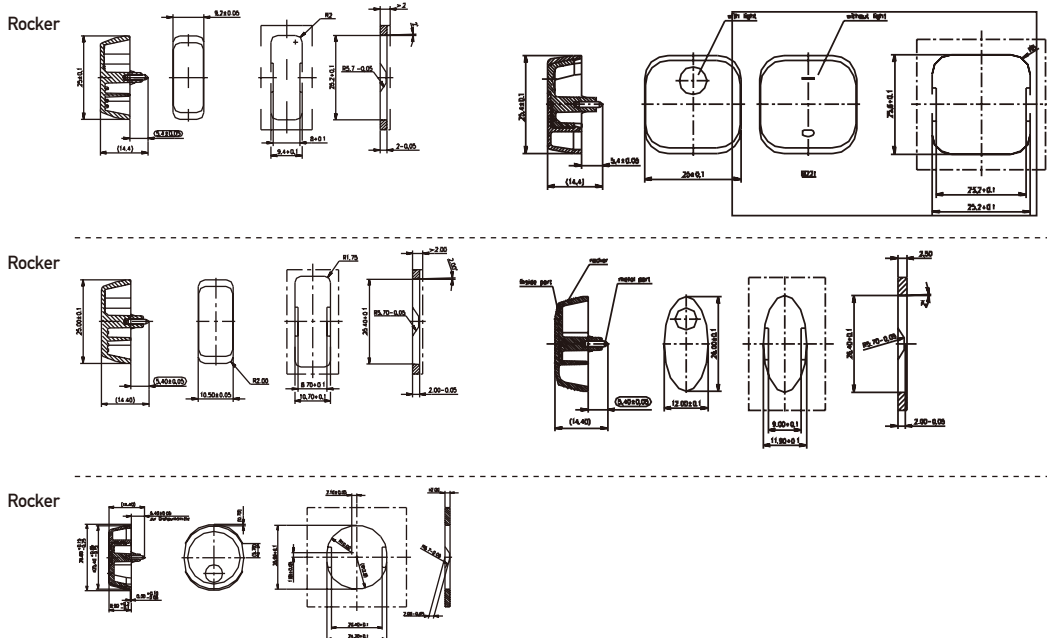
circuit diagram



Dimensions



Rocker dimensions



Standard range switch

Ordering Reference	Illumination	Terminals	Mounting	Rocker	Lens	Housing	Approval ENEC	UL
3680-002.01 1651	Without	tab 6.3 mm	Snap-in	White		White	250 VAC 6 (2) A	
3680-502.01 1652	With	tab 6.3 mm	Snap-in	White	Red	White	250 VAC 6 (2) A	
3680-506.01 1652	With	tab 6.3 mm	Snap-in	Red transparency		White	250 VAC 6 (2) A	
3680-407.01 1542	With	tab 4.8 mm	Customised	See below, not mounted		White		125 VAC 7,5 A

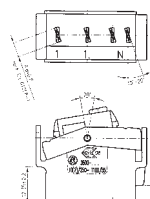
Standard range rocker

Ordering Reference	Size (mm)	Color	Shape	Lens
131-352.0000	9.2 × 25	Red transparency	Square	
131-330.0000	10.5 × 25	Black	Square	
131-343.0000	25	Black	Square	
131-327.0000	25	White	Square	Red
131-454.0000		White	Elliptical	Red
131-471.0000	Ø 25.4	Black	Round	Red

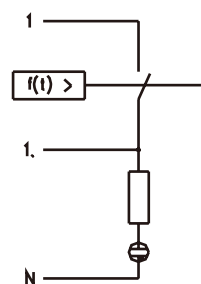
TIPPMATIC®



Dimensions



Circuit diagram



TIPPMATIC® Rocker switch with integrated auto-shut-off function

- Characteristics
- integral timer function
 - different times available
 - single pole
 - on/off
 - illuminated/non-illum.
 - snap-in mounting
 - temp. 100/55°

Rating 250 VAC, 12 (4) A
125 VAC, 15 A

Dimensions (mm) 37.2 × 17 × ~38

Actuator ■ standard rocker 25.4 × 10.7 mm

Approvals ENEC, cUL



Auto-Shut-Off

Preferred Range Switch

Ordering Reference	Illumination	Terminals 4,8	Time delay		Approvals
			50 Hz	60 Hz	
3600-411.27 1552	With	tab 4,8 mm	15 min.	12.5 min.	250 VAC 12 (4) A
3600-414.27 1552	With	tab 4,8 mm	120 min.	100 min.	250 VAC 12 (4) A
3600-412.27 1552	With	tab 4,8 mm	30 min.	25 min.	250 VAC 12 (4) A

Preferred Range Switch cover

Ordering Reference	Size (mm)	Color
100-012.0152	10,5 × 25	white
100-012.0167	10,5 × 25	black

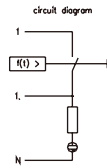
Preferred Range Adapter

Ordering Reference	Size (mm)	Color	Size (mm)	Wall thickness
100-071.0150		white	43.7 × 17,8	2.5 ± 0.5 mm
100-071.0167		black	43.7 × 17,8	2.5 ± 0.5 mm

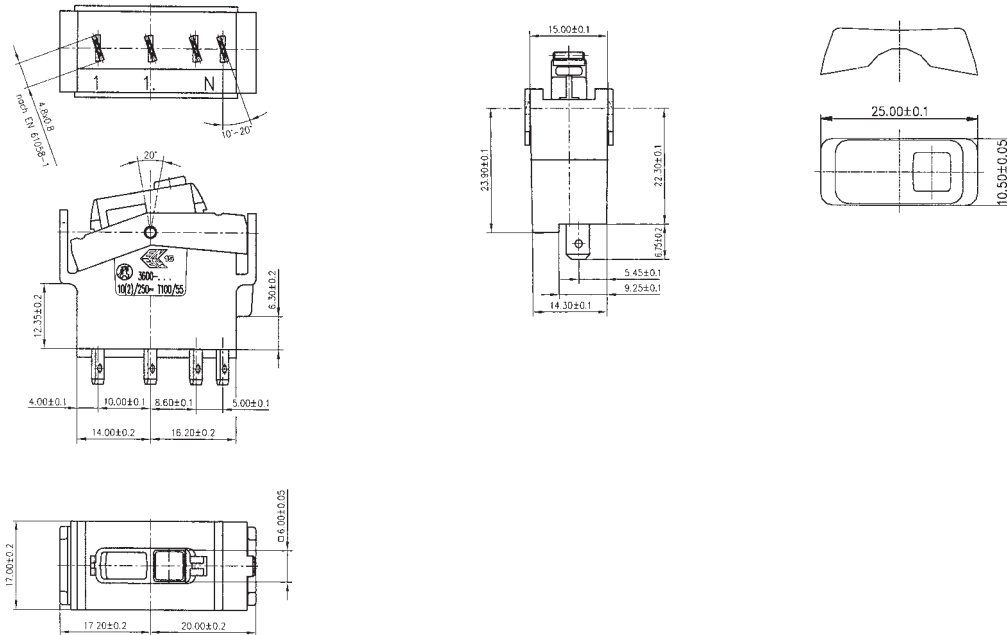
Specifications

Base	PA
Rocker	PC
Mechanism	Single pole
Functions	ON/OFF
Contacts	Ag/Ni
Protection	IP00
Mounting	Snap-in mounting or customised
Tracking Resistance	PTI 250
Glow-wire	850°C
Contact gap	3 mm

Circuit diagram



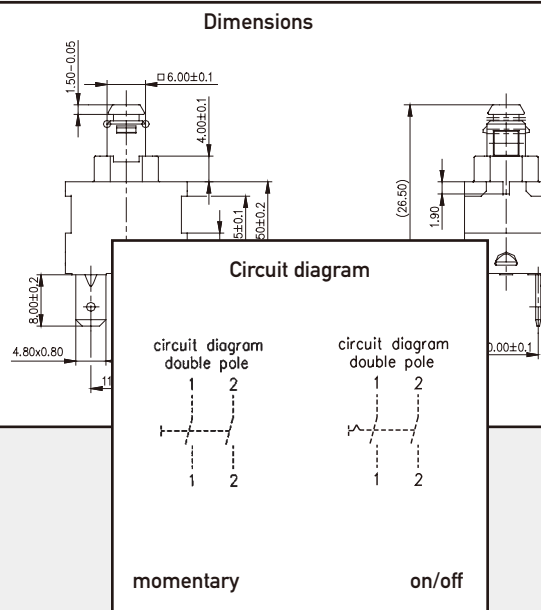
Dimensions



Production range switches

Ordering Reference	Illumination	Terminals 4,8	Time delay		Approvals ENEC	cUL
			50 Hz	60 Hz		
3600-410.27 1552	With	tab 4,8 mm	5 min.	4,1 min.	250 VAC 12 (4) A	
3600-413.27 1552	With	tab 4,8 mm	60 min.	50 min.	250 VAC 12 (4) A	
3600-419.27 1542	Without	tab 4,8 mm	30 min.	25 min.	250 VAC 12 (4) A	
3600-510.27 1542	With	tab 4,8 mm	5 min.	4,1 min.		125 VAC 15 A
3600-512.27 1542	With	tab 4,8 mm	30 min.	25 min.		125 VAC 15 A
3600-513.27 1542	With	tab 4,8 mm	60 min.	50 min.		125 VAC 15 A

Push Button Switches



3292

Characteristics	■ single /double pole ■ on/off ■ faston ■ PCB terminals ■ extended life (5E4) ■ customised mounting ■ momentary or latching
Rating	250 VAC, 16 (4) A, 1E4, T100 250 VAC, 10 (10) A, 1E4, T100 250 VAC, 8 (8) A, 5E4, T125 125 VAC, 16 A, ¾ hp, T85
Dimensions (mm)	13.5 × 19
Actuator	■ plunger ■ square 6 mm
Approvals	ENEC, cULUS



Push Button

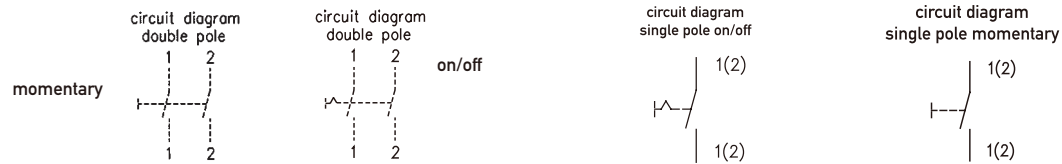
Preferred Range

Ordering Reference	Terminals	Mounting	Button length	Function	Pole
3292-411.01 1541	tab 4,8 mm, bottom side	Frameless	5.5 mm	On-off	Single
3292-410.01 1541	tab 4,8 mm, bottom side	Frameless	8 mm	On-off	Single
3292-401.01 2541	tab 4,8 mm, bottom side	Frameless	5.5 mm	On-off	Double
3292-400.01 2541	tab 4,8 mm, bottom side	Frameless	8 mm	On-off	Double

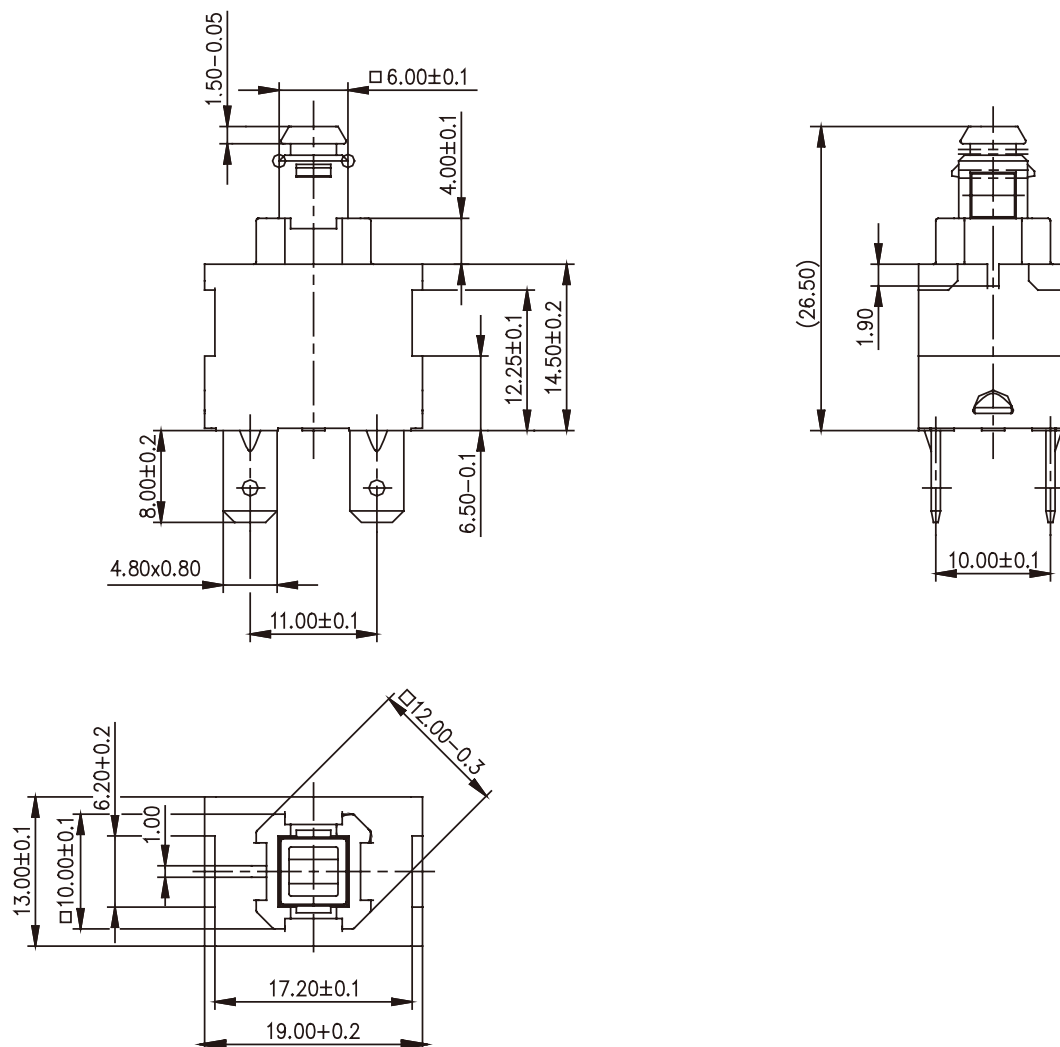
Specifications

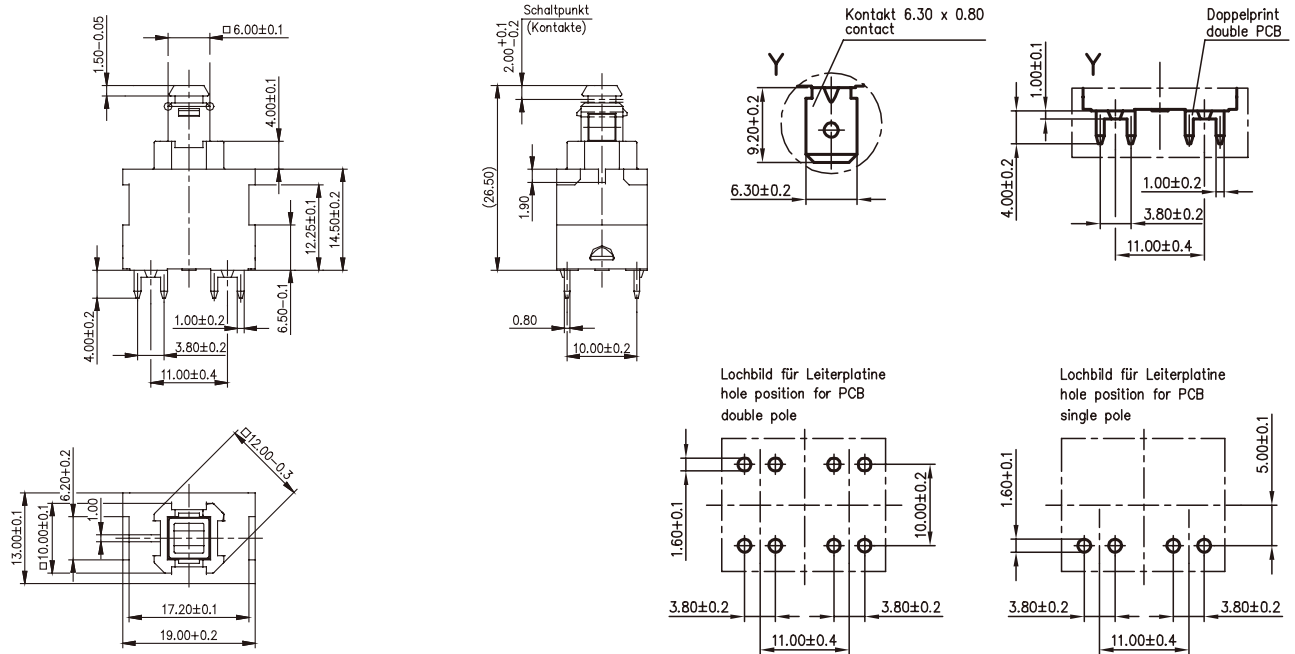
Base	PA
Button	PA
Mechanism	Single/ double pole
Functions	ON/OFF Momentary NO
Contacts	Ag/Ni
Protection	IP 00
Mounting	Customised
Tracking Resistance	PTI 250
Glow-wire	850°C and IEC 60335-1 Ed. 4
Contact gap	3 mm
Operating travel	4,5 mm ± 0,2

Circuit diagram



Dimensions





Standard range switches

Ordering Reference	Terminals	Mounting	Button length	Function	Pole
3292-412.01 1641	6.3, bottom side	Frameless	8 mm	On-off	Single
3292-413.01 1641	6.3, bottom side	Frameless	5.5 mm	On-off	Single
3292-416.01 1841	PCB, bottom side	Frameless	8.0 mm	On-off	Single
3292-417.01 1841	PCB, bottom side	Frameless	5.5 mm	On-off	Single
3292-402.01 2641	6.3, bottom side	Frameless	8.0 mm	On-off	Double
3292-403.01 2641	6.3, bottom side	Frameless	5.5 mm	On-off	Double
3292-404.01 2841	PCB, bottom side	Frameless	8.0 mm	On-off	Double
3292-405.01 2841	PCB, bottom side	Frameless	5.5 mm	On-off	Double

3293

Characteristics	■ single / double pole
	■ on/off
	■ faston
	■ PCB terminals
	■ customised mounting
Rating	■ momentary or latching
	250 VAC, 8 (8) A, 1E4, T100
	250 VAC, 10 (4) A, 1E4, T100
Dimensions (mm)	13.5 × 19
Actuator	■ plunger
	■ square 6 mm
Approvals	ENEC



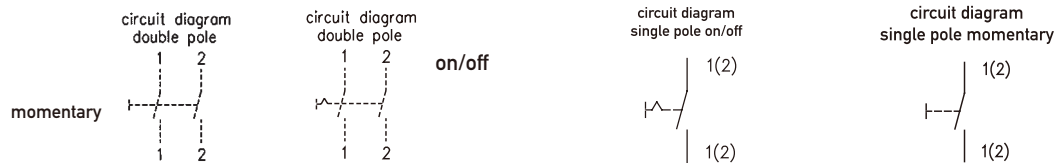
Preferred Range

Ordering Reference	Terminals	Mounting	Button length	Function	Pole
3293-410.01 1541	tab 4,8 mm, bottom side	Frameless	8 mm	On-off	Single
3293-400.01 2541	tab 4,8 mm, bottom side	Frameless	8 mm	On-off	Double

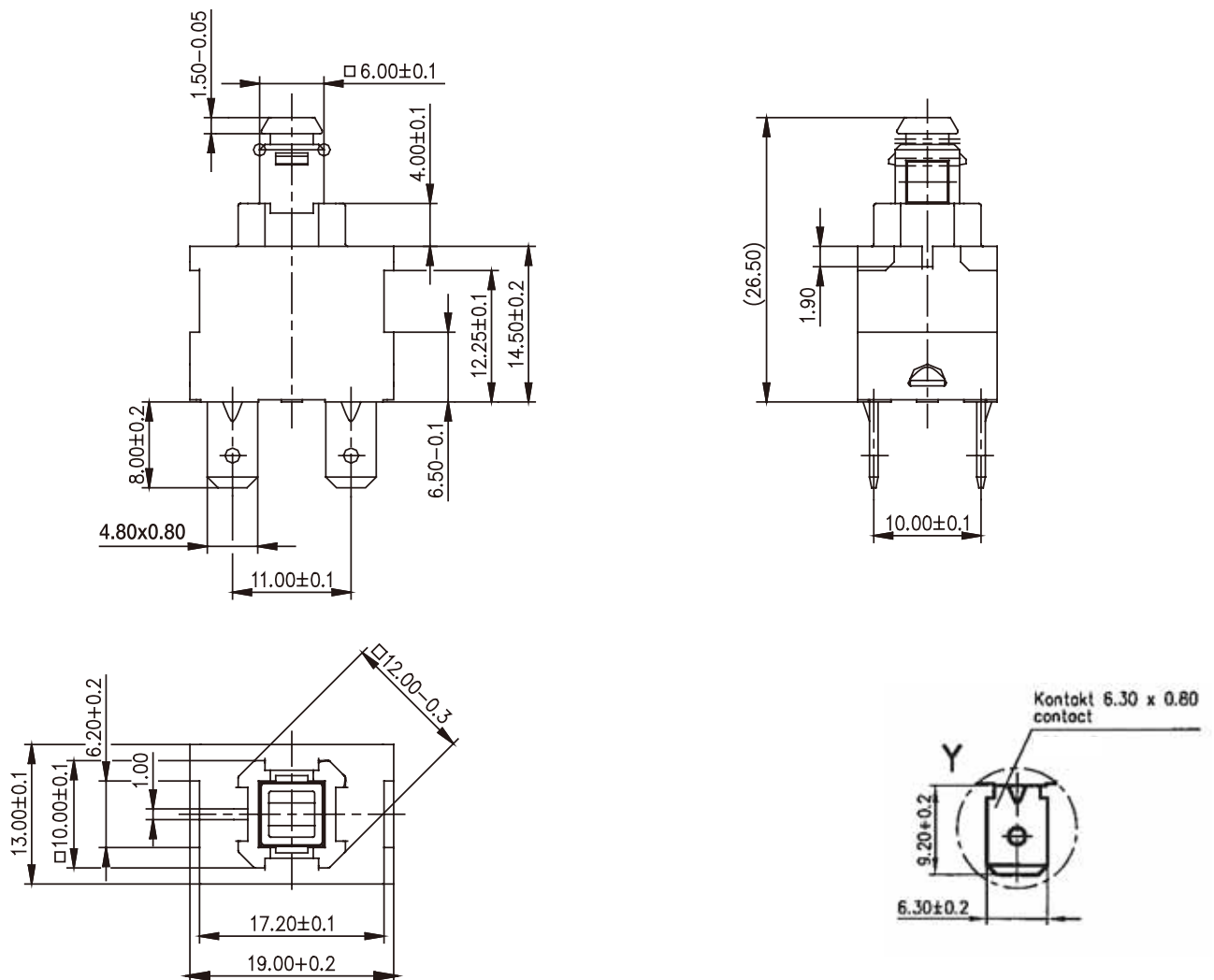
Specifications

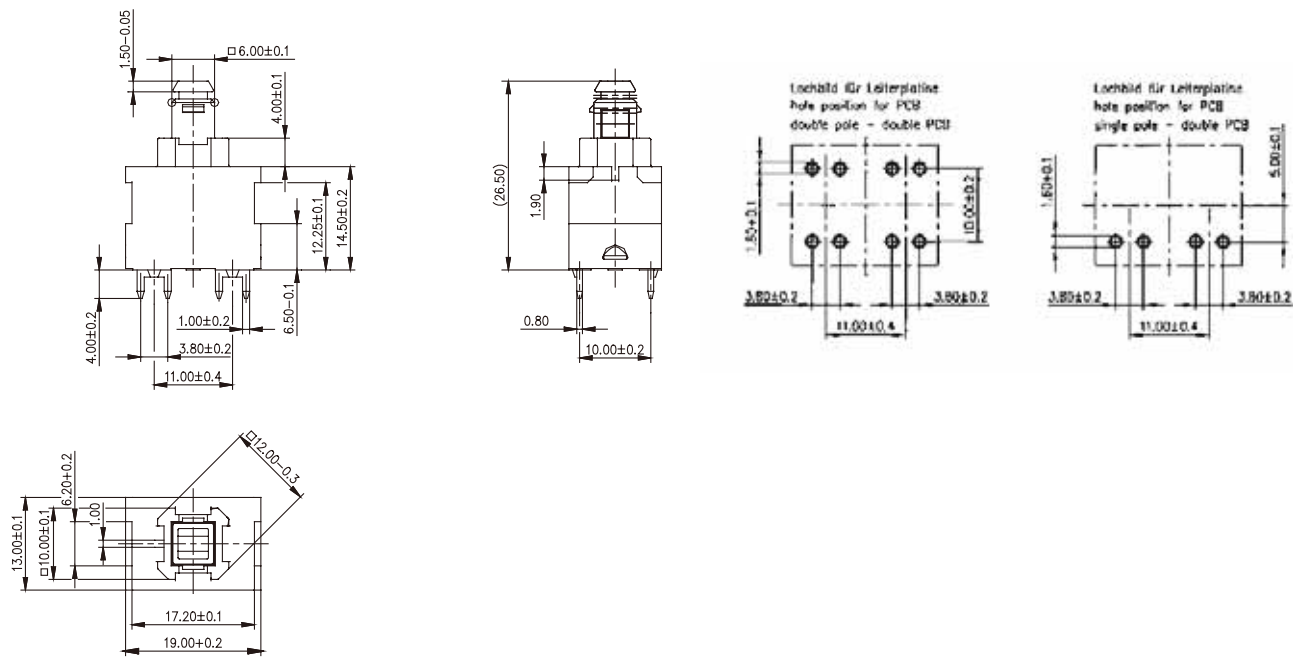
Base	PA
Button	PA
Mechanism	Single / double pole
Functions	ON/OFF Momentary NO
Contacts	Ag/Ni
Protection	IP 00
Mounting	Customised
Tracking Resistance	PTI 250
Glow-wire	850°C
Contact gap	< 3 mm

Circuit diagram



Dimensions





Standard range switches

Ordering Reference	Terminals	Mounting	Button length	Function	Pole
3293-412.01 1641	tab 6.3, bottom side	Frameless	8 mm	On-off	Single
3293-415.01 1841	PCB, bottom side	Frameless	8 mm	On-off	Single
3293-402.01 2641	tab 6.3, bottom side	Frameless	8 mm	On-off	Double
3293-404.01 2841	PCB, bottom side	Frameless	8 mm	On-off	Double

3200

Characteristics	■ illumination optional ■ single pole ■ change-over ■ customised mounting ■ momentary or latching ■ PCB terminals
Rating	12 VDC, 2 A
Dimensions (mm)	12,5 × 12,5 × 19,5
Actuator	■ square 10,4 mm
Approvals	none

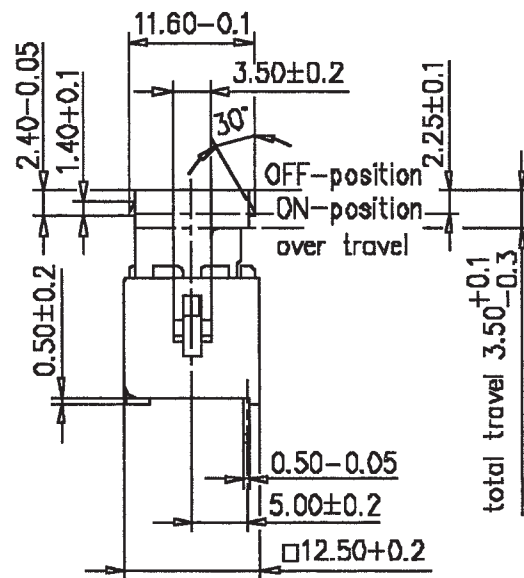
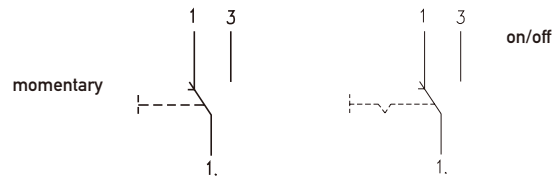


Preferred Range

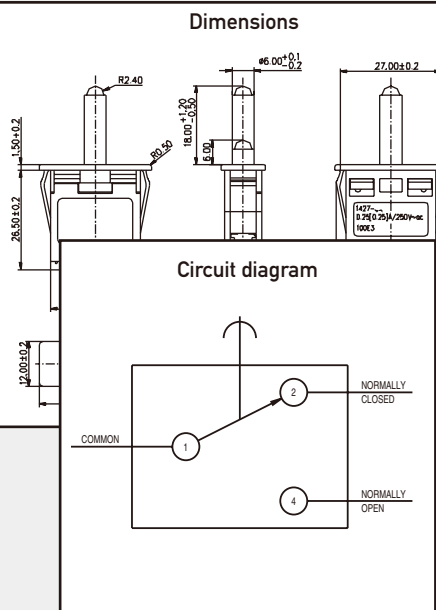
Ordering Reference	Terminals	Mounting	Actuator	Function
3200-001.09 4859	PCB	Customised	Button	CO
3200-102.04 4859	PCB	Customised	Button	CO, momentary

Base	PC
Cover	PBPT
Button	POM
Mechanism	Single pole
Functions	Change-over
Contacts	Ag
Protection	IP 00
Mounting	Customised
Contact Gap	< 3 mm
Operating travel	3.5 mm +0,1/-0,3

circuit diagram



Refrigerator Door Switches



1427

Characteristics ■ single pole
 ■ faston
 ■ snap-in mounting or center-fixing

Rating 250 VAC, 0.2 [0.2] A
 1E5
 250 VAC, 0.25 A

Dimensions (mm) various

Actuator ■ plunger

Approvals ENEC, cUL



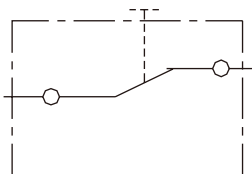
Preferred range switches

Ordering Reference	Illumination	Terminals	Mounting	Function	Actuator color	Length of plunger
1427-839.02 1551	without	tab	Snap-in	NC	White	18,0 mm

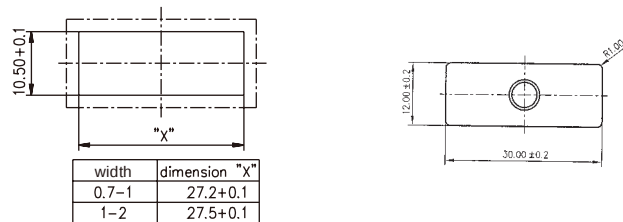
Specifications

Base / cover	PA
Plunger	PBPT
Mechanism	Single pole
Functions	Momentary normally closed
Contacts	Ag
Protection	IP 00
Mounting	Customised mounting
Tracking Resistance	PTI 250
Glow-wire	850°C

Circuit diagram circuit diagram



1427 250 VAC, 0,2 [0,2] A
100.000 cycles T55



Ordering Reference	Illumination	Terminals	Mounting	Function	Actuator color	Length of plunger
1427-022.02 1511	Without	tab	Center-fixing	NC	White	17,0 mm
1427-132.02 1551	Without	tab	Snap-in	NC	Black	12,2 mm

1430

Characteristics	■ single pole
	■ faston
	■ snap-in mounting
Rating	250 VAC, 0.2 [0.2] A 5E4
Dimensions (mm)	various
Actuator	■ lever
Approvals	ENEC



Preferred range switches

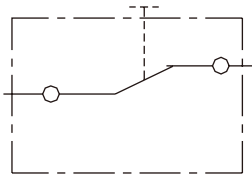
Preferred	Illumination	Terminals	Mounting	Function	Lever color	
1430-045.01 1551	None	tab	4,8 mm	Snap-in	NC	White

Specifications

Base / cover	PA
Plunger	PBPT
Mechanism	Single pole
Functions	Momentary normally closed
Contacts	Ag
Protection	IP 00
Mounting	Customised mounting
Tracking Resistance	PTI 250
Glow-wire	850°C

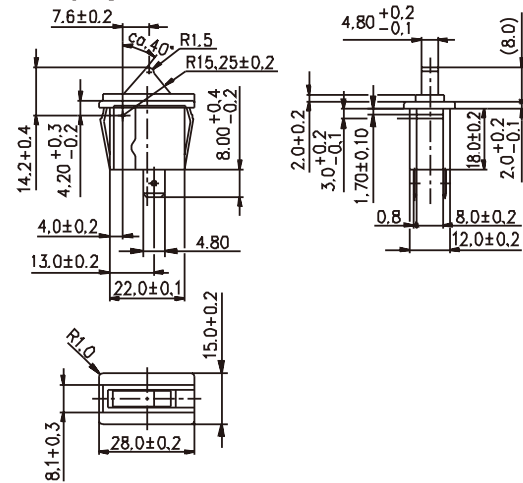
Circuit diagram

circuit diagram



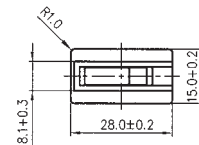
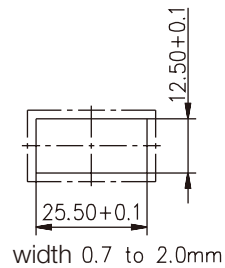
Dimensions

switching angle 30°



Operating Characteristics

1430 250 VAC, 0.2 (0.2) [0.2] A
50.000 cycles T55



Standard Range

Ordering Reference	Illumination	Terminals	Mounting	Function	Lever color
1430-042.01 1651	None	tab 6,3 mm	Snap-in	NC	White

1429

Characteristics	■ single pole ■ snap-action function ■ faston ■ snap-in mounting
Rating	250 VAC, 0,2 [0,2] A 2E5
Dimensions (mm)	various
Actuator	■ plunger
Approvals	ENEC



Preferred range switches

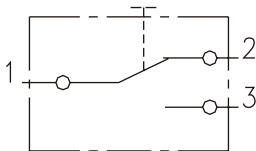
Ordering Reference	Illumination	Terminals	Mounting	Function	Plunger color	Length of plunger
1429-001.03 4451	None	tab 2,8 mm	Snap-in	CO	White	23,3 mm

Specifications

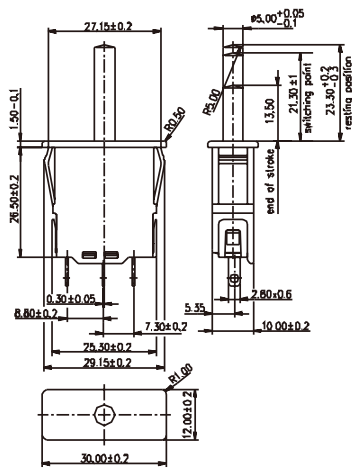
Base / cover	PA
Plunger	PBPT
Mechanism	Single pole
Functions	Momentary normally closed, change-over
Contacts	Ag
Protection	IP 00
Mounting	Customised mounting
Tracking Resistance	PTI 250
Glow-wire	850°C

Circuit diagram

circuit diagram

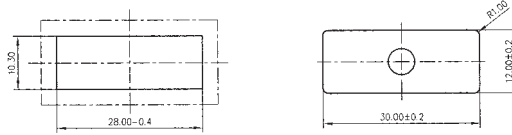


Dimensions



Operating Characteristics

1429 250 VAC, 0.2 (0.2) [0.2] A
 200.000 cycles T85
 Type of protection "n" according to IEC 60079-15 : 1987



Standard Range

Ordering Reference	Illumination	Terminals	Mounting	Function	Plunger color	Length of plunger
1429-002.03 4451	None	tab 2.8 mm	Snap-in	CO	Black	23.3 mm
1429-300.01 4451	None	tab 2.8 mm	Snap-in	CO	White	20.5 mm

XKA

Characteristics ■ long overtravel
■ snap-action CO
■ snap-in mounting
■ type of protection according to IEC 60079-15.1 : 1987

Rating 250 VAC, 1 (1) A
5E4, T85

Dimensions (mm) 28 × 20 × 15

Actuator ■ plain lever
■ round levers

Approvals UL, CSA, ENEC



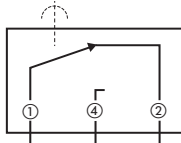
Preferred Range

Ordering Reference	Actuating Force (N)	Sealing	Operating pos. (mm)	Terminal	Circuit	Actuator	Contacts	Electrical rating
XKA304A1AAJ11	0,65	IP40	15,1 ± 1,6	tab	CO	Straight lever	Ag/AgNi	250 VAC, 1 A
XKA304A1AAJ21	0,62	IP40	14,9 ± 1,6	tab	CO	Straight lever	Ag/AgNi	250 VAC, 1 A

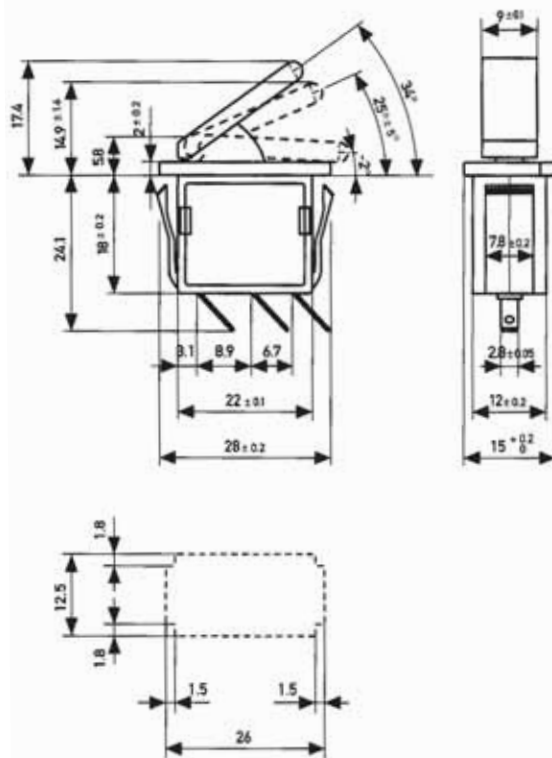
Specifications

Housing	PA
Plunger	PA
Mechanism	Snap-action system with stainless steel tension spring
Functions	Change-over
Contacts	Ag
Terminals	tab
Temperature range °C	85°C
Mechanical life	3 · 10 ⁵ cycles minimum
Protection	Enclosure IP 40
Mounting	Snap-in fixing
Contact carrier	Brass
Tracking resistance	PTI 175
Glow-wire	850 °C

Circuit diagram



Dimensions



Recommended maximum electrical ratings

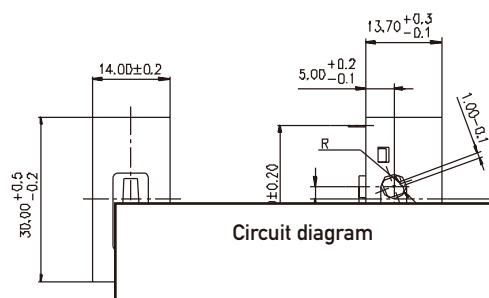
Voltage VAC	Resistive load (A)	Motor load (A)
250	1	1

The breaking capacities in the tables refer to silver contacts. Gold-plated contacts are intended for use in signal circuits where the energy being switched is at the milliwatt level. Power being switched must be limited in order to avoid overheating and possible dispersal of the gold from the contact area.

Rotary Switches



Dimensions



Circuit diagram

Contacts		Switch position
1. - 4	1-6	_____
○	○	0
●	○	1
●	●	2

4022

Characteristics	■ single pole with on/off or step function ■ double pole with on/off-function ■ solder, PCB, terminals ■ high temp. 100°
Rating	250 VAC, 12 (2) A 125 VAC, 10 A
Dimensions (mm)	30 × 14 × 15,3
Actuator	■ cam ■ square access hole 3,25 mm²
Approvals	ENEC, UL, CSA



Preferred Range

Ordering Reference	Terminals	Mounting	Switching	Actuator	Operation angle
4022-823.01 2849	PCB	Customised	On-off	Hole	60°
4022-001.01 9349	Solder	Customised	0-I-II	Shaft	30°

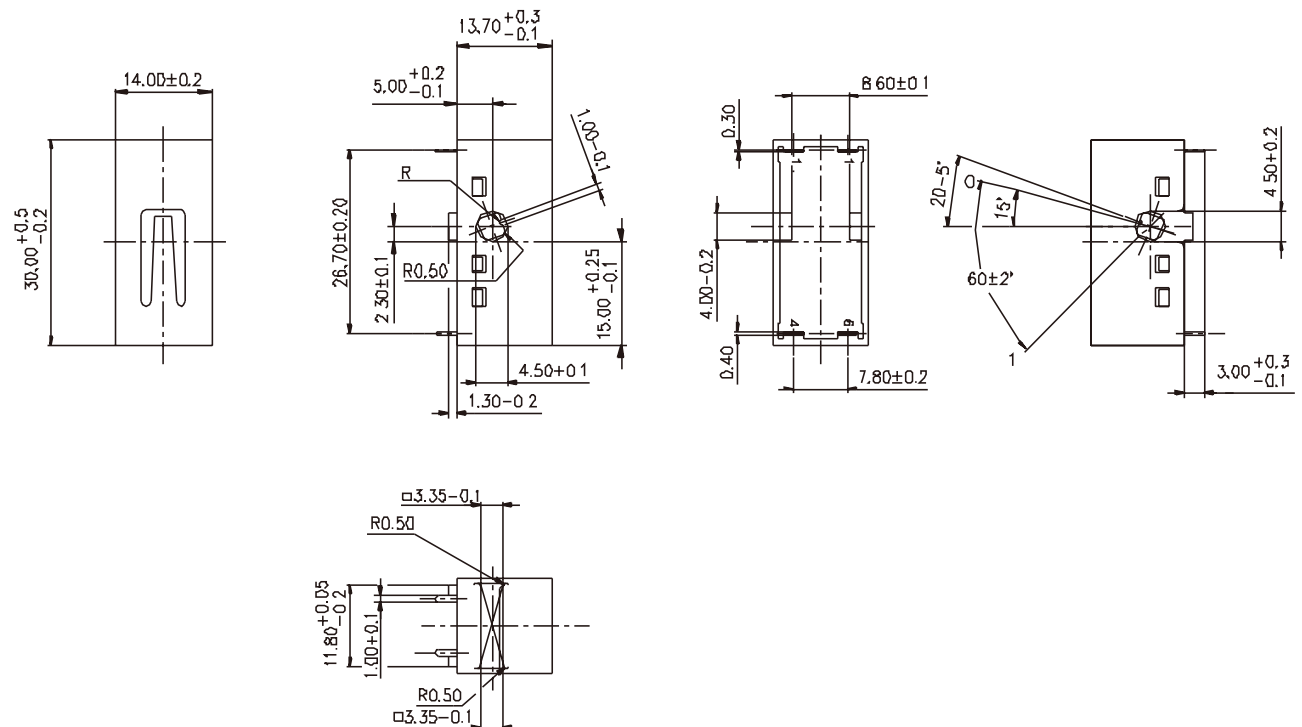
Specifications

Base and cover	PA
Cam	PBT
Mechanism	Single pole with ON/OFF or step function Double pole with ON/OFF function
Functions	ON/OFF or step function
Contacts	Ag/Ni
Protection	IP 00
Mounting	Customised mounting
Tracking Resistance	PTI 250
Glow-wire	850°C
Contact Gap	3 mm
Switch angle	30° / 45° / 60°

Circuit diagram

Contacts		Switch position
1-4	1-6	
○	○	0
●	○	1
●	●	2

Dimensions



Standard range switches

Ordering Reference	Terminals	Switching	Actuator	Operation angle
4022-042.01 1349	Solder	On-off	Hole	30°
4022-032.01 2849	PCB	On-off	Hole	30°
4022-827.01 9849	PCB	M-0-I-II	Shaft	30°

Table of preferred products

	Type	Preferred Products	Page
Rocker	3670	3670-201.01 1542	14
		3670-202.01 1542	
		3670-001.01 1555	
		3670-017.01 1551	
		3670-010.01 1551	
		3670-004.01 1552	
		3670-013.01 1552	
	3672	3672-722.01 1541	18
		3672-727.01 1341	
		3672-311.01 1541	
		3672-515.01 1542	
		111-342.0000	
		111-337.0000	
		111-355.0000	
		111-327.0000	
		111-439.0000	
		111-024.0167	
		111-026.0167	
	3673	3673-600.02 4550	22
		136-305.0000	
		136-301.0000	
		136-332.0000	
	3680	3680-012.01 1651	25
		3680-561.01 1552	
		3680-805.01 1552	
		3680-031.01 1541	
		3680-401.01 1542	
		3680-402.01 1642	
		3680-408.01 1642	
		131-350.0000	
		131-321.0000	
		131-455.0000	
Auto-Shut-Off Rocker	TIPPMATIC®	3600-411.27 1552	29
		3600-414.27 1552	
		3600-412.27 1552	
		100-012.0152	
		100-012.0167	
		100-071.0150	
		100-071.0167	
Push Button	3292	3292-411.01 1541	33
		3292-410.01 1541	
		3292-401.01 2541	
		3292-400.01 2541	
	3293	3293-410.01 1541	36
		3293-400.01 2541	
Door Switches	3200	3200-001.09 4859	39
		3200-102.04 4859	
Momentary	1427	1427-839.02 1551	42
	1430	1430-045.01 1551	44
Snap-action	1429	1429-001.03 4451	46
	XKA	XKA304A1AAJ11 XKA304A1AAJ21	48
Rotary Switches	4022	4022-823.01 2849	51
		4022-001.01 9349	

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