



GIOVENZANA
INTERNATIONAL B.V.



AUTOMATION
LIMIT AND MICRO SWITCHES



REV. 00_22

GIOVENZANA INTERNATIONAL B.V.

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GIOVENZANA INTERNATIONAL B.V.®
is one of the world's leading suppliers of
industrial safety technology.

With our wide range of limit switches and
microswitches, we offer our customers
effective and versatile solutions.

Our long-standing experience, our in-depth
knowledge of the market and our daily
proximity to our customers are reflected in
our production.

**High quality and compliance with major
international standards** characterize our
products which are custom designed to
meet all the specific needs of end users.

Our goal is safety first of all for the
operators, the machines and the industrial
processes.



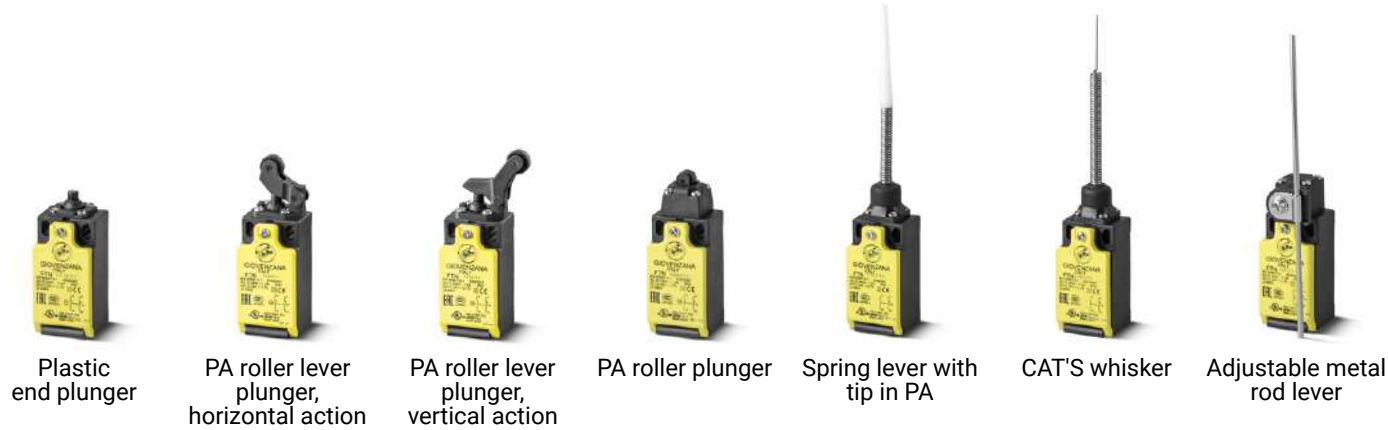
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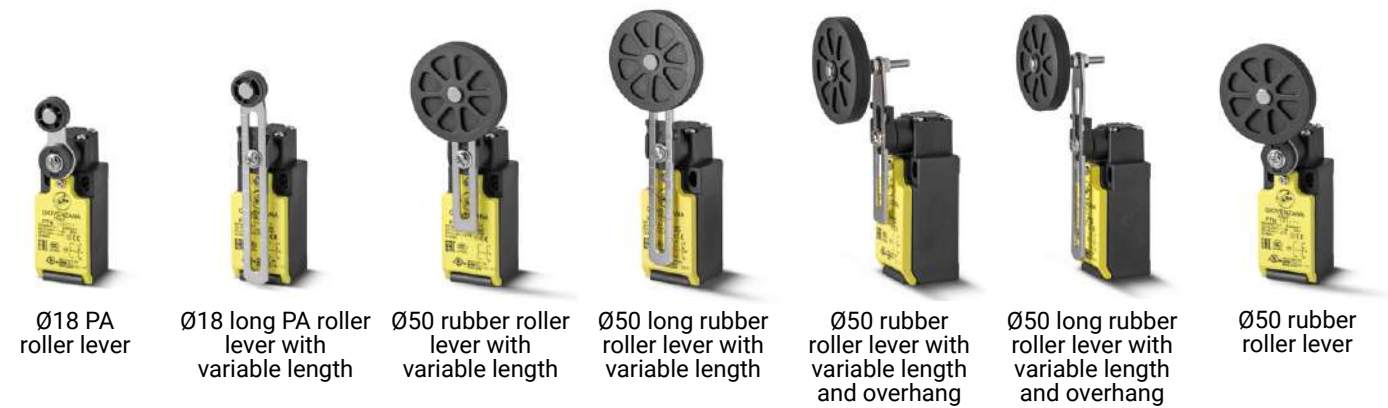
LIMIT AND MICRO SWITCHES
GIOVENZANA INTERNATIONAL B.V.®

A	FTN SERIES thermoplastic limit switches	10 - 41
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FTN131	FTN132	FTN133	FTN134	FTN135	FTN136	FTN137
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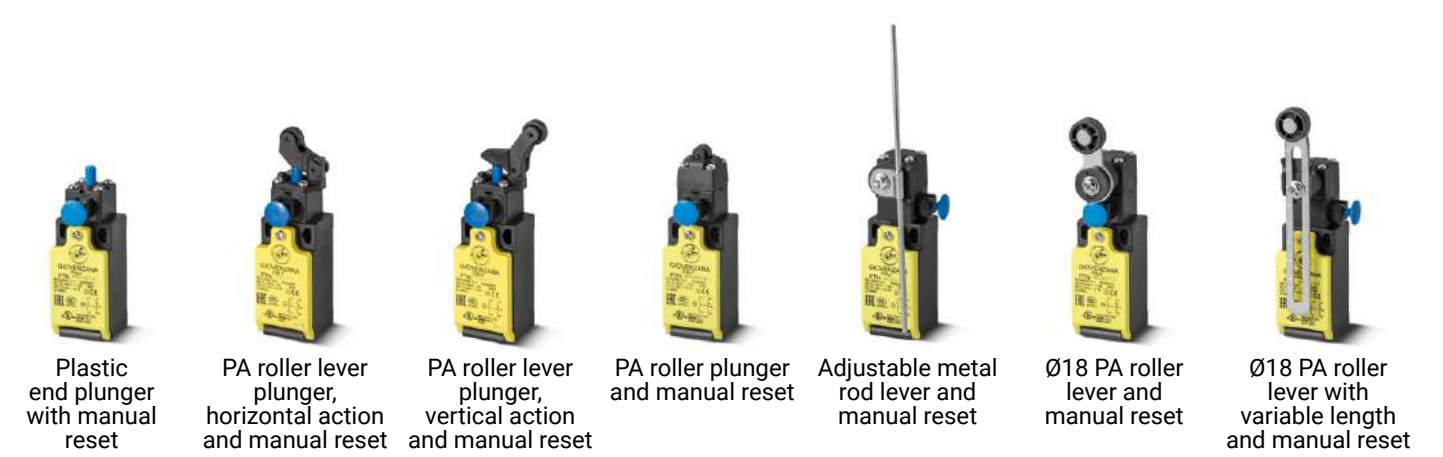


FTN142	FTN143	FTN144	FTN144S	FTN146	FTN198
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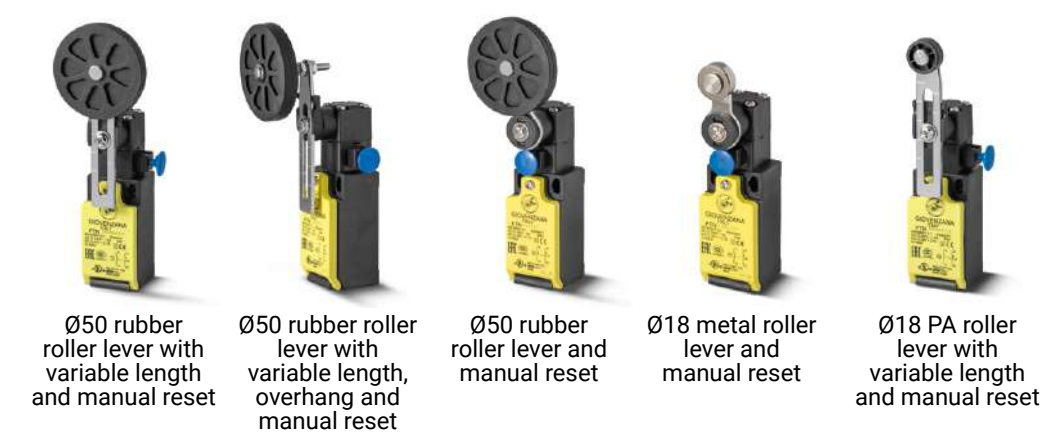


B	FTN1R SERIES thermoplastic limit switches with manual reset	42 - 65
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C

FTNG SERIES
 40 mm thermoplastic limit switches for heavy applications

66 - 83

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D

STNK SERIES
 thermoplastic safety switches with separate actuator

84 - 99

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E

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 M12-connected and pre-wired thermoplastic limit switches

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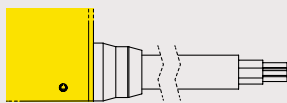
FCT07	FCT08	FCT09	FCT10	FCT11
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AVAILABLE VERSIONS

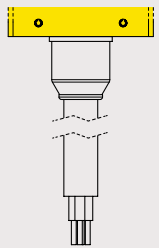
FCT2L..

with horizontal pre-wired connection



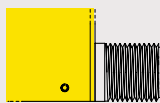
FCT2V..

with vertical pre-wired connection



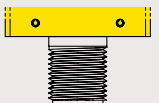
FCTML..

with horizontal M12 connection



FCTMV..

with vertical M12 connection



F

MFI SERIES
 micro switches

118 - 123

FASTON TERMINALS 6.3 x 0.8 mm

MFI

MFI.1

MFI.2

MFI.3

MFI.4

MFI.5

MFI.6

MFI.7



SOLDER TERMINALS

MFI.S

MFI.1S

MFI.2S

MFI.3S

MFI.4S

MFI.5S

MFI.6S

MFI.7S



SCREW TERMINALS

MFI.ST

MFI.1ST

MFI.2ST

MFI.3ST

MFI.4ST

MFI.5ST

MFI.6ST

MFI.7ST



SCREW TERMINALS + PLATE PROTECTION

MFI.STP

MFI.1STP

MFI.2STP

MFI.3STP

MFI.4STP

MFI.5STP

MFI.6STP

MFI.7STP



Pin plunger	Long roller lever	Simulated roller lever	Roller lever	Long lever	Medium lever	Short lever	16 mm roller lever
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FASTON TERMINALS 6.3 x 0.8 mm + TOWER ACTUATOR WITH THREADED FLANGE

MFI.T



Tower actuator

G

MZ SERIES
 micro switches

124 - 136

S 13

SCREW TERMINALS

MZS1300

MZS1301

MZS1303

MZS1305

MZS1306

MZS1307

MZS1308

MZS1318

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Short plunger Ø2.3

Bending lever

Bending roller lever

Long plunger Ø4

Short plunger Ø7.2

Panel mount plunger

Panel mount roller plunger

Panel mount cross roller plunger

S 17

SCREW TERMINALS

MZS1701

MZS1702

MZS1703

MZS1704

MZS1744

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Hinge lever

Short hinge lever

Hinge roller lever

Short hinge roller lever

Unidirectional hinge roller lever

ACCESSORY

MZA8000

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Terminal enclosure

W 13

SOLDER TERMINALS

MZW1300

MZW1301

MZW1303

MZW1305

MZW1306

MZW1307

MZW1308

MZW1318

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Short plunger Ø2.3

Bending lever

Bending roller lever

Long plunger Ø4

Short plunger Ø7.2

Panel mount plunger

Panel mount roller plunger

Panel mount cross roller plunger

W 17

SOLDER TERMINALS

MZW1701

MZW1702

MZW1703

MZW1704

MZW1744

Pag. 134 - 135



Hinge lever

Short hinge lever

Hinge roller lever

Short hinge roller lever

Unidirectional hinge roller lever

ACCESSORY

MZA8000

Pag. 136



Terminal enclosure



FTN SERIES



The thermoplastic limit switches of the **FTN series** comply with EN 50047 and are designed to provide a wide range of switch variants (slow action or snap action basic switches) and a variety of actuating heads and levers suitable for safety applications.

The thermoplastic bodies have two fixing holes with distance of 20 or 22 mm and one hole for cable entry on the bottom of the switch. Various types of threaded cable entry are available to cover the main requirements of the international market.

The maximum product versatility is guaranteed by the adjustable actuator heads in 90° steps and the possibility of adjusting the levers every 18° for 360°. They can be used in applications other than protective doors, e.g. on moving machinery benches, crane arms, hoists, elevators, etc.

They are also suitable for use in the harshest environmental conditions with an **operating temperature range of -25°C to +80°C**.

All models in the series are **IP67-rated except code FTN146 which is IP65-rated**.

The actuators are made of metal or thermoplastic material, while the housing is made of thermoplastic glass-filled polybutylene terephthalate.

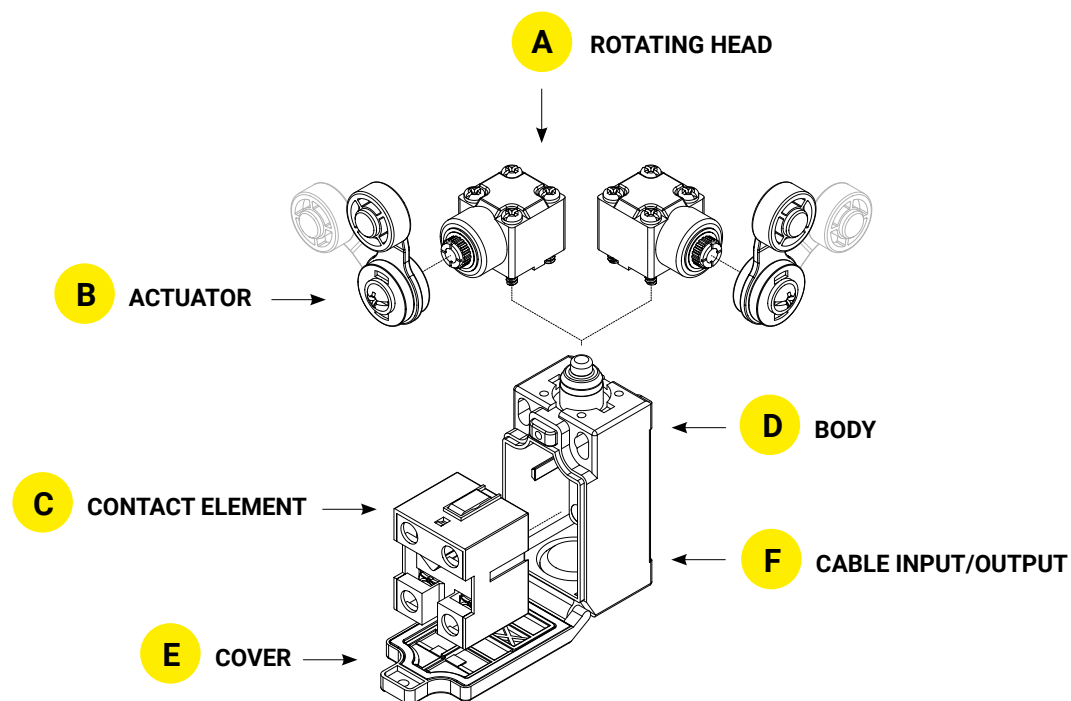
Giovenzana limit switches offer solutions for every need and are suitable for the most varied sectors of use.



SPECIFICATIONS

Standards		EN 60947-5-1, UL 508, EN 50047, EN 1088, EN 60204-1
Approvals		cULus, CCC, EAC, CE and UKCA marked for all applicable directives
Positive opening operation		NC contact conforming to IEC /EN 60947-5-1 ⊕
Minimum current		5 mA - 5 V DC
Thermal current	Ith	10 A
Rated insulation voltage	Ui	500 V
Rated impulse withstand voltage	Uimp	6 kV
Insulation resistance	min	100 MΩ (DC 500 V)
Contact resistance	max	25 mΩ (initial)
Switching speed	max	250 mm/s
Switching frequency	max	6000 operations per hour
Enclosure material		UL approved glass-filled polybutylene terephthalate
Enclosure protection		IP67 (all models except for code FTN146 which is IP65-rated)
Operating temperature		-25 ... +80°C (-13 ... +176°F)
Pollution degree		3
Protection against electric shock		Class II (double Insulation) □ Double insulation makes ground terminal unnecessary.
Electrical life expectancy	min	150.000 cycles
Mechanical life expectancy	min	1 × 10 ⁷ cycles
Vibration	IEC 68-2-6 excursion	10 - 55 Hz ± 1Hz 0.35 mm, 1 octave/min
Conduit entry		Various international conduit sizes (see product selection table pag. 19)
Fixing		2 × M4 screws

STRUCTURE DESCRIPTION

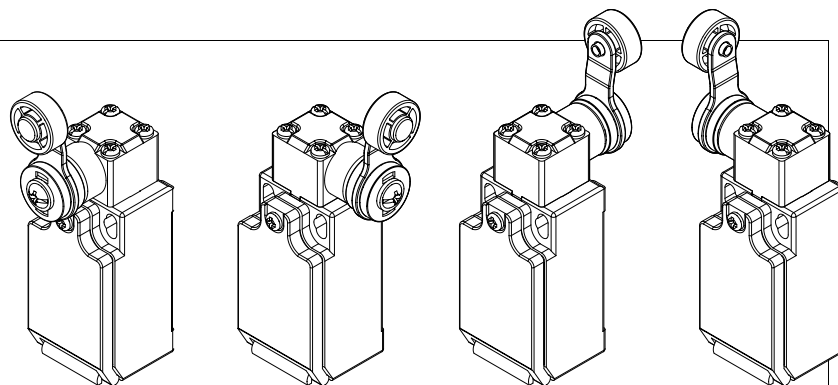


A - ROTATING HEAD

The heads are made of UL approved glass-filled polybutylene terephthalate.

All heads can be adjusted in steps of 90° over 360°, compared to the body.

The direction of the switch head can be varied in one of four directions by loosening the screws at the four corners of the head.



B - ACTUATOR

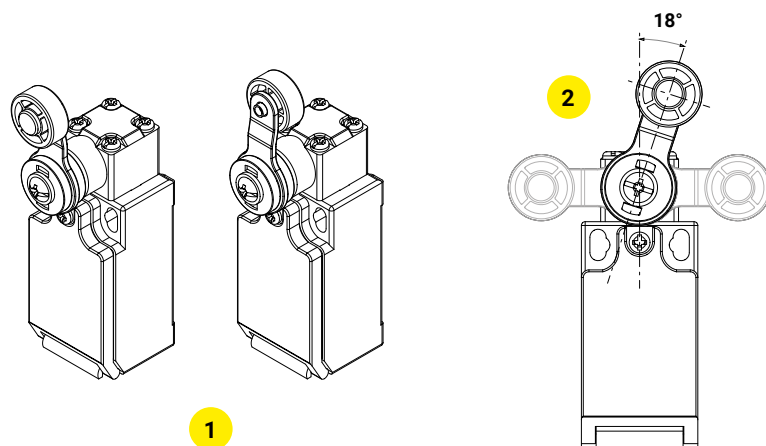
Available different types of actuators: plungers, levers, rollers and rods.

1. Tilting levers

Possibility to fix the lever on the observe or on the reverse, keeping the positive opening of the NC contact. In this way is possible to obtain two different lever work plans.

2. Adjustable levers

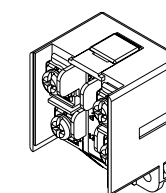
All levers are adjustable in steps of 18° over 360°, compared to the horizontal axis of the head. The positive movement transmission is always guaranteed thanks to the particular geometric coupling between the lever and the rotation shaft.



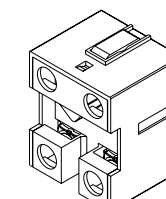
C - CONTACT ELEMENT

The built-in switch has a direct opening mechanism that forcibly separates the NC contact even in the event of accidental welding (overload, short circuit, etc.).

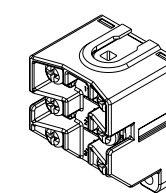
Different contact elements are available, both fast-acting and slow-acting, depending on the different application requirements.



X11: 1NO+1NC
Slow action (Zb)



Z11: 1NO+1NC
Snap action (Zb)



W12: 1NO+2NC
Slow action (Zb)

W02: 2NC
Slow action (Zb)

Z02: 2NC
Snap action (Zb)

W03: 3NC
Slow action (Zb)

W20: 2NO
Slow action (Zb)

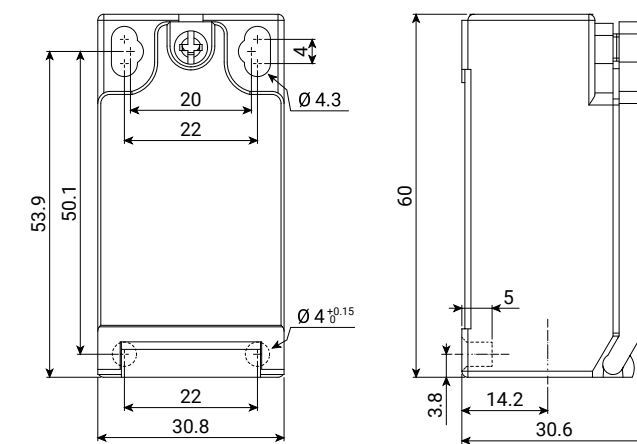
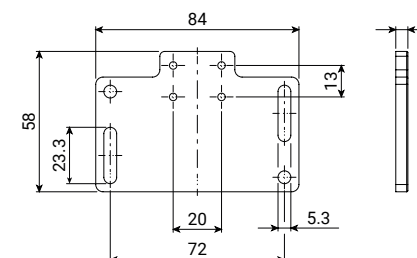
→ Not suitable for safety applications!

D - BODY

The body complies with EN 50047, with a distance of 20/22 mm between the fixing holes.

It is available a fixing plate with slots to adjust the operating point, developed for backward compatibility with old products. The plate is sold in kits (code: **KIT-FTN**) comprising:

- 1 plate;
- 2 self-tapping screws 4 × 28 mm;
- 2 washers Ø4 mm.



In order to provide more fixing stability, it is possible to use the basic holes of the device with dowel insertion.

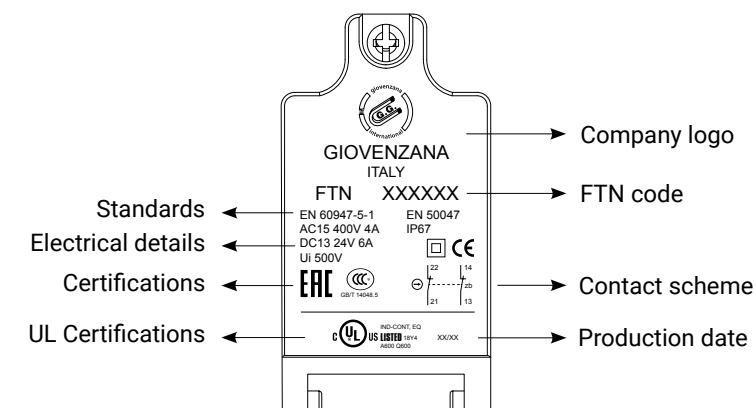
E - COVER

Material conforming to the RoHS Directive.

The lid is laser marked to ensure branding, coding and information on product specifications such as technical data, production date, stock or lot number, revision or control date. Lasering ensures the complete traceability of our products and components and is essential for compliance with ISO quality standards.

Some of the advantages:

- clear and precise text legibility;
- guaranteed lifetime unlike ink which deteriorates over time.



F - CABLE INPUT / OUTPUT

A threaded cable input/output is provided at the bottom of the switch.

6 standard and customised cable input/output models are available to cover the main international markets.

Standard: Blank: M16 × 1.5

On request: M: M20 × 1.5

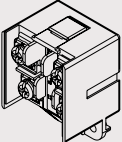
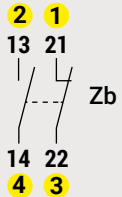
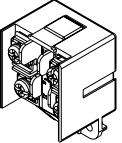
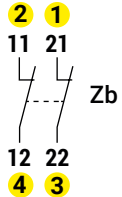
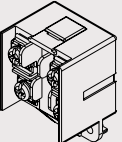
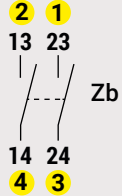
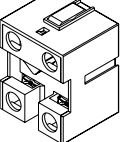
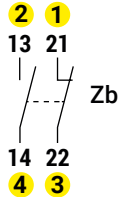
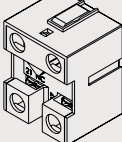
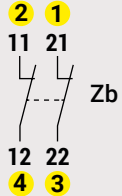
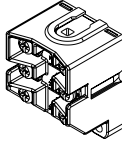
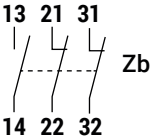
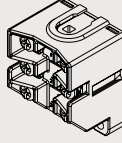
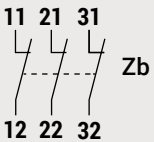
N: 1/2" NPT

G1: Pg 11

G3: Pg 13.5

C: M12 connector

CONTACT ELEMENT - SPECIFICATIONS

CONTACT CODE	CONTACT TYPE	ELECTRICAL SCHEME	CONNECTOR PIN ARRANGEMENT
X11 	1NO+1NC Slow action Zb 		
W02 	2NC Slow action Zb 		
W20 	2NO Slow action Zb Not suitable for safety applications!		
Z11 	1NO+1NC Snap action Zb 		
Z02 	2NC Snap action Zb 		
W12 	1NO+2NC Slow action Zb 		No connector
W03 	3NC Slow action Zb 		No connector

NOTE: FTN135, FTN136, FTN142 and FTN198 have no positive opening regardless of the contact installed.

CONTACT ELEMENT - OPERATING PRINCIPLE

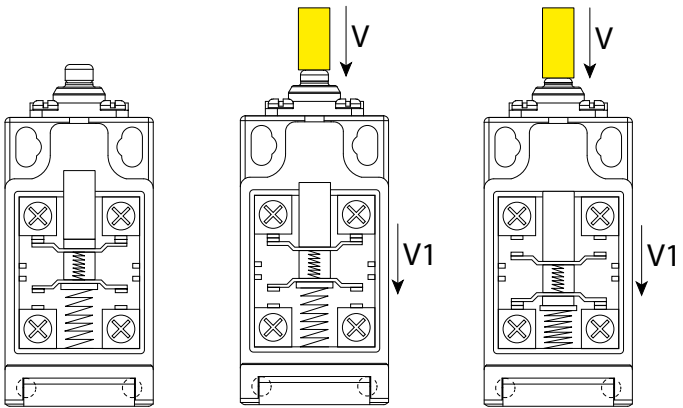
SLOW ACTION - Contact elements direct acting

Slow-acting contact blocks are characterised by identical switching and resetting points (no differential travel).

The contact movement speed (V1) is equal or proportional to the actuator speed (V).

This type of contact is suitable for fast movements.

The opening distance depends on the distance travelled by the operator.



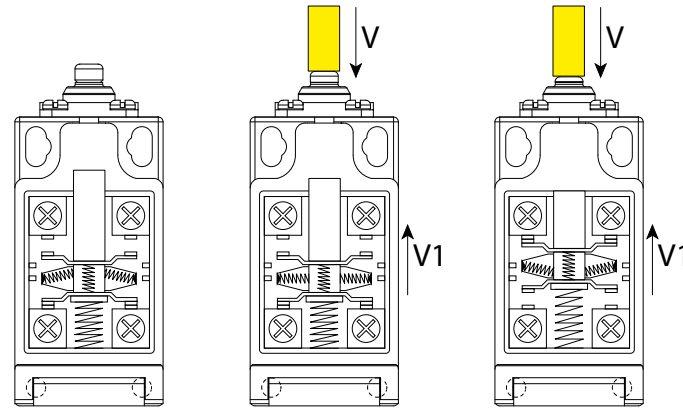
SNAP ACTION - Contact elements acting independently

Snap-action contact blocks are characterised by non-coincident switching and resetting points (differential travel).

The speed of the contact movement (V1) is not linked to the speed of the actuator (V).

This type of contact is also suitable for slow movements.

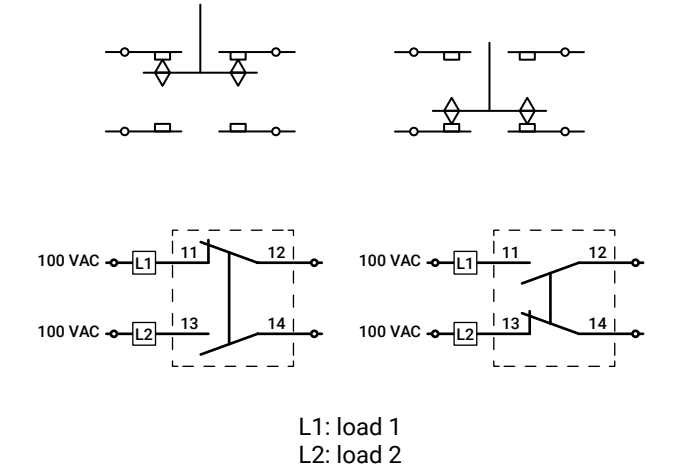
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



CONTACT ELEMENT - CLASSIFICATION (ACCORDING EN 60947-5-1)

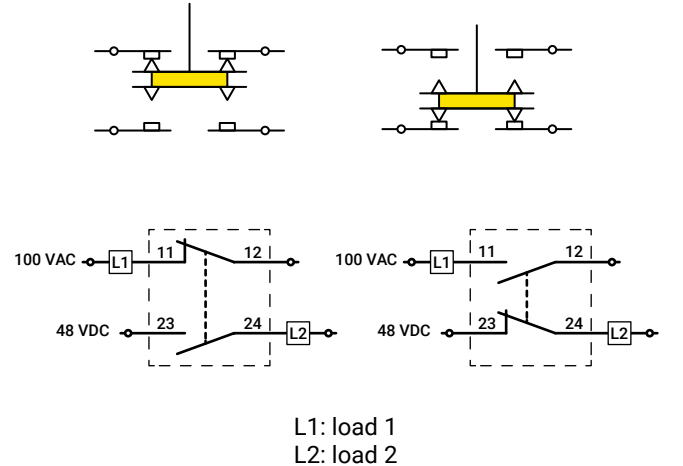
Za contact type

A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



Zb contact type

In this case there are two blades that open and close the contact. The two blades are electrically isolated from each other. Therefore, with this type of contact it is possible to supply the circuit with different voltages and polarities.

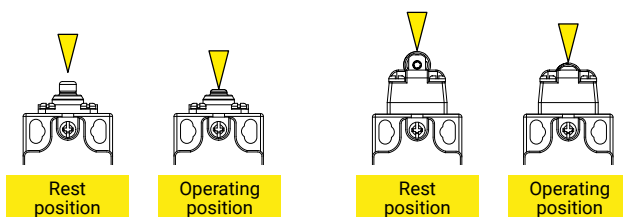


FTN series of thermoplastic limit switches is equipped with Zb contacts.

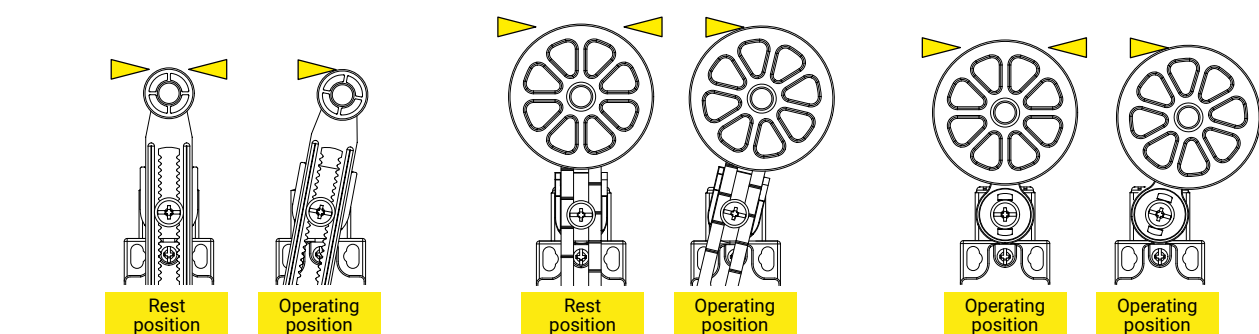
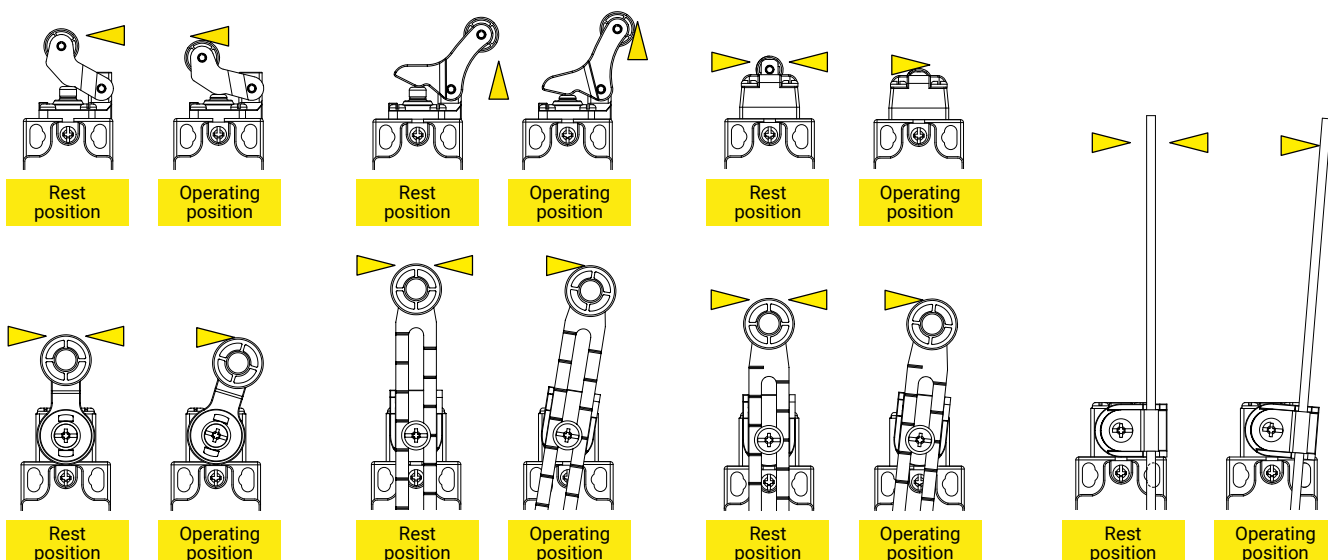
DETECTION MOVEMENTS

Limit switches are used in all automated installations and also in a wide variety of other applications. They transmit data to the logic processing system regarding: presence/absence, passage, positioning and end of travel. They have different detection movements: linear, rotary and multidirectional.

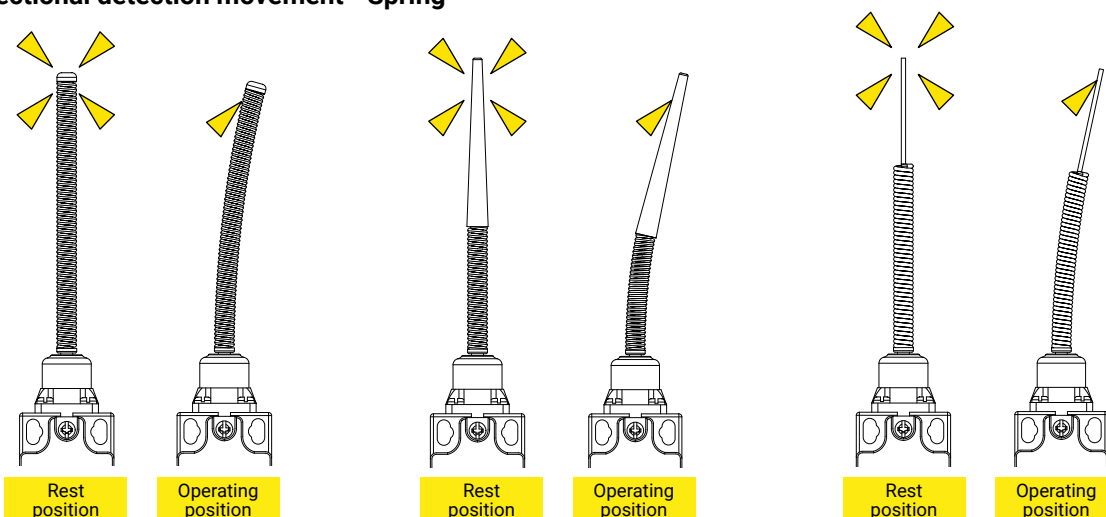
1. Linear detection movement - Plunger



2. Rotary detection movement - Lever



3. Multidirectional detection movement - Spring



SAFETY INTEGRITY LEVEL ACCORDING TO IEC 61508

IEC 61508: Functional safety of electrical/electronic/programmable electronic safety systems

IEC 61508 is the international technical-legislative reference for Functional Safety. The seven parts that make up the **SIL standard** are the guideline that must be applied to the safety function that an object must perform.

The standard provides a set of mandatory requirements and best practices aimed at determining the reliability of a safety system. In this sense, it is possible to say that reliability is the measure of risk reduction. The IEC states that any safety-related control system must function properly or fail predictably and safely.

Therefore, there are at least three requirements that a safety system must meet in order to comply with the SIL standard:

- **Systematic Capability**, i.e. the degree of reliability in terms of product design, both hardware and software (where applicable).
- **Architecture Constraints**, i.e. constraints on the architecture of the object that affect its level of security
- **PFDavg or PFH**, i.e. the probability of dangerous random failures, whether on demand or on an hourly basis.

The safety system meets each requirement with a different SIL level (with SIL 1 to 4).

Safety Integrity Level (SIL) is the quantification of the reliability (or degree of reliability) achieved by any object that performs a safety-related function. The greater its reliability, the greater its ability to perform safety-critical functions or machine or plant availability. The determination of a SIL is based on quantitative and qualitative factors such as the development process and safety lifecycle management.

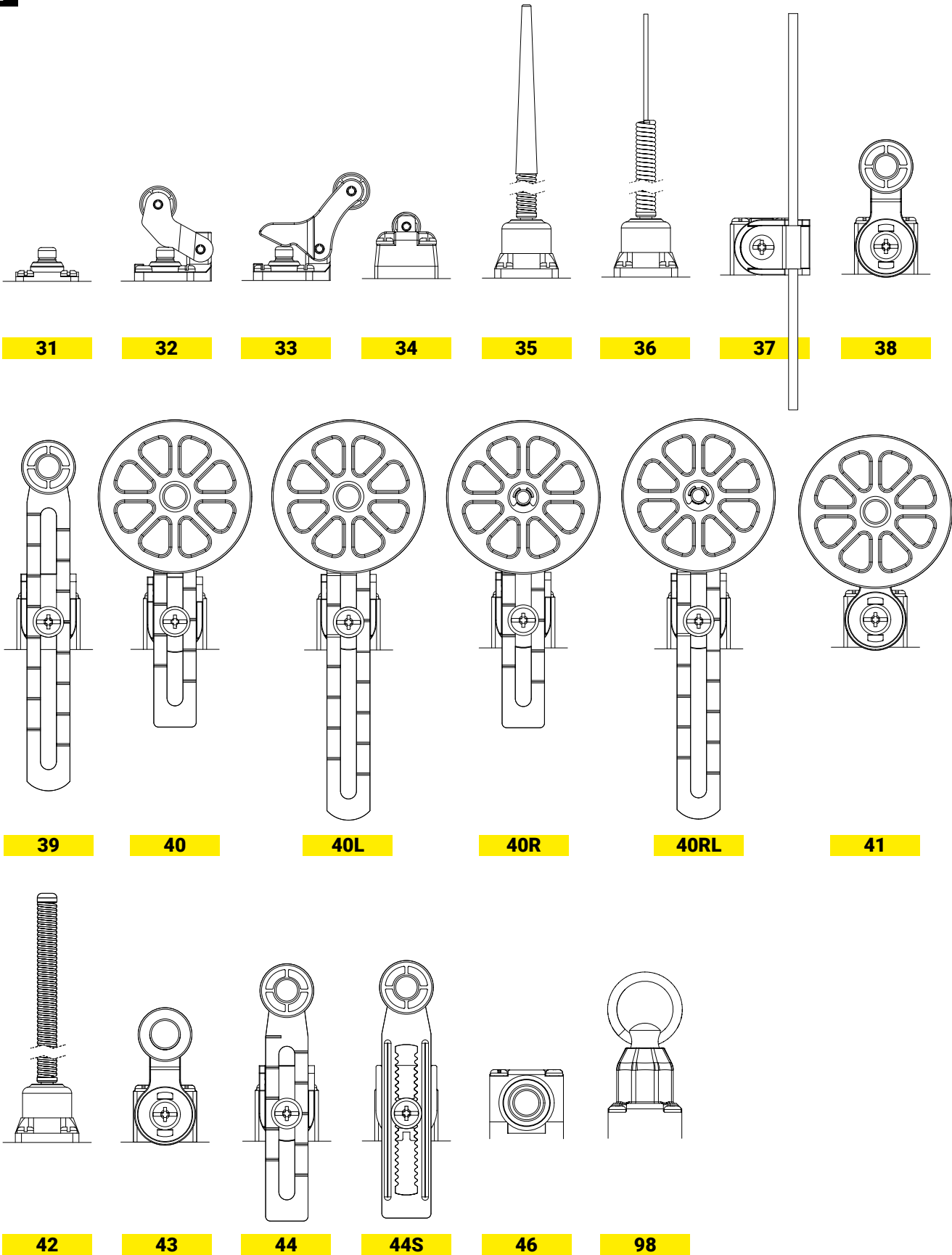
The FTN series thermoplastic limit switches are SIL 3.

SIL³

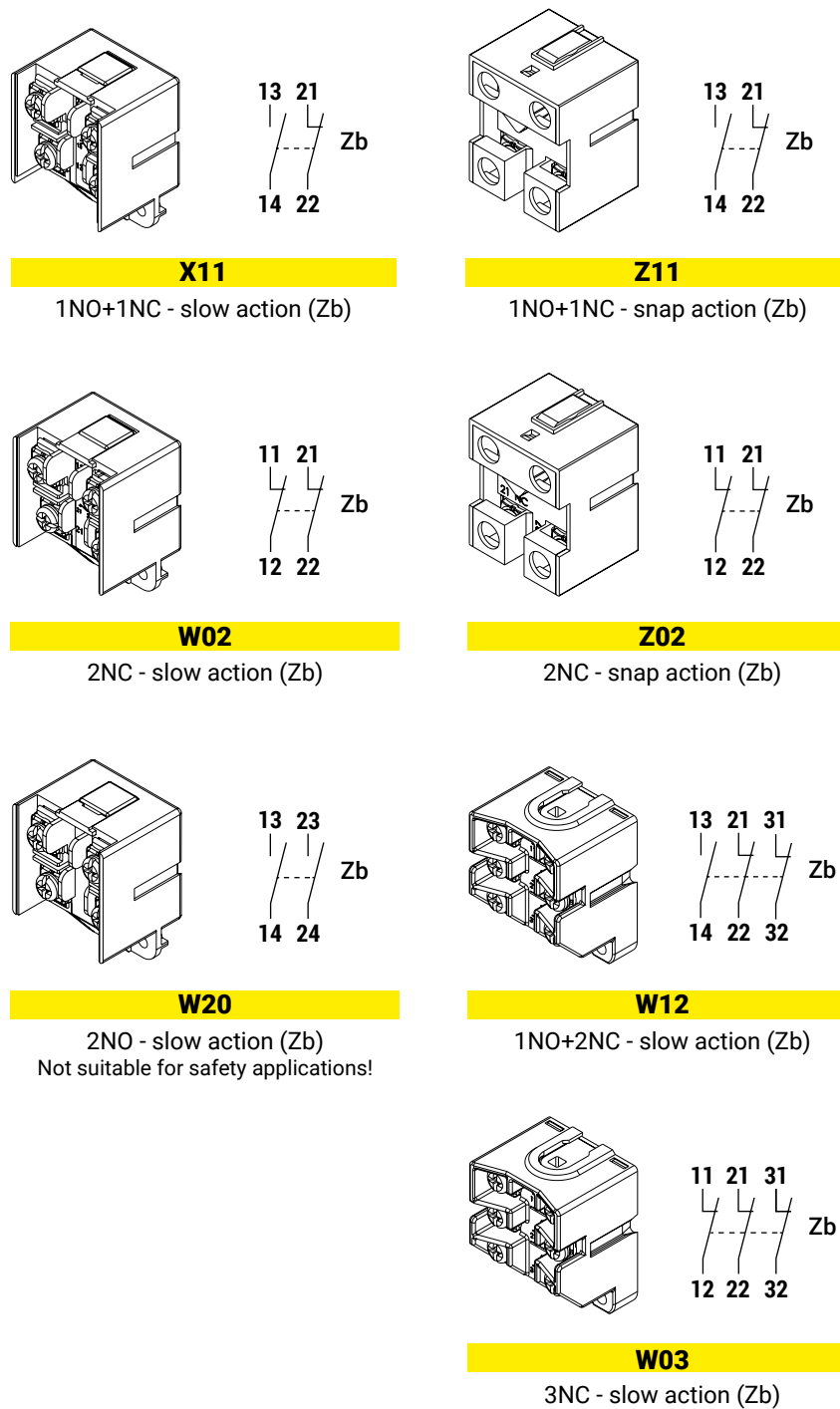


FTN - PRODUCT SELECTION OVERVIEW

1 ACTUATORS



2 CONTACT BLOCKS



3 CONDUIT ENTRY

Threaded conduit entry

Standard:
 M16 × 1.5

On request:
 M20 × 1.5
 1/2" NPT
 PG11
 PG13.5
 With connector

CONTACT TYPES			CATEGORIES	RATINGS
X11	1NO+1NC	slow action (Zb)	A600	AC15: 400 V - 4 A
W02	2NC		Q600	
W20	2NO	snap action (Zb)	B600	DC13: 24V - 6 A
Z11	1NO+1NC		Q600	
Z02	2NC		A300	
W12	1NO+2NC	slow action (Zb)	Q300	
W03	3NC			

FTN - CODE SELECTION OVERVIEW

F T N	1	3 1	X 1 1	
SERIES	FUNCTION	ACTUATOR	CONTACT TYPE	CONDUIT ENTRY
FTN thermoplastic limit switches	1 without reset	31 Plastic end plunger 32 PA roller lever plunger, horizontal action 33 PA roller lever plunger, vertical action 34 PA roller plunger 35 spring lever with tip in PA 36 CAT'S whisker 37 adjustable metal rod lever 38 Ø18 PA roller lever 39 Ø18 long PA roller lever with variable length 40 Ø50 rubber roller lever with variable length 40L Ø50 long rubber roller lever with variable length 40R Ø50 rubber roller lever with variable length and overhang 40RL Ø50 long rubber roller lever with variable length and overhang 41 Ø50 rubber roller lever 42 wobble stick 43 Ø18 metal roller lever 44 Ø18 PA roller lever with variable length 44S Ø18 PA roller lever with variable sawtooth lenght (step: 2.2 mm) 46 safety-door hinge switch 98 rope pull lever	X11 1NO+1NC slow action Zb W02 2NC slow action Zb W20 2NO slow action Zb Z11 1NO+1NC snap action Zb Z02 2NC snap action Zb W12 1NO+2NC slow action Zb W03 3NC slow action Zb	standard blank M16 × 1.5 on request M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 × 1

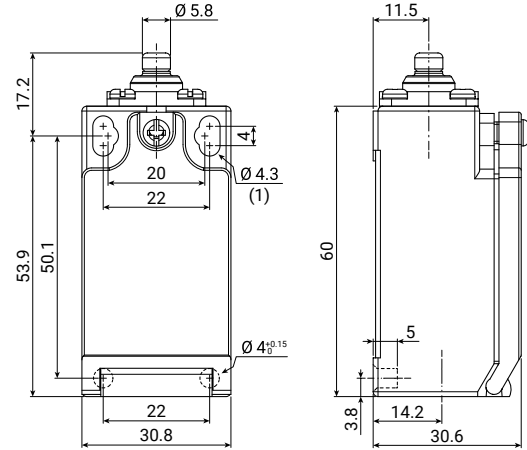
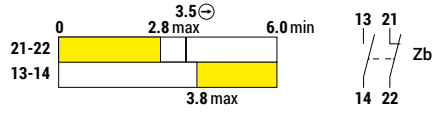
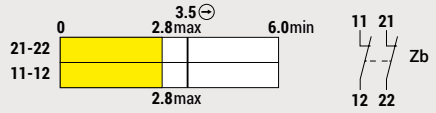
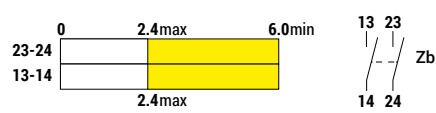
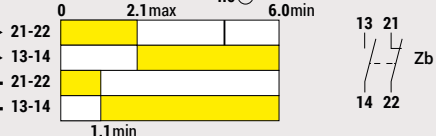
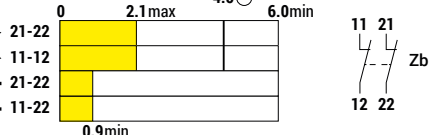
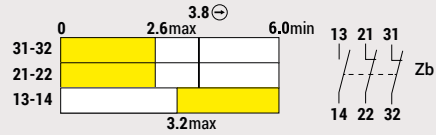
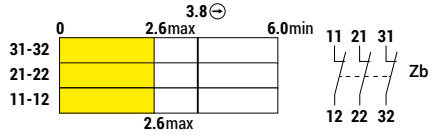
FTN131

Limit switch with plastic end plunger

IP67



FTN		1		31		XXX		XX	
series		function		actuator		contact type		conduit entry	
FTN	thermoplastic limit switch	1	without reset function	31	plastic end plunger	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)
						W02: 2NC			
						W20: 2NO			
Z11: 1NO+1NC	snap action (Zb)	G1	PG11						
Z02: 2NC		G3	PG13.5						
W12: 1NO+2NC	slow action (Zb)	C	male connector "A"						
W03: 3NC				M12 × 1					

technical drawing - sizes in mm	contact type	operation diagrams
	X11 1NO+1NC slow action (Zb)	
	W02 2NC slow action (Zb)	
	W20 2NO slow action (Zb)	
	Z11 1NO+1NC snap action (Zb)	
	Z02 2NC snap action (Zb)	
	W12 1NO+2NC slow action (Zb)	
	W03 3NC slow action (Zb)	

(1) mounting holes

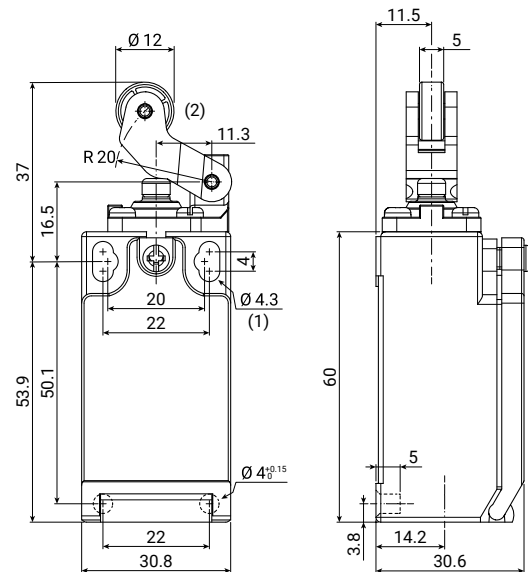
contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		OF	POT (travel)	
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	2.8 mm	3.8 mm	7.3 N	3.5 mm	22 N	6.0 mm
W02: 2NC				2.8 mm	-	7.3 N	3.5 mm	22 N	
W20: 2NO				2.4 mm	-	8.2 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	2.1 mm	1.1 mm	7.2 N	4.5 mm	16.3 N	
Z02: 2NC				2.1 mm	0.9 mm	7.2 N	4.5 mm	16.3 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300		2.6 mm	3.2 mm	7.3 N	3.8 mm	23 N	
W03: 3NC				2.6 mm	-	7.3 N	3.8 mm	23 N	

Limit switch with PA roller lever plunger, horizontal action IP67



FTN series		1 function		32 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1	without reset function	32	PA roller lever plunger, horizontal action	X11: 1NO+1NC	slow action (Zb)	blank M N G1 G3 C	M16 x 1.5 (standard) M20 x 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 x 1
						W02: 2NC			
						W20: 2NO	snap action (Zb)		
						Z11: 1NO+1NC Z02: 2NC			
						W12: 1NO+2NC W03: 3NC	slow action (Zb)		

technical drawing - sizes in mm



- (1) mounting holes
- (2) PA roller

[illegible]

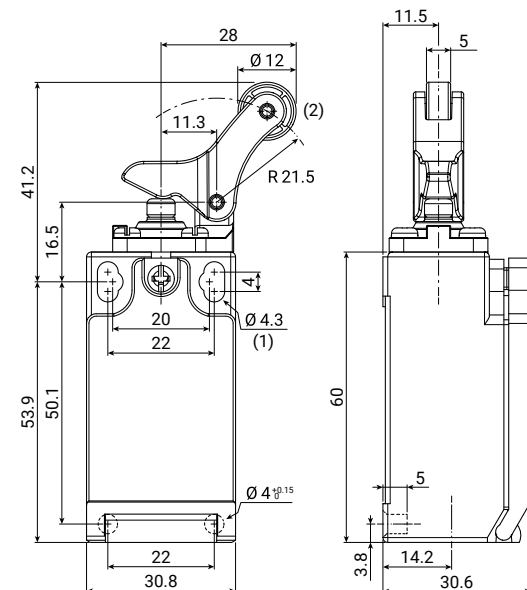
contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	3.6 mm	5.4 mm	5.3 N	7.5 mm	13.5 N	9.3 mm
W02: 2NC				3.6 mm	-	5.3 N	7.5 mm	13.5 N	
W20: 2NO				3.3 mm	-	5.7 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	3.1 mm	1.5 mm	5.0 N	6.8 mm	10.4 N	
Z02: 2NC				3.1 mm	1.3 mm	5.0 N	6.8 mm	10.4 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300	3.6 mm	4.5 mm	5.3 N	8.8 mm	15 N		
W03: 3NC			3.6 mm	-	5.3 N	8.8 mm	15 N		

**Limit switch with PA roller lever plunger, vertical action
IP67**



FTN		1		33		XXX		XX	
series		function		actuator		contact type		conduit entry	
FTN	thermoplastic limit switch	1	without reset function	33	PA roller lever plunger, vertical action	X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	blank M N	M16 x 1.5 (standard) M20 x 1.5 1/2" NPT
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	G1 G3	PG11 PG13.5
						W12: 1NO+2NC W03: 3NC	slow action (Zb)	C	male connector "A" M12 x 1

technical drawing - sizes in mm



- (1) mounting holes
- (2) PA roller

technical drawing - sizes in mm	contact type	operation diagrams
(1) mounting holes (2) PA roller	X11 1NO+1NC slow action (Zb)	
	W02 2NC slow action (Zb)	
	W20 2NO slow action (Zb)	
	Z11 1NO+1NC snap action (Zb)	
	Z02 2NC snap action (Zb)	
	W12 1NO+2NC slow action (Zb)	
	W03 3NC slow action (Zb)	

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	4.5 mm	6.4 mm	7.0 N	5.5 mm	15 N	8.9 mm
W02: 2NC				4.5 mm	-	7.0 N	5.5 mm	15 N	
W20: 2NO				3.8 mm	-	7.0 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	3.7 mm	1.8 mm	4.2 N	8.0 mm	8.3 N	
Z02: 2NC				3.7 mm	1.6 mm	4.2 N	8.0 mm	8.3 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300	4.2 mm	5.0 mm	7.0 N	5.5 mm	17 N		
W03: 3NC			4.2 mm	-	7.0 N	5.5 mm	17 N		

FTN134

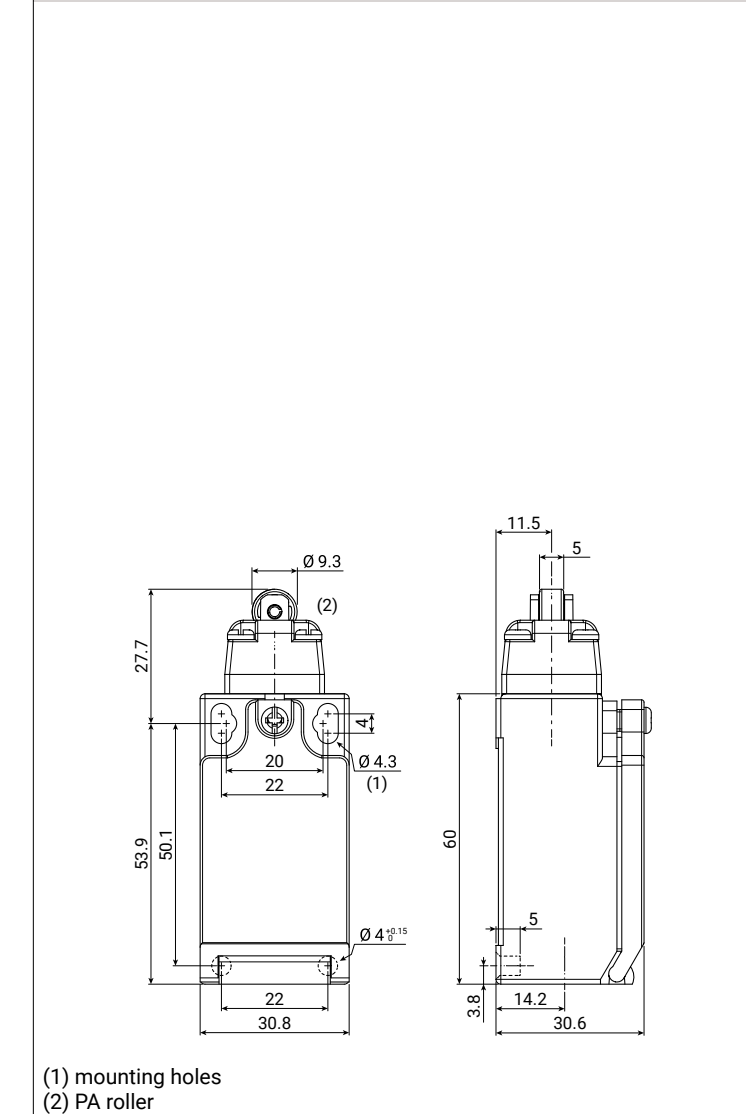
Limit switch with PA roller plunger

IP67



FTN series		1 function	34 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	34 PA roller plunger	X11: 1NO+1NC W02: 2NC W20: 2NO	blank M N G1 G3 C M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1
				Z11: 1NO+1NC Z02: 2NC	
				W12: 1NO+2NC W03: 3NC	

technical drawing - sizes in mm



contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	A600-Q600	AC15: 400V - 4A	2.8 mm	3.8 mm	7.3 N	3.5 mm	22 N	6.0 mm
				2.8 mm	-	7.3 N	3.5 mm	22 N	
				2.4 mm	-	8.2 N	-	-	
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	2.1 mm	1.1 mm	7.2 N	4.5 mm	16.3 N	
				2.1 mm	0.9 mm	7.2 N	4.5 mm	16.3 N	
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		2.6 mm	3.2 mm	7.3 N	3.8 mm	23 N	
				2.6 mm	-	7.3 N	3.8 mm	23 N	

FTN135

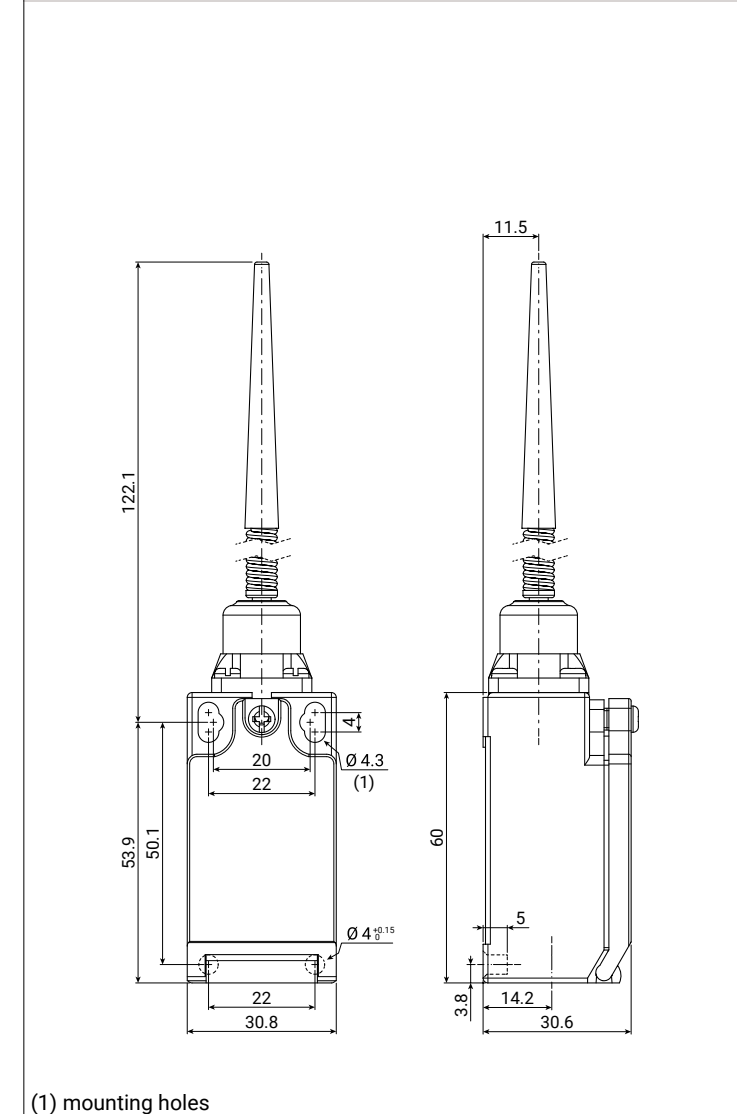
Limit switch with spring lever with tip in PA

IP67



FTN series		1 function	35 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	35 spring lever with tip in PA	W02: 2NC	blank M N G1 G3 C M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1
				Z11: 1NO+1NC Z02: 2NC	
				W03: 3NC	

technical drawing - sizes in mm



contact type	operation diagrams
W02 2NC slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W03 3NC slow action (Zb)	

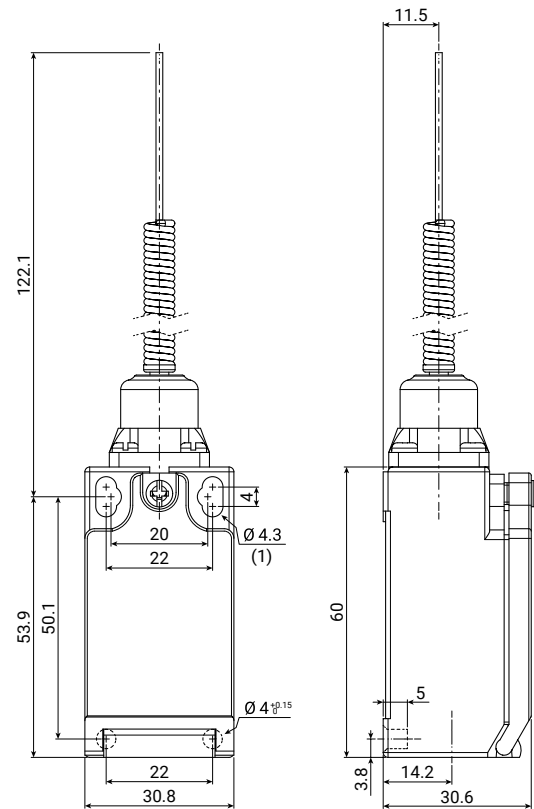
contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		OF	POT (travel)	
W02: 2NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	15°	-	6.5 N	-	-	-
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600		18° 18°	3° 2°	5.8 N 5.8 N	- -	- -	
W03: 3NC	slow action (Zb)	A300-Q300	DC13: 24V - 6A	12°	-	6.5 N	-	-	

FTN136

 Limit switch with CAT'S whisker
 IP67

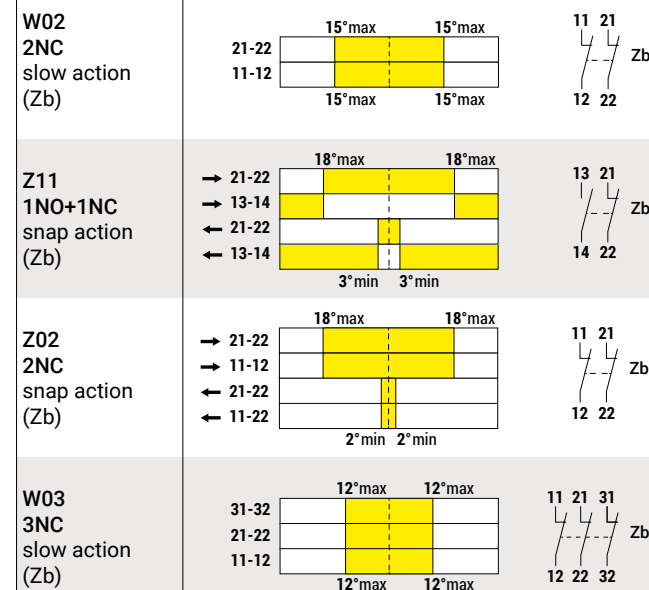

FTN series		1 function		36 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1	without reset function	36	CAT'S whisker	W02: 2NC	slow action (Zb)	blank M N G1 G3 C	M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)		
						W03: 3NC	slow action (Zb)		

technical drawing - sizes in mm



(1) mounting holes

contact type operation diagrams



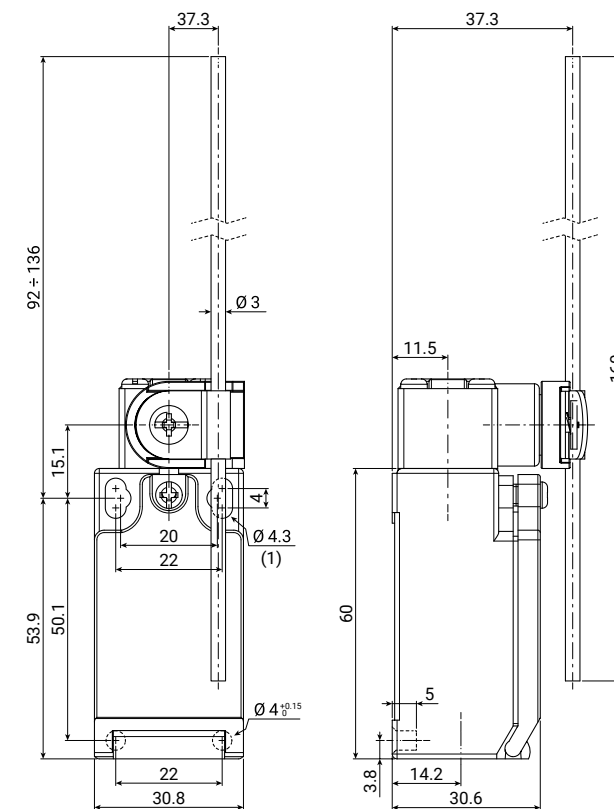
contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
W02: 2NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	15°	-	6.5 N	-	-	-
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600		18° 18°	3° 2°	5.8 N 5.8 N	- -	- -	
W03: 3NC	slow action (Zb)	A300-Q300	DC13: 24V - 6A	12°	-	6.5 N	-	-	

FTN137

 Limit switch with adjustable metal rod lever
 IP67

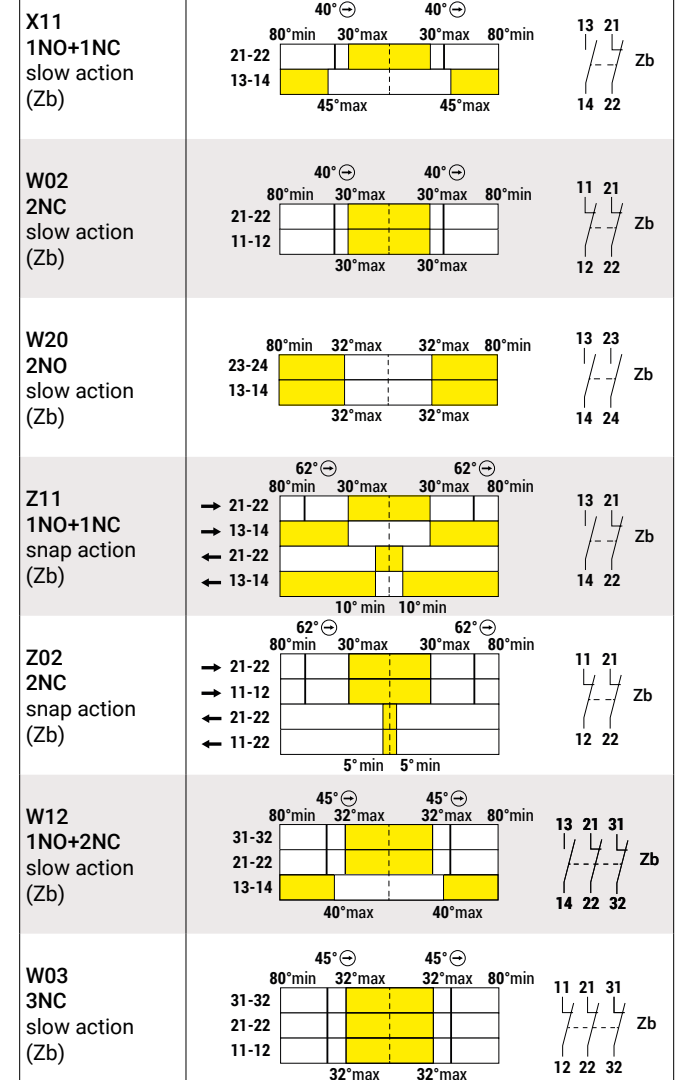

FTN		1		37		XXX		XX	
series		function		actuator		contact type		conduit entry	
FTN	thermoplastic limit switch	1	without reset function	37	adjustable metal rod lever	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)
						W02: 2NC		M	M20 × 1.5
						W20: 2NO	N	1/2" NPT	
						Z11: 1NO+1NC	snap action (Zb)	G1	PG11
						Z02: 2NC		G3	PG13.5
						W12: 1NO+2NC	slow action (Zb)	C	male code "A"
						W03: 3NC		M12 × 1 connector	

technical drawing - sizes in mm



(1) mounting holes

contact type operation diagrams



contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	30°	45°	1.8 N	40°	6 N	80°
W02: 2NC				30°	-	1.8 N	40°	6 N	
W20: 2NO				32°	-	1.8 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
Z02: 2NC				30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300		32°	40°	1.8 N	45°	5.4 N	
W03: 3NC				32°	-	1.8 N	45°	5.4 N	

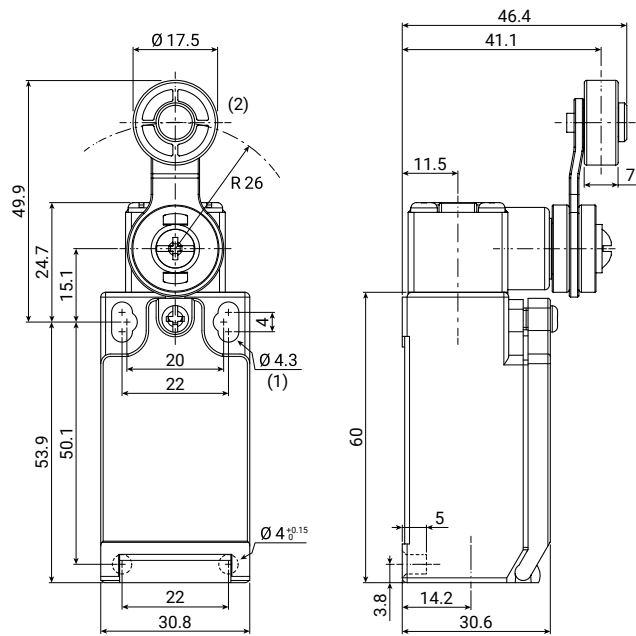
FTN138

Limit switch with Ø18 PA roller lever
IP67



FTN series	1 function	38 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	38 Ø18 PA roller lever	
			X11: 1NO+1NC W02: 2NC W20: 2NO	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT
			Z11: 1NO+1NC Z02: 2NC	G1 PG11 G3 PG13.5
			W12: 1NO+2NC W03: 3NC	C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type

operation diagrams

X11 1NO+1NC slow action (Zb)		
W02 2NC slow action (Zb)		
W20 2NO slow action (Zb)		
Z11 1NO+1NC snap action (Zb)		
Z02 2NC snap action (Zb)		
W12 1NO+2NC slow action (Zb)		
W03 3NC slow action (Zb)		

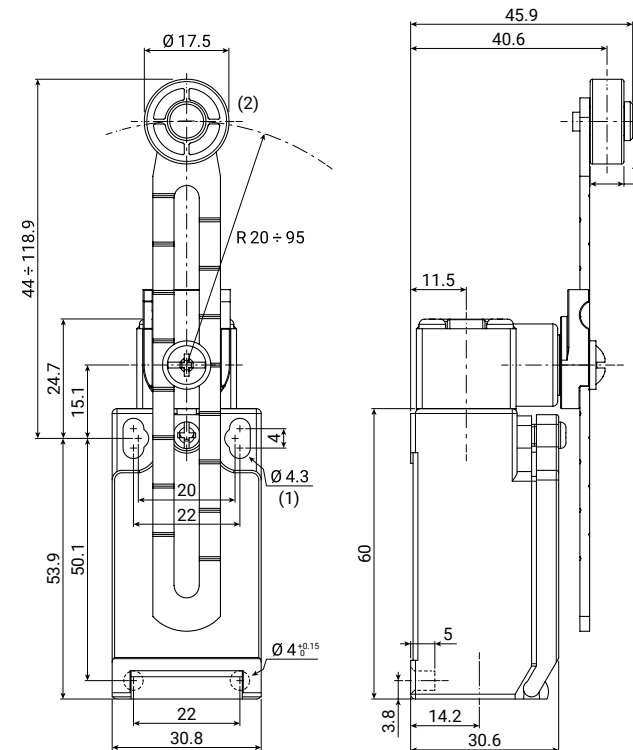
FTN139

Limit switch with Ø18 long PA roller lever with variable length
IP67



FTN series	1 function	39 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	39 Ø18 long PA roller lever with variable length	
			X11: 1NO+1NC W02: 2NC W20: 2NO	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT
			Z11: 1NO+1NC Z02: 2NC	G1 PG11 G3 PG13.5
			W12: 1NO+2NC W03: 3NC	C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type

operation diagrams

X11 1NO+1NC slow action (Zb)		
W02 2NC slow action (Zb)		
W20 2NO slow action (Zb)		
Z11 1NO+1NC snap action (Zb)		
Z02 2NC snap action (Zb)		
W12 1NO+2NC slow action (Zb)		
W03 3NC slow action (Zb)		

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
			30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
			30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	

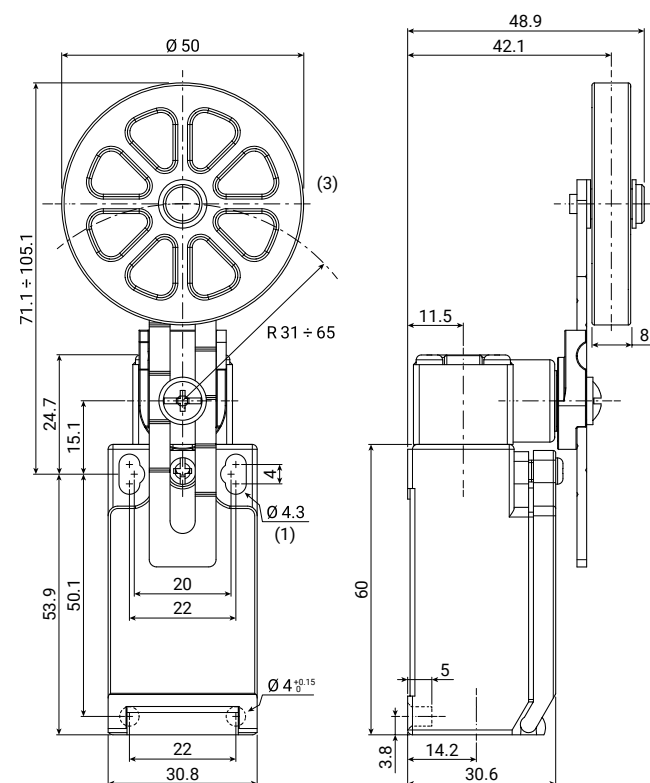
FTN140

**Limit switch with Ø50 rubber roller lever with variable length
IP67**



FTN		1		40		XXX		XX	
series		function		actuator		contact type		conduit entry	
FTN	thermoplastic limit switch	1	without reset function	40	Ø50 rubber roller lever with variable length	X11: 1NO+1NC	slow action (Zb)	blank M N G1 G3 C	M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1
						W02: 2NC			
						W20: 2NO	snap action (Zb)		
						Z11: 1NO+1NC Z02: 2NC			
						W12: 1NO+2NC W03: 3NC	slow action (Zb)		

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

technical drawing - sizes in mm

Technical drawing of the 1100 series door handle. The front view (left) shows a circular top with a diameter of $\varnothing 50$ and a central hole of $\varnothing 4.3$. The handle has a length of 71.1 ± 105.1 mm and a width of 30.8 mm. The side view (right) shows a total height of 60 mm and a mounting plate width of 48.9 mm. Dimensions for the handle body include 42.1 mm, 11.5 mm, 8 mm, 53.9 mm, 50.1 mm, 24.7 mm, 15.1 mm, 20 mm, 22 mm, 3.8 mm, 14.2 mm, and 30.6 mm. A rubber roller (3) is shown at the bottom of the handle body with a radius of R31 ± 65. Mounting holes (1) are indicated at the base of the handle body.

(1) mounting holes
(3) rubber roller

contact type

X11
1NO+1NC
slow action
(Zb)

Contact diagram for X11 (1NO+1NC slow action). The diagram shows a 2-position switch with 40° max and 80° min contact angles. The common terminal is 21-22. The normally open (NO) contact is 13-14, and the normally closed (NC) contact is 14-22. The contact width is 45° max.

13 21
14 22
Zb

W02
2NC
slow action
(Zb)

Contact diagram for W02 (2NC slow action). The diagram shows a 2-position switch with 40° max and 80° min contact angles. The common terminal is 21-22. The normally closed (NC) contacts are 11-12 and 12-22. The contact width is 30° max.

11 21
12 22
Zb

W20
2NO
slow action
(Zb)

Contact diagram for W20 (2NO slow action). The diagram shows a 2-position switch with 80° min and 32° max contact angles. The common terminal is 23-24. The normally open (NO) contacts are 13-14 and 14-24. The contact width is 32° max.

13 23
14 24
Zb

Z11
1NO+1NC
snap action
(Zb)

Contact diagram for Z11 (1NO+1NC snap action). The diagram shows a 2-position switch with 62° max and 80° min contact angles. The common terminal is 21-22. The normally open (NO) contact is 13-14, and the normally closed (NC) contact is 14-22. The contact width is 10° min.

13 21
14 22
Zb

Z02
2NC
snap action
(Zb)

Contact diagram for Z02 (2NC snap action). The diagram shows a 2-position switch with 62° max and 80° min contact angles. The common terminal is 21-22. The normally closed (NC) contacts are 11-12 and 12-22. The contact width is 5° min.

11 21
12 22
Zb

W12
1NO+2NC
slow action
(Zb)

Contact diagram for W12 (1NO+2NC slow action). The diagram shows a 2-position switch with 45° max and 80° min contact angles. The common terminal is 31-32. The normally open (NO) contact is 21-22, and the normally closed (NC) contacts are 13-14 and 14-22. The contact width is 40° max.

13 21 31
14 22 32
Zb

W03
3NC
slow action
(Zb)

Contact diagram for W03 (3NC slow action). The diagram shows a 2-position switch with 45° max and 80° min contact angles. The common terminal is 31-32. The normally closed (NC) contacts are 21-22 and 11-12. The contact width is 32° max.

11 21 31
12 22 32
Zb

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
W02: 2NC				30°	-	6.5 N	40°	6 N	
W20: 2NO				32°	-	6.5 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
Z02: 2NC				30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300	32°	40°	6.5 N	45°	5.4 N		
W03: 3NC			32°	-	6.5 N	45°	5.4 N		

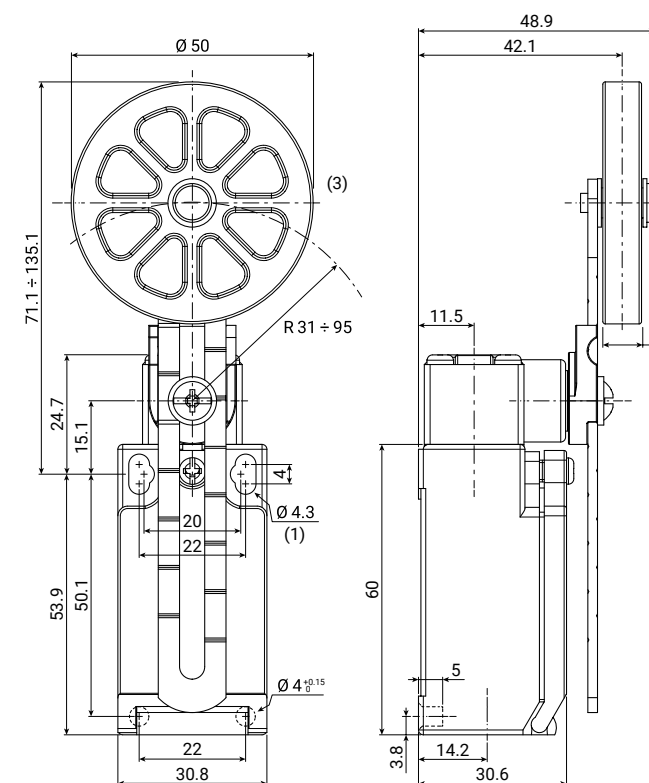
FTN140L

**Limit switch with Ø50 long rubber roller lever with variable length
IP67**



FTN		1		40L		XXX		XX	
series		function		actuator		contact type		conduit entry	
FTN	thermoplastic limit switch	1	without reset function	40L	Ø50 long rubber roller lever with variable length	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)
						W02: 2NC			
						W20: 2NO			
						Z11: 1NO+1NC	snap action (Zb)	G1	PG11
						Z02: 2NC		G3	PG13.5
						W12: 1NO+2NC	slow action (Zb)	C	male connector "A"
						W03: 3NC			

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

[illegible]

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
W02: 2NC				30°	-	6.5 N	40°	6 N	
W20: 2NO				32°	-	6.5 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
Z02: 2NC				30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300	32°	40°	6.5 N	45°	5.4 N		
W03: 3NC			32°	-	6.5 N	45°	5.4 N		

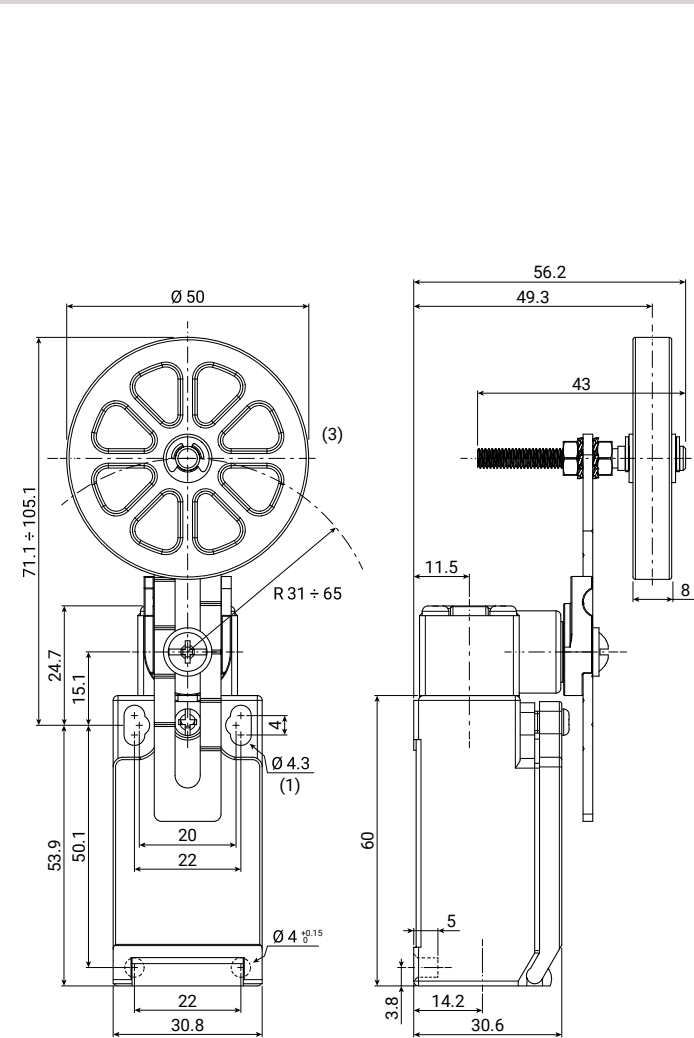
FTN140R

Limit switch with Ø50 rubber roller lever with variable length and overhang
IP67



FTN series	1 function	40R actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	40R Ø50 rubber roller lever with variable length and overhang	blank M16 x 1.5 (standard) M M20 x 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 x 1
			X11: 1NO+1NC slow action (Zb)	
			W02: 2NC snap action (Zb)	
			Z11: 1NO+1NC snap action (Zb)	
			Z02: 2NC snap action (Zb)	
			W12: 1NO+2NC slow action (Zb)	
			W03: 3NC slow action (Zb)	

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
W02: 2NC			30°	-	6.5 N	40°	6 N	
W20: 2NO			32°	-	6.5 N	-	-	
Z11: 1NO+1NC	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
Z02: 2NC			30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC	A300-Q300		32°	40°	6.5 N	45°	5.4 N	
W03: 3NC			32°	-	6.5 N	45°	5.4 N	

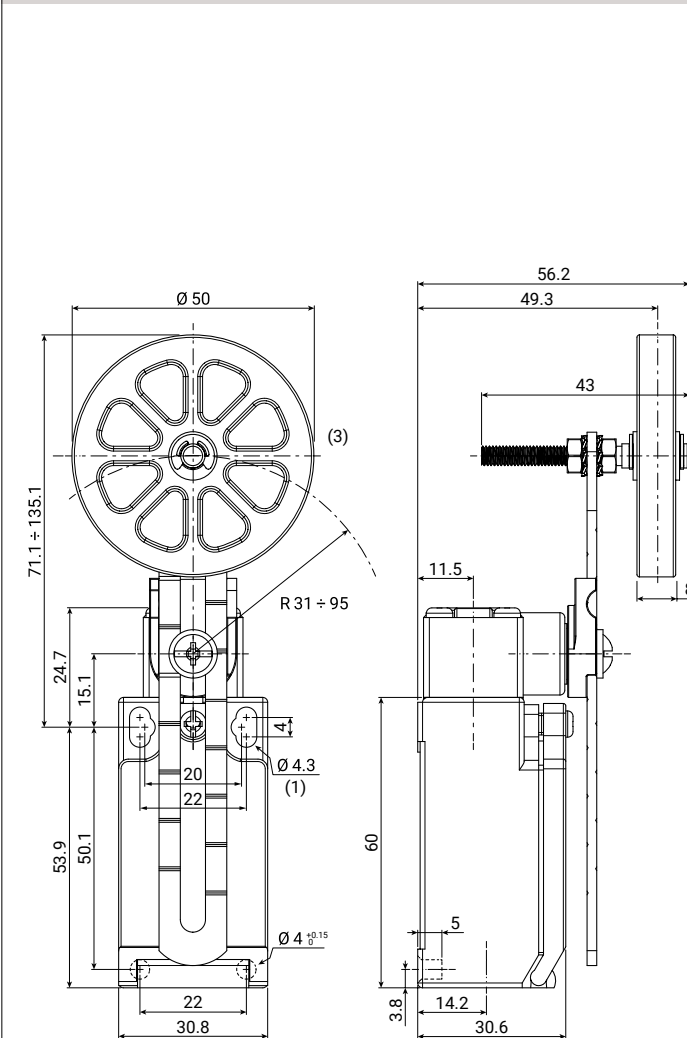
FTN140RL

Limit switch with Ø50 long rubber roller lever with variable length and overhang
IP67



FTN series	1 function	40RL actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	40RL Ø50 long rubber roller lever with variable length and overhang	blank M16 x 1.5 (standard) M M20 x 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 x 1
			X11: 1NO+1NC slow action (Zb)	
			W02: 2NC snap action (Zb)	
			Z11: 1NO+1NC snap action (Zb)	
			Z02: 2NC snap action (Zb)	
			W12: 1NO+2NC slow action (Zb)	
			W03: 3NC slow action (Zb)	

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
W02: 2NC			30°	-	6.5 N	40°	6 N	
W20: 2NO			32°	-	6.5 N	-	-	
Z11: 1NO+1NC	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
Z02: 2NC			30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC	A300-Q300		32°	40°	6.5 N	45°	5.4 N	
W03: 3NC			32°	-	6.5 N	45°	5.4 N	

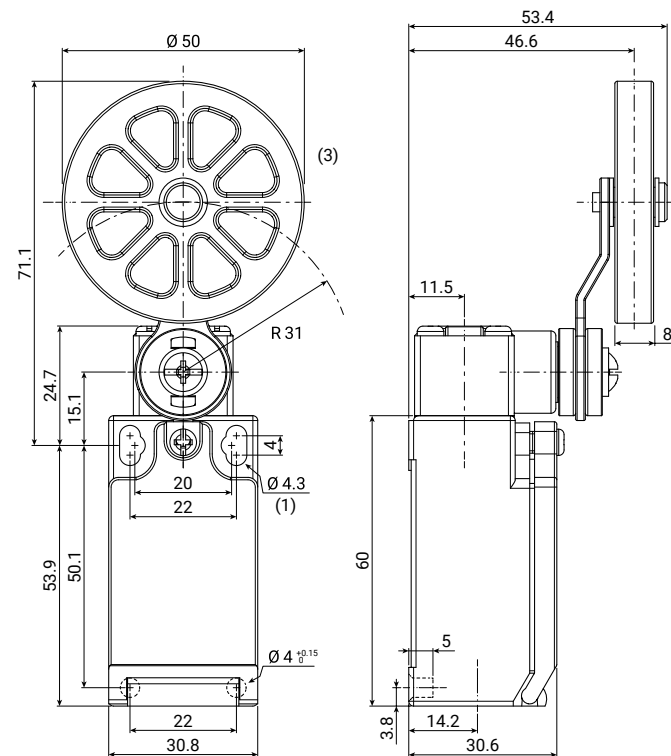
FTN141

Limit switch with Ø50 rubber roller lever
IP67



FTN series		1 function	41 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	41 Ø50 rubber roller lever	X11: 1NO+1NC W02: 2NC W20: 2NO	blank M N
				Z11: 1NO+1NC Z02: 2NC	G1 PG11 G3 PG13.5
				W12: 1NO+2NC W03: 3NC	C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
				30°	-	6.5 N	40°	6 N	
				32°	-	6.5 N	-	-	
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
				30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		32°	40°	6.5 N	45°	5.4 N	
				32°	-	6.5 N	45°	5.4 N	

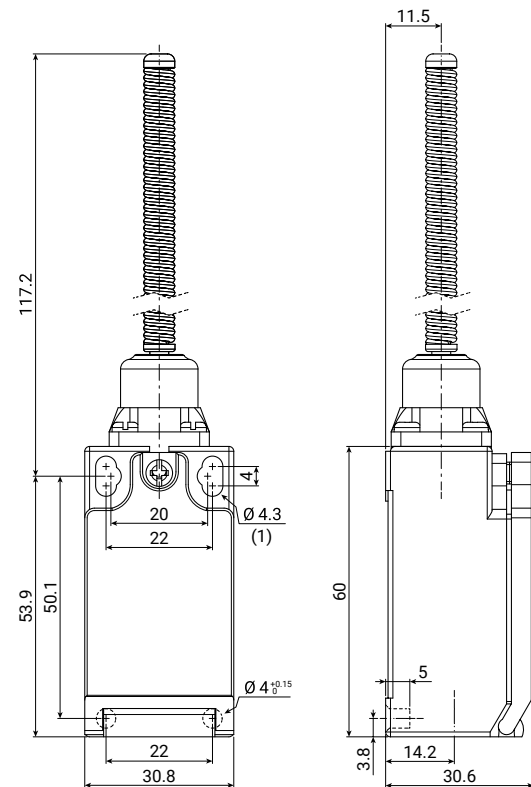
FTN142

Limit switch with wobble stick
IP67



FTN series		1 function	42 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	42 wobble stick	W02: 2NC	blank M N
				Z11: 1NO+1NC Z02: 2NC	G1 PG11 G3 PG13.5
				W03: 3NC	C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes

contact type		operation diagrams	
W02 2NC slow action (Zb)		21-22 11-12	11 21 12 22
Z11 1NO+1NC snap action (Zb)		21-22 13-14 21-22 13-14	13 21 14 22
Z02 2NC snap action (Zb)		21-22 11-12 21-22 11-12	11 21 12 22
W03 3NC slow action (Zb)		31-32 21-22 11-12	11 21 31 12 22 32

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
W02: 2NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	30°	-	6.5 N	-	-	-
				18°	3°	5.8 N	-	-	
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	18°	2°	5.8 N	-	-	
				32°	-	6.5 N	-	-	
W03: 3NC	slow action (Zb)	A300-Q300							

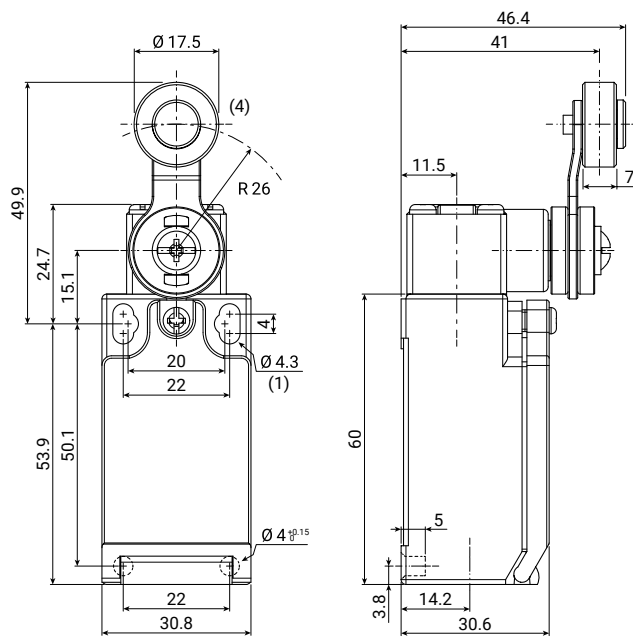
FTN143

Limit switch with Ø18 metal roller lever
IP67



FTN series	1 function	43 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	43 Ø18 metal roller lever	
			X11: 1NO+1NC W02: 2NC W20: 2NO	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT
			Z11: 1NO+1NC Z02: 2NC	G1 PG11 G3 PG13.5
			W12: 1NO+2NC W03: 3NC	C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(4) metal roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		30°	5°	2.1 N	62°	5.5 N	
			32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	

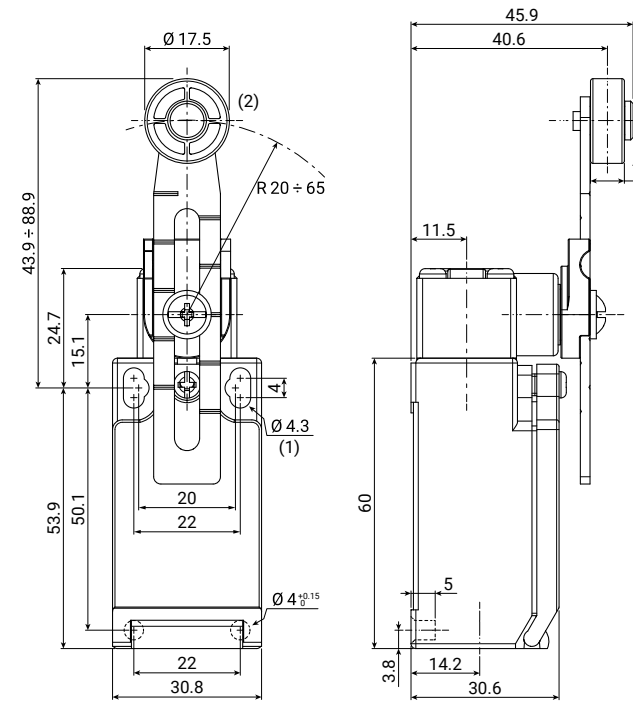
FTN144

Limit switch with Ø18 PA roller lever with variable length
IP67



FTN series	1 function	44 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	44 Ø18 PA roller lever with variable length	
			X11: 1NO+1NC W02: 2NC W20: 2NO	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT
			Z11: 1NO+1NC Z02: 2NC	G1 PG11 G3 PG13.5
			W12: 1NO+2NC W03: 3NC	C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		30°	5°	2.1 N	62°	5.5 N	
			32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	

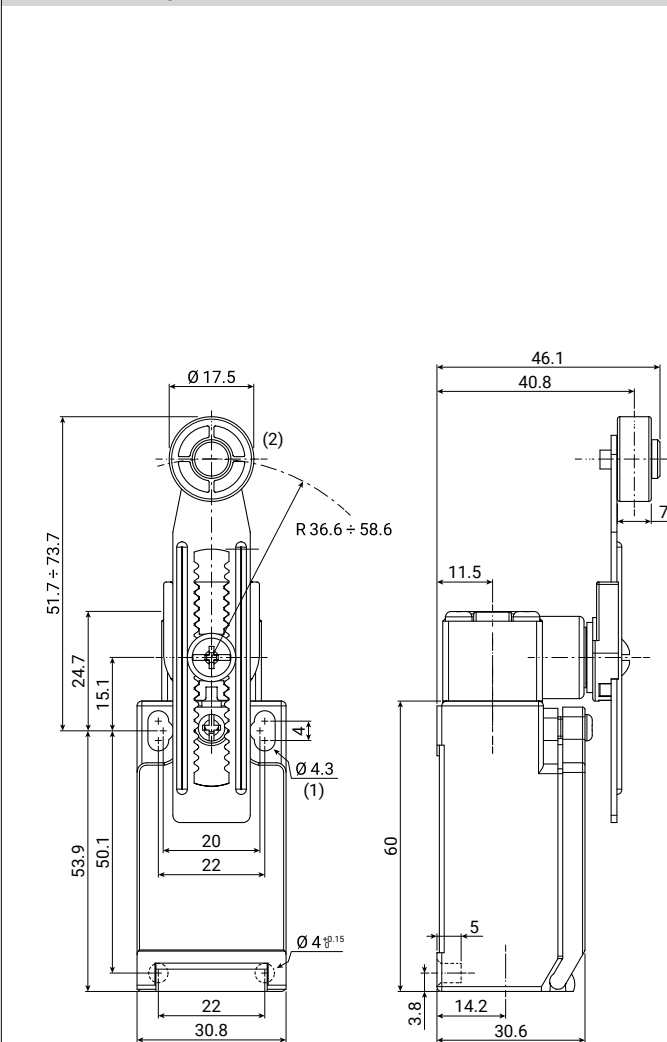
FTN144S

Limit switch with Ø18 PA roller lever with variable sawtooth length (step: 2.2 mm)
IP67



FTN series		1 function		44S actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1	without reset function	44S	Ø18 PA roller lever with variable sawtooth length (step: 2.2 mm)	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)
						W02: 2NC		M	
						W20: 2NO	N	1/2" NPT	
						Z11: 1NO+1NC	snap action (Zb)	G1	
Z02: 2NC	G3	PG13.5							
						W12: 1NO+2NC	slow action (Zb)	C	male connector "A"
						W03: 3NC			

technical drawing - sizes in mm



- (1) mounting holes
- (2) PA roller

technical drawing - sizes in mm

(1) mounting holes
(2) PA roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	30°	45°	6.5 N	40°	6 N	80°
W02: 2NC				30°	-	6.5 N	40°	6 N	
W20: 2NO				32°	-	6.5 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	
Z02: 2NC				30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300	32°	40°	6.5 N	45°	5.4 N		
W03: 3NC			32°	-	6.5 N	45°	5.4 N		

FTN146

Safety-door hinge switch IP65

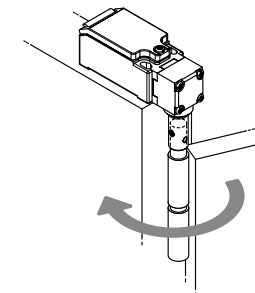


FTN		1		46		XXX		XX	
series		function		actuator		contact type		conduit entry	
FTN	thermoplastic limit switch	1	without reset function	46	safety-door hinge switch	X11: 1NO+1NC W02: 2NC W20: 2NO W12: 1NO+2NC W03: 3NC	slow action (Zb)	blank M N G1 G3 C	M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1

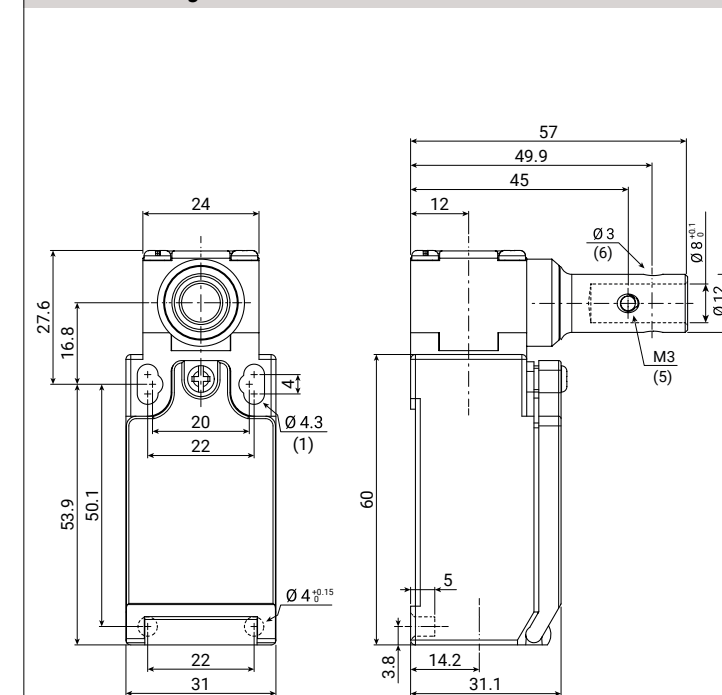
FTN146

Safety-door hinge switch - shaft type

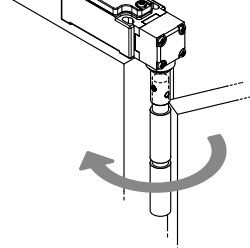
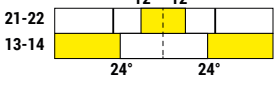
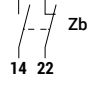
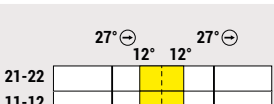
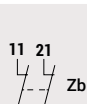
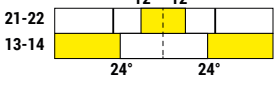
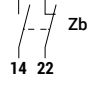
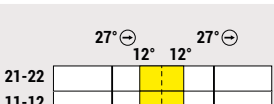
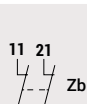
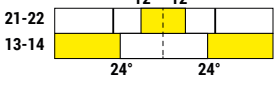
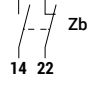
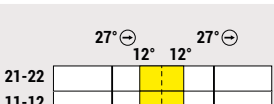
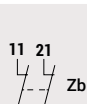
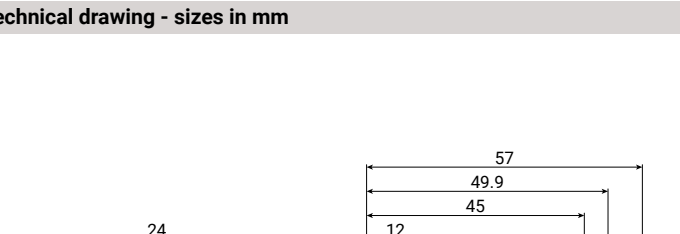
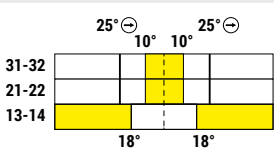
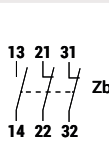
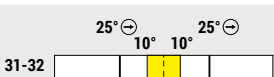
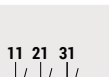
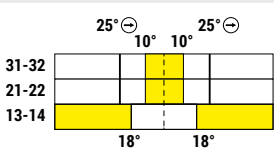
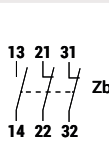
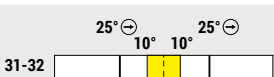
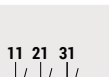
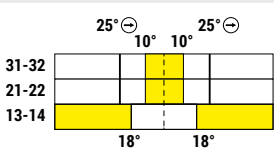
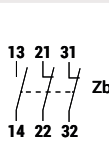
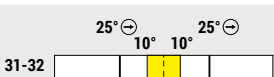
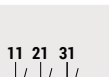
Where an attempt is made to open a protected door or flap during operation, the **FTN146** hinge switch immediately cuts off the power supply to the machine or system.



technical drawing - sizes in mm



(1) mounting holes
(5) 2 × M3 grub screws included
(6) spring pin not included

FTN146 Safety-door hinge switch - shaft type Where an attempt is made to open a protected door or flap during operation, the FTN146 hinge switch immediately cuts off the power supply to the machine or system. 	<table> <tr> <th data-bbox="2264 688 2418 705">contact type</th><th data-bbox="2558 688 2736 705">operation diagrams</th></tr> <tr> <td data-bbox="2264 705 2418 802"> X11 1NO+1NC slow action (Zb) </td><td data-bbox="2460 705 2861 802">   </td></tr> <tr> <td data-bbox="2264 802 2418 898"> W02 2NC slow action (Zb) </td><td data-bbox="2460 802 2861 898">   </td></tr> </table>	contact type	operation diagrams	X11 1NO+1NC slow action (Zb)	 	W02 2NC slow action (Zb)	 
contact type	operation diagrams						
X11 1NO+1NC slow action (Zb)	 						
W02 2NC slow action (Zb)	 						
technical drawing - sizes in mm 	<table> <tr> <td data-bbox="2264 951 2418 1098"> W12 1NO+2NC slow action (Zb) </td><td data-bbox="2460 951 2861 1098">   </td></tr> <tr> <td data-bbox="2264 1098 2418 1169"> W03 3NC slow action (Zb) </td><td data-bbox="2460 1098 2861 1169">   </td></tr> </table>	W12 1NO+2NC slow action (Zb)	 	W03 3NC slow action (Zb)	 		
W12 1NO+2NC slow action (Zb)	 						
W03 3NC slow action (Zb)	 						

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	10°	20°	0.06 N·m	25°	0.12 N·m	-
W02: 2NC			10°	-	0.06 N·m	25°	0.12 N·m		
W12: 1NO+2NC		A300-Q300	DC13: 24V - 6A	10°	20°	0.05 N·m	25°	0.12 N·m	
W03: 3NC			10°	-	0.05 N·m	25°	0.12 N·m		

FTN198

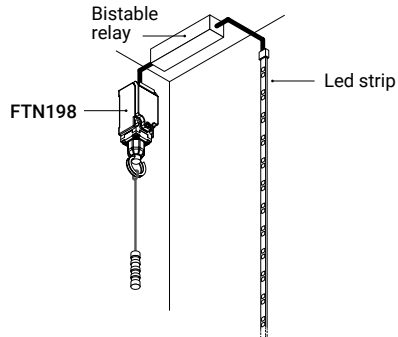
Limit switch with rope pull lever
IP67



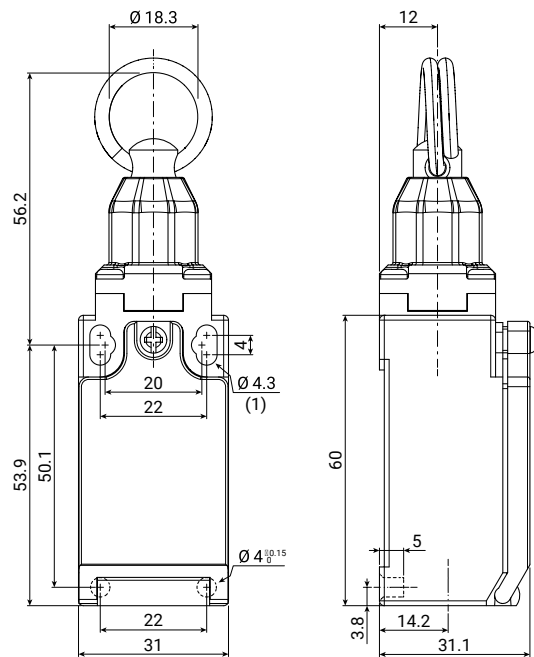
FTN series	1 function	98 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	98 rope pull lever	
			X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	snap action (Zb)
			W12: 1NO+2NC W03: 3NC	slow action (Zb)
				blank M N G1 G3 C
				M16 x 1.5 (standard) M20 x 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 x 1

The **FTN198** hasn't a maintained operating mode.

This means that a bistable relay must be inserted into the system to maintain the position.



technical drawing - sizes in mm



(1) mounting holes

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	3.5 mm	-	20 N	-	-	8.0 mm
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	3.5 mm	3.6 mm	20 N	-	-	
W12: 1NO+2NC W03: 3NC	A300-Q300		4.5 mm	3.5 mm	20 N	-	-	
			4.5 mm	3.3 mm	20 N	-	-	
			3.5 mm	-	20 N	-	-	
			3.5 mm	-	20 N	-	-	

Description

The **FTN198** switch is specifically designed to control lights in the elevator shaft. The EN 81-20 standard in paragraph 5.2.1.5 states that a light switch must be provided in the pit, near to each access point and in the engine room. The **FTN198** switch allows the compartment lights to be switched through a single wiring harness, without the need to install lighting points with related wiring on each floor.

Installation

The **FTN198** switch is fixed at the top of the elevator shaft and its switching is controlled by a rope running the length of the shaft near the cabin. At regular intervals, function indicators are fixed at each floor, which make the rope and the light switching operation clearly visible. The last indicator at the end of the rope has a weight inside to keep the rope extended. The operator on the roof of the cabin compartment or at any position along the elevator shaft can operate the switch by pulling the handy indicator to turn the lights in the shaft on or off.

Accessories

Function indicator for rope

Tightening torque of the locking screws > 0.8 ... 1.0 Nm



A FTN198-KNOB

Function intermediate indicator for rope

B FTN198-KNOBT

Function terminal indicator for rope

Rope roll

Galvanized steel rope ø3mm covered with transparent PVC



C FTN198-ROPE-050

Galvanized steel rope covered in PVC Ø3mm - L = 50m

C FTN198-ROPE-100

Galvanized steel rope covered in PVC Ø3mm - L = 100m

Steel rope clamp

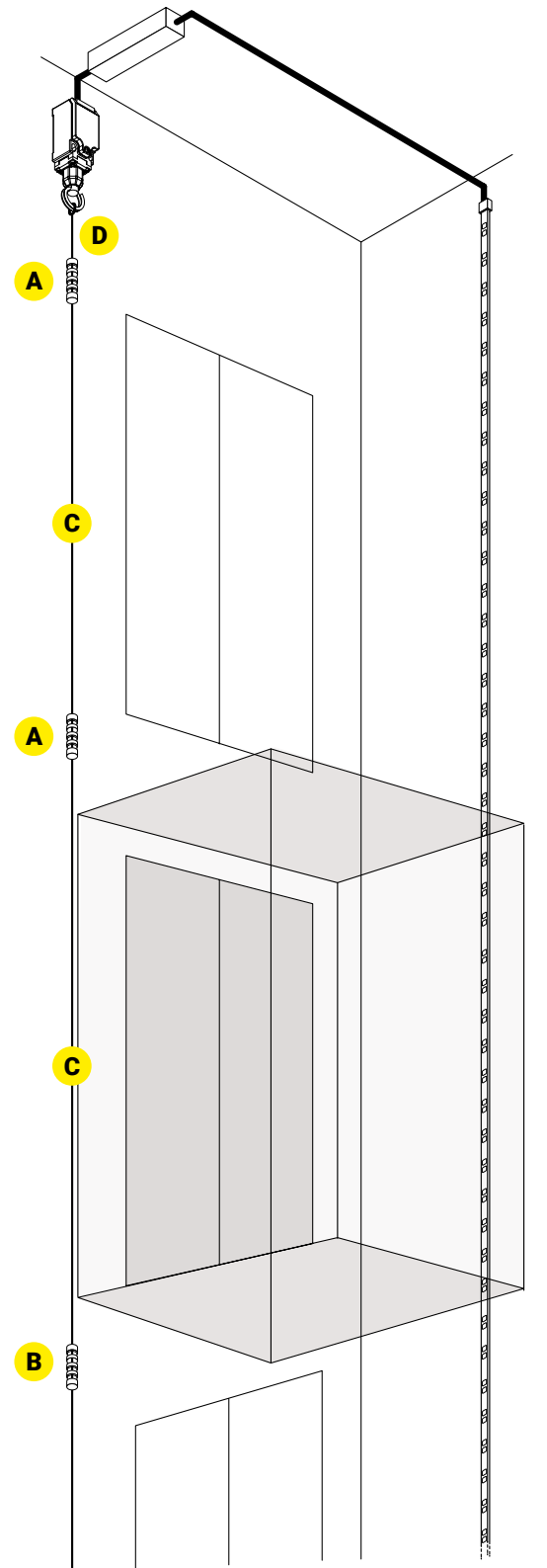
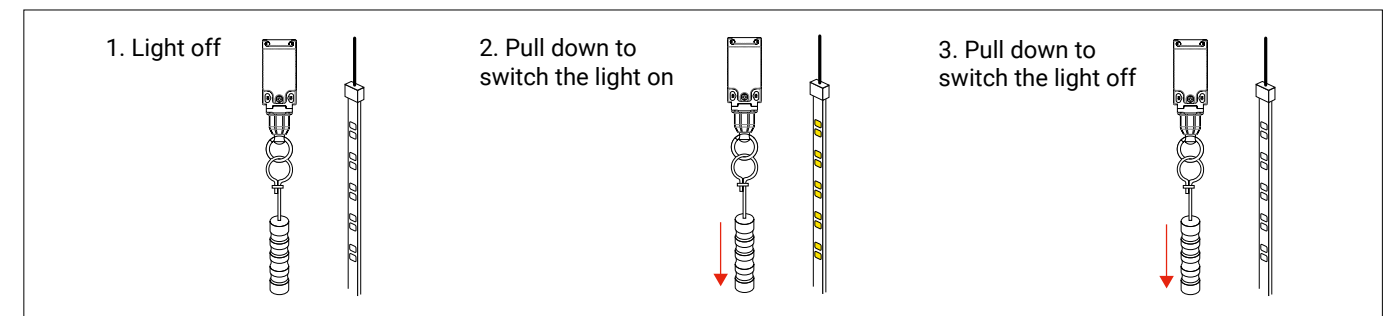


D 11001003

End clamp for steel wire rope

Operation

The **FTN198** switch has no maintained position operation mode. This means that a bistable relay must be inserted into the system to maintain the position. To switch on the light in the lift shaft, simply pull the cable, and to switch it off simply repeat the operation.





FTN1R SERIES



The **FTN1R series** of thermoplastic limit switches with reset device for manual reset comply with EN 50047 and are designed to provide a wide range of switch variants (slow action or snap action basic switches) and a variety of actuating heads and levers suitable also for safety applications.

Each model has a **positive opening mechanism** (NC contacts only) and is equipped with a drive retention mechanism.

The thermoplastic bodies have two fixing holes with 20 or 22 mm spacing and a cable entry hole in the bottom of the switch.

The maximum product versatility is guaranteed by the easy orientation of the actuator and reset heads in 90° steps and the possibility of adjusting the levers every 18° for 360°.

They are also suitable for use in the harshest environmental conditions with an **operating temperature range of -25°C to +80°C**.

All models in the series are **IP67-rated**.

The actuators are made of metal or thermoplastic material, while the housing is made of thermoplastic glass-filled polybutylene terephthalate.

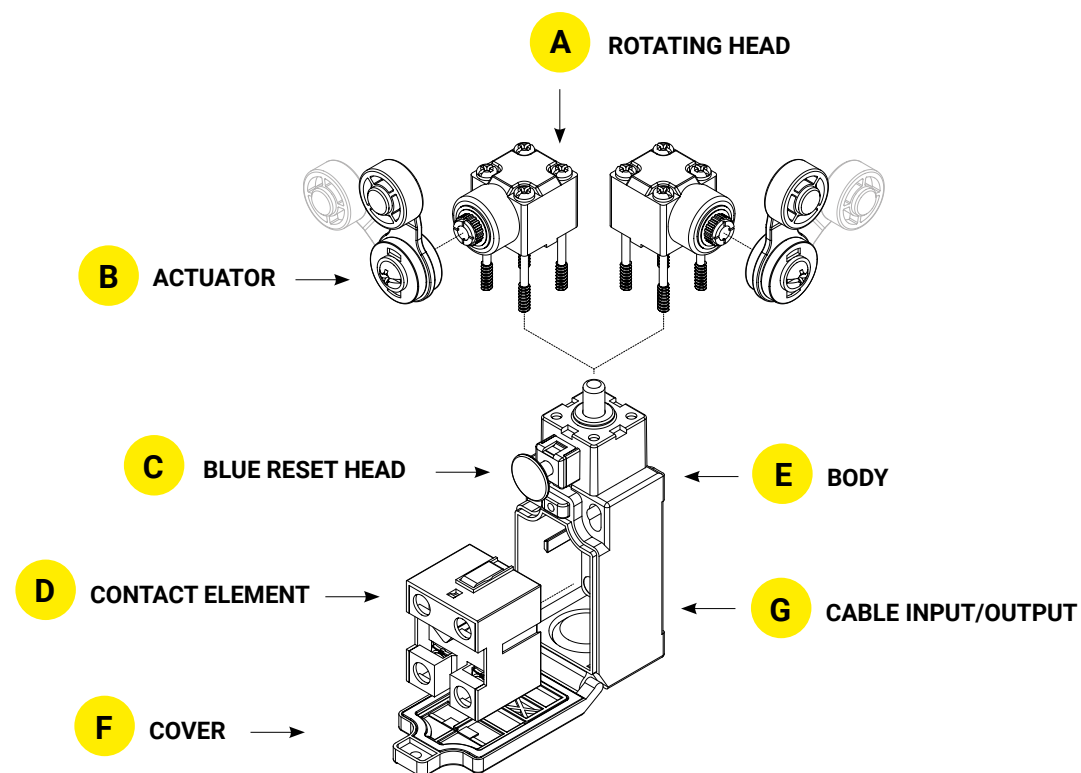
Giovenzana limit switches are suitable for every requirement and can be used in a wide range of sectors.



SPECIFICATIONS

Standards		EN 60947-5-1, UL 508, EN 50047, EN 1088, EN 60204-1
Approvals		cULus, EAC, CCC, CE and UKCA marked for all applicable directives
Positive opening operation		NC contacts conforming to IEC /EN 60947-5-1 ⊕
Minimum current		5 mA - 5 V DC
Thermal current	Ith	10 A
Rated insulation voltage	Ui	500 V
Rated impulse withstand voltage	Uimp	6 kV
Insulation resistance	min	100 MΩ (DC 500 V)
Contact resistance	max	25 mΩ (initial)
Switching speed	max	250 mm/s
Switching frequency	max	6000 operations per hour
Enclosure material		UL approved glass-filled polybutylene terephthalate
Enclosure protection		IP67
Operating temperature		-25 ... +80°C (-13 ... +176°F)
Pollution degree		3
Protection against electric shock		Class II (double Insulation) □ Double insulation makes ground terminal unnecessary (bears marking)
Electrical life expectancy	min	150.000 cycles
Mechanical life expectancy	min	1 × 10 ⁶ cycles
Vibration	IEC 68-2-6 excursion	10-55 Hz ± 1Hz 0.35 mm, 1 octave/min
Conduit entry		Various international conduit sizes (see product selection table pag. 51)
Fixing		2 × M4 screws

STRUCTURE DESCRIPTION

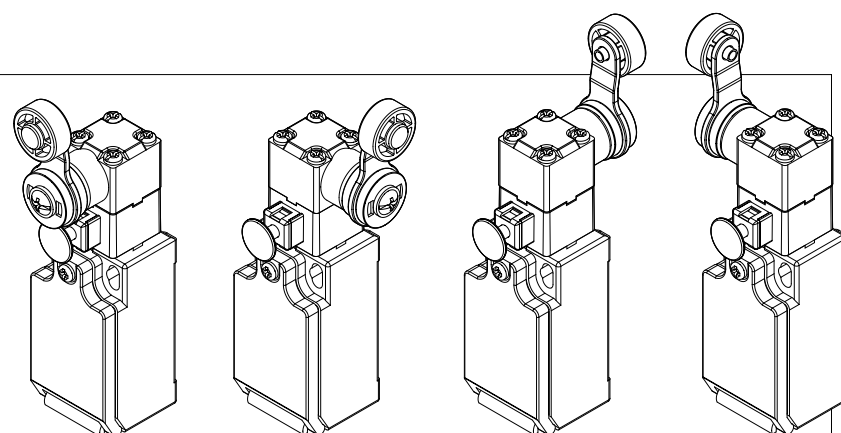


A - ROTATING HEAD

The heads are made of UL approved glass-filled polybutylene terephthalate.

All heads can be adjusted in steps of 90° over 360°, compared to the body.

The direction of the switch head can be varied in one of four directions by loosening the screws at the four corners of the head.



B - ACTUATOR

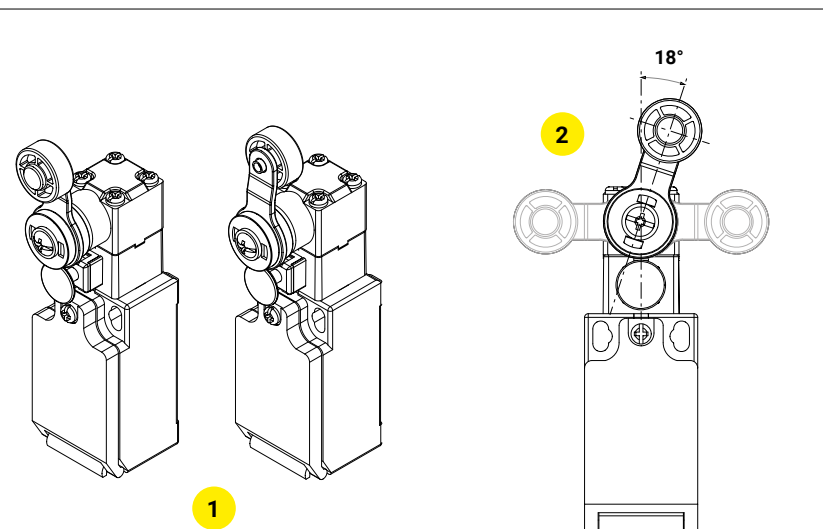
Available different types of actuators: plungers, levers, rollers and rods.

1. Tilting levers

Possibility to fix the lever on the observe or on the reverse, keeping the positive opening of the NC contact. In this way is possible to obtain two different lever work plans.

2. Adjustable levers

All levers are adjustable in steps of 18° over 360°, compared to the horizontal axis of the head. The positive movement transmission is always guaranteed thanks to the particular geometric coupling between the lever and the rotation shaft.

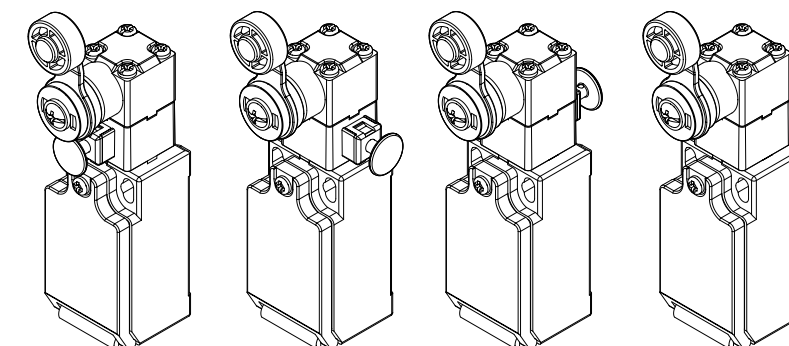


C - RESET HEAD

The heads are made of UL approved glass-filled polybutylene terephthalate.

The manual reset mechanism is blue.

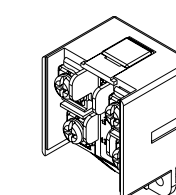
The direction of the reset head can be adjusted to any of the four directions.



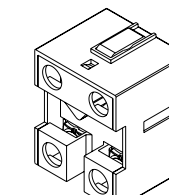
D - CONTACT ELEMENT

The integrated switch has a direct opening mechanism that forcibly separates the NC contact in the event of accidental welding (overload, short circuit, etc.).

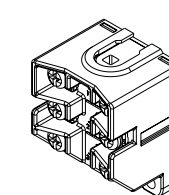
Different contact elements, both fast-acting and slow-acting, are available to suit different application requirements.



X11: 1NO+1NC
Slow action (Zb)



Z11: 1NO+1NC
Snap action (Zb)



W12: 1NO+2NC
Slow action (Zb)

W02: 2NC
Slow action (Zb)

Z02: 2NC
Snap action (Zb)

W03: 3NC
Slow action (Zb)

W20: 2NO
Slow action (Zb)

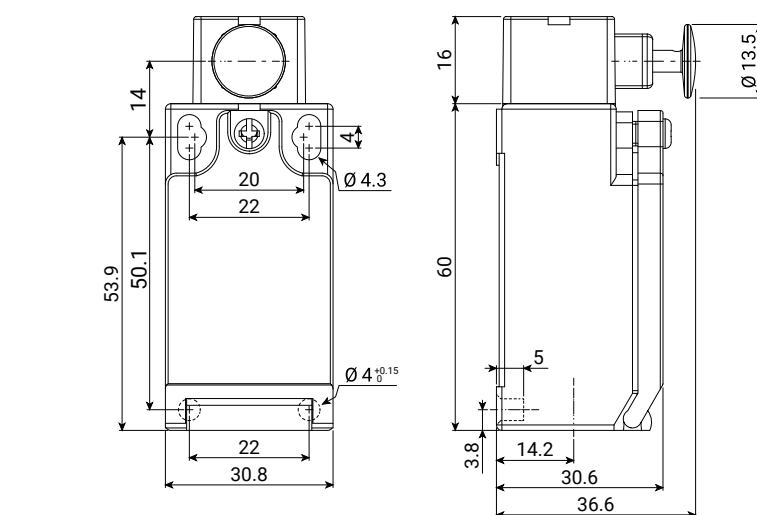
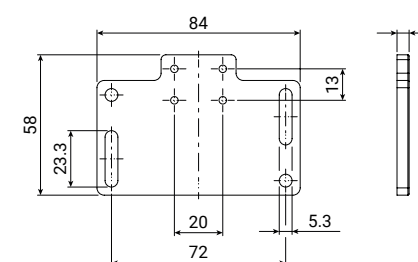
→ Not suitable for safety applications!

E - BODY

The body complies with EN 50047, with a distance of 20/22 mm between the fixing holes.

It is available a fixing plate with slots to adjust the operating point, developed for backward compatibility with old products. The plate is sold in kits (code: **KIT-FTN**) comprising:

- 1 plate;
- 2 self-tapping screws 4 × 28 mm;
- 2 washers Ø4 mm.



In order to provide more fixing stability, it is possible to use the basic holes of the device with dowel insertion.

F - COVER

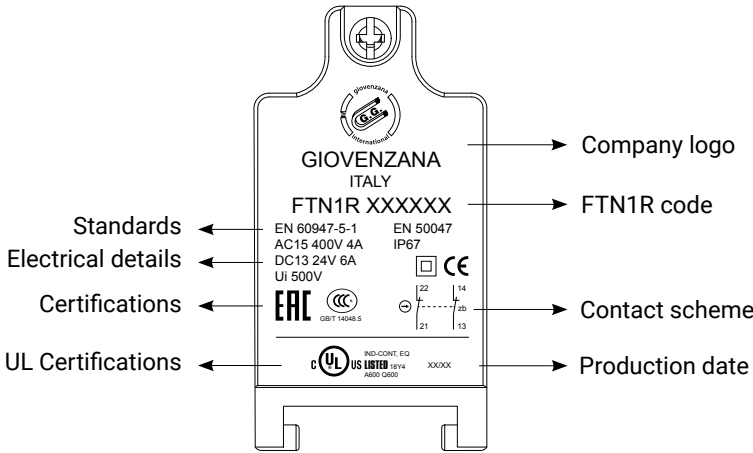
Material conforming to the RoHS Directive.

The lid is laser marked to ensure branding, coding and information on product specifications such as technical data, production date, stock or lot number, revision or control date. Lasering ensures the complete traceability of our products and components and is essential for compliance with ISO quality standards.

Some of the advantages:

- clear and precise text legibility;
- guaranteed lifetime unlike ink which deteriorates over time.

The switch cover can be opened by loosening the screw. The hinge at the bottom ensures a useful opening for easy maintenance and easy wiring, without having to completely remove the lid.



G - CABLE INPUT/OUTPUT

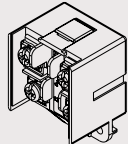
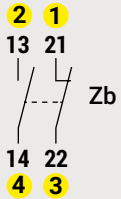
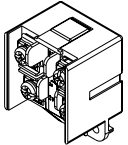
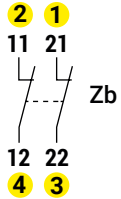
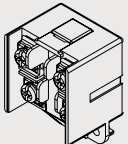
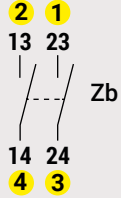
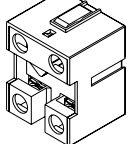
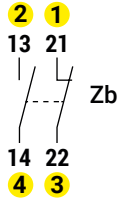
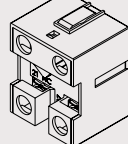
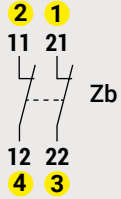
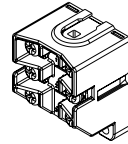
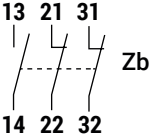
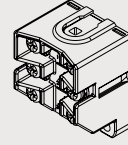
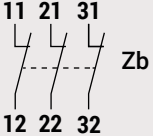
A threaded cable input/output is provided at the bottom of the switch.

6 standard and customised cable input/output models are available in order to cover the major international markets.

Standard: Blank: M16 × 1.5

On request: M: M20 × 1.5
 N: 1/2" NPT
 G1: Pg 11
 G3: Pg 13.5
 C: M12 connector

CONTACT ELEMENT - SPECIFICATIONS

CONTACT CODE	CONTACT TYPE	ELECTRICAL SCHEME	CONNECTOR PIN ARRANGEMENT
X11 	1NO+1NC Slow action Zb 		
W02 	2NC Slow action Zb 		
W20 	2NO Slow action Zb Not suitable for safety applications!		
Z11 	1NO+1NC Snap action Zb 		
Z02 	2NC Snap action Zb 		
W12 	1NO+2NC Slow action Zb 		No connector
W03 	3NC Slow action Zb 		No connector

CONTACT ELEMENT - OPERATING PRINCIPLE

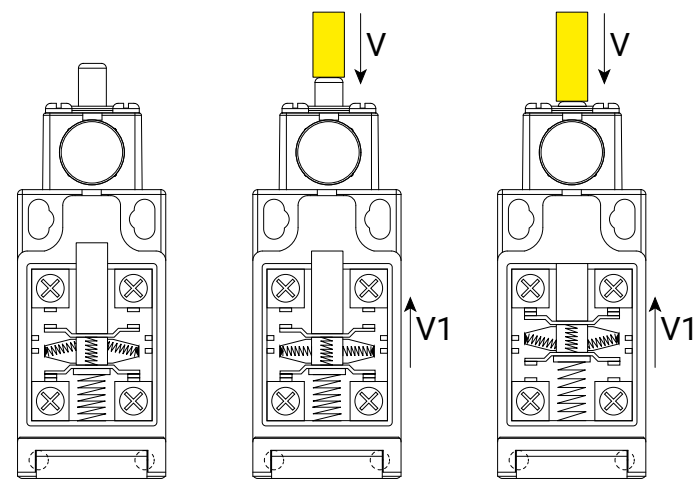
SLOW ACTION - Contact elements direct acting

Slow-acting contact blocks are characterised by identical switching and resetting points (no differential travel).

The contact movement speed (V1) is equal or proportional to the actuator speed (V).

This type of contact is suitable for fast movements.

The opening distance depends on the distance travelled by the operator.



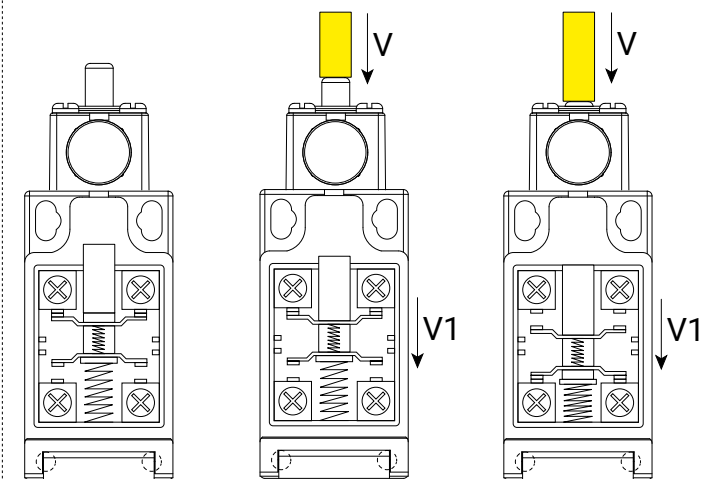
SNAP ACTION - Contact elements acting independently

Snap-action contact blocks are characterised by non-coincident switching and resetting points (differential travel).

The speed of the contact movement (V1) is not linked to the speed of the actuator (V).

This type of contact is also suitable for slow movements.

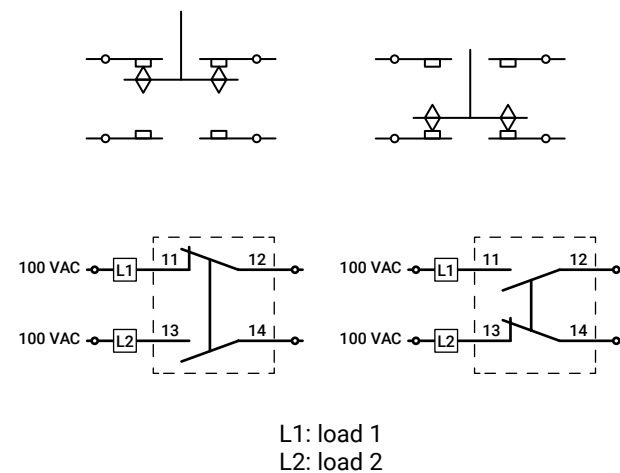
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



CONTACT ELEMENT - CLASSIFICATION (ACCORDING EN 60947-5-1)

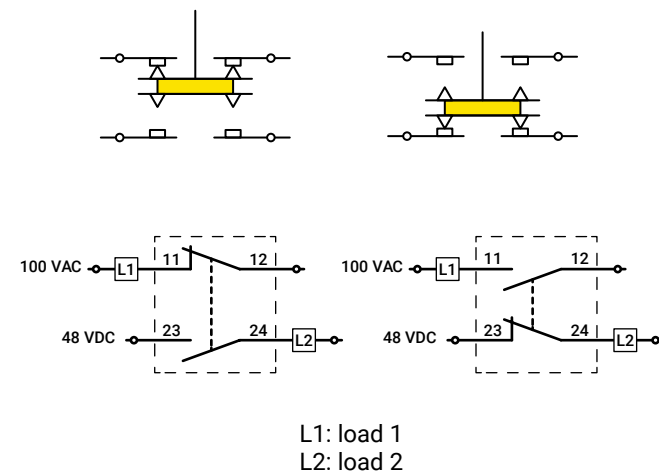
Za contact type

A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



Zb contact type

In this case there are two blades that open and close the contact. The two blades are electrically isolated from each other. Therefore, with this type of contact it is possible to supply the circuit with different voltages and polarities.

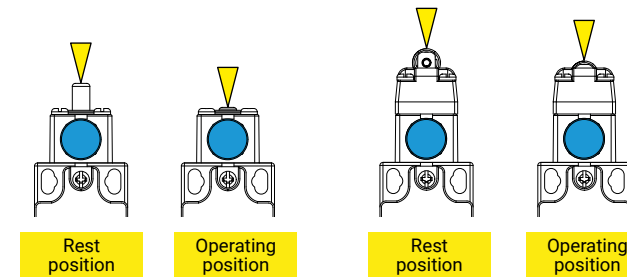


FTN1R series of thermoplastic limit switches with manual reset is equipped with Zb contacts.

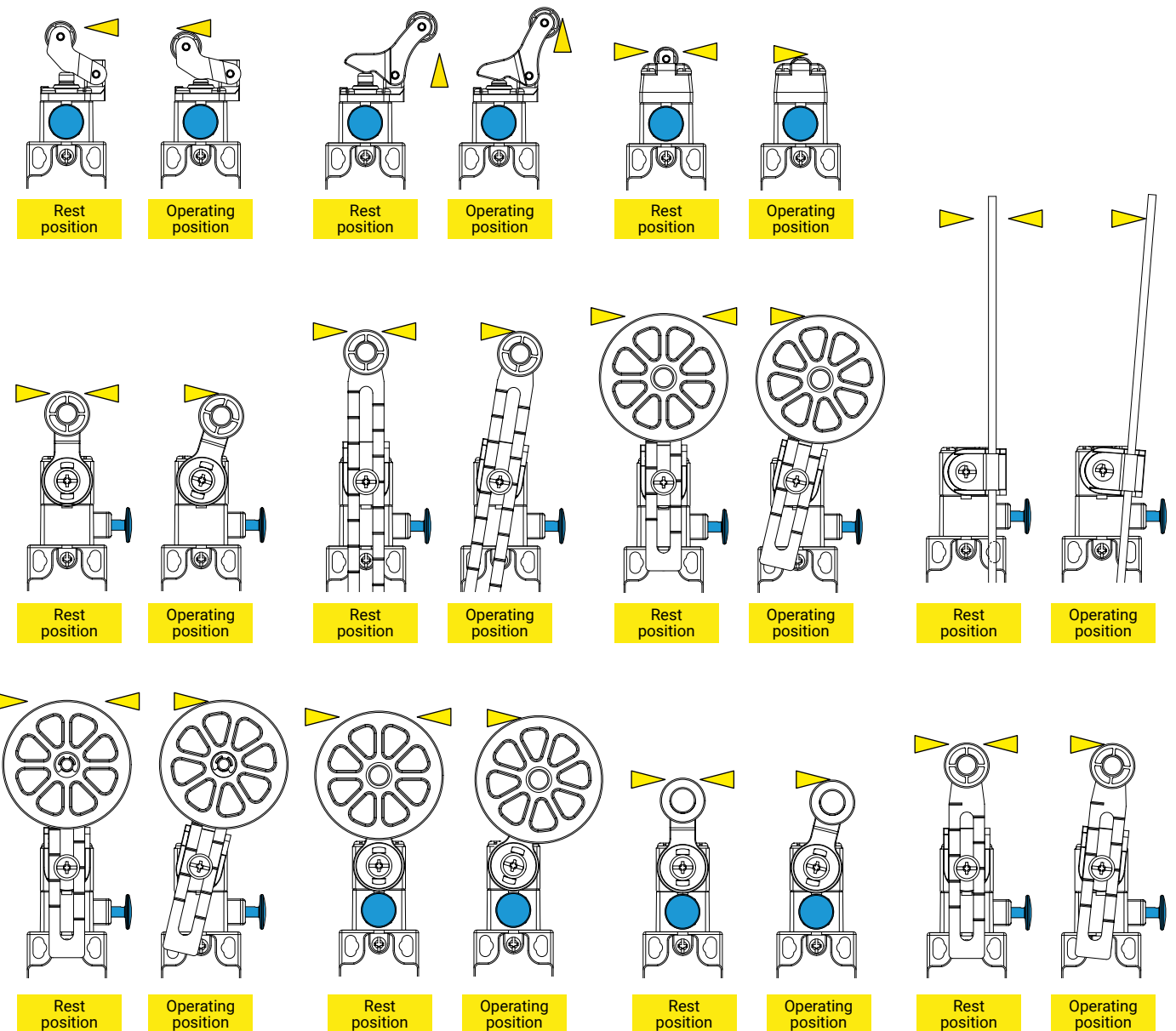
DETECTION MOVEMENTS

Limit switches are used in all automated installations and also in a wide variety of other applications. They transmit data to the logic processing system regarding: presence/absence, passage, positioning and end of travel. They have different detection movements: linear and rotary.

1. Linear detection movement - Plunger



2. Rotary detection movement - Lever



FTN1R - PRODUCT SELECTION OVERVIEW

1 HEADS + ACTUATORS

31 32 33 34 37 38

39 40 40R 41

40 40R

2 CONTACT BLOCKS

X11 1NO+1NC - slow action (Zb)

Z11 1NO+1NC - snap action (Zb)

W02 2NC - slow action (Zb)

Z02 2NC - snap action (Zb)

W20 2NO - slow action (Zb)
Not suitable for safety applications!

W12 1NO+2NC - slow action (Zb)

W03 3NC - slow action (Zb)

3 CONDUIT ENTRY

Threaded conduit entry

Standard:
M16 × 1.5

On request:
M20 × 1.5
1/2" NPT
PG11
PG13.5
With connector

CONTACT TYPES			CATEGORIES RATINGS	
X11	1NO+1NC	slow action (Zb)	A600	AC15: 400 V - 4 A
W02	2NC		Q600	
Z11	1NO+1NC	snap action (Zb)	B600	DC13: 24V - 6 A
Z02	2NC		Q600	
W12	1NO+2NC	slow action (Zb)	A300	
W03	3NC		Q300	

FTN1R - CODE SELECTION OVERVIEW

F	T	N	1	R	3	1			X	1	1		
SERIES			FUNCTION		ACTUATOR				CONTACT TYPE		CONDUIT ENTRY		
FTN			1R		31				X11		standard		
thermoplastic limit switches			with manual reset		plastic end plunger				1NO+1NC slow action Zb		blank M16 × 1.5		
					32				W02		on request		
					33				Z02		M M20 × 1.5		
					34				W12		N 1/2" NPT		
					37				Z02		G1 PG11		
					38				W03		G3 PG13.5		
					39						C male connector "A" M12 × 1		
					40R								
					41								
					43								
					44								

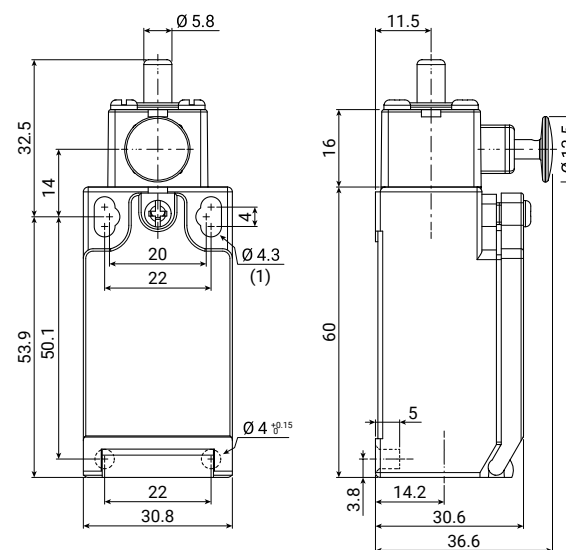
FTN1R31

Limit switch with plastic end plunger and manual reset
IP67



FTN series		1R function		31 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1R	with manual reset function	31	plastic end plunger	X11: 1NO+1NC W02: 2NC Z02: 2NC W12: 1NO+2NC W03: 3NC	slow action (Zb) snap action (Zb) slow action (Zb)	blank M N G1 G3 C	M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type		categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
				PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)		
X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	A600-Q600	AC15: 400V - 4A	2.4 mm	3.4 mm	7.5 N	3.1 mm	22 N	4.0 mm	6.0 mm
				2.4 mm	-	7.5 N	3.1 mm	22 N		
				2.4 mm	-	9.5 N	-	-		
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	2.0 mm	1.0 mm	8.5 N	4.4 mm	16.5 N		
				2.0 mm	0.8 mm	8.5 N	4.4 mm	16.5 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		2.3 mm	3.0 mm	7.5 N	3.0 mm	23 N		
				2.3 mm	-	7.5 N	3.0 mm	23 N		

FTN1R32

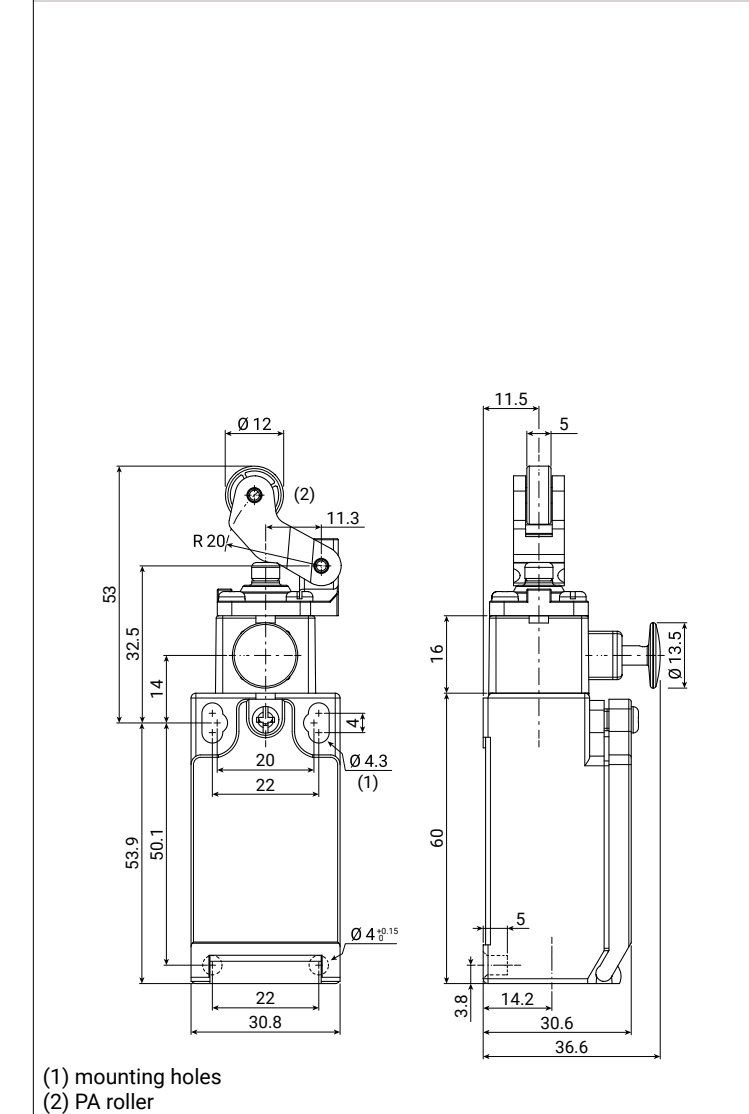
Limit switch with PA roller lever plunger, horizontal action and manual reset

IP67



FTN series		1R function		32 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1R	with manual reset function	32	PA roller lever plunger, horizontal action	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)
						W02: 2NC			
						W20: 2NO	snap action (Zb)	M	M20 × 1.5
						Z11: 1NO+1NC			
						Z02: 2NC	slow action (Zb)	G1	PG11
						W12: 1NO+2NC		G3	PG13.5
						W03: 3NC		C	male connector "A"
									M12 × 1

technical drawing - sizes in mm



contact type		categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
				PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)		
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	3.5 mm	5.0 mm	5.3 N	7.5 mm	13.5 N	5.7 mm	9.0 mm
				3.5 mm	-	5.3 N	7.5 mm	13.5 N		
				3.5 mm	-	7.2 N	-	-		
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	2.7 mm	1.3 mm	5.9 N	6.6 mm	10.8 N		
Z02: 2NC				2.7 mm	1.1 mm	5.9 N	6.6 mm	10.8 N		
W12: 1NO+2NC	slow action (Zb)	A300-Q300		3.5 mm	4.5 mm	5.3 N	8.8 mm	15 N		
W03: 3NC				3.5 mm	-	5.3 N	8.8 mm	15 N		

FTN1R33

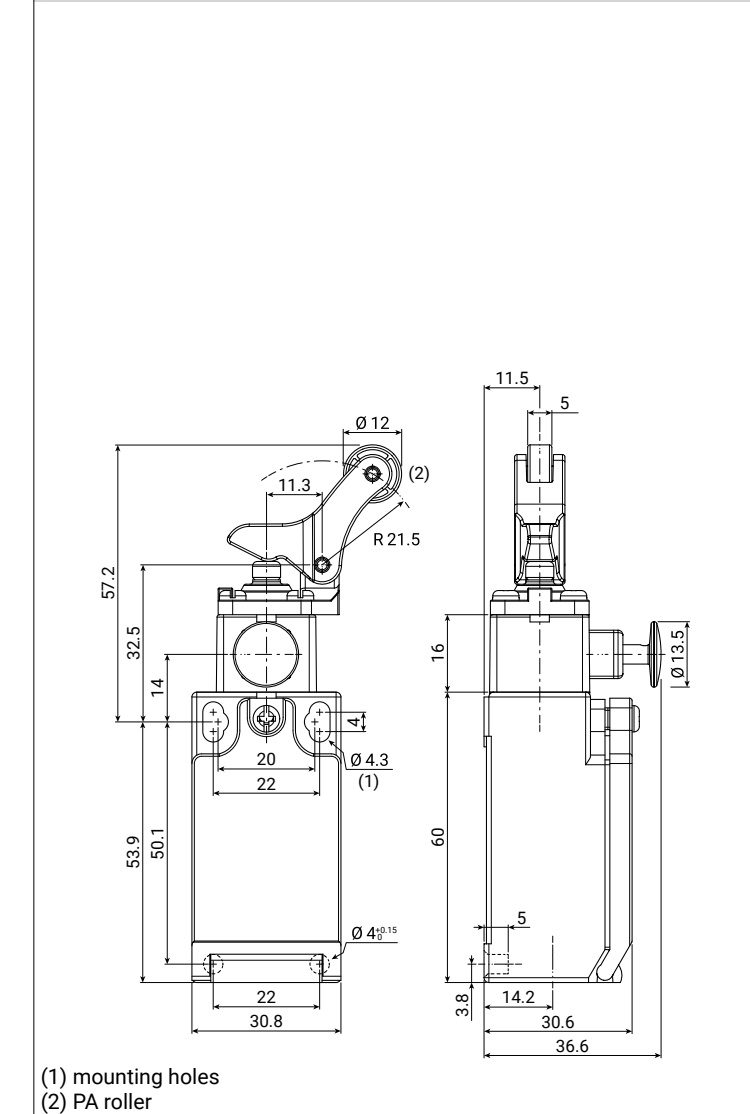
Limit switch with PA roller lever plunger, vertical action and manual reset

IP67



FTN series		1R function		33 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1R	with manual reset function	33	PA roller lever plunger, vertical action	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)
						W02: 2NC			
						W20: 2NO	snap action (Zb)	M	M20 × 1.5
						Z11: 1NO+1NC			
						Z02: 2NC	slow action (Zb)	G1	PG11
						W12: 1NO+2NC		G3	PG13.5
						W03: 3NC		C	male connector "A"
									M12 × 1

technical drawing - sizes in mm



contact type		categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
				PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)		
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	4.0 mm	6.0 mm	6.4 N	5.0 mm	15 N	6.8 mm	9.5 mm
				4.0 mm	-	7.0 N	5.0 mm	15 N		
				3.0 mm	-	5.8 N	-	-		
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	3.3 mm	1.6 mm	5.0 N	7.7 mm	10 N		
Z02: 2NC				3.3 mm	1.4 mm	5.0 N	7.7 mm	10 N		
W12: 1NO+2NC	slow action (Zb)	A300-Q300		4.0 mm	6.0 mm	6.4 N	5.3 mm	17 N		
W03: 3NC				4.0 mm	-	6.5 N	5.3 mm	17 N		

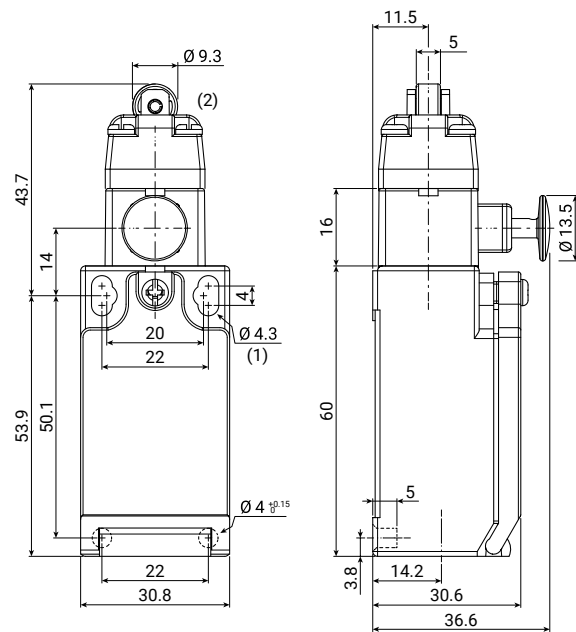
FTN1R34

Limit switch with PA roller plunger and manual reset
IP67



FTN series	1R function	34 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1R with manual reset function	34 PA roller plunger	
			X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	snap action (Zb)
			W12: 1NO+2NC W03: 3NC	slow action (Zb)
				blank M N G1 G3 C
				M16 x 1.5 (standard) M20 x 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 x 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

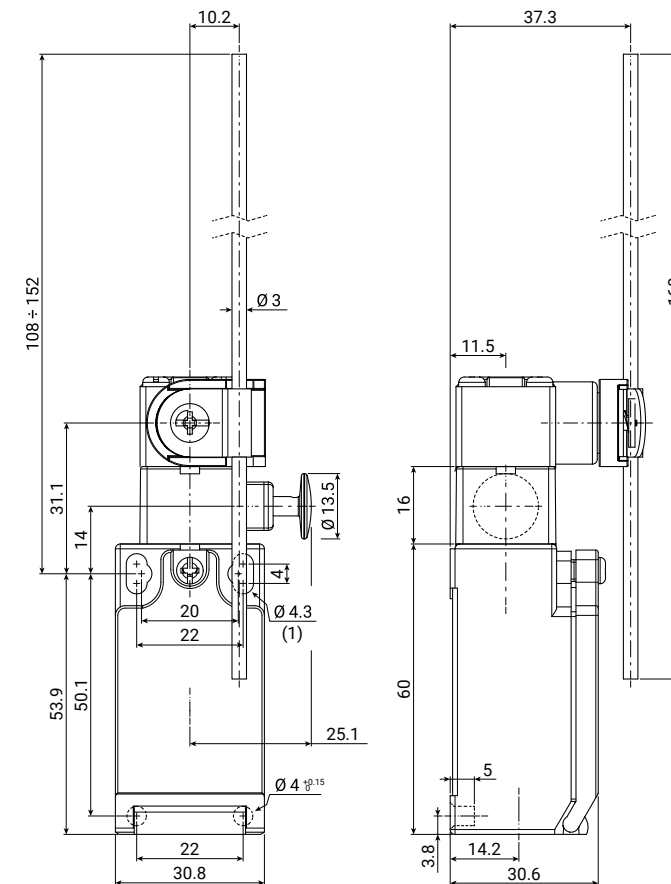
FTN1R37

Limit switch with adjustable metal rod lever and manual reset
IP67



FTN series	1R function	37 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1R with manual reset function	37 adjustable metal rod lever	
			X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	snap action (Zb)
			W12: 1NO+2NC W03: 3NC	slow action (Zb)
				blank M N G1 G3 C
				M16 x 1.5 (standard) M20 x 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 x 1

technical drawing - sizes in mm



(1) mounting holes

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
			PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	LT	TT
X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	A600-Q600	AC15: 400V - 4A	2.4 mm - 2.4 mm	7.5 N 7.5 N 9.5 N	3.1 mm 3.1 mm -	22 N 22 N -	4.0 mm	6.0 mm
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	2.0 mm 2.0 mm	8.5 N 8.5 N	4.4 mm 4.4 mm	16.5 N 16.5 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		2.3 mm 2.3 mm	7.5 N 7.5 N	3.0 mm 3.0 mm	23 N 23 N		
				-	-	-	-		

contact type	categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
			PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	LT	TT
X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	A600-Q600	AC15: 400V - 4A	35° 35° 35°	50° - - 1.8 N 1.8 N 1.8 N	45° 45° -	6 N 6 N -	55°	80°
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	35° 35°	9° 4° 5.9 N 5.9 N	60° 64°	5.5 N 5.5 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		32° 32°	40° - 1.8 N 1.8 N	45° 45°	5.4 N 5.4 N		
				-	-	-	-		

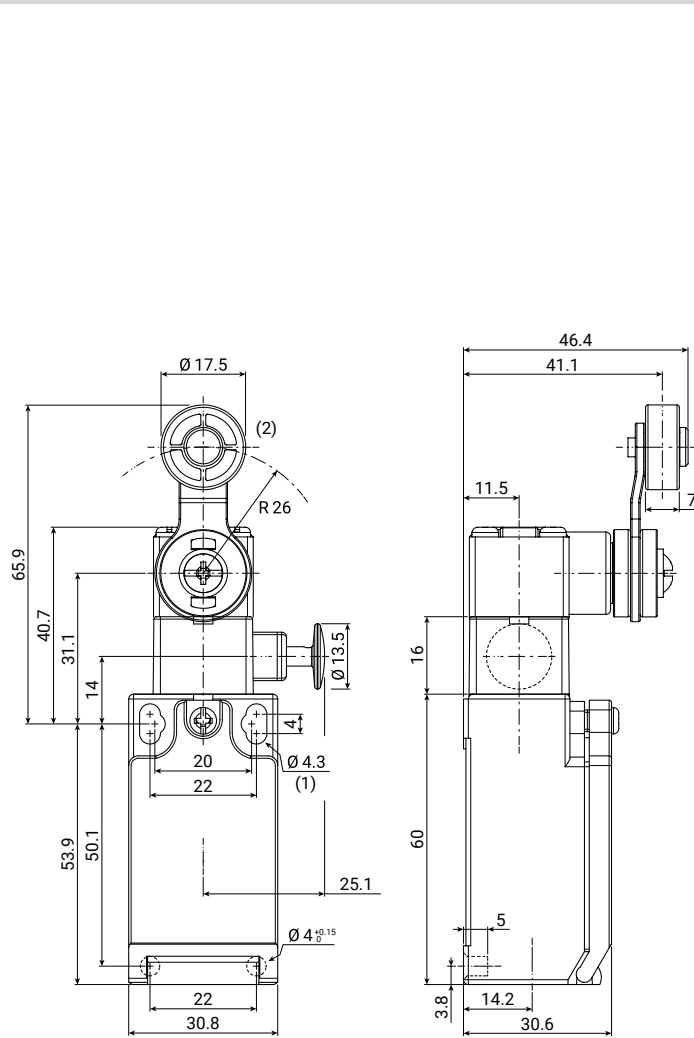
FTN1R38

Limit switch with Ø18 PA roller lever and manual reset
IP67



FTN series	1R function	38 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1R with manual reset function	38 Ø18 PA roller lever	
			X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	snap action (Zb)
			W12: 1NO+2NC W03: 3NC	slow action (Zb)
				blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)		
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	35°	50°	6.5 N	45°	6 N		
			35°	-	6.5 N	45°	6 N		
			35°	-	6.5 N	-	-		
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	35°	9°	5.9 N	60°	5.5 N	55°	80°
			35°	4°	5.9 N	64°	5.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300		32°	40°	6.5 N	45°	5.4 N		
			32°	-	6.5 N	45°	5.4 N		

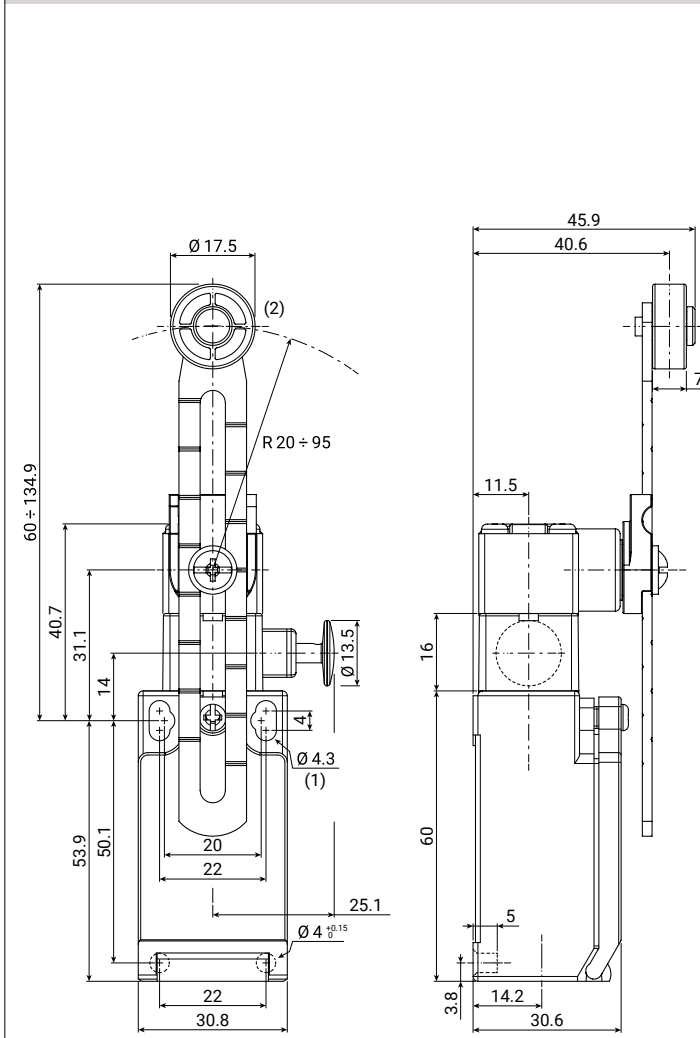
FTN1R39

Limit switch with Ø18 PA roller lever with variable length and manual reset
IP67



FTN series	1R function	39 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1R with manual reset function	39 Ø18 PA roller lever with variable length	
			X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	snap action (Zb)
			W12: 1NO+2NC W03: 3NC	slow action (Zb)
				blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)		
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	35°	50°	6.5 N	45°	6 N		
			35°	-	6.5 N	45°	6 N		
			35°	-	6.5 N	-	-		
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	35°	9°	5.9 N	60°	5.5 N	55°	80°
			35°	4°	5.9 N	64°	5.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300		32°	40°	6.5 N	45°	5.4 N		
			32°	-	6.5 N	45°	5.4 N		

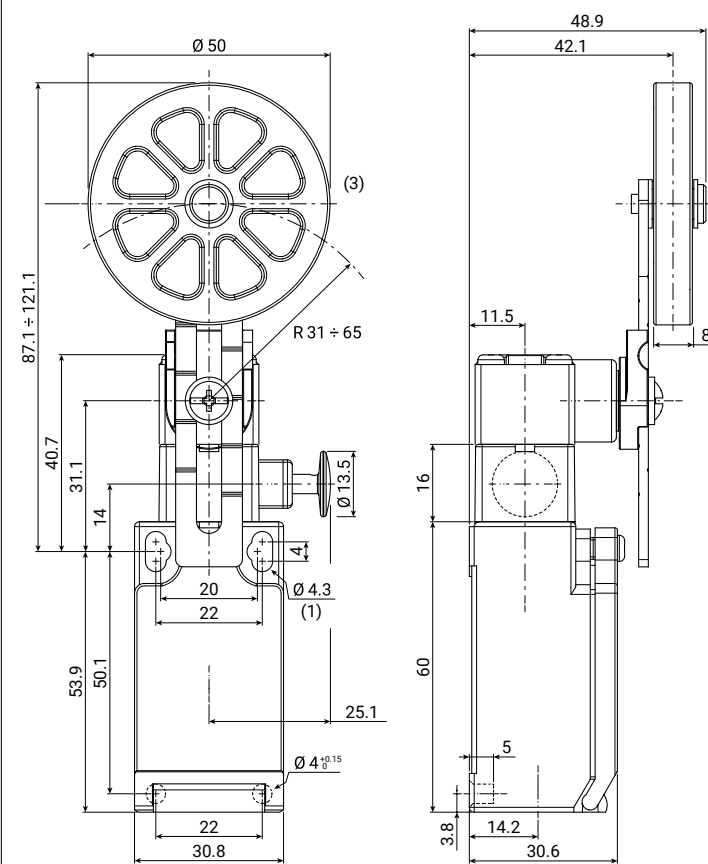
FTN1R40

**Limit switch with Ø50 rubber roller lever with variable length and manual reset
IP67**



FTN		1R		40		XXX		XX	
series		function		actuator		contact type		conduit entry	
FTN	thermoplastic limit switch	1R	with manual reset function	40	Ø50 rubber roller lever with variable length	X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	blank M N	M16 × 1.5 (standard) M20 × 1.5 1/2" NPT
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	G1 G3	PG11 PG13.5
						W12: 1NO+2NC W03: 3NC	slow action (Zb)	C	male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

technical drawing - sizes in mm

(1) mounting holes
(3) rubber roller

contact type

X11
1NO+1NC
slow action
(Zb)

W02
2NC
slow action
(Zb)

W20
2NO
slow action
(Zb)

Z11
1NO+1NC
snap action
(Zb)

Z02
2NC
snap action
(Zb)

W12
1NO+2NC
slow action
(Zb)

W03
3NC
slow action
(Zb)

operation diagrams

contact type		categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	LT	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	35°	50°	6.5 N	45°	6 N	55°	80°
W02: 2NC				35°	-	6.5 N	45°	6 N		
W20: 2NO				35°	-	6.5 N	-	-		
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13:	35°	9°	5.9 N	60°	5.5 N	55°	80°
Z02: 2NC				35°	4°	5.9 N	64°	5.5 N		
W12: 1NO+2NC	slow action (Zb)	A300-Q300	24V - 6A	32°	40°	6.5 N	45°	5.4 N	55°	80°
W03: 3NC				32°	-	6.5 N	45°	5.4 N		

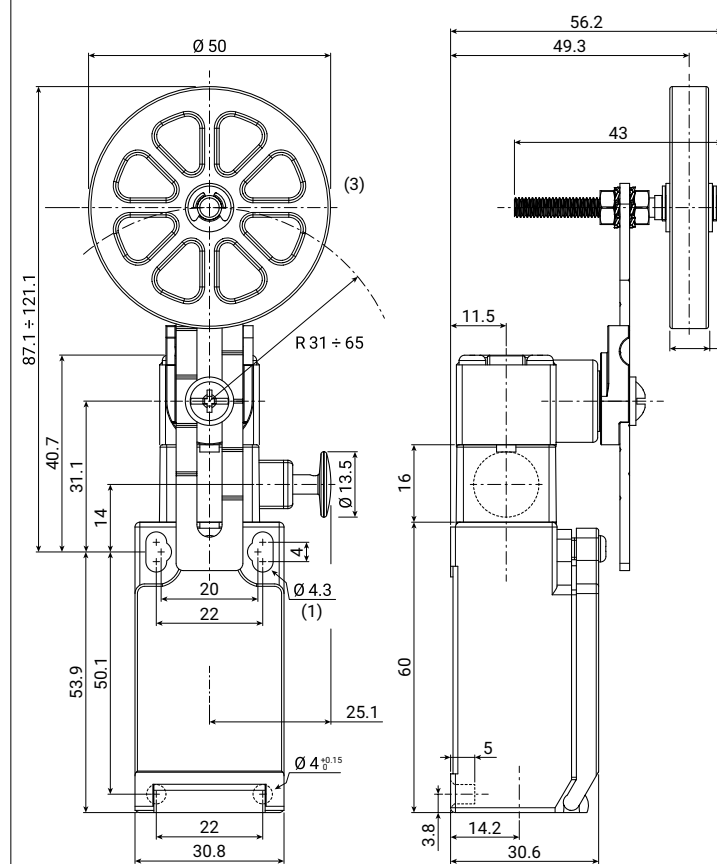
FTN1R40R

**Limit switch with Ø50 rubber roller lever with variable length, overhang and manual reset
IP67**



FTN		1R		40R		XXX		XX			
series		function		actuator		contact type		conduit entry			
FTN	thermoplastic limit switch	1R	with manual reset function	40R	Ø50 rubber roller lever with variable length and overhang	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)		
						W02: 2NC					
						W20: 2NO	snap action (Zb)			M	M20 × 1.5
						Z11: 1NO+1NC				G1	PG11
						Z02: 2NC	slow action (Zb)	G3	PG13.5		
						W12: 1NO+2NC			C	male connector "A"	
						W03: 3NC			M12 × 1		

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

technical drawing - sizes in mm

Technical drawing of the 1300 series door closer, showing front and side views with dimensions in mm.

Front View Dimensions:

- Overall width: $\varnothing 50$
- Overall height: $87.1 \div 121.1$
- Mounting hole spacing: 40.7
- Distance from top to mounting holes: 31.1
- Distance from mounting holes to bottom: 14
- Distance from bottom to base: 53.9
- Base width: 22
- Base mounting hole diameter: $\varnothing 4.3$ (1)
- Base mounting hole diameter: $\varnothing 4.3^{+0.15}_{-0}$
- Base width: 30.8
- Distance from base to top of body: 25.1
- Radius: $R 31 \div 65$

Side View Dimensions:

- Overall height: 56.2
- Distance from top to mounting holes: 49.3
- Mounting hole diameter: 43
- Distance from mounting holes to base: 11.5
- Base height: 16
- Base width: 60
- Base mounting hole diameter: 5
- Base width: 14.2
- Base width: 30.6
- Base height: 3.8

(1) mounting holes
(3) rubber roller

contact type

X11
1NO+1NC
slow action
(Zb)

Timing diagram for X11 contact type. The diagram shows a sequence of events: 45° min, 35° max, 35° max, 80° min, 50° max, 50° max. The sequence is labeled 21-22, 13-14, 50° max, 50° max.

13 21
14 22
Zb

W02
2NC
slow action
(Zb)

Timing diagram for W02 contact type. The diagram shows a sequence of events: 45° min, 35° max, 35° max, 80° min, 35° max, 35° max. The sequence is labeled 21-22, 11-12, 35° max, 35° max.

11 21
12 22
Zb

W20
2NO
slow action
(Zb)

Timing diagram for W20 contact type. The diagram shows a sequence of events: 80° min, 35° max, 35° max, 80° min, 35° max, 35° max. The sequence is labeled 23-24, 13-14, 35° max, 35° max.

13 23
14 24
Zb

Z11
1NO+1NC
snap action
(Zb)

Timing diagram for Z11 contact type. The diagram shows a sequence of events: 60° min, 35° max, 35° max, 60° min, 9° max, 9° max. The sequence is labeled 21-22, 13-14, 21-22, 13-14, 9° max, 9° max.

13 21
14 22
Zb

Z02
2NC
snap action
(Zb)

Timing diagram for Z02 contact type. The diagram shows a sequence of events: 64° min, 35° max, 35° max, 64° min, 4° max, 4° max. The sequence is labeled 21-22, 11-12, 21-22, 11-12, 4° max, 4° max.

11 21
12 22
Zb

W12
1NO+2NC
slow action
(Zb)

Timing diagram for W12 contact type. The diagram shows a sequence of events: 45° min, 32° max, 32° max, 80° min, 40° max, 40° max. The sequence is labeled 31-32, 21-22, 13-14, 40° max, 40° max.

13 21 31
14 22 32
Zb

W03
3NC
slow action
(Zb)

Timing diagram for W03 contact type. The diagram shows a sequence of events: 45° min, 32° max, 32° max, 80° min, 32° max, 32° max. The sequence is labeled 31-32, 21-22, 11-12, 32° max, 32° max.

11 21 31
12 22 32
Zb

contact type		categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	LT	TT
X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	A600-Q600	AC15: 400V - 4A	35°	50°	6.5 N	45°	6 N	55°	80°
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600		35°	-	6.5 N	45°	6 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		35°	-	6.5 N	-	-		
			DC13: 24V - 6A	35°	9°	5.9 N	60°	5.5 N		
				35°	4°	5.9 N	64°	5.5 N		
				32°	40°	6.5 N	45°	5.4 N		
				32°	-	6.5 N	45°	5.4 N		

FTN1R44

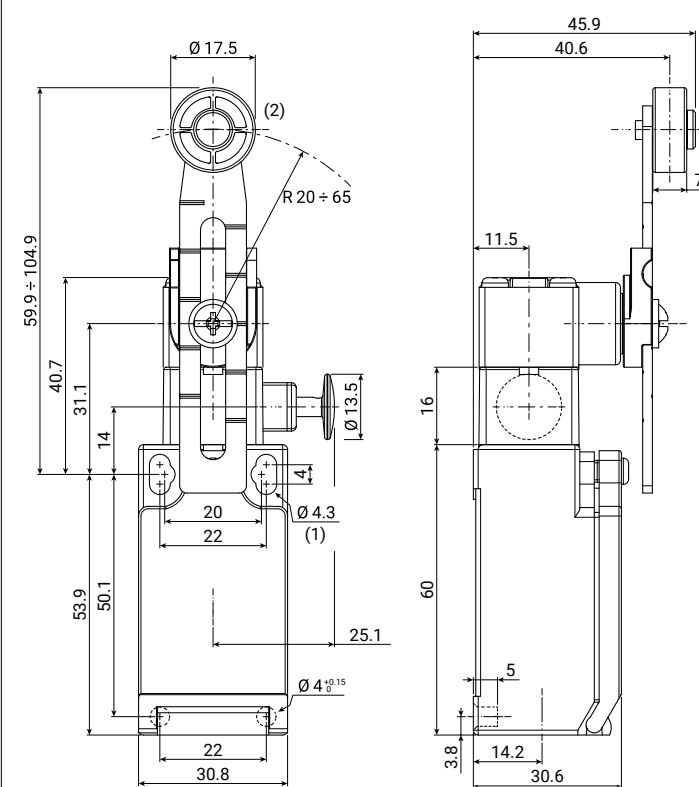
Limit switch with Ø18 PA roller lever with variable length and manual reset

IP67



FTN		1R		44		XXX		XX			
series		function		actuator		contact type		conduit entry			
FTN	thermoplastic limit switch	1R	with manual reset function	44	Ø18 PA roller lever with variable length	X11: 1NO+1NC	slow action (Zb)	blank	M16 × 1.5 (standard)		
						W02: 2NC					
						W20: 2NO	snap action (Zb)			M	M20 × 1.5
						Z11: 1NO+1NC					
Z02: 2NC	slow action (Zb)	N	1/2" NPT								
W12: 1NO+2NC											
W03: 3NC				G1	PG11						
						G3	PG13.5				
		C	male code "A"								
								M12 × 1 connector			

technical drawing - sizes in mm



(1) mounting holes

(2) PA roller

contact type

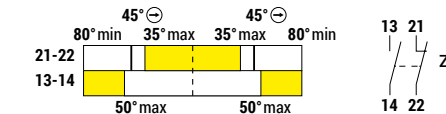
operation diagrams

X11

1NO+1NC

slow action

(Zb)

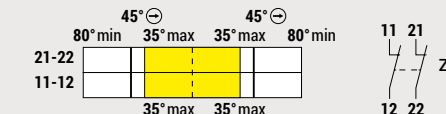


W02

2NC

slow action

(Zb)

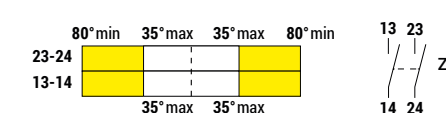


W20

2NO

slow action

(Zb)

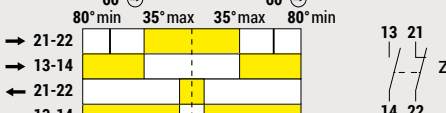


Z11

1NO+1NC

snap action

(Zb)

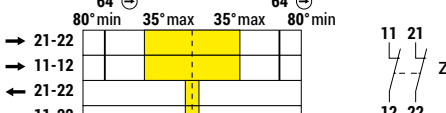


Z02

2NC

snap action

(Zb)

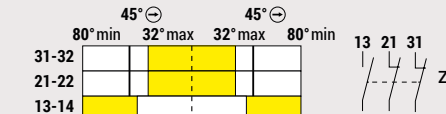


W12

1NO+2NC

slow action

(Zb)

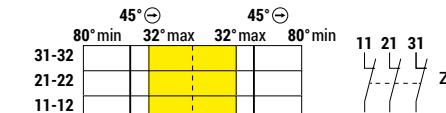


W03

3NC

slow action

(Zb)



contact type		categories	ratings	operational travel		operating force	positive opening		lock travel	total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	LT	TT
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	35°	50°	6.5 N	45°	6 N	55°	80°
				35°	-	6.5 N	45°	6 N		
				35°	-	6.5 N	-	-		
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	35°	9°	5.9 N	60°	5.5 N		
Z02: 2NC	snap action (Zb)	B600-Q600		35°	4°	5.9 N	64°	5.5 N		
W12: 1NO+2NC	slow action (Zb)	A300-Q300		32°	40°	6.5 N	45°	5.4 N		
W03: 3NC	slow action (Zb)	A300-Q300		32°	-	6.5 N	45°	5.4 N		



FTNG SERIES



The 40 mm **FTNG series** of thermoplastic limit switches conforms to EN 50041 and is designed to provide a wide range of switch variants (slow action or snap action basic switches) and a variety of actuating heads and levers suitable also suitable for safety applications.

The thermoplastic bodies have four fixing holes at a distance of 30 × 60 mm and a hole for the cable input/output at the bottom of the switch.

The maximum product versatility is guaranteed by the easy orientation of the actuator heads in 90° steps and the possibility of adjusting the levers every 18° for 360°.

They are particularly suitable **for heavy applications**, thanks to the solidity of the steel parts, head and lid fixed by threaded inserts and metric screws. The fixing is prepared for 4 M5 screws.

They are also suitable for use in the harshest environmental conditions with an **operating temperature range of -25°C to +80°C**.

All models in the series are **IP67-rated**.

The actuators are made of metal or thermoplastic material, while the case is made of thermoplastic glass-filled polybutylene terephthalate.

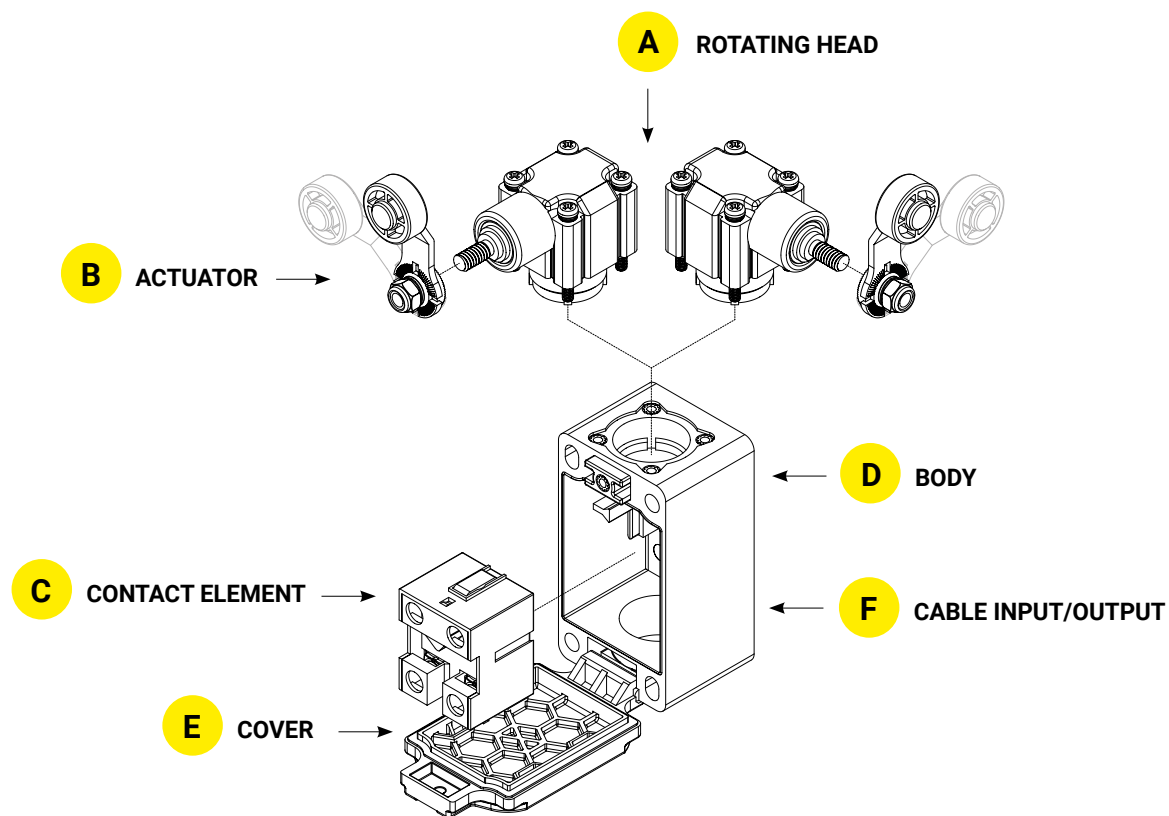
Giovenzana limit switches offer solutions for every need and are suitable for the most varied sectors of use.



SPECIFICATIONS

Standards		EN 60947-5-1, UL 508, EN 50041, EN 1088, EN 60204-1
Approvals		cULus, EAC, CCC, CE and UKCA marked for all applicable directives
Positive opening operation		NC contacts conforming to IEC /EN 60947-5-1 ☺
Minimum current		5 mA - 5 V DC
Thermal current	Ith	10 A
Rated insulation voltage	Ui	500 V
Rated impulse withstand voltage	Uimp	6 kV
Insulation resistance	min	100 MΩ (DC 500 V)
Contact resistance	max	25 mΩ (initial)
Switching speed	max	250 mm/s
Switching frequency	max	6000 operations per hour
Enclosure material		UL approved glass-filled polybutylene terephthalate
Enclosure protection		IP67
Operating temperature		-25 ... +80°C (-13 ... +176°F)
Pollution degree		3
Protection against electric shock		Class II (double Insulation) ☐ Double insulation makes ground terminal unnecessary
Electrical life expectancy	min	150.000 cycles
Mechanical life expectancy	min	1 × 10 ⁷ cycles
Vibration	IEC 68-2-6 excursion	10-55 Hz ± 1Hz 0.35 mm, 1 octave/min
Conduit entry		Various international conduit sizes (see product selection table pag. 75)
Fixing		4 × M5 screws

STRUCTURE DESCRIPTION

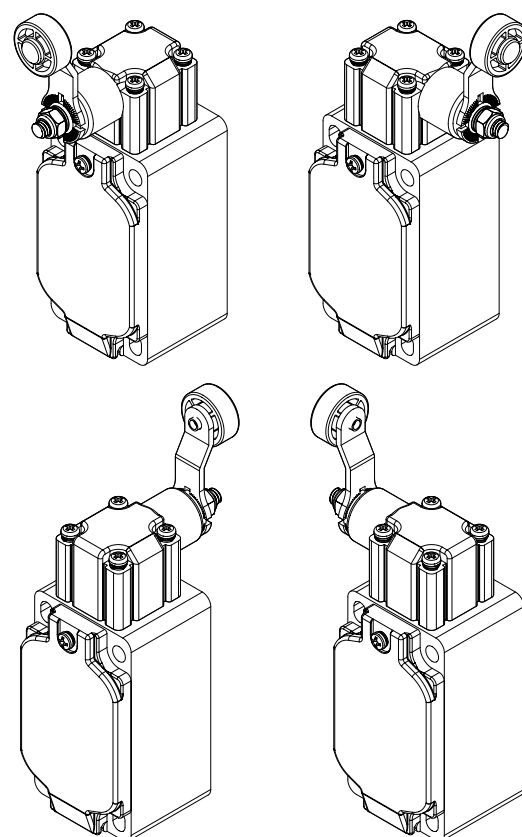


A - ROTATING HEAD

The heads are made of UL approved glass-filled polybutylene terephthalate.

All heads can be adjusted in steps of 90° over 360°, compared to the body.

The direction of the switch head can be varied in one of four directions by loosening the screws at the four corners of the head.



B - ACTUATOR

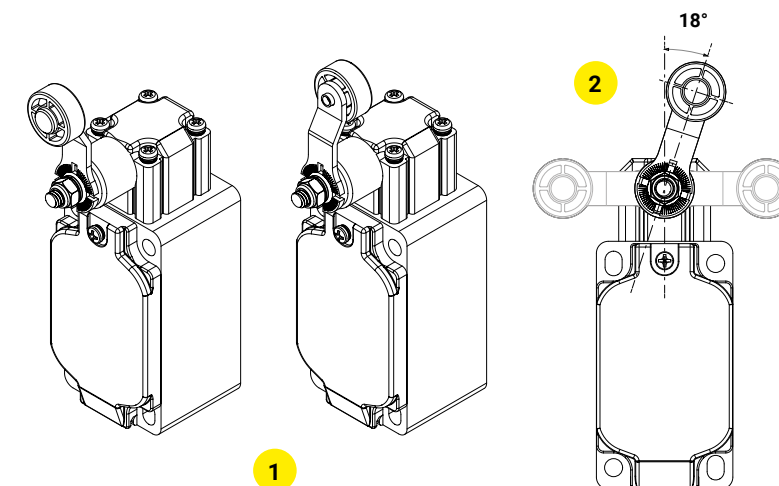
Available different types of actuators: plungers, levers, rollers and rods.

1. Tilting levers

Possibility to fix the lever on the observe or on the reverse, keeping the positive opening of the NC contact. In this way is possible to obtain two different lever work plans.

2. Adjustable levers

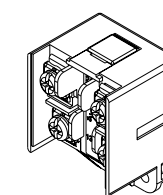
All levers are adjustable in steps of 18° over 360°, compared to the horizontal axis of the head. The positive movement transmission is always guaranteed thanks to the particular geometric coupling between the lever and the rotation shaft.



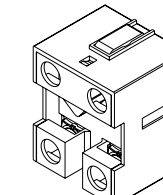
C - CONTACT ELEMENT

The integrated switch has a direct opening mechanism that forcibly separates the NC contact even in the event of accidental welding (overload, short circuit, etc.).

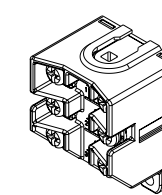
Different contact elements are available, both fast-acting and slow-acting, depending on the different application requirements.



X11: 1NO+1NC
Slow action (Zb)



Z11: 1NO+1NC
Snap action (Zb)



W12: 1NO+2NC
Slow action (Zb)

W02: 2NC
Slow action (Zb)

Z02: 2NC
Snap action (Zb)

W03: 3NC
Slow action (Zb)

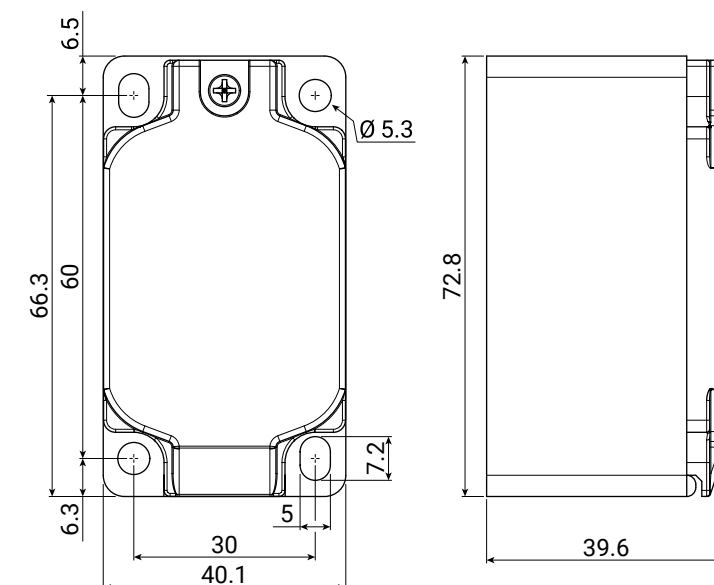
W20: 2NO
Slow action (Zb)

→ Not suitable for safety applications!

D - BODY

The body complies with EN 50041, with a distance of 30 × 60 mm between the fixing holes.

The FTNG series has the special feature of having 4 fixing holes to ensure better and more solid installation stability using M5 screws.



E - COVER

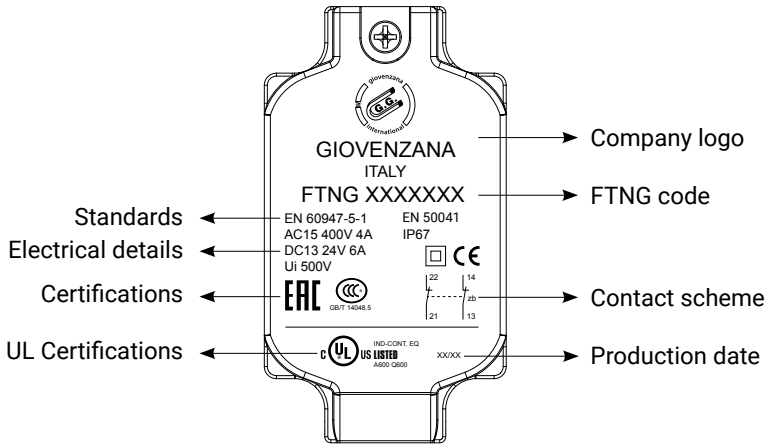
Material conforming to the RoHS Directive.

The lid is laser marked to ensure branding, coding and information on product specifications such as technical data, production date, stock or lot number, revision or control date. Lasering ensures the complete traceability of our products and components and is essential for compliance with ISO quality standards.

Some of the advantages:

- clear and precise text legibility;
- guaranteed lifetime unlike ink which deteriorates over time.

The switch cover can be opened by loosening the screw. The hinge at the bottom ensures a useful opening for easy maintenance and easy wiring, without having to completely remove the lid.



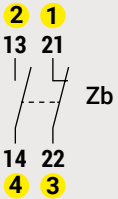
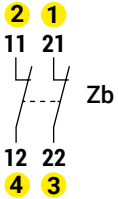
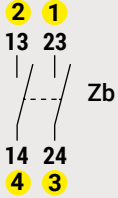
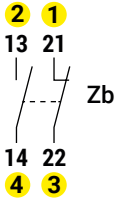
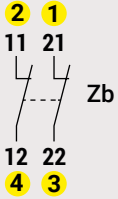
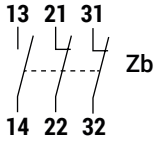
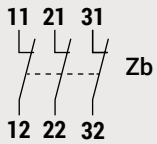
F - CABLE INPUT/OUTPUT

A threaded cable input/output is provided at the bottom of the switch.

Four standard and customised cable input/output models are available in order to cover the major international markets.

Standard: Blank: M20 × 1.5 On request: N: 1/2" NPT
 G3: Pg 13.5
 C: M12 connector

CONTACT ELEMENT - SPECIFICATIONS

CONTACT CODE	CONTACT TYPE	ELECTRICAL SCHEME	CONNECTOR PIN ARRANGEMENT
X11	1NO+1NC Slow action Zb		
W02	2NC Slow action Zb		
W20	2NO Slow action Zb Not suitable for safety applications!		
Z11	1NO+1NC Snap action Zb		
Z02	2NC Snap action Zb		
W12	1NO+2NC Slow action Zb		No connector
W03	3NC Slow action Zb		No connector

CONTACT ELEMENT - OPERATING PRINCIPLE

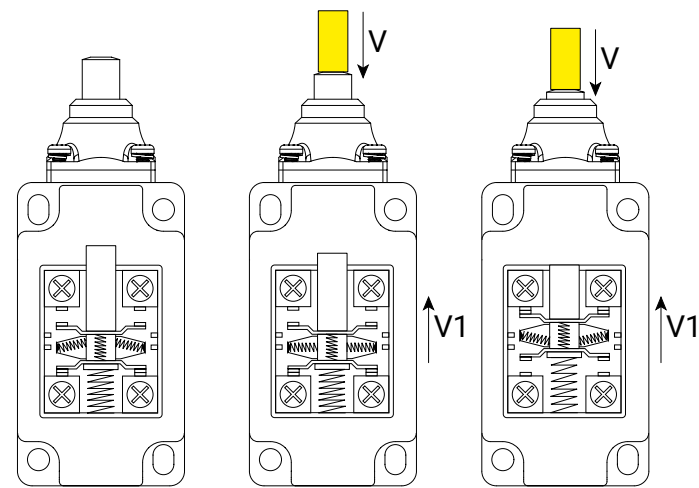
SLOW ACTION - Contact elements direct acting

Slow-acting contact blocks are characterised by identical switching and resetting points (no differential travel).

The contact movement speed (V_1) is equal or proportional to the actuator speed (V).

This type of contact is suitable for fast movements.

The opening distance depends on the distance travelled by the operator.



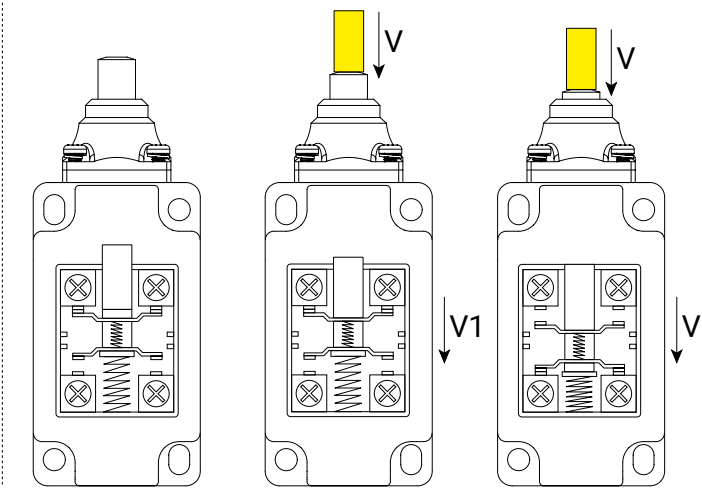
SNAP ACTION - Contact elements acting independently

Snap-action contact blocks are characterised by non-coincident switching and reset points (differential travel).

The speed of the contact movement (V_1) is not linked to the speed of the actuator (V).

This type of contact is also suitable for slow movements.

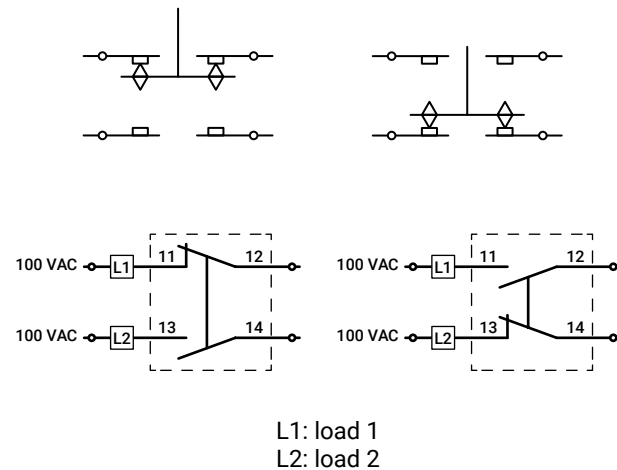
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



CONTACT ELEMENT - CLASSIFICATION (ACCORDING EN 60947-5-1)

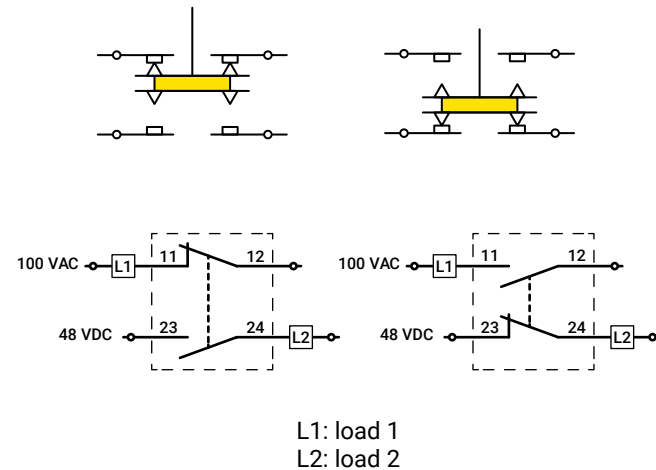
Za contact type

A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



Zb contact type

In this case there are two blades that open and close the contact. The two blades are electrically isolated from each other. Therefore, with this type of contact it is possible to supply the circuit with different voltages and polarities.

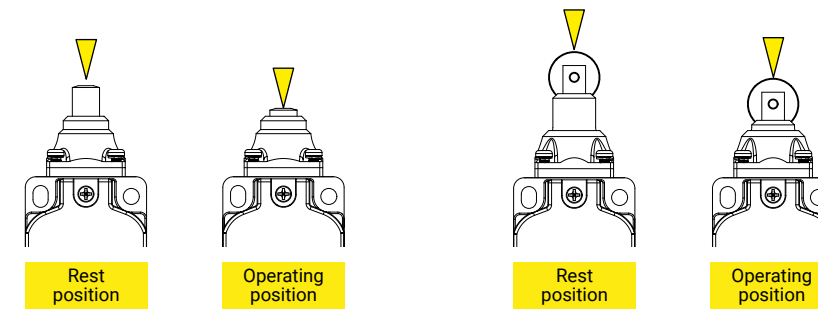


40 mm FTNG series of thermoplastic limit switches is equipped with Zb contacts.

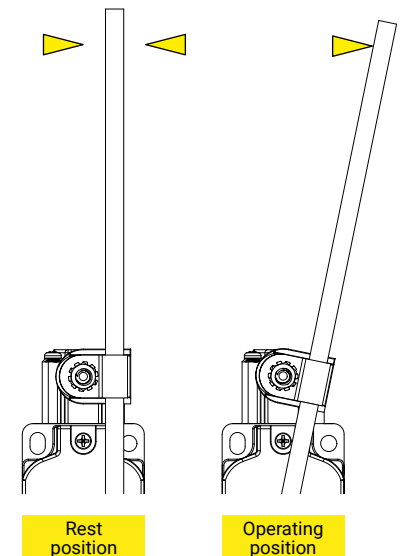
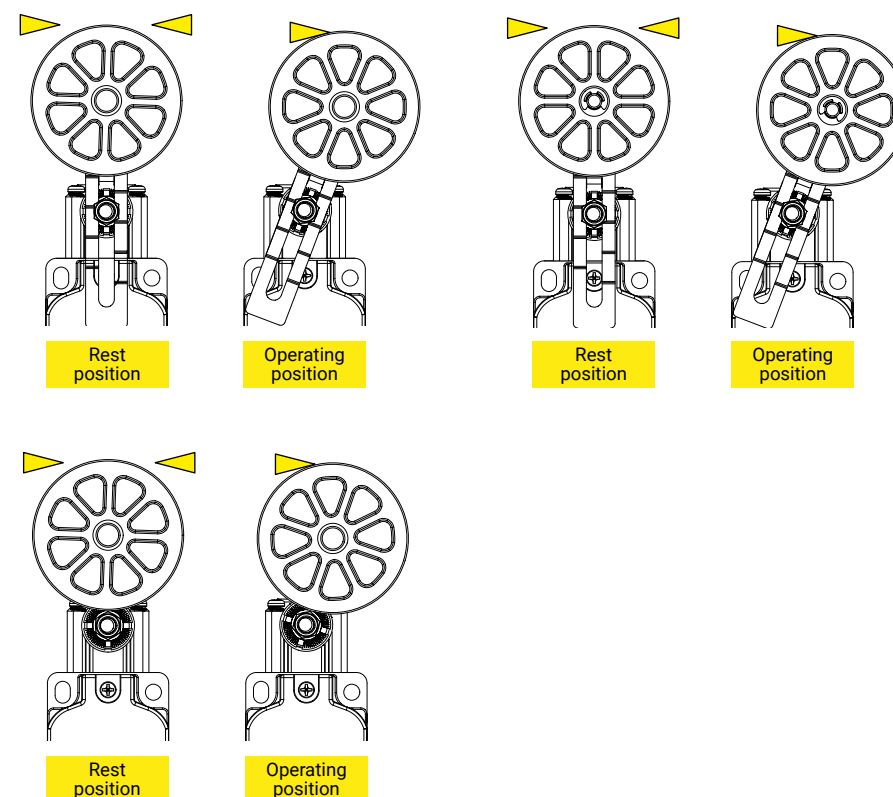
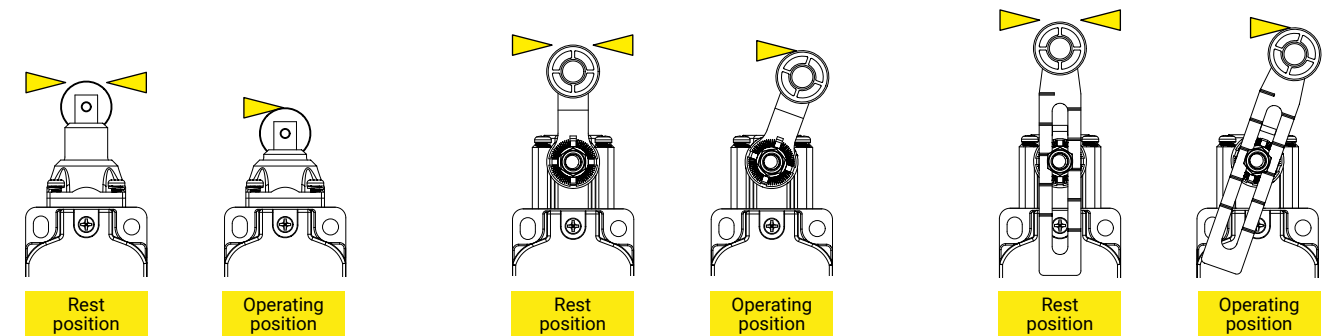
DETECTION MOVEMENTS

Limit switches are used in all automated installations and also in a wide variety of other applications. They transmit data to the logic processing system regarding: presence/absence, passage, positioning and end of travel. They have different detection movements: linear and rotary.

1. Linear detection movement - Plunger

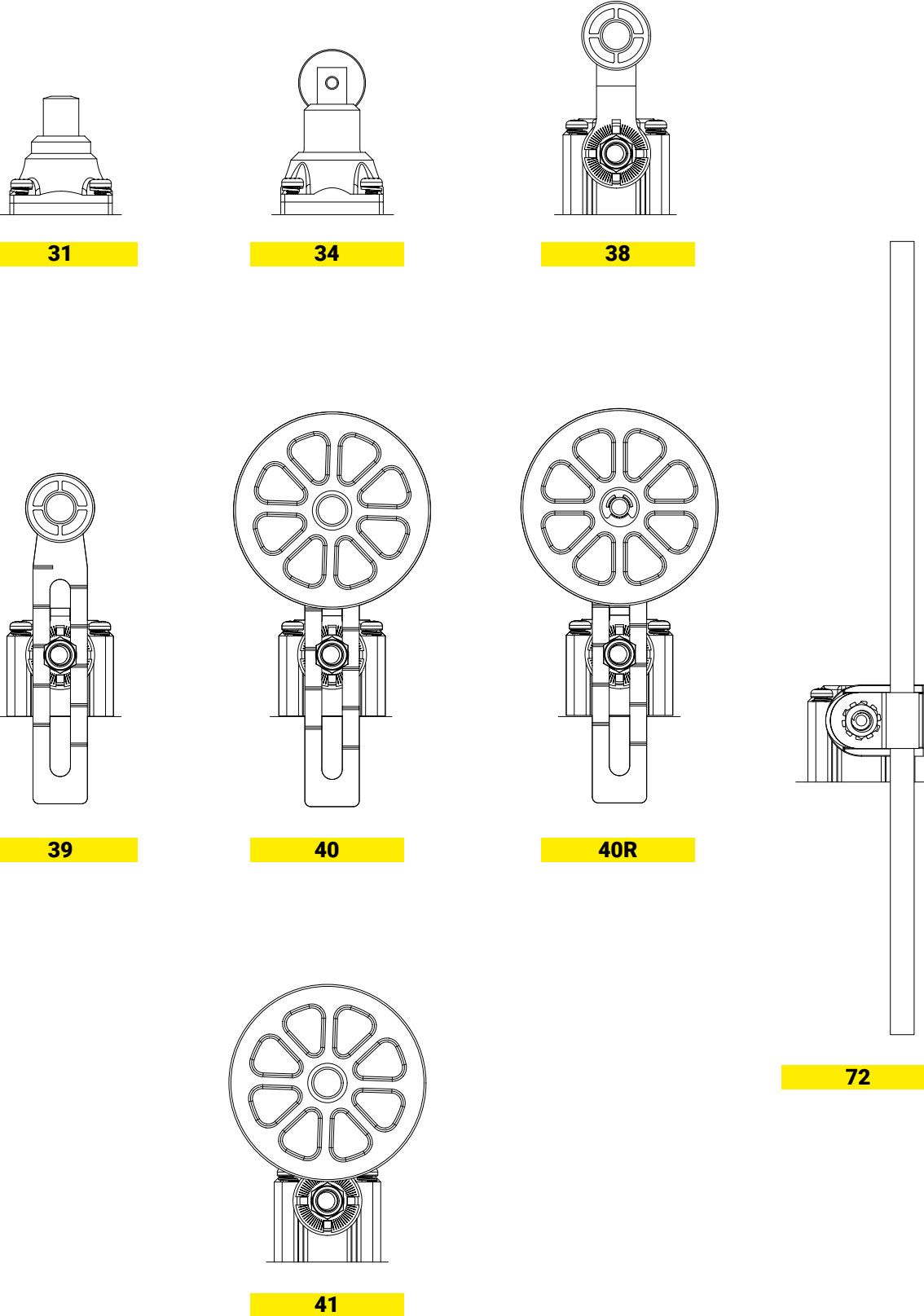


2. Rotary detection movement - Lever

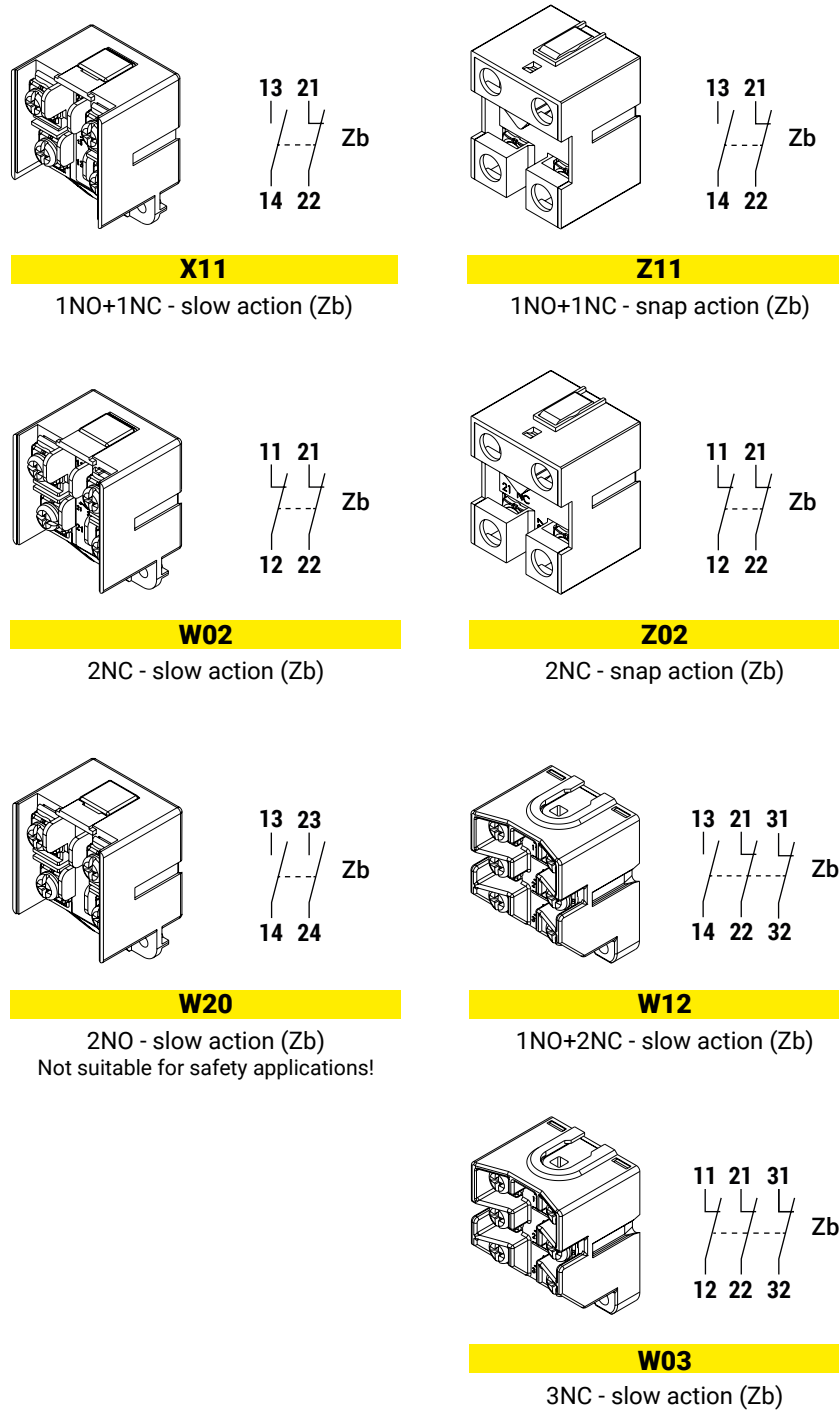


FTNG - PRODUCT SELECTION OVERVIEW

1 HEADS + ACTUATORS



2 CONTACT BLOCKS



3 CONDUIT ENTRY

Threaded conduit entry

Standard:
M20 × 1.5

On request:
1/2" NPT
PG13.5
With connector

CONTACT TYPES			CATEGORIES RATINGS	
X11	1NO+1NC	slow action (Zb)	A600	AC15: 400 V - 4 A
W02	2NC		Q600	
Z11	1NO+1NC	snap action (Zb)	B600	DC13: 24V - 6 A
Z02	2NC		Q600	
W12	1NO+2NC	slow action (Zb)	A300	
W03	3NC		Q300	

SAFETY INTEGRITY LEVEL ACCORDING TO IEC 61508

Safety Integrity Level (SIL) is the quantification of the reliability (or degree of reliability) achieved by any object that performs a safety-related function. The greater its reliability, the greater its ability to perform safety-critical functions or machine or plant availability. The determination of a SIL is based on quantitative and qualitative factors such as the development process and safety lifecycle management.

The FTNG series thermoplastic limit switches are SIL 3.

SIL³

FTNG - CODE SELECTION OVERVIEW

F T N G	1	3 1	X 1 1	
SERIES	FUNCTION	ACTUATOR	CONTACT TYPE	CONDUIT ENTRY
FTNG 40 mm thermoplastic limit switches for heavy applications	1 without reset	31 metal end plunger 34 steel roller plunger 38 Ø18 PA roller lever 39 Ø18 PA roller lever with variable length 40 Ø50 rubber roller lever with variable length 41 Ø50 rubber roller lever 72 adjustable PA rod lever	X11 1NO+1NC slow action Zb W02 2NC slow action Zb W20 2NO slow action Zb Z11 1NO+1NC snap action Zb Z02 2NC snap action Zb W12 1NO+2NC slow action Zb W03 3NC slow action Zb	<i>standard</i> blank M20 × 1.5 <i>on request</i> N 1/2" NPT G3 PG13.5 C male code "A" M12 ×1 connector



FTNG131

Limit switch with metal end plunger
IP67

FTNG	1	31	XXX	XX
series	function	actuator	contact type	conduit entry
FTNG	40 mm thermoplastic limit switches for heavy applications	31 metal end plunger	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	slow action (Zb) snap action (Zb) slow action (Zb) blank N G3 C M20 × 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 × 1

technical drawing - sizes in mm	contact type	operation diagrams
	X11 1NO+1NC slow action (Zb)	
	W02 2NC slow action (Zb)	
	W20 2NO slow action (Zb)	
	Z11 1NO+1NC snap action (Zb)	
	Z02 2NC snap action (Zb)	
	W12 1NO+2NC slow action (Zb)	
	W03 3NC slow action (Zb)	

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		OF	POT (travel)	
X11: 1NO+1NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	2.6 mm	3.8 mm	11.6 N	6.0 mm	28 N	7.0 mm
W02: 2NC				2.6 mm	-	11.6 N	6.0 mm	28 N	
W20: 2NO				2.6 mm	-	11.4 N	-	-	
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	2.5 mm	1.2 mm	10.4 N	4.9 mm	22 N	
Z02: 2NC				2.5 mm	1.2 mm	8.6 N	4.9 mm	22 N	
W12: 1NO+2NC	slow action (Zb)	A300-Q300		2.8 mm	3.5 mm	9.4 N	5.0 mm	10 N	
W03: 3NC				2.8 mm	-	9.4 N	5.0 mm	10 N	



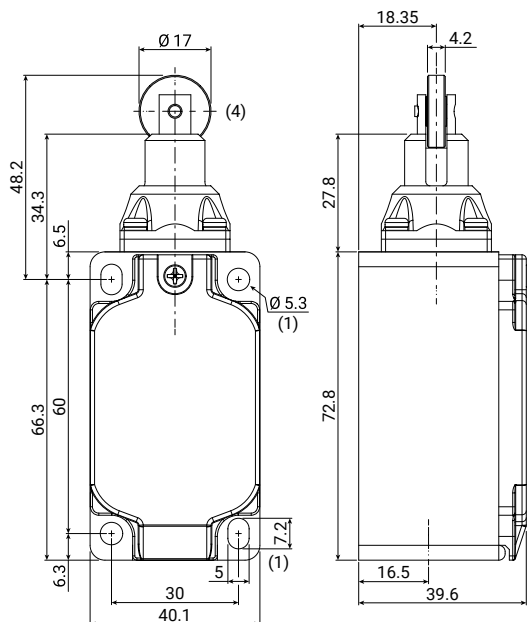
FTNG134

Limit switch with steel roller plunger
IP67



FTNG series	1 function	34 actuator	XXX contact type	XX conduit entry
FTNG 40 mm thermoplastic limit switches for heavy applications	1 without reset function	34 steel roller plunger	X11: 1NO+1NC slow action (Zb) W02: 2NC snap action (Zb) Z11: 1NO+1NC slow action (Zb) Z02: 2NC snap action (Zb) W12: 1NO+2NC slow action (Zb) W03: 3NC slow action (Zb)	blank N G3 C M20 x 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 x 1

technical drawing - sizes in mm



(1) mounting holes
(4) steel roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	2.6 mm	3.8 mm	11.6 N	6.0 mm	28 N	7.0 mm
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	2.6 mm	-	11.6 N	6.0 mm	28 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		2.6 mm	-	11.4 N	-	-	
			2.5 mm	1.2 mm	10.4 N	4.9 mm	22 N	
			2.5 mm	1.2 mm	8.6 N	4.9 mm	22 N	
			2.8 mm	3.5 mm	9.4 N	5.0 mm	10 N	
			2.8 mm	-	9.4 N	5.0 mm	10 N	

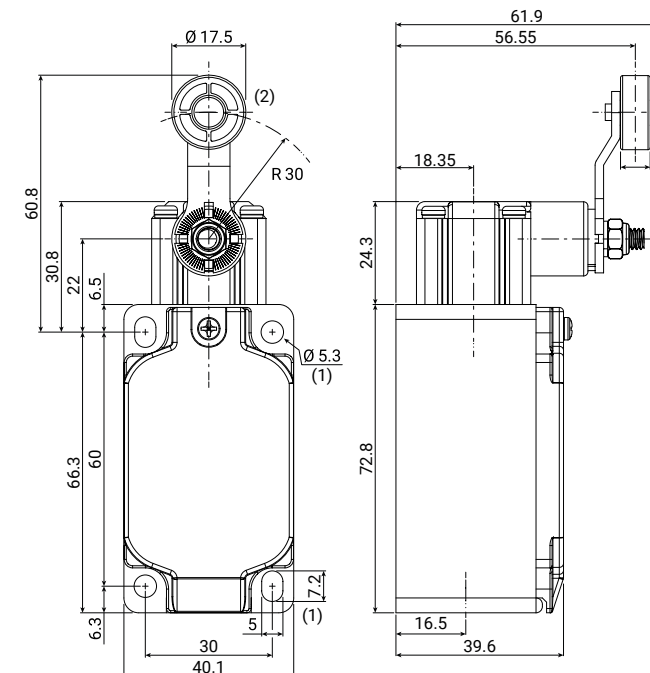
FTNG138

Limit switch with Ø18 PA roller lever
IP67



FTNG series	1 function	38 actuator	XXX contact type	XX conduit entry
FTNG 40 mm thermoplastic limit switches for heavy applications	1 without reset function	38 Ø18 PA roller lever	X11: 1NO+1NC slow action (Zb) W02: 2NC snap action (Zb) Z11: 1NO+1NC slow action (Zb) Z02: 2NC snap action (Zb) W12: 1NO+2NC slow action (Zb) W03: 3NC slow action (Zb)	blank N G3 C M20 x 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 x 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	33°	45°	6.5 N	45°	8.5 N	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	33°	-	6.5 N	45°	8.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		33°	-	6.5 N	-	-	
			35°	15°	5.5 N	65°	13.2 N	
			35°	15°	5.5 N	65°	13.2 N	
			35°	42°	6.5 N	50°	8 N	
			35°	-	6.5 N	50°	8 N	

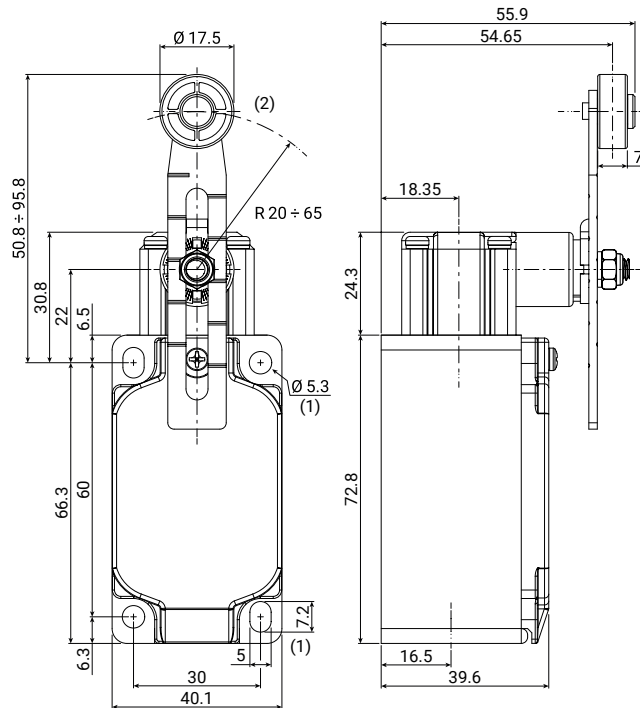
FTNG139

Limit switch with Ø18 PA roller lever with variable length
IP67



FTNG series	1 function	39 actuator	XXX contact type	XX conduit entry
FTNG	40 mm thermoplastic limit switches for heavy applications	1 without reset function	39 Ø18 PA roller lever with variable length	blank N G3 C M20 x 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 x 1
			X11: 1NO+1NC slow action (Zb)	
			W02: 2NC	
			W20: 2NO	
			Z11: 1NO+1NC snap action (Zb)	
			Z02: 2NC	
			W12: 1NO+2NC slow action (Zb)	
			W03: 3NC	

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

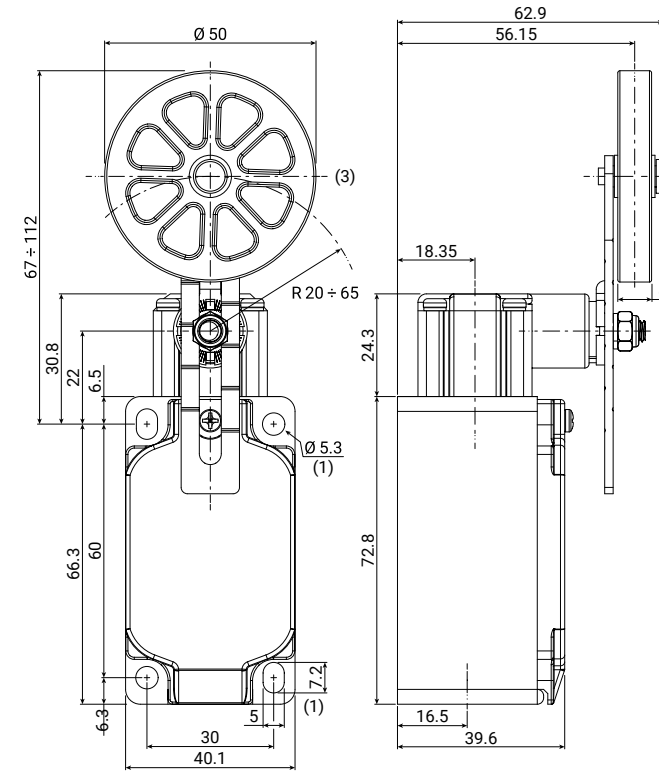
FTNG140

Limit switch with Ø50 rubber roller lever with variable length
IP67



FTNG series	1 function	40 actuator	XXX contact type	XX conduit entry
FTNG	40 mm thermoplastic limit switches for heavy applications	1 without reset function	40 Ø50 rubber roller lever with variable length	blank N G3 C M20 x 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 x 1
			X11: 1NO+1NC slow action (Zb)	
			W02: 2NC	
			W20: 2NO	
			Z11: 1NO+1NC snap action (Zb)	
			Z02: 2NC	
			W12: 1NO+2NC slow action (Zb)	
			W03: 3NC	

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC	A600-Q600	AC15: 400V - 4A	33°	45°	6.5 N	45°	8.5 N	80°
W02: 2NC			33°	-	6.5 N	45°	8.5 N	
W20: 2NO			33°	-	6.5 N	-	-	
Z11: 1NO+1NC	B600-Q600	DC13: 24V - 6A	35°	15°	5.5 N	65°	13.2 N	
Z02: 2NC			35°	15°	5.5 N	65°	13.2 N	
W12: 1NO+2NC	A300-Q300	24V - 6A	35°	42°	6.5 N	50°	8 N	
W03: 3NC			35°	-	6.5 N	50°	8 N	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC	A600-Q600	AC15: 400V - 4A	33°	45°	6.5 N	45°	8.5 N	80°
W02: 2NC			33°	-	6.5 N	45°	8.5 N	
W20: 2NO			33°	-	6.5 N	-	-	
Z11: 1NO+1NC	B600-Q600	DC13: 24V - 6A	35°	15°	5.5 N	65°	13.2 N	
Z02: 2NC			35°	15°	5.5 N	65°	13.2 N	
W12: 1NO+2NC	A300-Q300	24V - 6A	35°	42°	6.5 N	50°	8 N	
W03: 3NC			35°	-	6.5 N	50°	8 N	

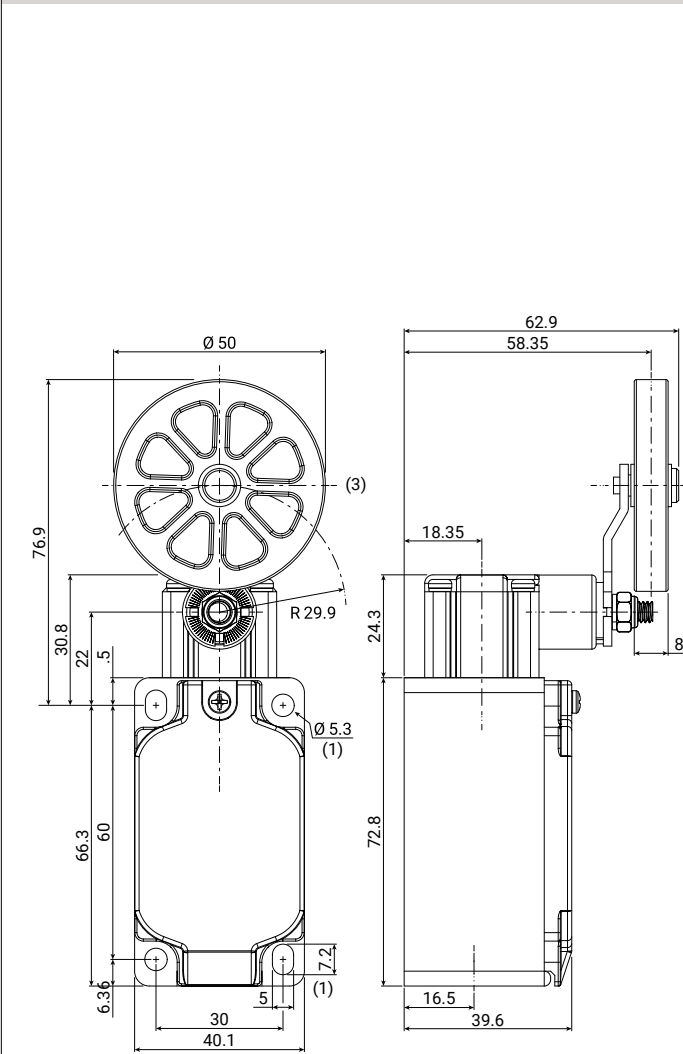
FTNG141

Limit switch with Ø50 rubber roller lever
IP67



FTNG series	1 function	41 actuator	XXX contact type	XX conduit entry
FTNG	40 mm thermoplastic limit switches for heavy applications	1 without reset function	41 Ø50 rubber roller lever	
			X11: 1NO+1NC W02: 2NC W20: 2NO	blank N G3
			Z11: 1NO+1NC Z02: 2NC	C
			W12: 1NO+2NC W03: 3NC	M20 × 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(3) rubber roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	33°	45°	6.5 N	45°	8.5 N	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	33°	-	6.5 N	45°	8.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		35°	15°	5.5 N	65°	13.2 N	
			35°	15°	5.5 N	65°	13.2 N	
			35°	42°	6.5 N	50°	8 N	
			35°	-	6.5 N	50°	8 N	

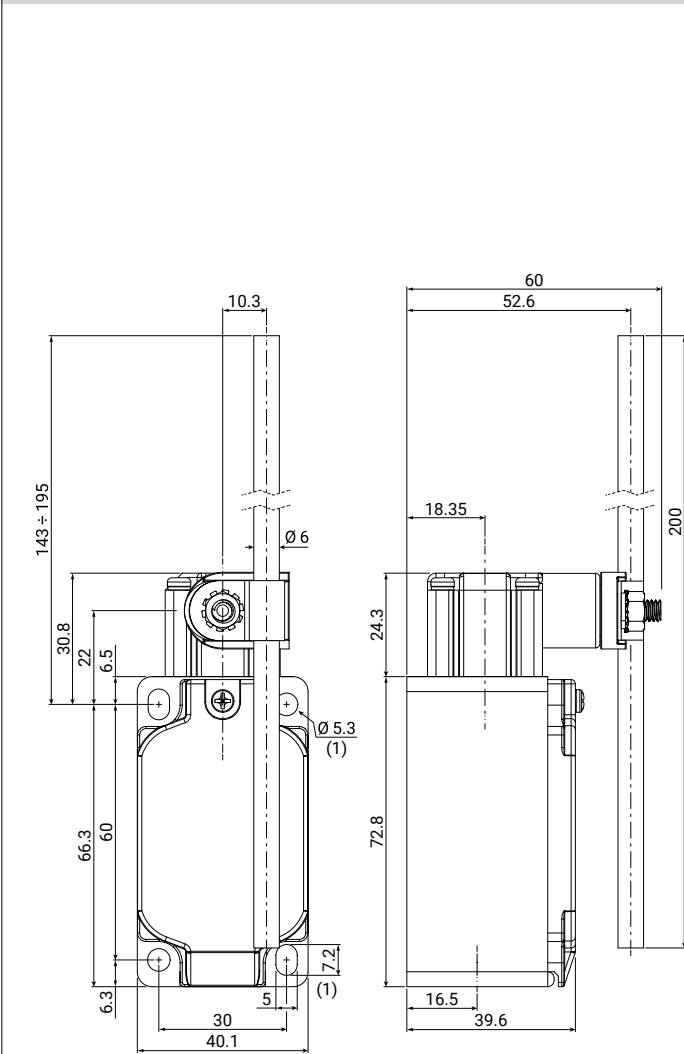
FTNG172

Limit switch with adjustable PA rod lever
IP67



FTNG series	1 function	72 actuator	XXX contact type	XX conduit entry
FTNG	40 mm thermoplastic limit switches for heavy applications	1 without reset function	72 adjustable PA rod lever	
			X11: 1NO+1NC W02: 2NC W20: 2NO	blank N G3
			Z11: 1NO+1NC Z02: 2NC	C
			W12: 1NO+2NC W03: 3NC	M20 × 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
W20 2NO slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	33°	45°	6.5 N	45°	8.5 N	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	33°	-	6.5 N	45°	8.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		35°	15°	5.5 N	65°	13.2 N	
			35°	15°	5.5 N	65°	13.2 N	
			35°	42°	6.5 N	50°	8 N	
			35°	-	6.5 N	50°	8 N	



STNK SERIES



The **STNK series** thermoplastic safety switches with separate actuator comply with EN 50047 and is designed to provide different switch variants (slow action or snap action basic switches) and three different separate actuators that complete the product body.

The thermoplastic bodies have two fixing holes with 20 or 22 mm spacing and a cable entry hole at the bottom of the switch. Various types of threaded cable entry are available to cover the main requirements of the international market.

In this type of switch, the switching element and the actuator are actually separate. However, **the product is sold as complete with body and key**. The stainless steel key is fixed to the moving part of the guard in such a way that it is separated from the switch whenever the guard is opened.

The positive opening NC contact is always open when the actuator is removed.
A special mechanism ensures that the removal of the actuator forces a positive opening of the electrical contacts.

The STNK series is designed to control gates, sliding doors and other guards that protect dangerous parts of machinery without inertia.

They are suitable for use in the harshest environmental conditions with an **operating temperature range of -25°C to +80°C**.

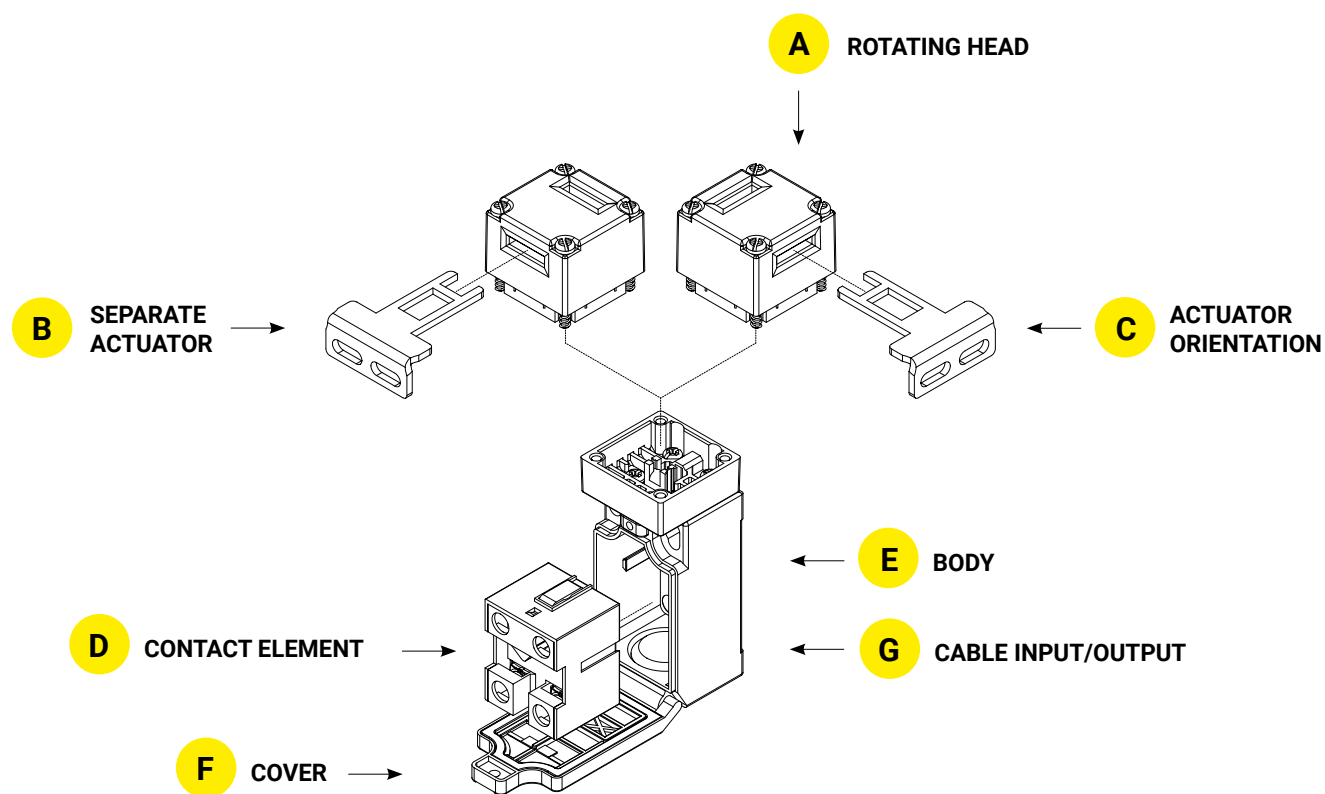
All models in the series are **IP65-rated**.



SPECIFICATIONS

Standards		EN 60947-5-1, UL 508, EN 50047, EN 1088, EN 60204-1
Approvals		cULus, EAC, CCC, CE and UKCA marked for all applicable directives
Positive opening operation		NC contacts conforming to IEC /EN 60947-5-1 ☹
Minimum current		5 mA - 5 V DC
Thermal current	Ith	10 A
Rated insulation voltage	Ui	500 V AC
Rated impulse withstand voltage	Uimp	6 kV
Insulation resistance	min	100 MΩ (DC 500 V)
Contact resistance	max	25 mΩ (initial)
Actuator frequency	max	2 cycles/min
Enclosure material		UL approved glass-filled polybutylene terephthalate
Enclosure protection		IP65
Operating temperature		-25 ... +80°C (-13 ... +176°F)
Pollution degree		3
Protection against electric shock		Class II (double Insulation) ☐ Double insulation makes ground terminal unnecessary
Electrical life expectancy	min	150.000 cycles
Mechanical life expectancy	min	1 x 10 ⁶ cycles
Vibration	IEC 68-2-6 excursion	10-55 Hz ± 1Hz 0.35 mm, 1 octave/min
Conduit entry		Various international conduit sizes (see product selection table pag. 91)
Fixing		2 x M4 screws

STRUCTURE DESCRIPTION



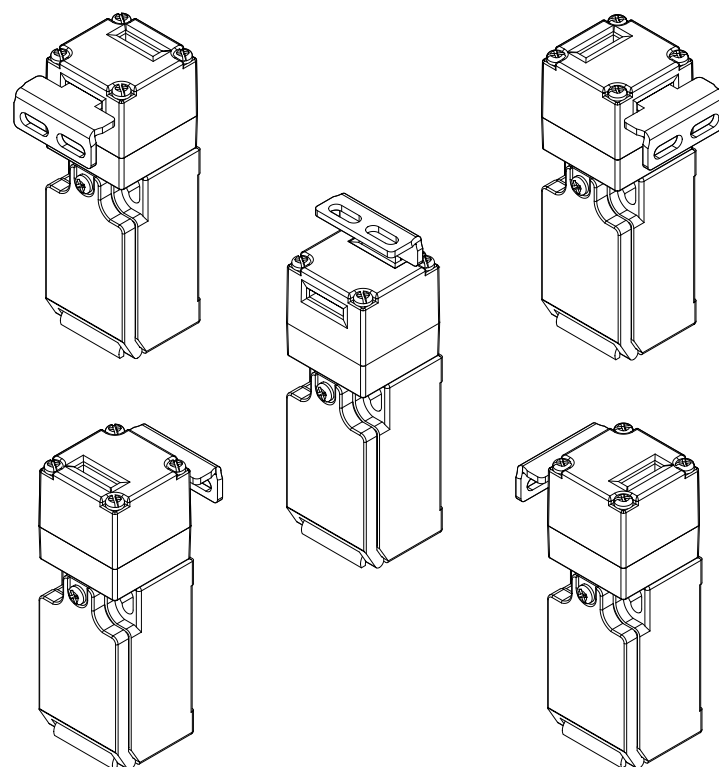
A - ROTATING HEAD

The heads are made of UL approved glass-filled polybutylene terephthalate.

All heads can be adjusted in steps of 90° over 360°, compared to the body.

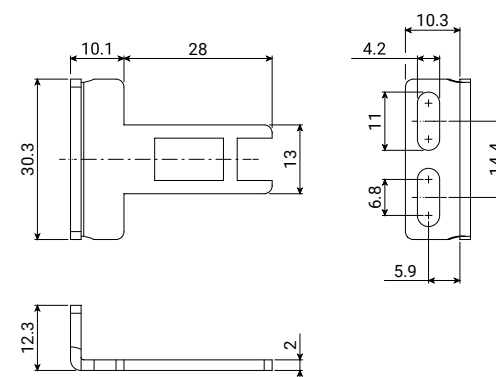
The direction of the switch head can be varied in one of four directions by loosening the screws at the four corners of the head.

The working planes of the device vary depending on the orientation of the head and actuator.

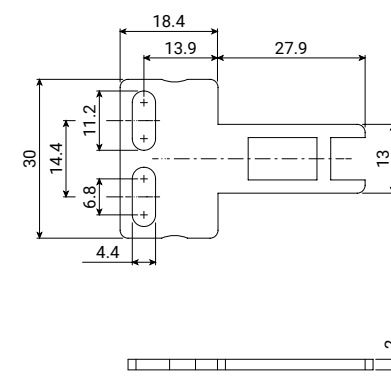


B - SEPARATE ACTUATOR

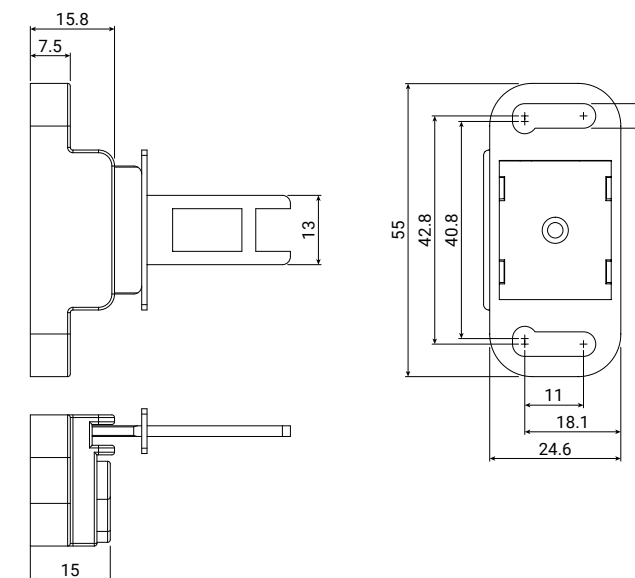
01 Angled actuator



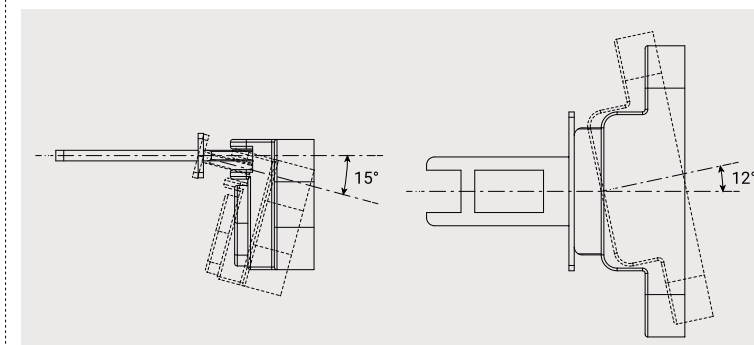
02 Straight actuator



03 Jointed actuator



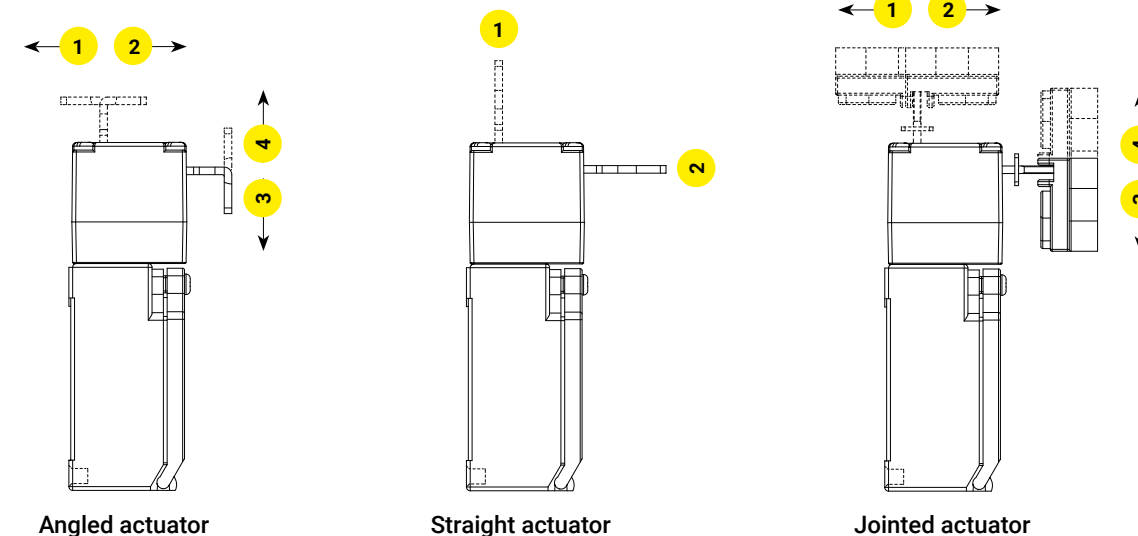
The actuator can flex in four directions for applications where the protection alignment is not precise.



C - ACTUATOR ORIENTATION

The key actuator can be inserted into the side or upper hole.

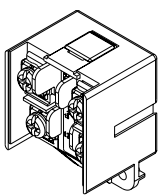
The keys can be inserted in both housings by choosing the orientation that suits the application.



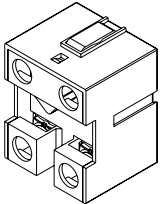
D - CONTACT ELEMENT

The integrated switch has a direct opening mechanism that forcibly separates the NC contact even in the event of accidental welding (overload, short circuit, ...).

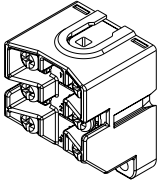
Different contact elements are available, both fast-acting and slow-acting, depending on the different application requirements.



X11: 1NO+1NC
Slow action (Zb)



Z11: 1NO+1NC
Snap action (Zb)



W12: 1NO+2NC
Slow action (Zb)

W02: 2NC
Slow action (Zb)

Z02: 2NC
Snap action (Zb)

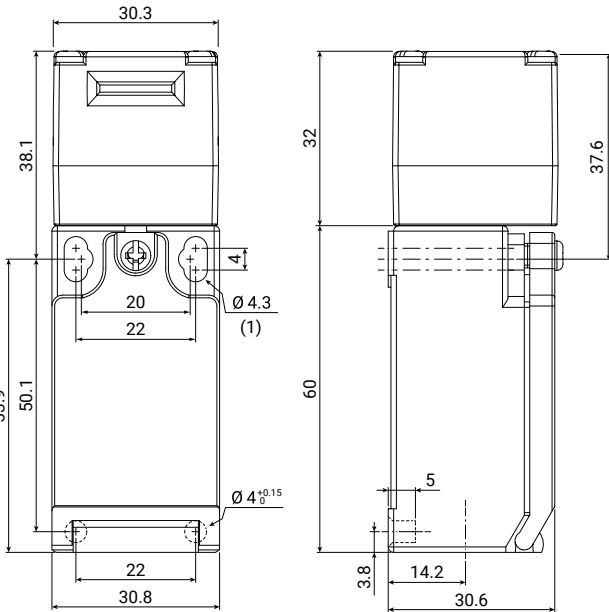
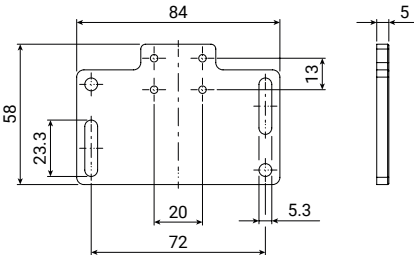
W03: 3NC
Slow action (Zb)

E - BODY

The body complies with EN 50047, with a distance of 20/22 mm between the fixing holes.

It is available a fixing plate with slots to adjust the operating point, developed for backward compatibility with old products. The plate is sold in kits (code: **KIT-FTN**) comprising:

- 1 plate;
- 2 self-tapping screws 4 × 28 mm;
- 2 washers Ø4 mm.



F - COVER

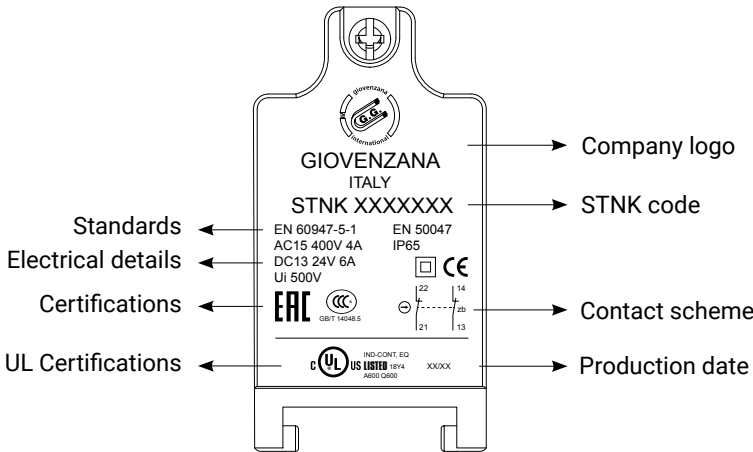
Material conforming to the RoHS Directive.

The lid is laser marked to ensure branding, coding and information on product specifications such as technical data, production date, stock or lot number, revision or control date. Lasering ensures the complete traceability of our products and components and is essential for compliance with ISO quality standards.

Some of the advantages:

- clear and precise text legibility;
- guaranteed lifetime unlike ink which deteriorates over time.

The cover, with a hinge at the bottom, can be opened by removing the screw, which ensures easy maintenance and wiring.



G - CABLE INPUT/OUTPUT

A threaded cable input/output is provided at the bottom of the switch.

6 standard and customised cable input/output models are available in order to cover the major international markets.

Standard: Blank: M16 × 1.5

On request: M: M20 × 1.5
N: 1/2" NPT
G1: Pg 11
G3: Pg 13.5
C: M12 connector

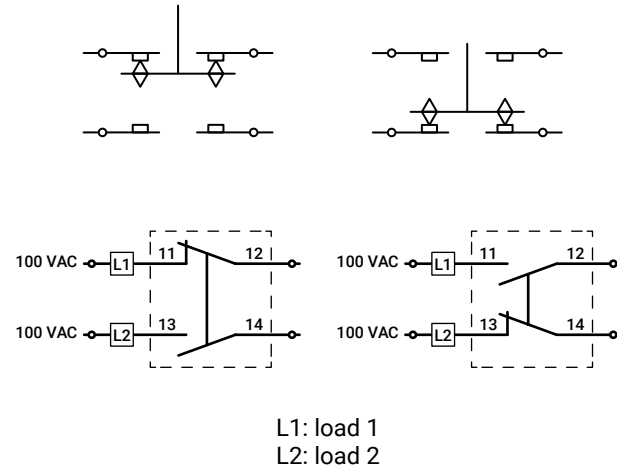
CONTACT ELEMENT - SPECIFICATIONS

CONTACT CODE	CONTACT TYPE	ELECTRICAL SCHEME	CONNECTOR PIN ARRANGEMENT
X11	1NO+1NC Slow action Zb		
W02	2NC Slow action Zb		
Z11	1NO+1NC Snap action Zb		
Z02	2NC Snap action Zb		
W12	1NO+2NC Slow action Zb		No connector
W03	3NC Slow action Zb		No connector

CONTACT ELEMENT - CLASSIFICATION (ACCORDING EN 60947-5-1)

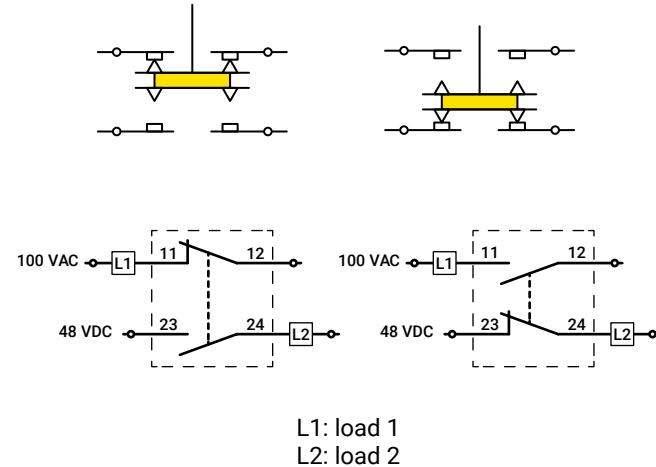
Za contact type

A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



Zb contact type

In this case there are two blades that open and close the contact. The two blades are electrically isolated from each other. Therefore, with this type of contact it is possible to supply the circuit with different voltages and polarities.



STNK series of thermoplastic safety switches with separate actuator is equipped with Zb contacts.

SAFETY INTEGRITY LEVEL ACCORDING TO IEC 61508

Safety Integrity Level (SIL) is the quantification of the reliability (or degree of reliability) achieved by any object that performs a safety-related function. The greater its reliability, the greater its ability to perform safety-critical functions or machine or plant availability. The determination of a SIL is based on quantitative and qualitative factors such as the development process and safety lifecycle management.

The STNK series thermoplastic limit switches are SIL 3.

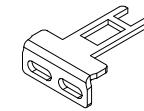
SIL³



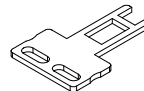
STNK - PRODUCT SELECTION OVERVIEW

1 SEPARATE ACTUATORS

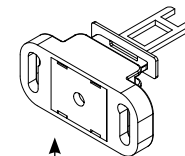
01



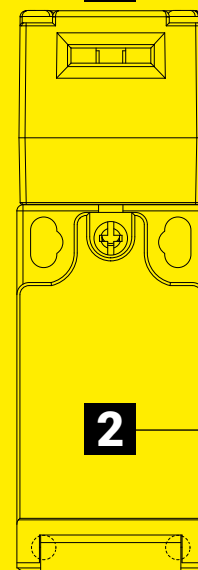
02



03



1



3

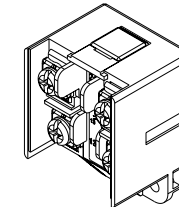
3 CONDUIT ENTRY

Threaded conduit entry

Standard:
M16 × 1.5

On request:
M20 × 1.5
1/2" NPT
PG11
PG13.5
With connector

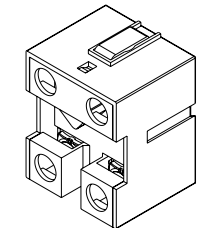
2 CONTACT BLOCKS



13 21
14 22
Zb

X11

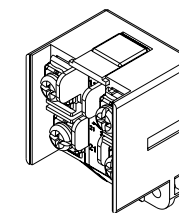
1NO+1NC - slow action (Zb)



13 21
14 22
Zb

Z11

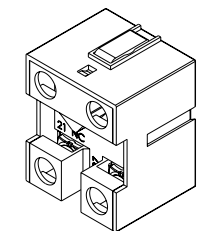
1NO+1NC - snap action (Zb)



11 21
12 22
Zb

W02

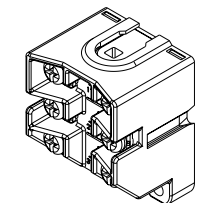
2NC - slow action (Zb)



11 21
12 22
Zb

Z02

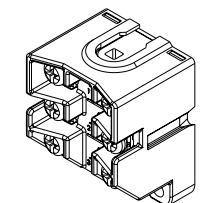
2NC - snap action (Zb)



13 21 31
14 22 32
Zb

W12

1NO+2NC - slow action (Zb)



11 21 31
12 22 32
Zb

W03

3NC - slow action (Zb)

CONTACT TYPES			CATEGORIES RATINGS	
X11	1NO+1NC	slow action (Zb)	A600	AC15: 400 V - 4 A
W02	2NC		Q600	
Z11	1NO+1NC	snap action (Zb)	B600	DC13: 24V - 6 A
Z02	2NC		Q600	
W12	1NO+2NC	slow action (Zb)	A300	
W03	3NC		Q300	

STNK - CODE SELECTION OVERVIEW

S	T	N	K	0	1	X	1	1		
↓				↓		↓			↓	
SERIES				SEPARATE ACTUATOR		CONTACT TYPE			CONDUIT ENTRY	
STNK thermoplastic safety switches with separate actuator				01 angled actuator 02 straight actuator 03 jointed actuator		X11 1NO+1NC slow action Zb W02 2NC slow action Zb Z11 1NO+1NC snap action Zb Z02 2NC snap action Zb W12 1NO+2NC slow action Zb W03 3NC slow action Zb			standard blank M16 × 1.5 on request M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male code "A" M12 × 1 connector	

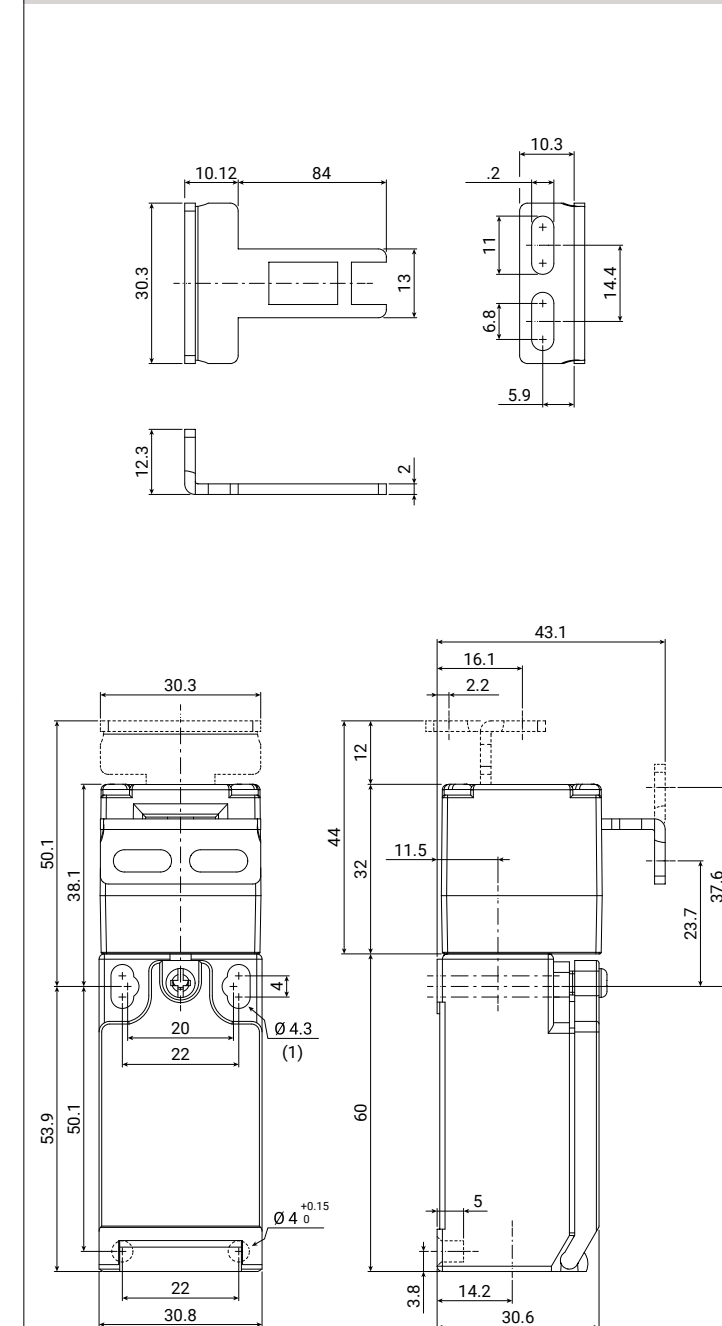
STNK01

Thermoplastic safety switch with angled actuator
IP65



STNK SERIES

technical drawing - sizes in mm



(1) mounting holes

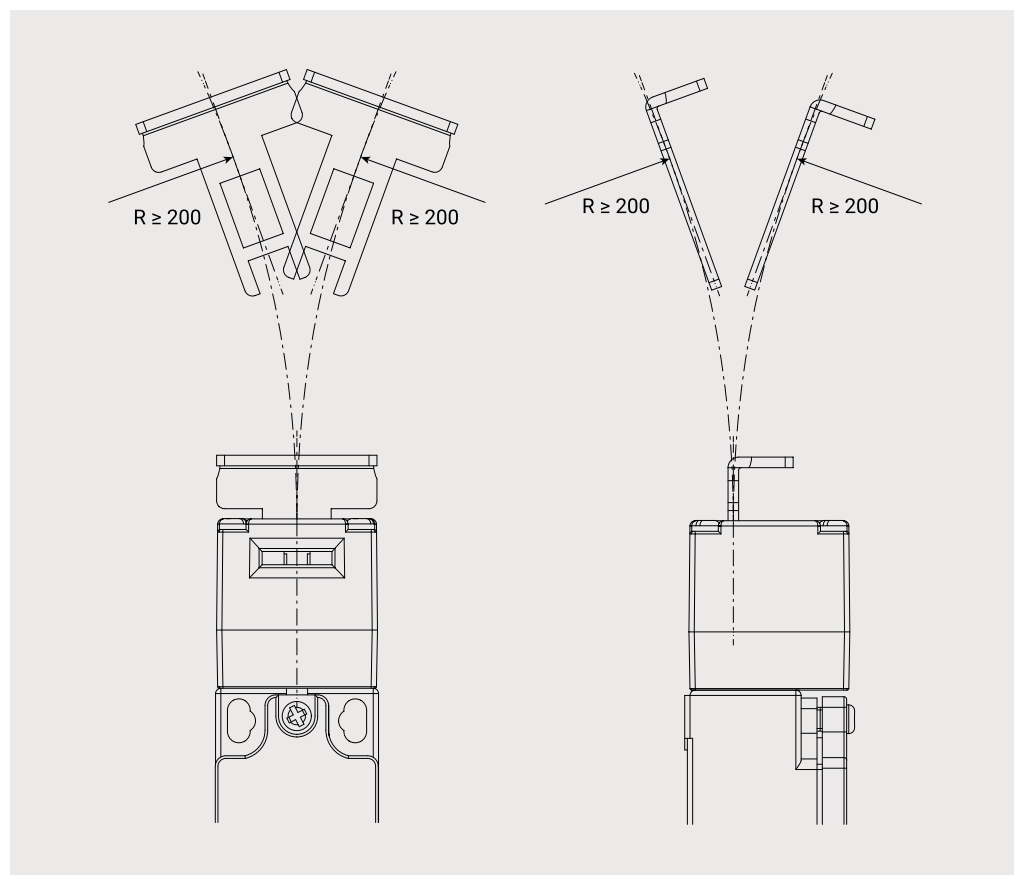
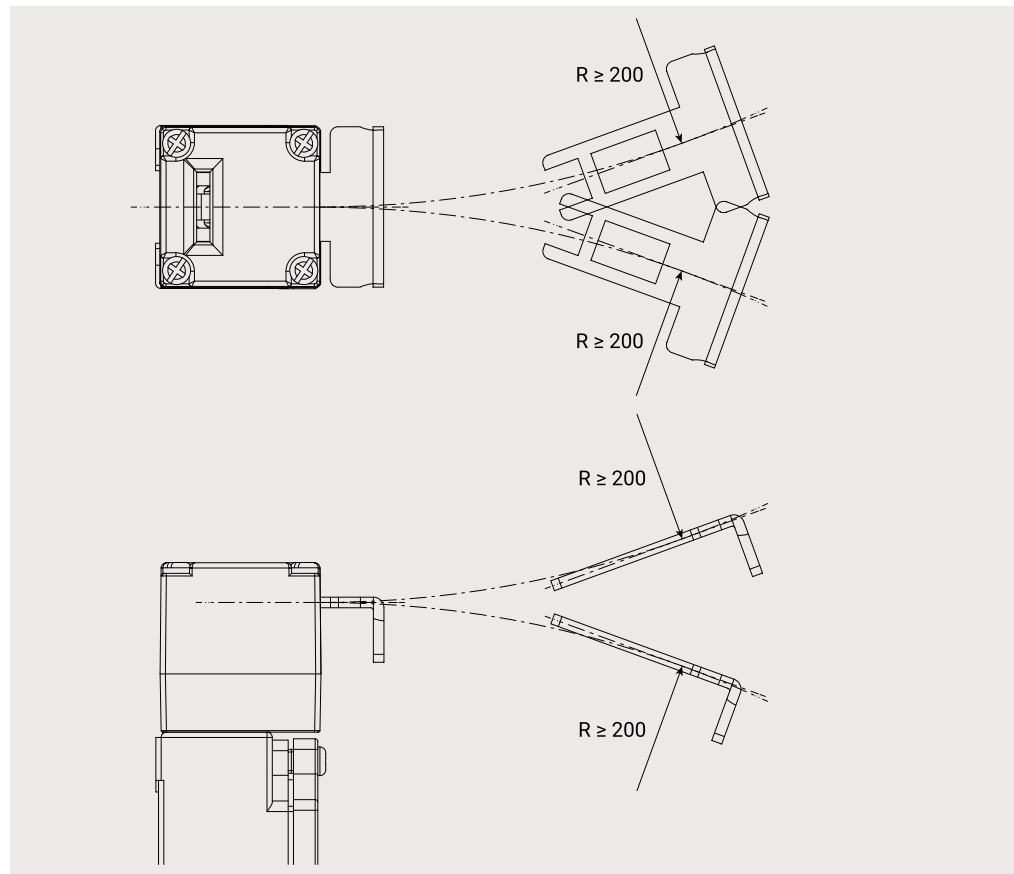
STNK	01	XXX	XX
series	actuator	contact type	conduit entry
STNK thermoplastic safety switch	01 with angled actuator	X11: 1NO+1NC slow action (Zb) W02: 2NC Z11: 1NO+1NC snap action (Zb) Z02: 2NC W12: 1NO+2NC slow action (Zb) W03: 3NC	blank M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1

contact type	operation diagrams	
X11 1NO+1NC slow action (Zb)		
W02 2NC slow action (Zb)		
Z11 1NO+1NC snap action (Zb)		
Z02 2NC snap action (Zb)		
W12 1NO+2NC slow action (Zb)		
W03 3NC slow action (Zb)		

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)		OF	POT (travel)	
X11: 1NO+1NC W02: 2NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	7.4 mm	8.4 mm	25 N	8.1 mm	60 N	∞
				7.4 mm	-	25 N	8.1 mm	60 N	
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600		6.5 mm	4.8 mm	14 N	8.0 mm	26 N	
				6.5 mm	4.5 mm	14 N	8.0 mm	26 N	
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300	DC13: 24V - 6A	7.2 mm	8.0 mm	25 N	8.2 mm	60 N	
				7.2 mm	-	25 N	8.2 mm	60 N	

STNK01

Thermoplastic safety switch with angled actuator
IP65

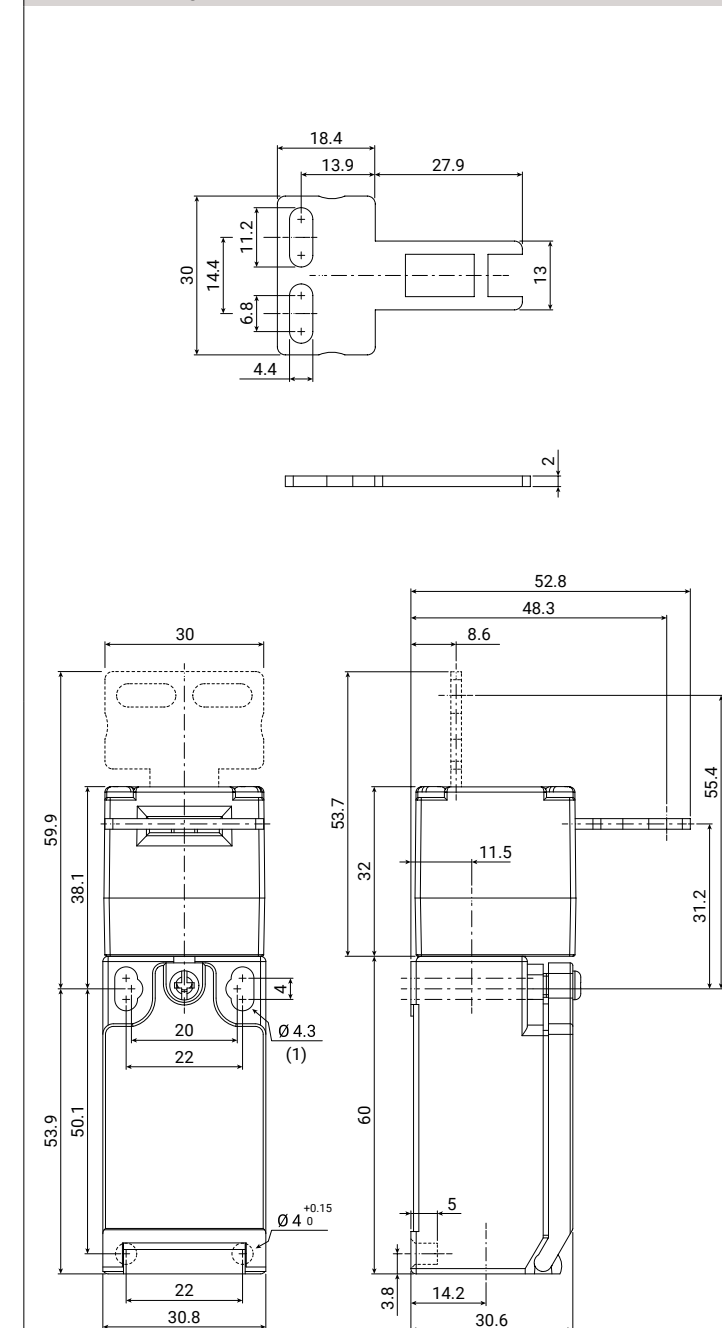


STNK02

Thermoplastic safety switch with straight actuator
IP65



technical drawing - sizes in mm



(1) mounting holes

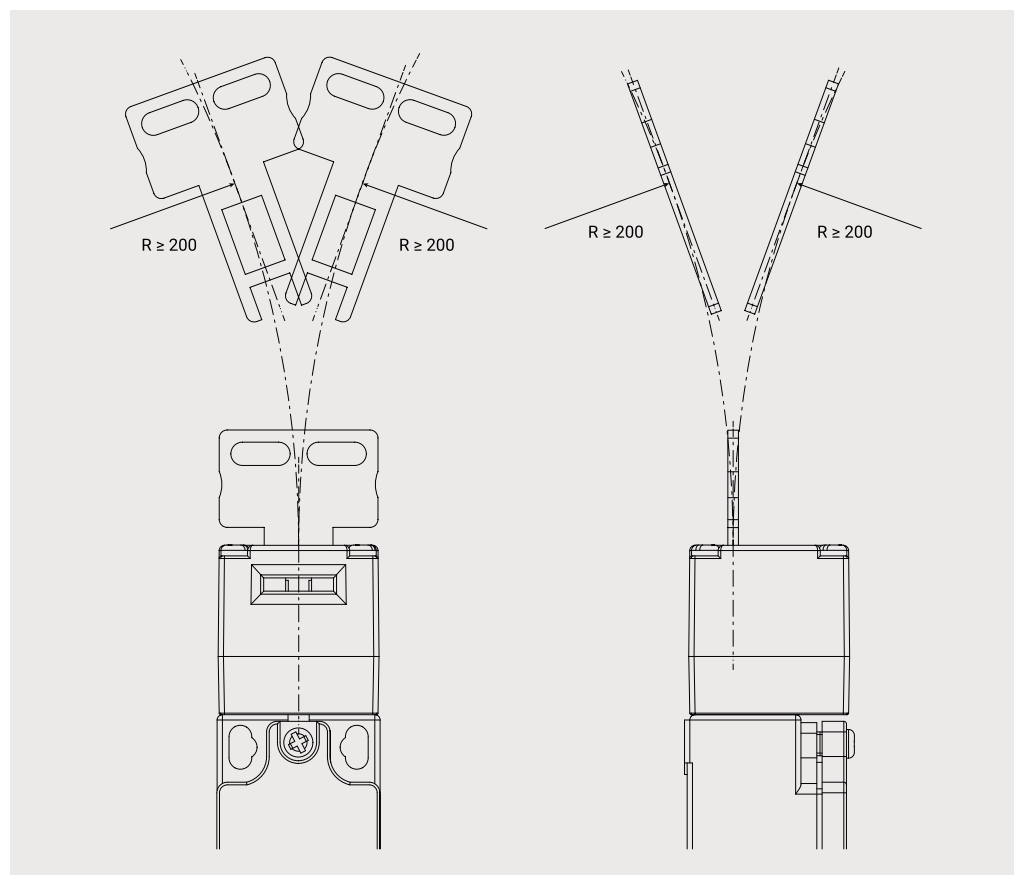
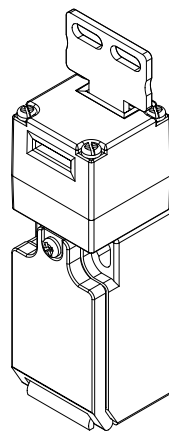
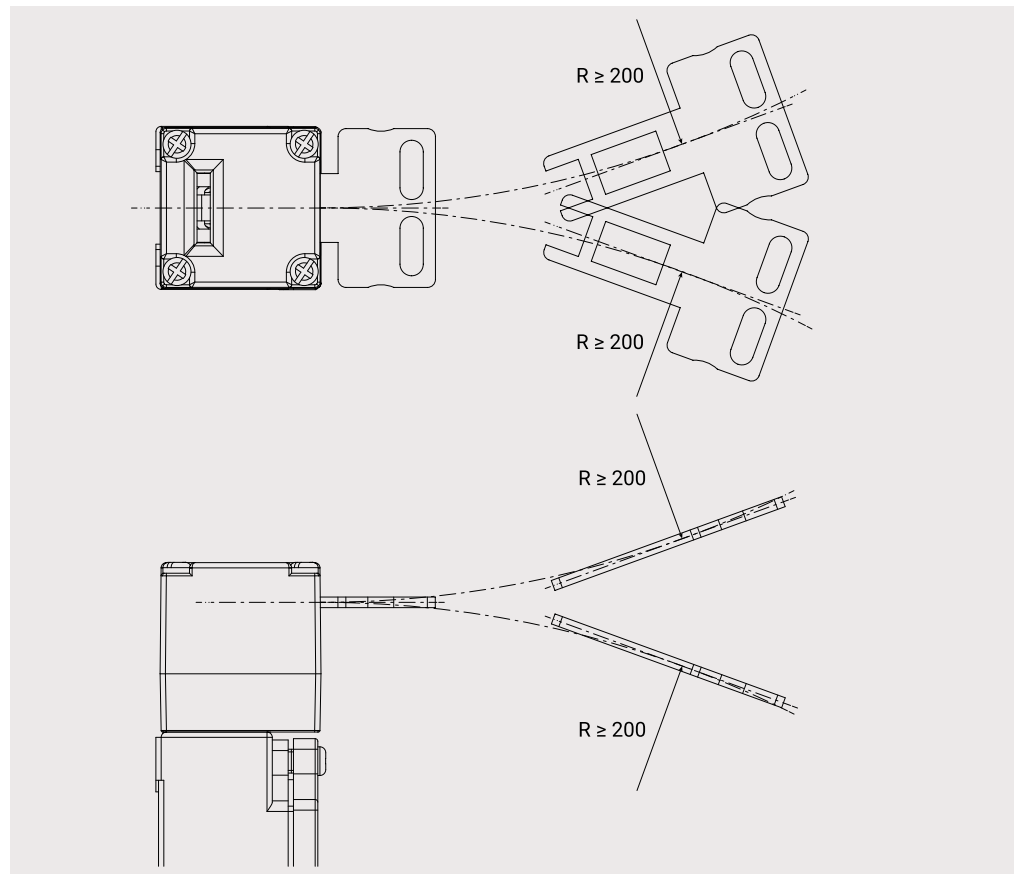
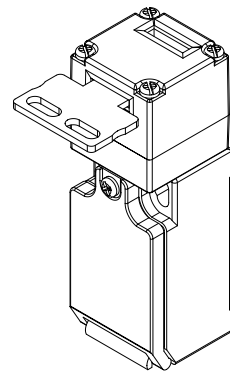
STNK series	02 actuator	XXX contact type	XX conduit entry
STNK thermoplastic safety switch	02 with straight actuator	X11: 1NO+1NC W02: 2NC Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	blank M N G1 G3 C M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1

contact type	operation diagrams	
X11 1NO+1NC slow action (Zb)		
W02 2NC slow action (Zb)		
Z11 1NO+1NC snap action (Zb)		
Z02 2NC snap action (Zb)		
W12 1NO+2NC slow action (Zb)		
W03 3NC slow action (Zb)		

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC	A600-Q600	AC15: 400V - 4A	7.4 mm	8.4 mm	25 N	8.1 mm	60 N	∞
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	7.4 mm	-	25 N	8.1 mm	60 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		6.5 mm	4.8 mm	14 N	8.0 mm	26 N	
			6.5 mm	4.5 mm	14 N	8.0 mm	26 N	
			7.2 mm	8.0 mm	25 N	8.2 mm	60 N	
			7.2 mm	-	25 N	8.2 mm	60 N	

STNK02

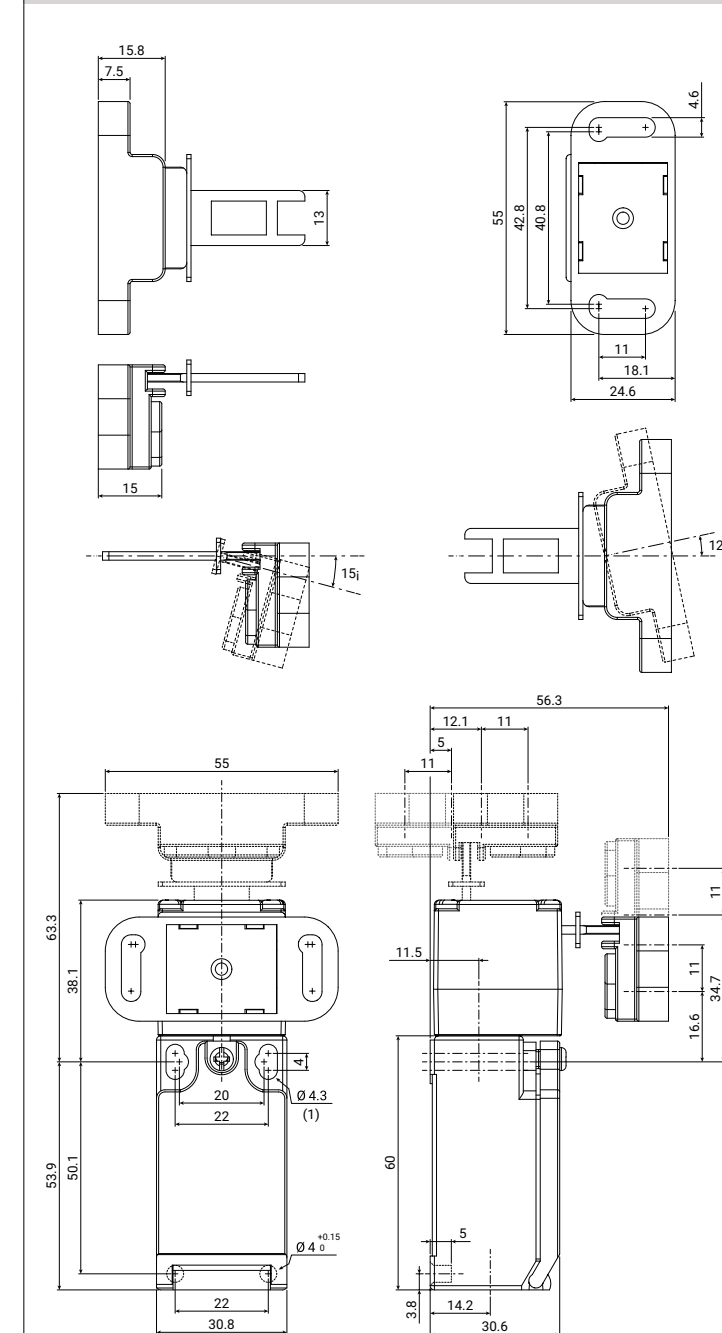
Thermoplastic safety switch with straight actuator
IP65



STNK03

Thermoplastic safety switch with jointed actuator
IP65

technical drawing - sizes in mm



(1) mounting holes



STNK series	03 actuator	XXX contact type	XX conduit entry
STNK thermoplastic safety switch	with jointed actuator	X11: 1NO+1NC slow action (Zb) W02: 2NC Z11: 1NO+1NC snap action (Zb) Z02: 2NC W12: 1NO+2NC slow action (Zb) W03: 3NC	blank M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1

contact type	operation diagrams	
X11 1NO+1NC slow action (Zb)		
W02 2NC slow action (Zb)		
Z11 1NO+1NC snap action (Zb)		
Z02 2NC snap action (Zb)		
W12 1NO+2NC slow action (Zb)		
W03 3NC slow action (Zb)		

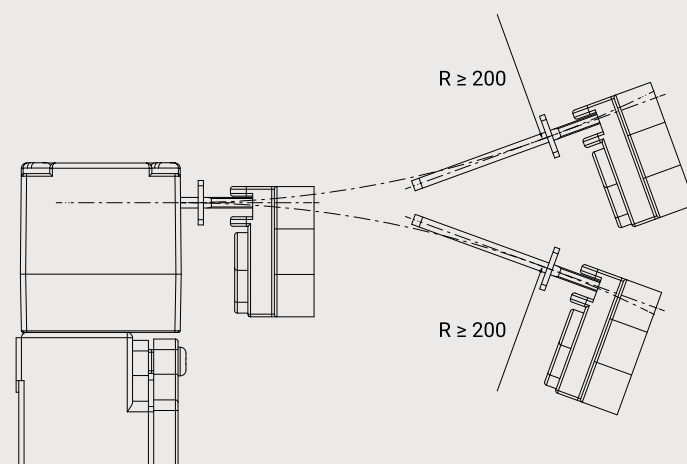
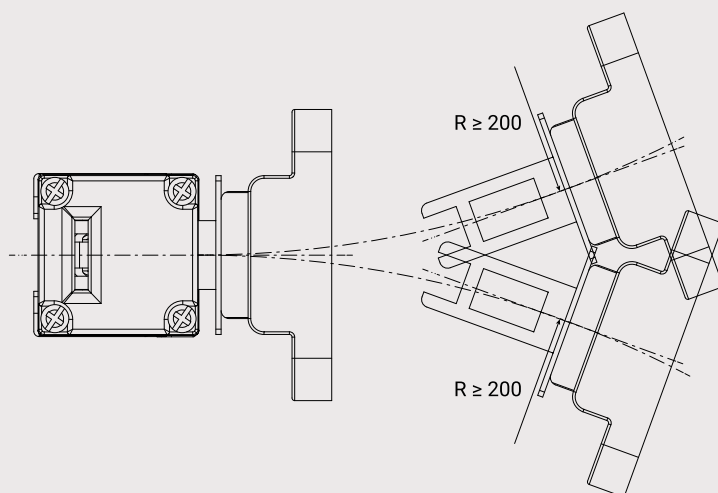
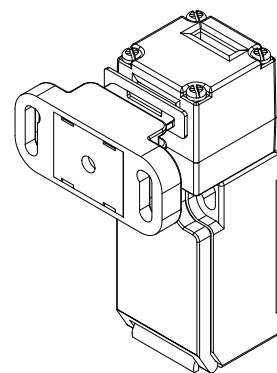
contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action) RP (snap action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC W02: 2NC	slow action (Zb)	A600-Q600	AC15: 400V - 4A	7.4 mm	8.4 mm	25 N	8.1 mm	60 N	∞
				7.4 mm	-	25 N	8.1 mm	60 N	
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600		6.5 mm	4.8 mm	14 N	8.0 mm	26 N	
				6.5 mm	4.5 mm	14 N	8.0 mm	26 N	
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300	DC13: 24V - 6A	7.2 mm	8.0 mm	25 N	8.2 mm	60 N	
				7.2 mm	-	25 N	8.2 mm	60 N	



GIOVENZANA
INTERNATIONAL B.V.

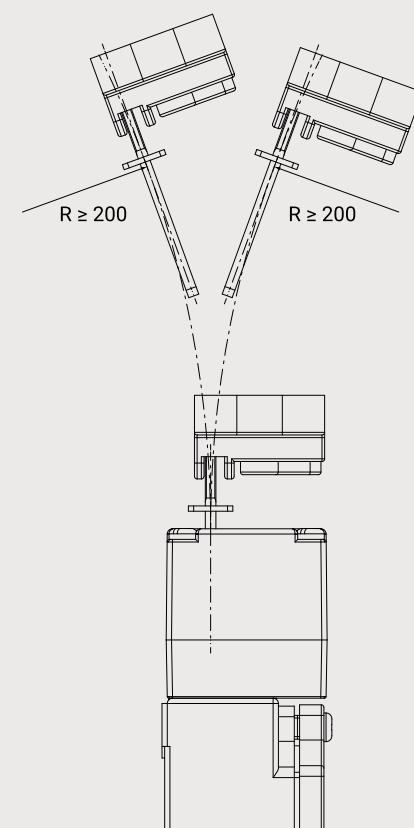
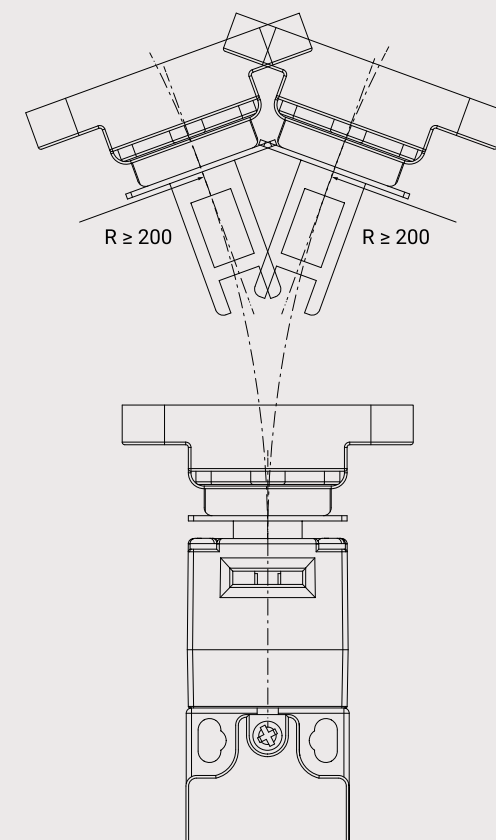
STNK03

Thermoplastic safety switch with jointed actuator
IP65



STNK03

Thermoplastic safety switch with jointed actuator
IP65





FCT SERIES

FCT series of pre-wired or M12-connected thermoplastic switches includes 4 product families characterised by the different type of connection (pre-wired or M12 connection) and the orientation of the connection output (horizontal or vertical):

- FCT2L series: with pre-wired horizontal connection on the side.
- FCT2V series: with pre-wired vertical connection on the bottom.
- FCTML series: with horizontal M12 connection on the side.
- FCTMV series: with vertical M12 connection on the bottom.

- FCT2L..EX/FCT2V..EX series: Available in our catalog dedicated to components for use in hazardous areas and potentially explosive atmospheres, the following pre-wired thermoplastic limit switches are ATEX and IECEx certified.

The FCTM series of industrial limit switches is available with a 4-pin M12 connector integrated into the limit switch housing for quick wiring. This industrial limit switch serie is available with the M12 connector for horizontal or vertical cable entry.

Switches with M12 connectors allow greater installation flexibility and quicker wiring replacement than standard limit switches wired by the customer.

Giovenzana also offers pre-wired limit switches with standard 2 m cable or with customised lengths on request (FCTL series).

The thermoplastic limit switches of the FTC series have an IP67 protection class for use in harsh environments.

They are equipped with piston, roller, lever and adjustable rod actuators and a double insulated housing.



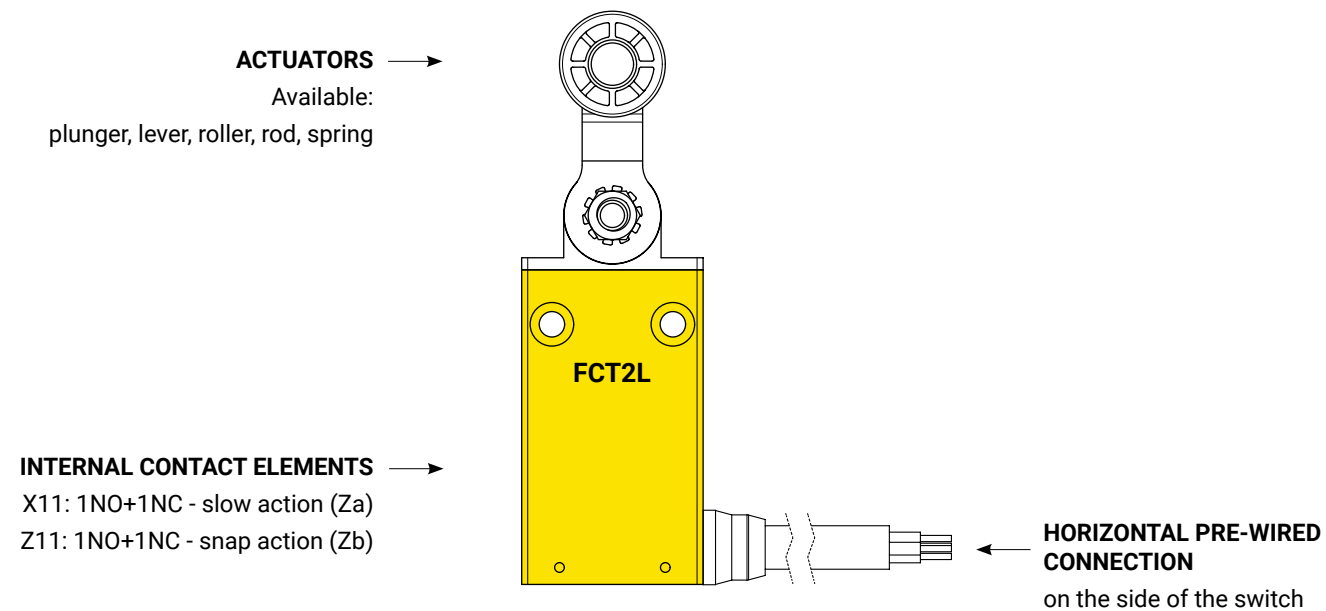
SPECIFICATIONS

Standards		IEC/EN 60947-5-1, EN 60204-1
Approvals		cULus, EAC, CCC, CE and UKCA marked for all applicable directives
Positive opening operation		Only for M12-connected available also cRUus
Rated thermal current	Ith	NC contacts conforming to IEC /EN 60947-5-1 ⊖ 10 A - pre-wired 4 A - M12 connection
Rated insulation voltage	Ui	500 V AC
Rated impulse withstand voltage	Uimp	4 kV
Insulation resistance	min	100 MΩ (DC 500 V)
Contact resistance	max	25 mΩ (initial)
Enclosure material		self-extinguishing, shock-proof glass fibre reinforced technopolymer
Enclosure protection		IP67
Operating temperature		-25 ... +80°C (-13 ... +176°F)
Pollution degree		3
Protection against electric shock		Class II (double Insulation) □ Double insulation makes ground terminal unnecessary
Electrical life expectancy	min	150.000 cycles
Mechanical life expectancy	min	1 x 10 ⁷ cycles
Vibration	IEC 68-2-6 excursion	10-55 Hz ± 1Hz 0.35 mm, 1 octave/min
Fixing		2 x M4 screws

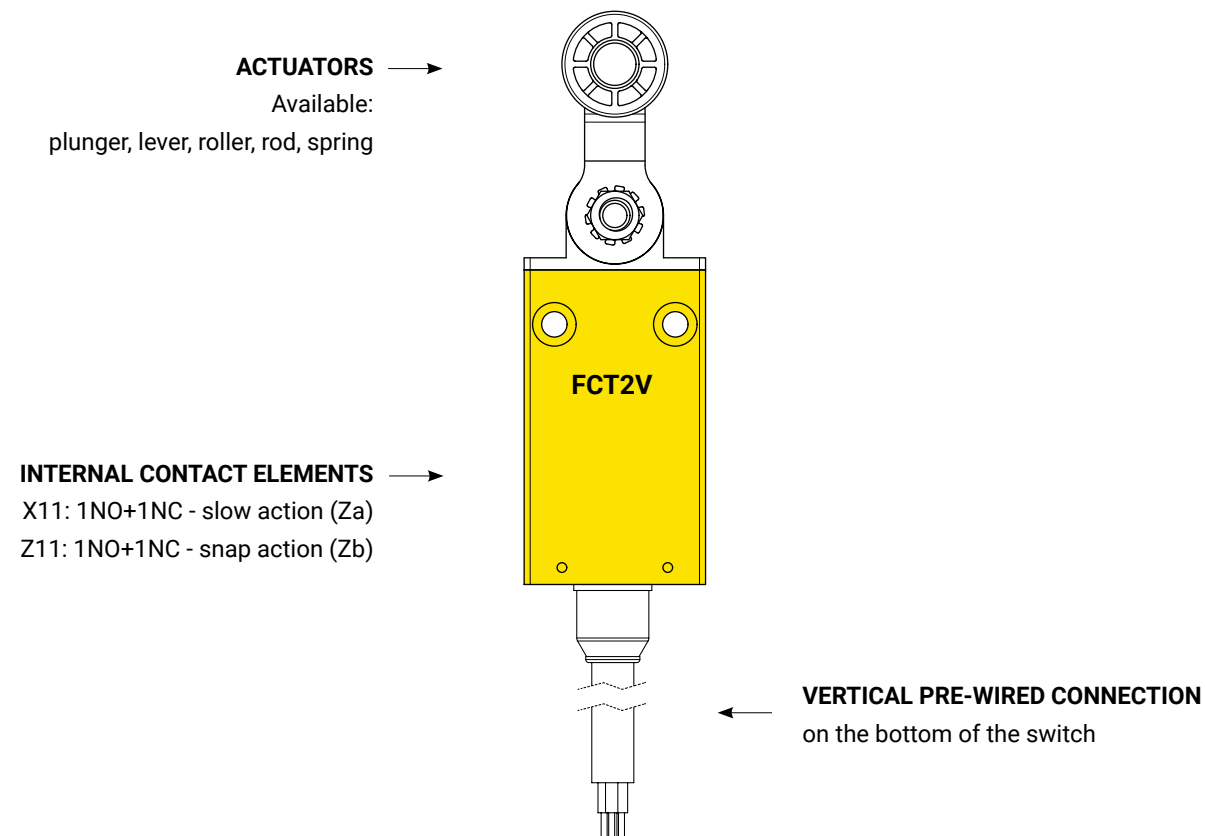
STRUCTURE DESCRIPTION

PRE-WIRED CONNECTION

L HORIZONTAL PRE-WIRED CONNECTION



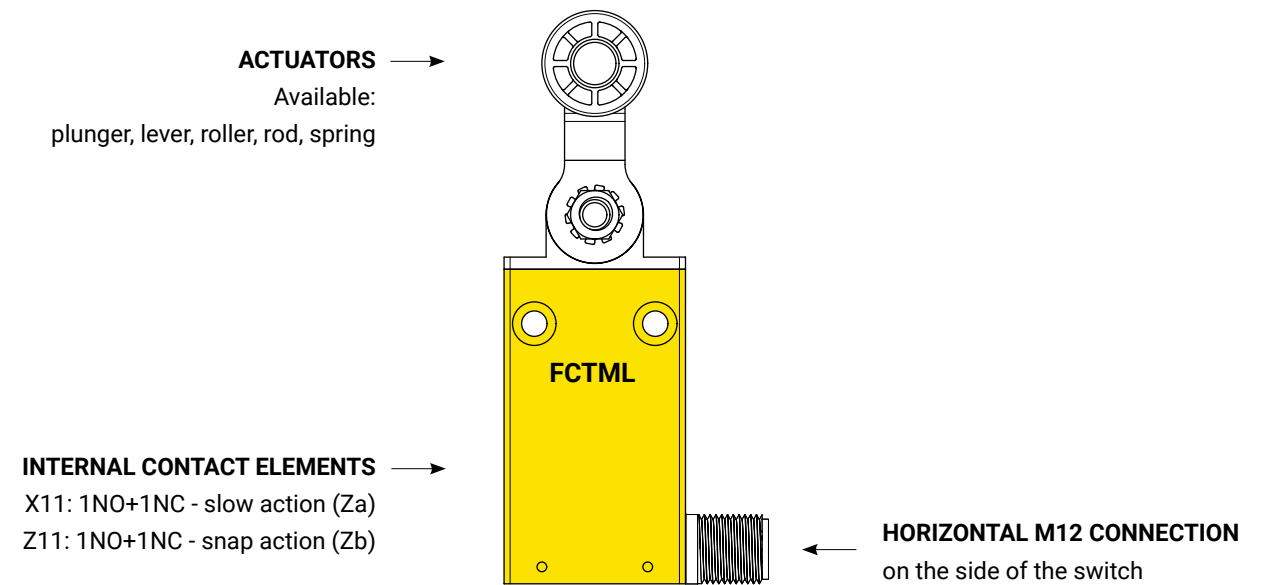
V VERTICAL PRE-WIRED CONNECTION



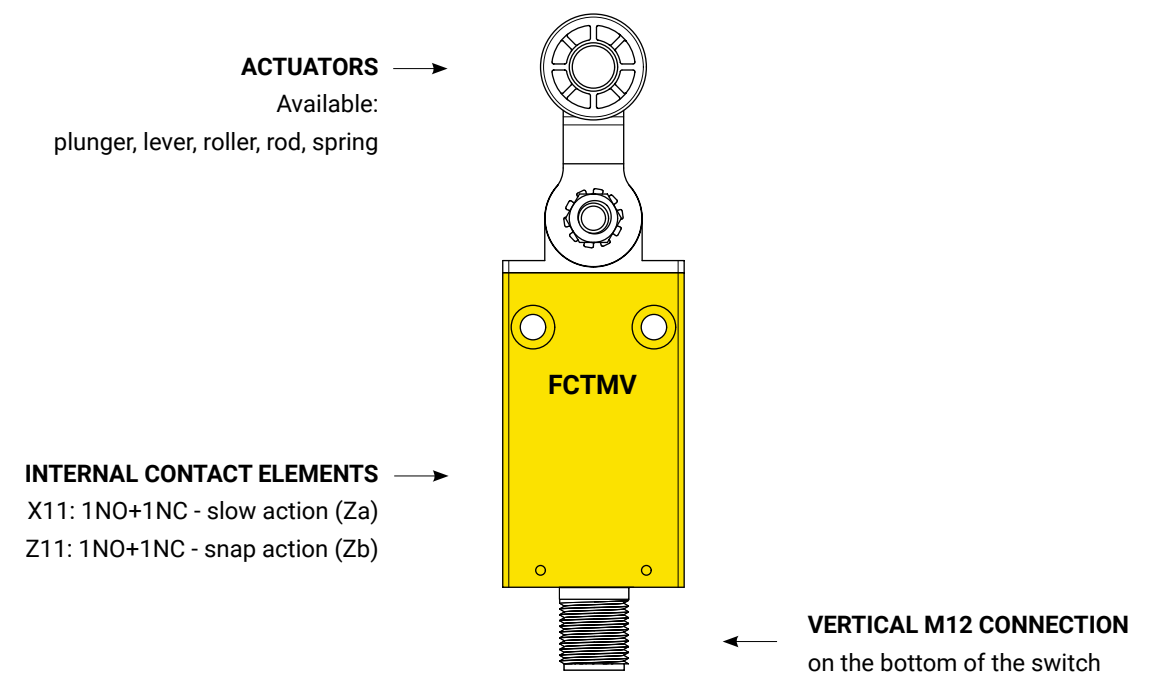
STRUCTURE DESCRIPTION

M12 CONNECTION

L HORIZONTAL M12 CONNECTION



V VERTICAL M12 CONNECTION



FCT - PRODUCT SELECTION OVERVIEW

1 ACTUATORS

01

02

03

04

05

06

07

08

09

10

11

2 CONTACT BLOCKS

X11
1NO+1NC - slow action (Zb)

Z11
1NO+1NC - snap action (Za)

CONTACT TYPES			CATEGORIES	
X11	1NO+1NC	slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A
Z11	1NO+1NC	snap action (Za)		DC13: 125 V - 0.55 A 240 V - 0.27 A

3 CONNECTION TYPE

PRE-WIRED

Pre-wired connection
(standard with 2 m cable)

Custom pre-wired connection
(with custom cable length)

M12-CONNECTED

M12 connection

3 CONNECTION ORIENTATION

L = horizontal
(side connection)

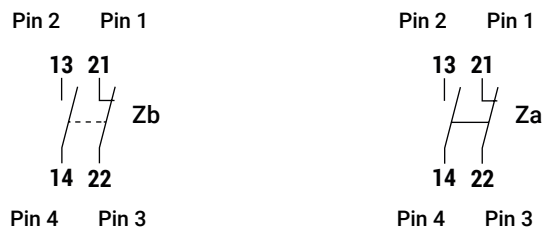
V = vertical
(bottom connection)

FCT - CODE SELECTION OVERVIEW

F C T			0 1	1 1	D
SERIES	CONNECTION TYPE	CONNECTION ORIENTATION	ACTUATOR	CONTACT TYPE	HOUSING
FCT thermoplastic limit switches	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable lenght (lenght = x meters) M M12 connector	L horizontal output V vertical output	01 metal end plunger 02 steel roller plunger 03 90° steel roller plunger 04 metal revolving lever with Ø17.5 nylon roller 05 adjustable metal revolving lever with Ø17.5 nylon roller 06 metal end plunger with threaded flange 07 steel roller plunger with threaded flange 08 90° steel roller plunger with threaded flange 09 metal end plunger with rubber protection 10 adjustable steel rod lever 11 thermoplastic end flexible rod	X11 1NO+1NC slow action Zb Z11 1NO+1NC snap action Za	D plastic with 20 mm fixing holes spacing

WIRING

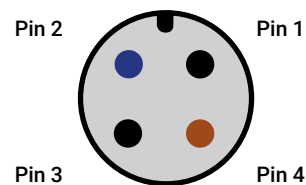
INTERNAL CABLE WIRING



X11 1NO+1NC - slow action (Zb)	Z11 1NO+1NC - snap action (Za)
--	--

WIRING

CONNECTOR PIN ASSIGNMENT



PIN	CABLE COLOUR
1	BLACK
2	BLUE
3	BLACK
4	BROWN

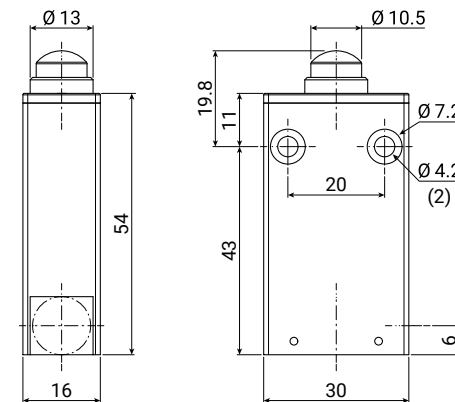
FCT01

Thermoplastic pre-wired or M12-connected limit switch with metal end plunger IP67



FCT series	X connection type	X connection orientation	01 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch				
	2 pre-wired with 2 m cable (standard)	L horizontal output	01 metal end plunger	X11: 1NO+1NC slow action (Zb)	D plastic with 20 mm fixing holes spacing
	x pre-wired with custom cable lenght	V vertical output		Z11: 1NO+1NC snap action (Za)	
	M M12-connected				

technical drawing - sizes in mm

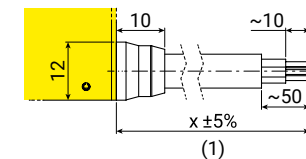


(2) mounting holes

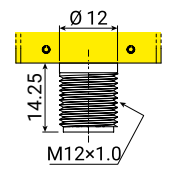
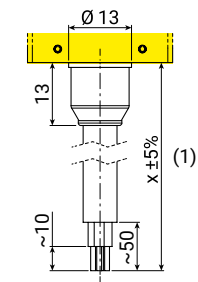
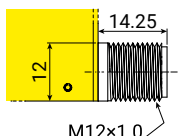
contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
Z11 1NO+1NC snap action (Za)	

technical drawing connection output - sizes in mm

PRE-WIRED



M12-CONNECTED



(1) x = cable lenght in meters

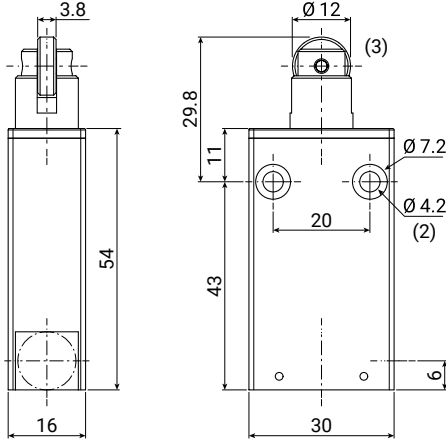
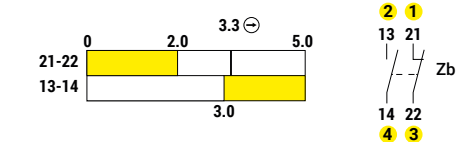
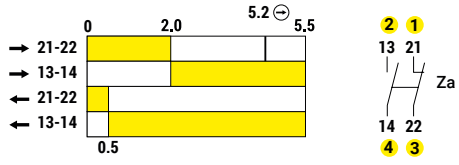
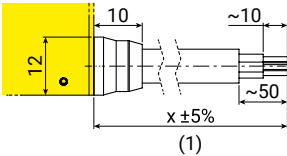
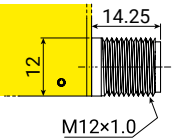
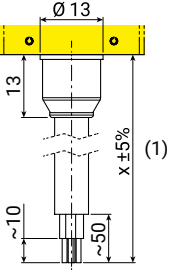
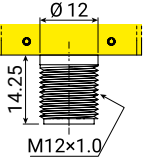
contact type	categories	ratings	operational travel PT1	operational travel PT2 (slow action)	operating force OF	positive opening POT (travel)	positive opening POF (force)	total travel TT
X11: 1NO+1NC slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A DC13: 125 V - 0.55 A 240 V - 0.27 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC snap action (Za)			2.0 mm	0.5 mm	9.8 N	5.2 mm	24 N	5.5 mm

FCT02

Thermoplastic pre-wired or M12-connected limit switch with steel roller plunger
IP67



FCT series	X connection type	X connection orientation	02 actuator	XXX contact type	D housing
FCT	2 pre-wired with 2 m cable (standard)	L horizontal output	02 steel roller plunger	X11: 1NO+1NC slow action (Zb)	D plastic with 20 mm fixing holes spacing
	x pre-wired with custom cable lenght	V vertical output		Z11: 1NO+1NC snap action (Za)	
	M M12-connected				

technical drawing - sizes in mm	contact type	operation diagrams
 (2) mounting holes (3) steel roller	X11 1NO+1NC slow action (Zb)	
	Z11 1NO+1NC snap action (Za)	
technical drawing connection output - sizes in mm		
PRE-WIRED  M12-CONNECTED    (1) x = cable lenght in meters		

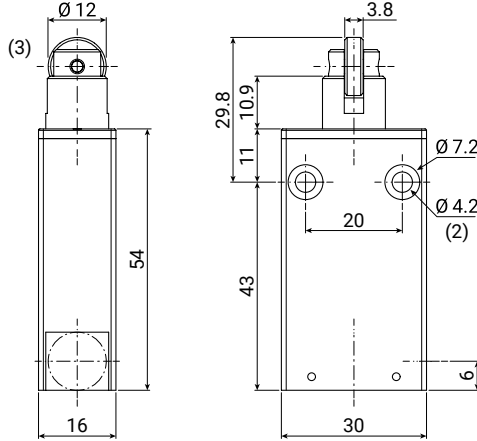
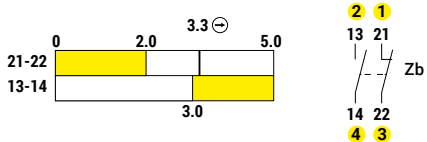
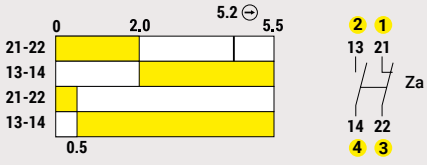
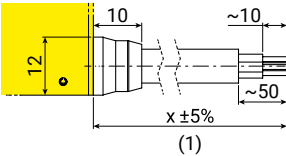
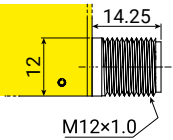
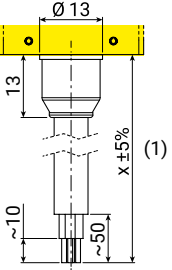
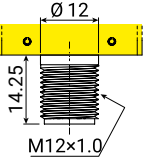
contact type		categories	ratings	operational travel		operating force OF	positive opening		total travel TT
PT1	PT2 (slow action)						POT (travel)	POF (force)	
X11: 1NO+1NC	slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC	snap action (Za)		DC13: 125 V - 0.55 A 240 V - 0.27 A	2.0 mm	0.5 mm	9.8 N	5.2 mm	24 N	5.5 mm

FCT03

Thermoplastic pre-wired or M12-connected limit switch with 90° steel roller plunger
IP67



FCT series	X connection type	X connection orientation	03 actuator	XXX contact type	D housing
FCT	2 pre-wired with 2 m cable (standard)	L horizontal output	03 90° steel roller plunger	X11: 1NO+1NC slow action (Zb)	D plastic with 20 mm fixing holes spacing
	x pre-wired with custom cable lenght	V vertical output		Z11: 1NO+1NC snap action (Za)	
	M M12-connected				

technical drawing - sizes in mm	contact type	operation diagrams
 (2) mounting holes (3) steel roller	X11 1NO+1NC slow action (Zb)	
	Z11 1NO+1NC snap action (Za)	
technical drawing connection output - sizes in mm		
PRE-WIRED  M12-CONNECTED    (1) x = cable lenght in meters		

contact type		categories	ratings	operational travel		operating force OF	positive opening		total travel TT
PT1	PT2 (slow action)						POT (travel)	POF (force)	
X11: 1NO+1NC	slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC	snap action (Za)		DC13: 125 V - 0.55 A 240 V - 0.27 A	2.0 mm	0.5 mm	9.8 N	5.2 mm	24 N	5.5 mm

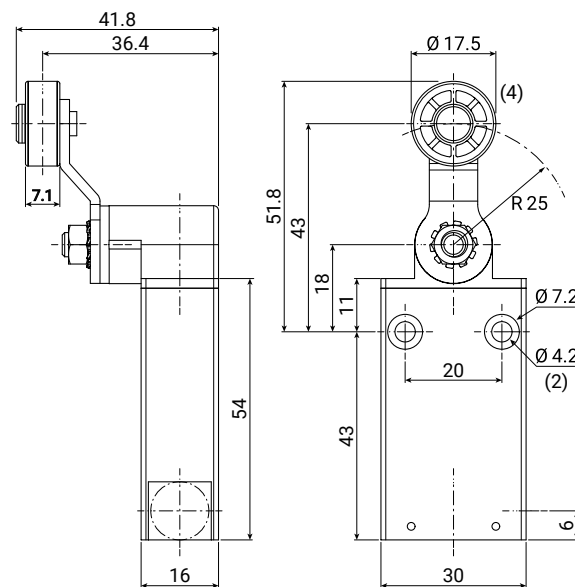
FCT04

Thermoplastic pre-wired or M12-connected limit switch with metal revolving lever with Ø17.5 nylon roller
IP67



FCT series	X connection type	X connection orientation	04 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable lenght M M12-connected	L horizontal output V vertical output	04 metal revolving lever with Ø17.5 nylon roller X11: 1NO+1NC slow action (Zb) Z11: 1NO+1NC snap action (Za)	D plastic with 20 mm fixing holes spacing

technical drawing - sizes in mm



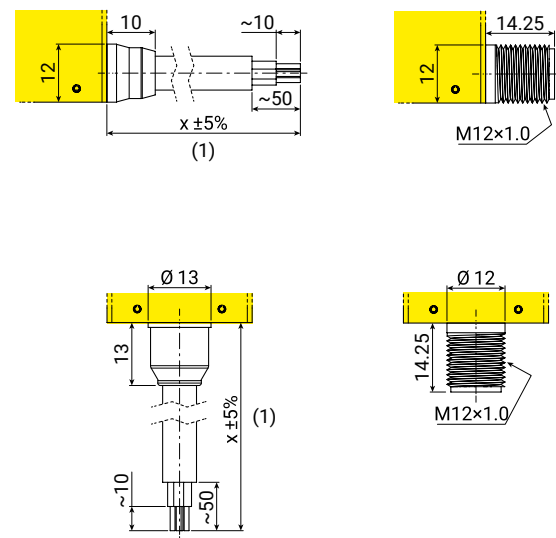
(2) mounting holes
(4) nylon roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
Z11 1NO+1NC snap action (Za)	

technical drawing connection output - sizes in mm

PRE-WIRED

M12-CONNECTED



(1) x = cable lenght in meters

contact type	categories	ratings	operational travel PT1	operational travel PT2 (slow action)	operating force OF	positive opening POT (travel)	positive opening POF (force)	total travel TT
X11: 1NO+1NC slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A DC13: 125 V - 0.55 A 240 V - 0.27 A	35°	45°	2 N	60°	4 N	80°
Z11: 1NO+1NC snap action (Za)			35°	20°	3 N	75°	6 N	85°

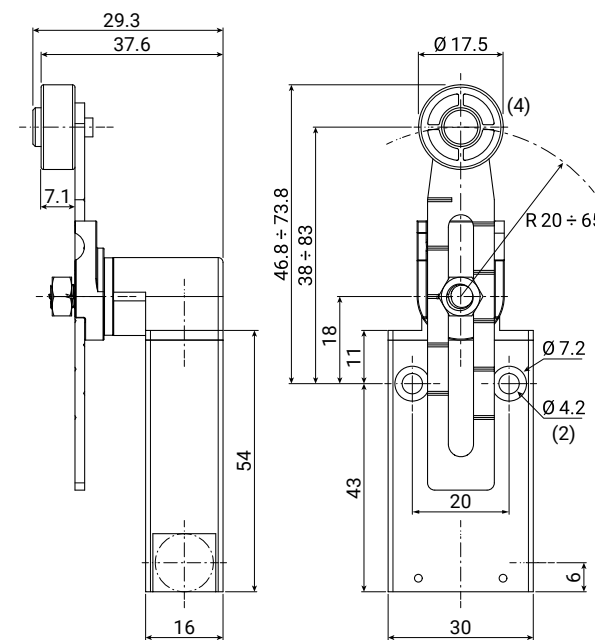
FCT05

Thermoplastic pre-wired or M12-connected limit switch with adjustable metal revolving lever with Ø17.5 nylon roller
IP67



FCT series	X connection type	X connection orientation	05 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable lenght M M12-connected	L horizontal output V vertical output	05 adjustable metal revolving lever with Ø17.5 nylon roller X11: 1NO+1NC slow action (Zb) Z11: 1NO+1NC snap action (Za)	D plastic with 20 mm fixing holes spacing

technical drawing - sizes in mm



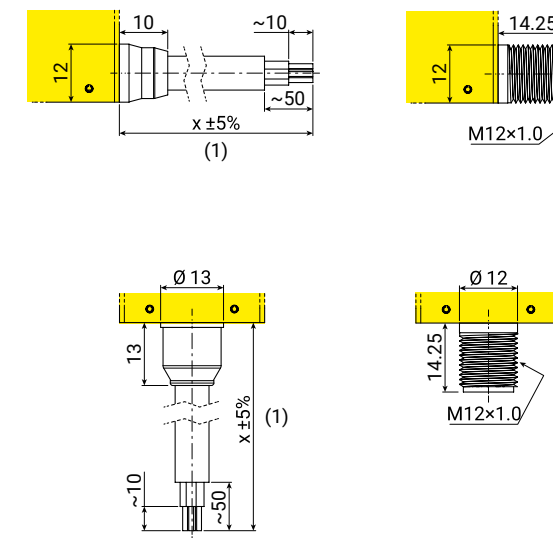
(2) mounting holes
(4) nylon roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
Z11 1NO+1NC snap action (Za)	

technical drawing connection output - sizes in mm

PRE-WIRED

M12-CONNECTED



(1) x = cable lenght in meters

contact type	categories	ratings	operational travel PT1	operational travel PT2 (slow action)	operating force OF	positive opening POT (travel)	positive opening POF (force)	total travel TT
X11: 1NO+1NC slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A DC13: 125 V - 0.55 A 240 V - 0.27 A	35°	45°	2 N	60°	4 N	80°
Z11: 1NO+1NC snap action (Za)			35°	20°	3 N	75°	6 N	85°

FCT06

Thermoplastic pre-wired or M12-connected limit switch with metal end plunger with threaded flange
IP67



FCT series		X connection type		X connection orientation		06 actuator		XXX contact type		D housing	
FCT	thermoplastic limit switch	2	pre-wired with 2 m cable (standard)	L	horizontal output	06	metal end plunger with threaded flange	X11: 1NO+1NC	slow action (Zb)	D	plastic with 20 mm fixing holes spacing
		x	pre-wired with custom cable lenght	V	vertical output			Z11: 1NO+1NC	snap action (Za)		
		M	M12-connected								

technical drawing - sizes in mm		contact type		operation diagrams	
(2) mounting holes		X11 1NO+1NC slow action (Zb)			
		Z11 1NO+1NC snap action (Za)			
technical drawing connection output - sizes in mm					
		PRE-WIRED	M12-CONNECTED		
		(1)			
		(1)			
		(1) x = cable lenght in meters			

contact type		categories	ratings	operational travel		operating force OF	positive opening		total travel
				PT1	PT2 (slow action)		POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC	snap action (Za)		DC13: 125 V - 0.55 A 240 V - 0.27 A	2.0 mm	0.5 mm	9.8 N	5.2 mm	24 N	5.5 mm

FCT07

Thermoplastic pre-wired or M12-connected limit switch with steel roller plunger with threaded flange
IP67



FCT		X		X		07		XXX		D	
series		connection type		connection orientation		actuator		contact type		housing	
FCT	thermoplastic limit switch	2	pre-wired with 2 m cable (standard)	L	horizontal output	07	steel roller plunger with threaded flange	X11: 1NO+1NC	slow action (Zb)	D	plastic with 20 mm fixing holes spacing
		x	pre-wired with custom cable lenght	V	vertical output			Z11: 1NO+1NC	snap action (Za)		
		M	M12-connected								

technical drawing - sizes in mm

Technical drawing of the 1NO+1NC relay showing front and side views with dimensions in mm:

- Front View:**
 - Top terminal spacing: 3.8
 - Coil height: 11
 - Terminal block height: 54
 - Base width: 16
- Side View:**
 - Top terminal diameter: $\varnothing 10.5$
 - Coil height: 44.7
 - Terminal block height: 43
 - Base width: 30
 - Base thickness: 6
 - Mounting hole diameter: $\varnothing 7.2$
 - Mounting hole spacing: 20
 - Steel roller diameter: $\varnothing 4.2$
 - Coil thread: M12x1.0

(2) mounting holes
(3) steel roller

contact type

X11
1NO+1NC
slow action
(Zb)

operation diagrams

Operation diagram for X11 relay (Zb):

- Timing Diagram:** Shows a pulse of 2.0 units with a 3.3 unit delay. The total duration is 5.0 units. The contact sequence is 21-22 (yellow) and 13-14 (white).
- Contact Sequence Diagram:** Shows the sequence of contacts: 2 (yellow), 1 (yellow), 13 (white), 21 (white), 14 (white), 22 (white), 4 (yellow), 3 (yellow).

Z11
1NO+1NC
snap action
(Za)

Operation diagram for Z11 relay (Za):

- Timing Diagram:** Shows a pulse of 2.0 units with a 5.2 unit delay. The total duration is 5.5 units. The contact sequence is 21-22 (yellow) and 13-14 (white).
- Contact Sequence Diagram:** Shows the sequence of contacts: 2 (yellow), 1 (yellow), 13 (white), 21 (white), 14 (white), 22 (white), 4 (yellow), 3 (yellow).

technical drawing connection output - sizes in mm

PRE-WIRED

M12-CONNECTED

Technical drawing of the pre-wired connection output showing dimensions in mm:

- Terminal block width: 12
- Terminal block height: 10
- Terminal block thickness: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing 12$
- Terminal block spacing: 12
- Terminal block height: ~ 10
- Terminal block length: $x \pm 5\%$
- Terminal block diameter: $\varnothing 13$
- Terminal block spacing: 13
- Terminal block height: 13
- Terminal block length: ~ 50
- Terminal block diameter: $\varnothing$

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC	snap action (Za)		DC13: 125 V - 0.55 A 240 V - 0.27 A	2.0 mm	0.5 mm	9.8 N	5.2 mm	24 N	5.5 mm

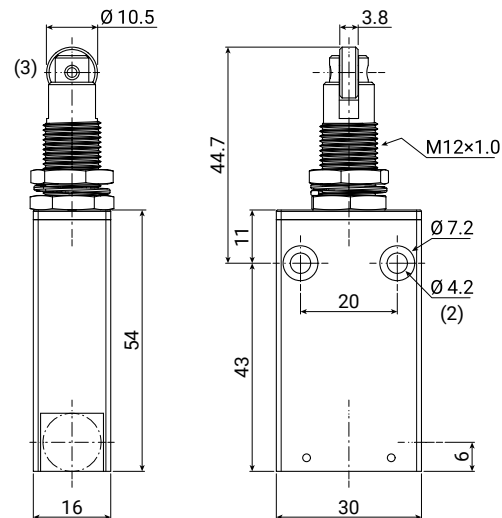
FCT08

Thermoplastic pre-wired or M12-connected limit switch with 90° steel roller plunger with threaded flange
IP67



FCT series		X connection type		X connection orientation		08 actuator		XXX contact type		D housing	
FCT	thermoplastic limit switch	2	pre-wired with 2 m cable (standard)	L	horizontal output	08	90° steel roller plunger with threaded flange	X11: 1NO+1NC	slow action (Zb)	D	plastic with 20 mm fixing holes spacing
		x	pre-wired with custom cable lenght	V	vertical output			Z11: 1NO+1NC	snap action (Za)		
		M	M12-connected								

technical drawing - sizes in mm



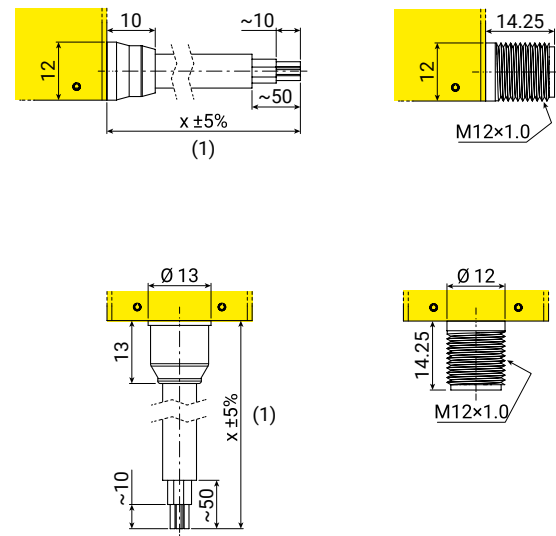
(2) mounting holes
(3) steel roller

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
Z11 1NO+1NC snap action (Za)	

technical drawing connection output - sizes in mm

PRE-WIRED

M12-CONNECTED



(1) x = cable length in meters

contact type	categories	ratings	operational travel PT1	operational travel PT2 (slow action)	operating force OF	positive opening POT (travel)	positive opening POF (force)	total travel TT
X11: 1NO+1NC slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A DC13: 125 V - 0.55 A 240 V - 0.27 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC snap action (Za)			2.0 mm	0.5 mm	9.8 N	5.2 mm	24 N	5.5 mm

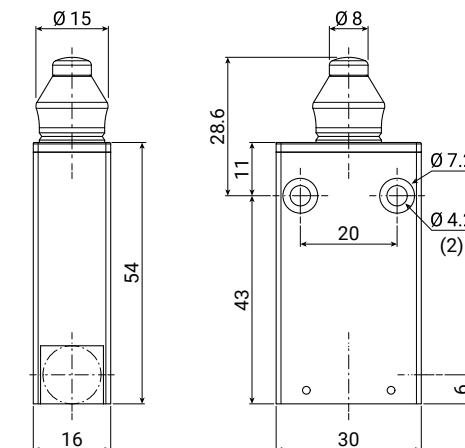
FCT09

Thermoplastic pre-wired or M12-connected limit switch with metal end plunger with rubber protection
IP67



FCT series		X connection type		X connection orientation		09 actuator		XXX contact type		D housing	
FCT	thermoplastic limit switch	2	pre-wired with 2 m cable (standard)	L	horizontal output	09	steel roller plunger with threaded flange	X11: 1NO+1NC	slow action (Zb)	D	plastic with 20 mm fixing holes spacing
		x	pre-wired with custom cable lenght	V	vertical output			Z11: 1NO+1NC	snap action (Za)		
		M	M12-connected								

technical drawing - sizes in mm



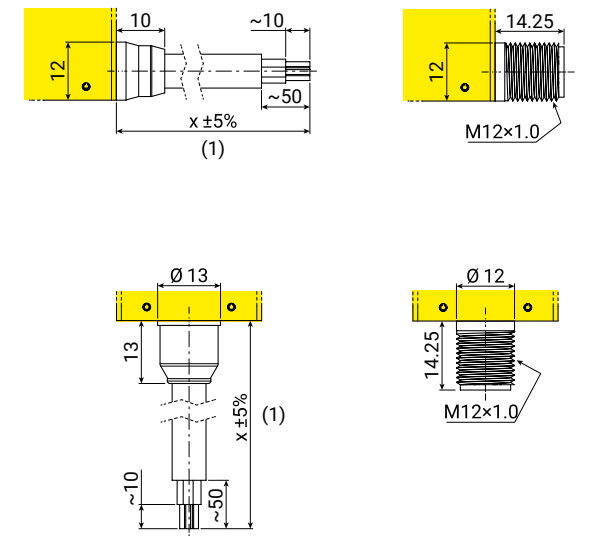
(2) mounting holes

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
Z11 1NO+1NC snap action (Za)	

technical drawing connection output - sizes in mm

PRE-WIRED

M12-CONNECTED



(1) x = cable length in meters

contact type	categories	ratings	operational travel PT1	operational travel PT2 (slow action)	operating force OF	positive opening POT (travel)	positive opening POF (force)	total travel TT
X11: 1NO+1NC slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A DC13: 125 V - 0.55 A 240 V - 0.27 A	2.5 mm	3.5 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC snap action (Za)			2.5 mm	1.0 mm	9.8 N	5.2 mm	24 N	5.5 mm

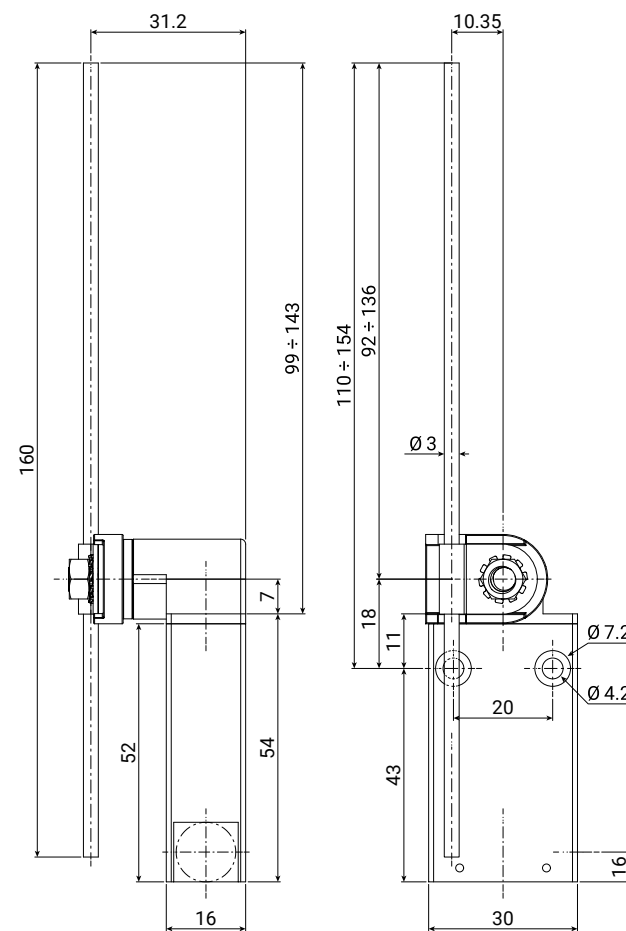
FCT10

**Thermoplastic pre-wired or M12-connected limit switch with adjustable steel rod lever
IP67**



FCT series		X		X		10		XXX		D	
		connection type		connection orientation		actuator		contact type		housing	
FCT	thermoplastic limit switch	2	pre-wired with 2 m cable (standard)	L	horizontal output	10	adjustable steel rod lever	X11: 1NO+1NC	slow action (Zb)	D	plastic with 20 mm fixing holes spacing
		x	pre-wired with custom cable lenght	V	vertical output			Z11: 1NO+1NC	snap action (Za)		
		M	M12-connected								

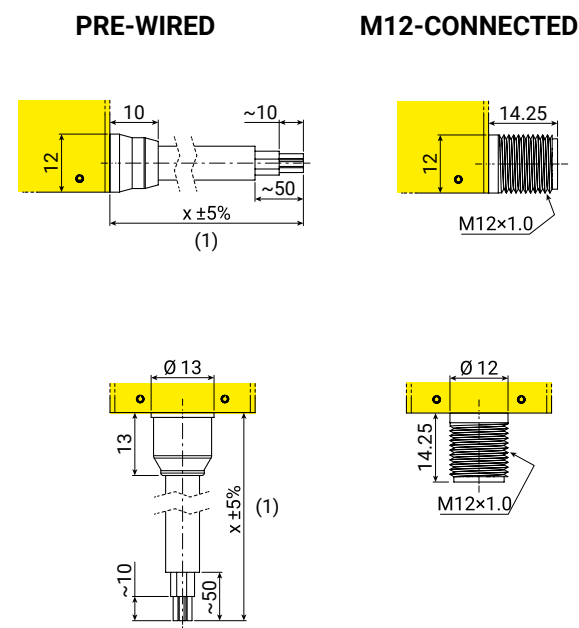
technical drawing - sizes in mm



(2) mounting holes

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	60° 80° 35° 35° 80° 21-22 13-14 45° 45° 2 1 13 21 Zb 14 22 4 3
Z11 1NO+1NC snap action (Za)	75° 85° 35° 35° 75° 85° → 21-22 → 13-14 ← 21-22 ← 13-14 20° 20° 2 1 13 21 Za 14 22 4 3

technical drawing connection output - sizes in mm



(1) x = cable length in meters

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	35°	45°	2 N	60°	4 N	80°
Z11: 1NO+1NC	snap action (Za)		DC13: 125 V - 0.55 A 240 V - 0.27 A	35°	20°	3 N	75°	6 N	85°

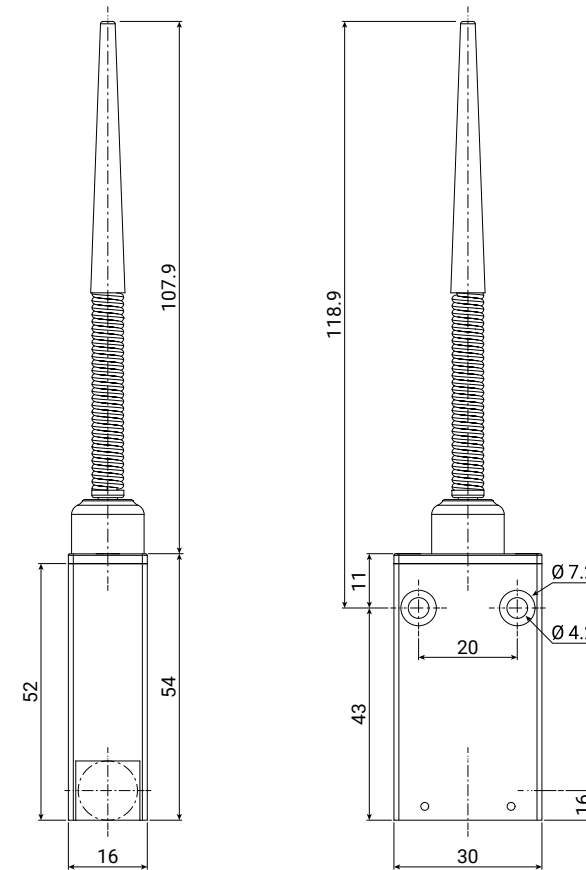
FCT11

Thermoplastic pre-wired or M12-connected limit switch with thermoplastic end flexible rod
IP67



FCT		X		X		11		XXX		D	
series		connection type		connection orientation		actuator		contact type		housing	
FCT	thermoplastic limit switch	2	pre-wired with 2 m cable (standard)	L	horizontal output	11	thermoplastic end flexible rod	X11: 1NO+1NC	slow action (Zb)	D	plastic with 20 mm fixing holes spacing
		x	pre-wired with custom cable lenght	V	vertical output			Z11: 1NO+1NC	snap action (Za)		
		M	M12-connected								

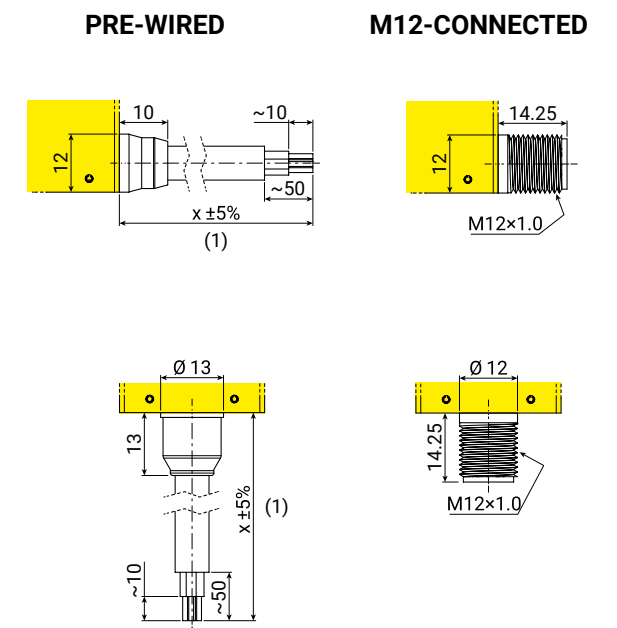
technical drawing - sizes in mm



(2) mounting holes

contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
Z11 1NO+1NC snap action (Za)	

technical drawing connection output - sizes in mm



(1) x = cable length in meters

contact type		categories	ratings	operational travel		operating force	positive opening		total travel
				PT1	PT2 (slow action)	OF	POT (travel)	POF (force)	TT
X11: 1NO+1NC	slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	12°	21°	-	-	-	-
Z11: 1NO+1NC	snap action (Za)		DC13: 125 V - 0.55 A 240 V - 0.27 A	18°	3°	-	-	-	-



MFI SERIES



A **micro switch** is a switch used in electronics to interrupt or divert small currents.

It has a contact mechanism that is covered by a housing and has a control actuator on the outside of the switch.

A micro switch requires very little force to operate.

The contact distance of the switch is therefore quite small.

A micro switch is a solution designed to control the movement of a mechanical part and is used in household appliances, electronic equipment, automatic machines and electric cars.

Giovenzana offers different types of microswitches that can be easily adapted to different equipment and requirements.

Available six different series of micro switches, normalized with self-cleaning contacts and different actuating types:

- **MFI series:** with 6.3 × 0.8 mm faston terminals;
- **MFI.S series:** with solder terminals;
- **MFI.ST series:** with screw terminals (M3 for wire 1.5 mm²);
- **MFI.STP series:** with screw terminals (M3 for wire 1.5 mm²) and plate protection;
- **MFI.T series:** with 6.3 × 0.8 mm faston terminals and tower actuator with threaded flange;
- **MFI.EX series:** ATEX and IECEx micro switches for use in hazardous areas and potentially explosive atmospheres. Discover them in our dedicated catalogue.

MAIN FEATURES

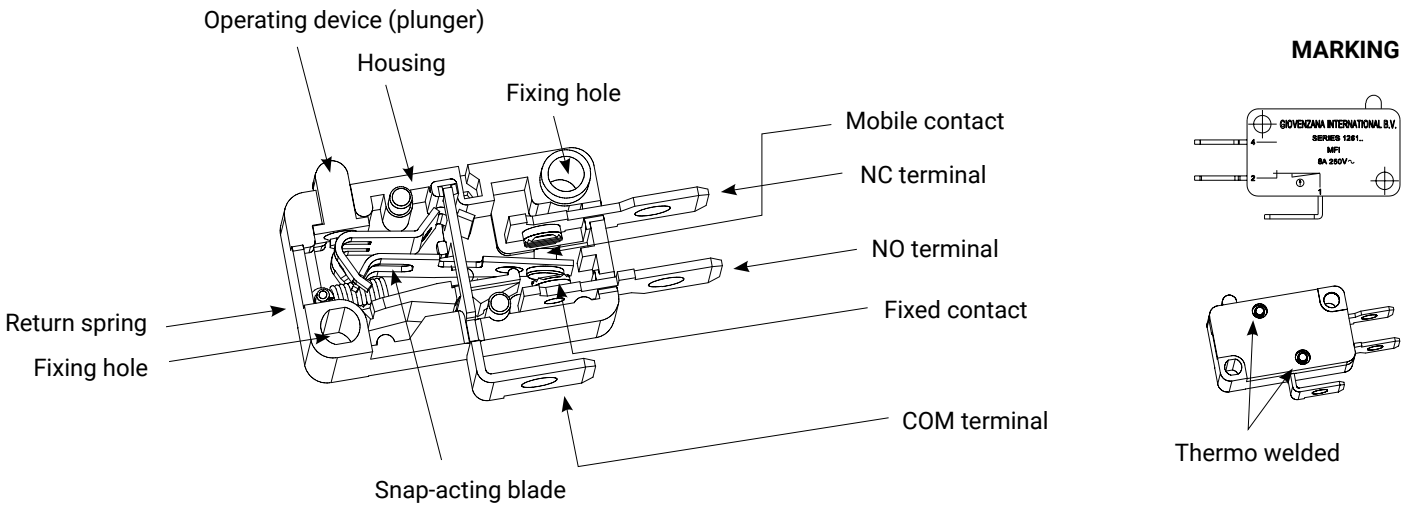
- Fast and reliable switching, independent from actuating speed.
- High electrical ratings with small dimensions.
- High repetition accuracy of switching points and forces.
- Low operating force.
- NC positive opening. Ⓢ
- Very long service life.
- Equipped with self-cleaning silver alloy switching contacts.
- Contacts: 1NC+1NO (snap action).

SPECIFICATIONS

Standards		IEC/EN 61058, UL 1054
Approvals		CE, CCC, cRUus and UKCA
Operating temperature		-25 ... +85°C (-13 ... +185°F)
Minimum life expectancy	mechanical	1 × 10 ⁶ cycles
	electrical	5 × 10 ⁵ cycles
Rated thermal current	I _{th}	8 A
Rated insulation voltage	U _i	250 V AC
Rated impulse withstand voltage	U _{imp}	1500 V
Rated operating current	I _e	resistive load: 8 A - 250 V inductive load: 3 A - 250 V
Pollution degree		2
Protection against electric shock		class II



STRUCTURE DESCRIPTION



The micro switches are activated by a spring (or snap) mechanism. Pressing the actuator activates the switching operation, with a predefined force and travel. The switching speed itself is independent of the actuating speed.

CONTROL LEVERS

A control lever can be attached to a snap switch to meet the specific requirements of a particular application. This usually changes the travel and forces involved in the switching operation, depending on the length of the levers. By connecting an appropriate actuating lever, it's possible to increase the travel and/or reduce the required actuating force.

CONTROL DEVICE (PLUNGER)

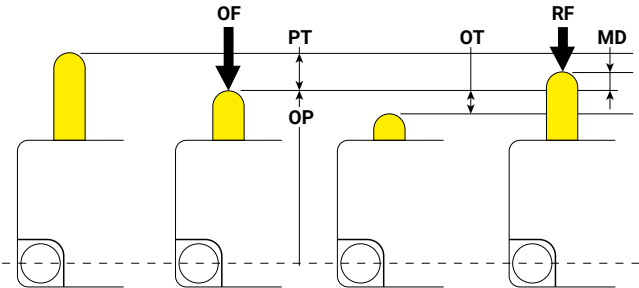
Applying force to the trigger of a snap switch releases the snap mechanism, which in turn triggers the switching operation.

POSITIVE OPENING

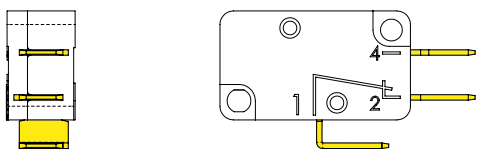
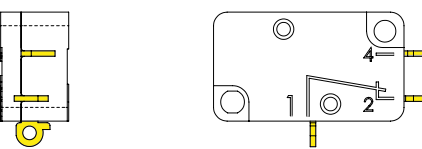
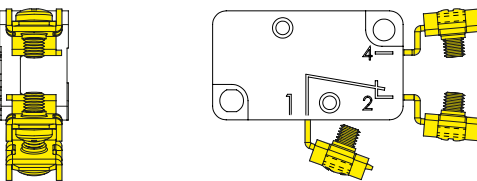
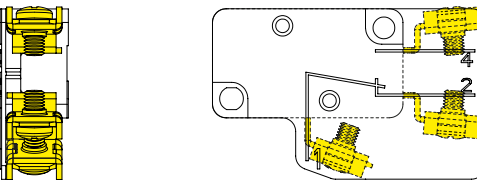
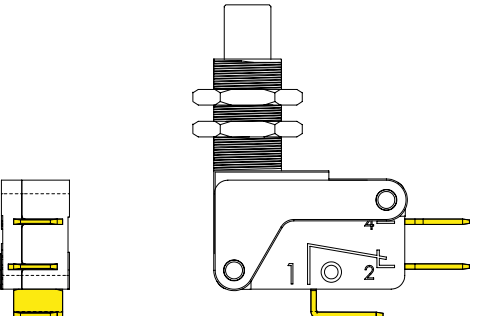
An additional internal mechanism, consisting of non-resistant parts, forces the opening of the NC contacts in case of accidental welding (overload, short circuit, ...) or failure of the trigger mechanism. The models equipped with this function are particularly suitable for safety-related applications according to ISO13849-1 or EN60204-1. To ensure the correct operation of the positive opening, the control device must be pressed into the positive opening position or beyond.

TRAVELS AND ACTUATING FORCE

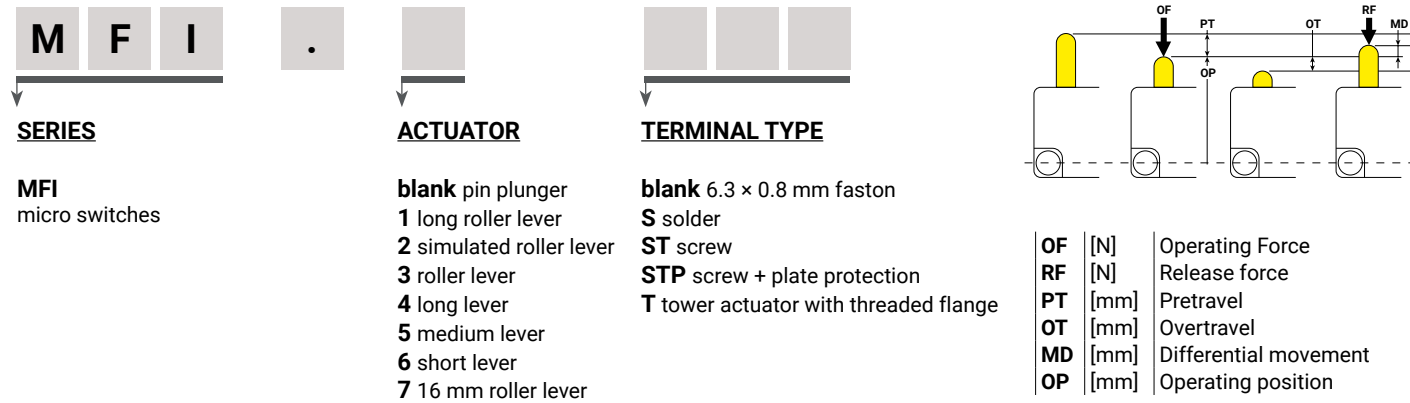
OF	[N]	Operating Force Force, applied to the actuator, required to operate the contacts
RF	[N]	Release force Value to which the force applied to the actuator must be reduced to allow the contacts to return to the release position and reset
PT	[mm]	Pretravel The distance or angle that the operator travels from the starting position to the operating position
OT	[mm]	Overtravel The distance or angle that the operator travels from the operating position to the total travel position
MD	[mm]	Differential movement The distance or angle that the operator travels from the activation position to the release position in which the reset occurs
OP	[mm]	Operating position Position of the actuator in which the contacts are activated with a snap action, reached when the actuating force is applied



MFI - PRODUCT SELECTION BY TERMINAL TYPE

Technical drawing	Series - Terminals	Code	Actuator
	 MFI series 6.3 x 0.8 mm faston terminals	MFI MFI.1 MFI.2 MFI.3 MFI.4 MFI.5 MFI.6 MFI.7	Pin plunger Long roller lever Simulated roller lever Roller lever Long lever Medium Lever Short lever 16 mm roller lever
	 MFI.S series solder terminals	MFI .S MFI.1S MFI.2S MFI.3S MFI.4S MFI.5S MFI.6S MFI.7S	Pin plunger Long roller lever Simulated roller lever Roller lever Long lever Medium Lever Short lever 16 mm roller lever
	 MFI.ST series screw terminals M3 for wire 1.5 mm ²	MFI .ST MFI.1ST MFI.2ST MFI.3ST MFI.4ST MFI.5ST MFI.6ST MFI.7ST	Pin plunger Long roller lever Simulated roller lever Roller lever Long lever Medium Lever Short lever 16 mm roller lever
	 MFI.STP series screw terminals M3 for wire 1.5 mm ² + plate protection	MFI .STP MFI.1STP MFI.2STP MFI.3STP MFI.4STP MFI.5STP MFI.6STP MFI.7STP	Pin plunger Long roller lever Simulated roller lever Roller lever Long lever Medium Lever Short lever 16 mm roller lever
	 MFI.T 6.3 x 0.8 mm faston terminals and tower actuator with threaded flange	MFI .T	Tower actuator with threaded flange

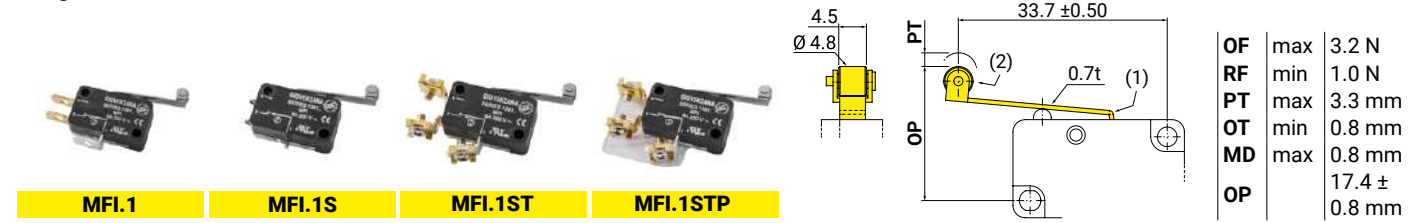
MFI - CODE SELECTION OVERVIEW



Pin plunger



Long roller lever



Simulated roller lever



Roller lever



Long lever



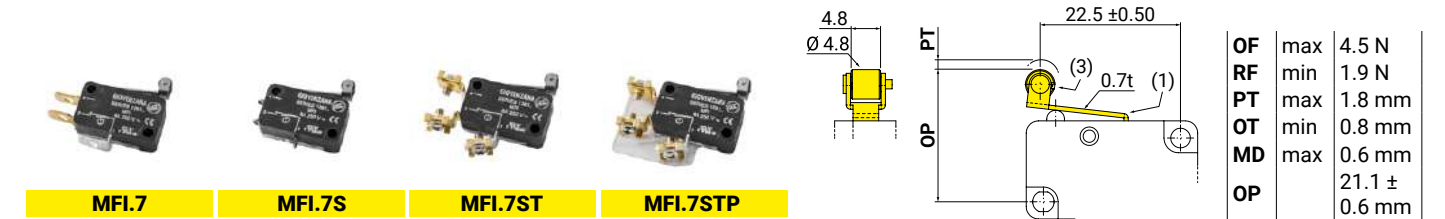
Medium lever



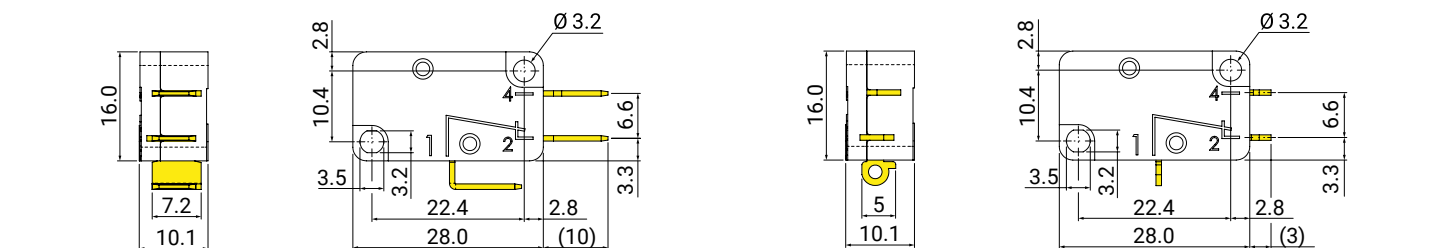
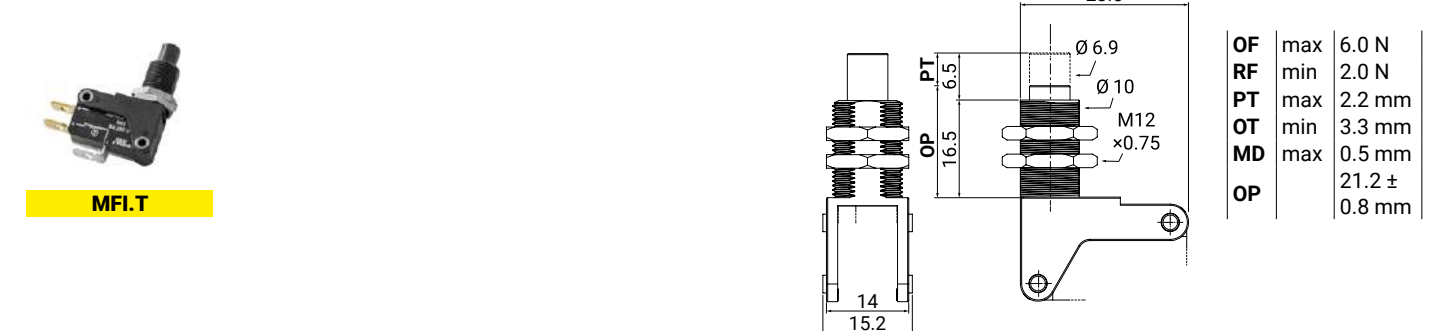
Short lever



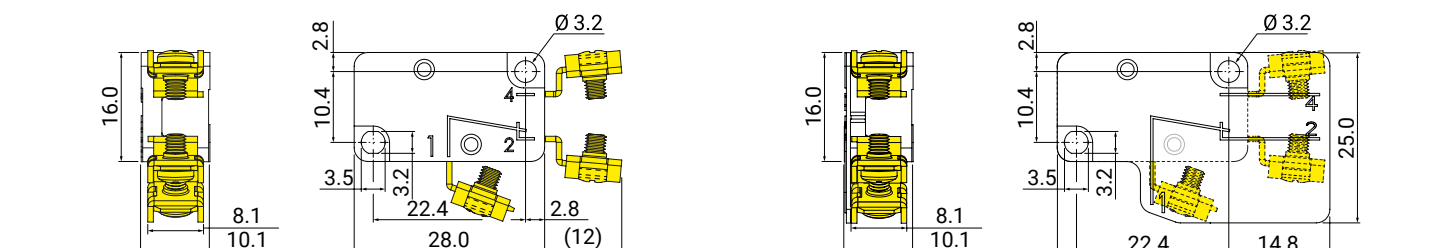
16 mm roller lever



Tower actuator with threaded flange



FASTON TERMINALS



SCREW TERMINALS

SCREW TERMINALS + PLATE PROTECTION



MZ SERIES



A micro switch, better known as a snap-action switch, contains a spring mechanism that opens and closes connections between 2 devices, quickly changing the current direction.

Giovenzana offers micro switches with a **IP40 degree of protection (with MZA8000 terminal enclosure)**, with high temperature resistance and a long service life. The compact, ergonomic and functional design meets the needs of various applications in the industrial field.

The wide choice of actuators allows most installation requirements to be covered. They are mainly used in workshop equipment, communication devices, test instruments, household appliances, electro-medical equipment, electrical automation instruments, lifts and elevators, etc.

The MZ series micro switches are divided into two lines characterized by different electrical connection:

- **MZS**: with screw terminals;
- **MZW**: with solder terminals.

These two lines, in turn, are divided into two groups characterised by normal body (the micro switches of **group 13**) and by raised body (the micro switches of **group 17**).

MAIN FEATURES

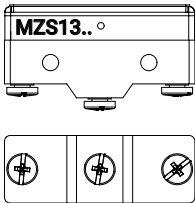
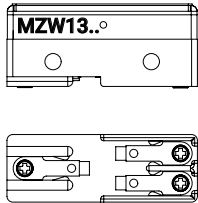
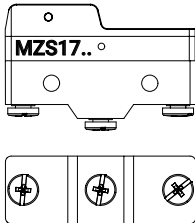
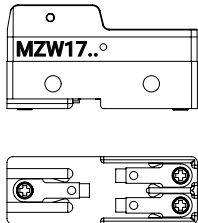
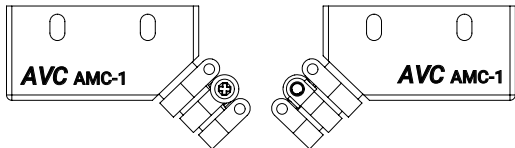
- High precision snap action micro switches.
- Various types of actuators are available.
- The spring mechanism switches the electrical contacts inside the microswitches.
- The power supply direction changes rapidly between the devices connected to the micro switches.
- Wide operating speed margins.
- Available in general purpose.



SPECIFICATIONS

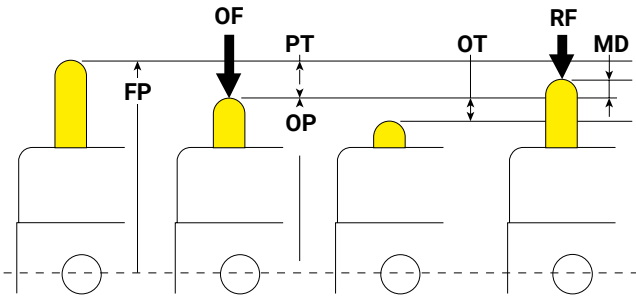
Approvals		CE, UL and UKCA			
Rating					
Rated contact voltage	UL 61058	125 V AC	250 V AC	125 V DC	250 V DC
Maximum contact current		15 A	15 A	0.5 A	0.25 A
Electrical characteristics					
Maximum contact resistance	initial	15 mΩ			
Minimum insulation resistance	at 500 V DC	100 MΩ			
Dielectric withstanding voltage	for 1 minute	1000 V AC (50 or 60 Hz)			
Mechanical characteristics					
Operating speed		0.1 mm/s ... 1 m/s			
Operating frequency		30 operations per minute			
Vibration		10 ... 55 Hz, 1.5 mm double amplitude			
Minimum operating life	electrical	1 × 10 ⁵ cycles			
	mechanical	1 × 10 ⁶ cycles			
Climatic characteristics					
Operating temperature	UL certified	0 ... +55°C (maximum humidity of 60%)			
Degree of protection	with accessory	IP40			

MZ - PRODUCT SELECTION BY TERMINAL TYPE

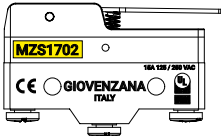
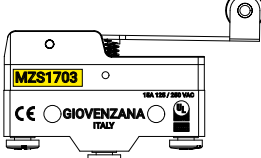
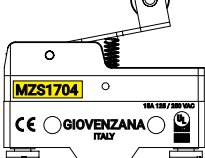
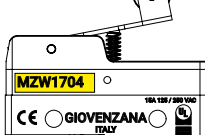
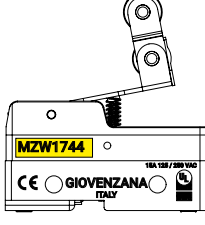
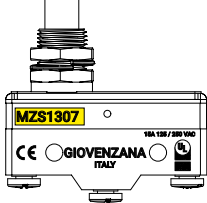
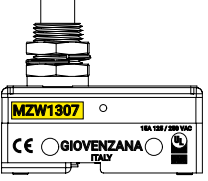
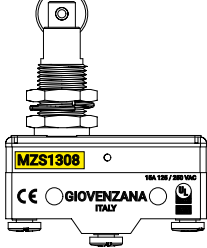
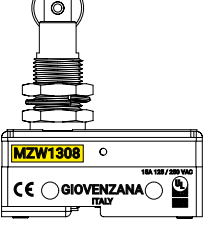
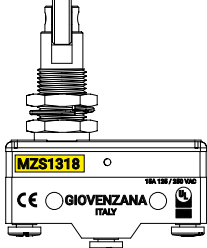
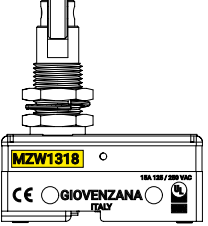
Screw terminals	Solder terminals	Code	Actuator
		1300	Short plunger Ø2.3
		1301	Bending lever
		1303	Bending roller lever
		1305	Long plunger Ø4
		1306	Short plunger Ø7.2
		1307	Panel mount plunger
		1308	Panel mount roller plunger
1318	Panel mount cross roller plunger		
		1701	Hinge lever
		1702	Short hinge lever
		1703	Hinge roller lever
		1704	Short hinge roller lever
		1744	Unidirectional hinge roller lever
			
MZA8000		Terminal enclosure	

TRAVELS AND ACTUATING FORCE

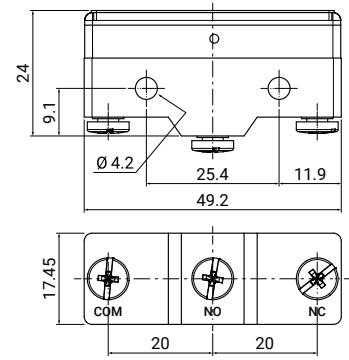
OF	[N]	Operating Force Force, applied to the actuator, required to operate the contacts
RF	[N]	Release force Value to which the force applied to the actuator must be reduced to allow the contacts to return to the release position and reset
PT	[mm]	Pretravel The distance or angle that the operator travels from the starting position to the operating position
OT	[mm]	Overtravel The distance or angle that the operator travels from the operating position to the total travel position
MD	[mm]	Differential movement The distance or angle that the operator travels from the activation position to the release position in which the reset occurs
FP	[mm]	Initial position Initial position of the actuator (no forces applied)
OP	[mm]	Operating position Position of the actuator in which the contacts are activated with a snap action, reached when the actuating force is applied



MZ - PRODUCT SELECTION BY OPERATING LEVERS

SCREW TERMINALS		SOLDER TERMINALS	
MZS13	MZS17	MZW13	MZW17
			
			
			
			
			
			
			
			

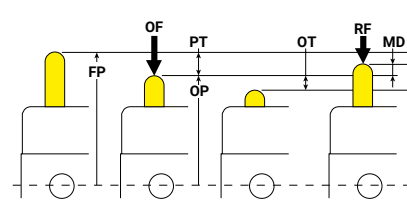
MZS13 SCREW TERMINALS - CODE SELECTION OVERVIEW



SERIES	TERMINAL TYPE	BODY CONFIGURATION	ACTUATOR TYPE
MZ	S	13	
MZ micro switches	S screw terminals	13 standard	00 short plunger Ø2.3 01 bending lever 03 bending roller lever 05 long plunger Ø4 06 short plunger Ø7.2 07 panel mount plunger 08 panel mount roller plunger 18 panel mount cross roller plunger

TRAVELS AND ACTUATING FORCES

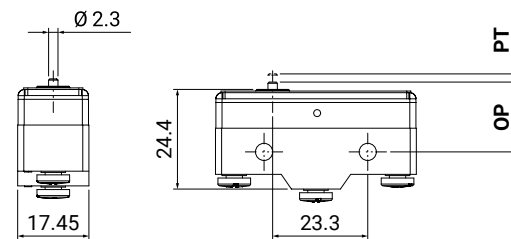
OF	[N]	Operating Force
RF	[N]	Release force
PT	[mm]	Pretravel
OT	[mm]	Overtravel
MD	[mm]	Differential movement
FP	[mm]	Initial position
OP	[mm]	Operating position



Short plunger Ø2.3



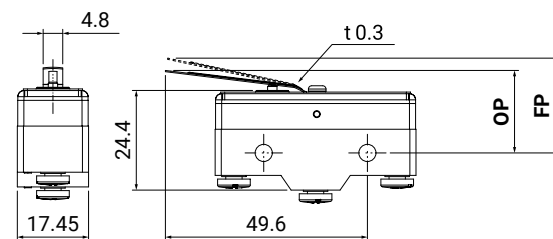
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	0.13 mm
MD	max	0.10 mm
FP	max	-
OP		15.9 ± 0.4 mm



Bending lever



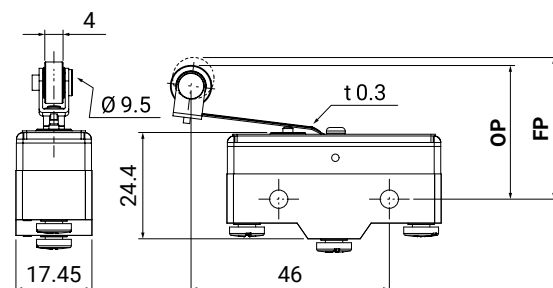
OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	20.6 mm
OP		17.4 ± 0.8 mm



Bending roller lever



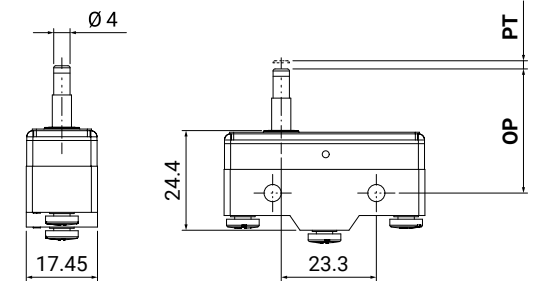
OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	31.8 mm
OP		28.6 ± 0.8 mm



Long plunger Ø4



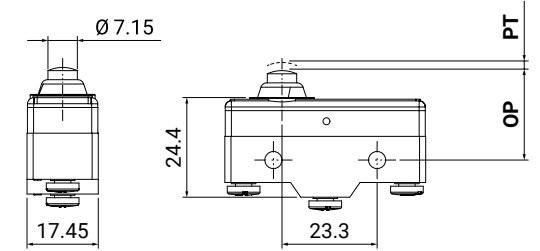
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		28.2 ± 0.5 mm



Short plunger Ø7.2



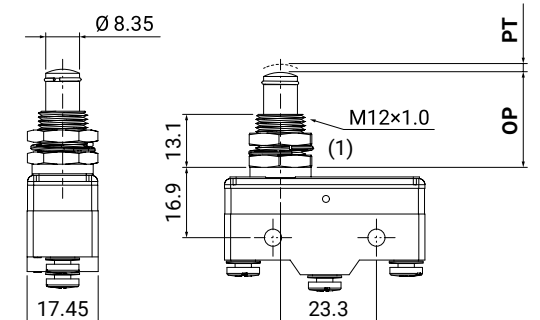
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		21.5 ± 0.5 mm



Panel mount plunger



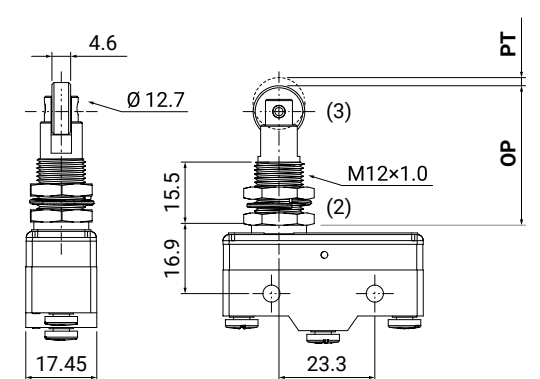
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	5.5 mm
MD	max	0.10 mm
FP	max	-
OP		21.8 ± 0.8 mm



Panel mount roller plunger



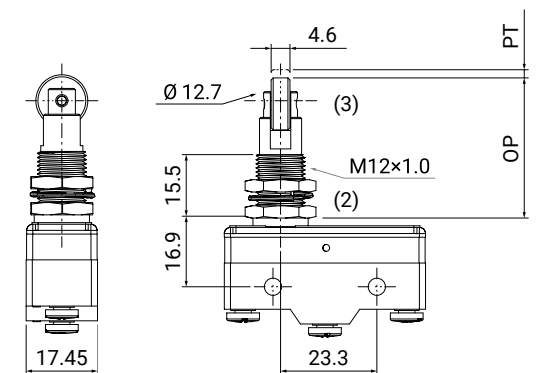
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	3.58 mm
MD	max	0.10 mm
FP	max	-
OP		33.4 ± 1.2 mm



Panel mount cross roller plunger

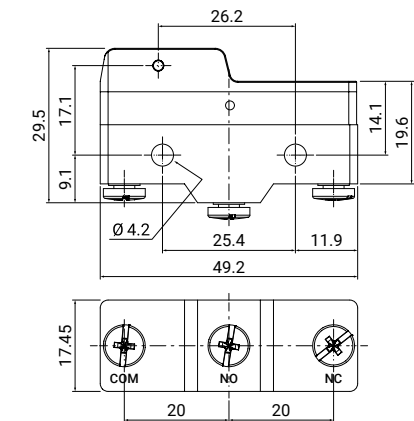


OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	3.58 mm
MD	max	0.10 mm
FP	max	-
OP		33.4 ± 1.2 mm



(1) 2 hexagonal brass nuts 3×15 mm (2) 2 hexagonal brass nuts 3×17 mm (3) Stainless steel roller

MZS17 SCREW TERMINALS - CODE SELECTION OVERVIEW



MZ

S

17

SERIES

TERMINAL TYPE

BODY CONFIGURATION

ACTUATOR TYPE

MZ micro switches

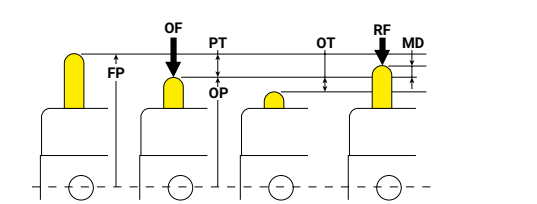
S screw terminals

17 hinged

01 hinge lever
 02 short hinge lever
 03 hinge roller lever
 04 short hinge roller lever
 44 unidirectional hinge roller lever

TRAVELS AND ACTUATING FORCES

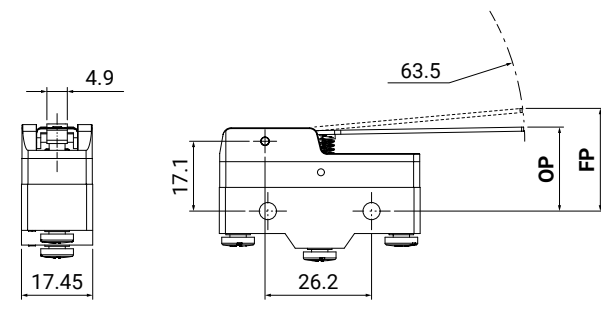
OF	[N]	Operating Force
RF	[N]	Release force
PT	[mm]	Pretravel
OT	[mm]	Overtravel
MD	[mm]	Differential movement
FP	[mm]	Initial position
OP	[mm]	Operating position



Hinge lever



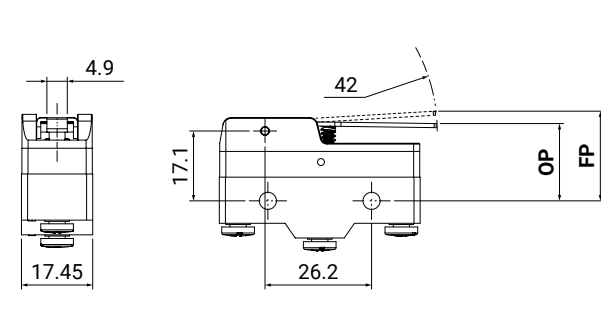
OF	max	70 g
RF	min	14 g
PT	max	10 mm
OT	min	5.6 mm
MD	max	1.27 mm
FP	max	28.2 mm
OP		19 ± 0.8 mm



Short hinge lever



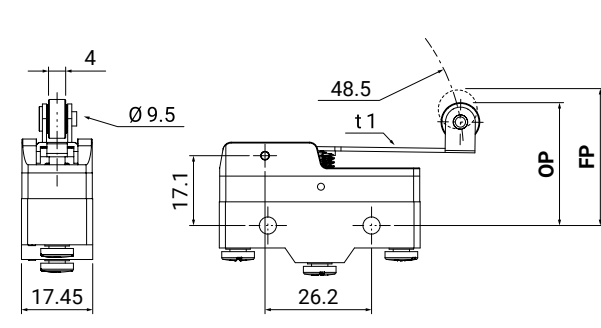
OF	max	90 g
RF	min	18 g
PT	max	7 mm
OT	min	3.5 mm
MD	max	1 mm
FP	max	26.2 mm
OP		19.8 ± 0.8 mm



Hinge roller lever



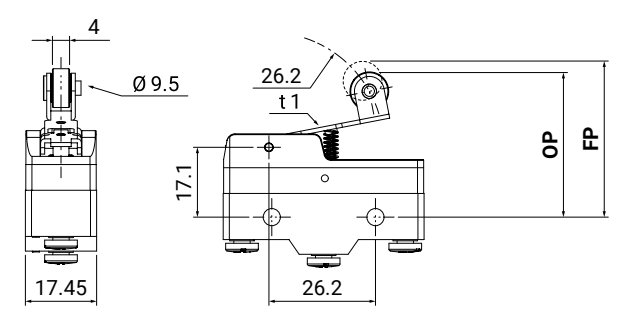
OF	max	100 g
RF	min	22 g
PT	max	7.1 mm
OT	min	4 mm
MD	max	1.02 mm
FP	max	36.5 mm
OP		30.2 ± 0.8 mm



Short hinge roller lever



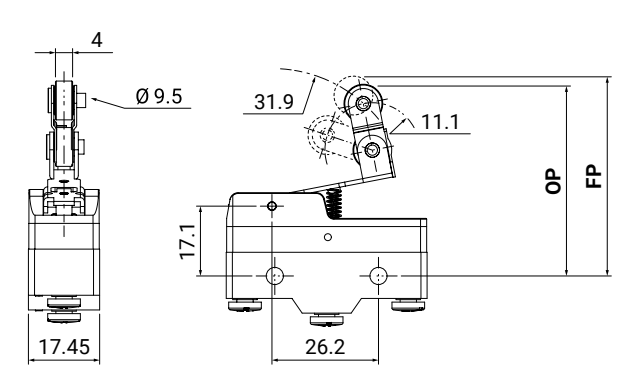
OF	max	160 g
RF	min	42 g
PT	max	2.7 mm
OT	min	2.4 mm
MD	max	0.5 mm
FP	max	32.5 mm
OP		30.2 ± 0.4 mm



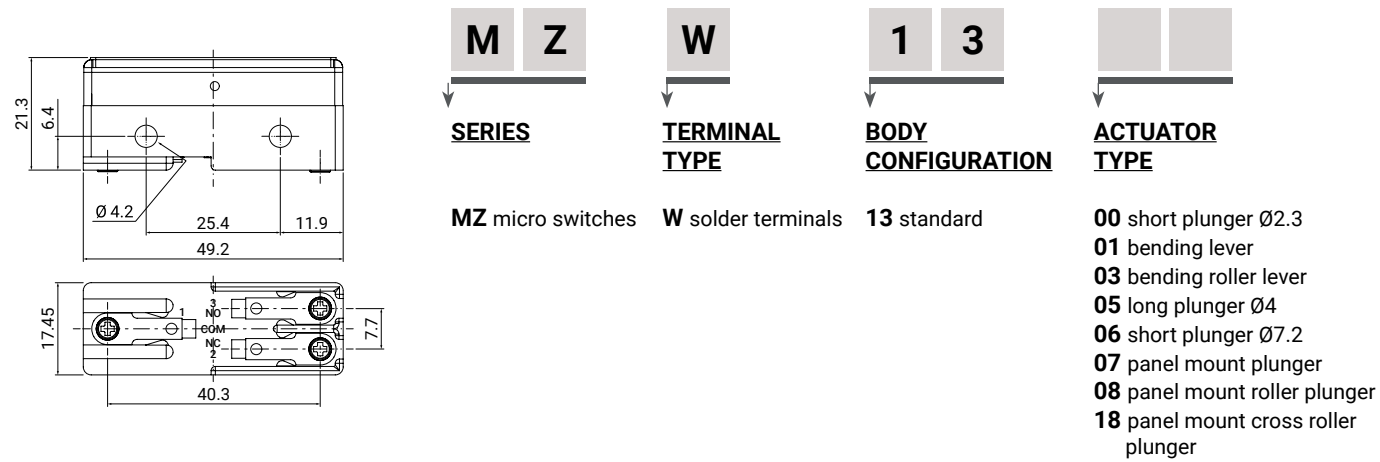
Unidirectional hinge roller lever



OF	max	170 g
RF	min	42 g
PT	max	2.7 mm
OT	min	2.4 mm
MD	max	0.51 mm
FP	max	43.6 mm
OP		41.3 ± 0.8 mm

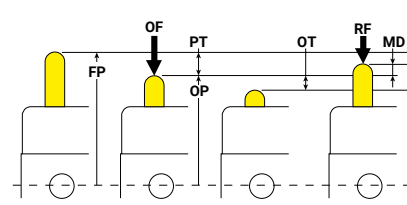


MZW13 SOLDER TERMINALS - CODE SELECTION OVERVIEW



TRAVELS AND ACTUATING FORCES

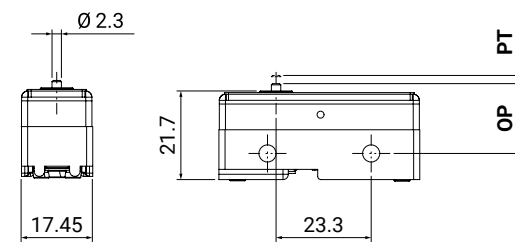
OF	[N]	Operating Force
RF	[N]	Release force
PT	[mm]	Pretravel
OT	[mm]	Overtravel
MD	[mm]	Differential movement
FP	[mm]	Initial position
OP	[mm]	Operating position



Short plunger Ø2.3



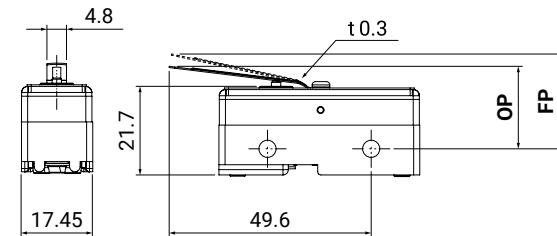
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	0.13 mm
MD	max	0.10 mm
FP	max	-
OP		15.9 ± 0.4 mm



Bending lever



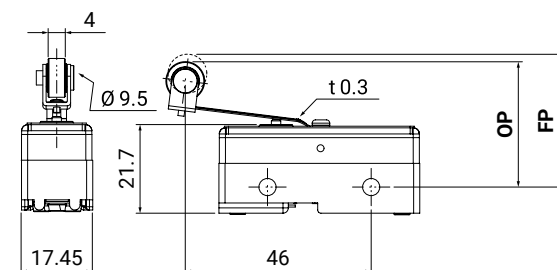
OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	20.6 mm
OP		17.4 ± 0.8 mm



Bending roller lever



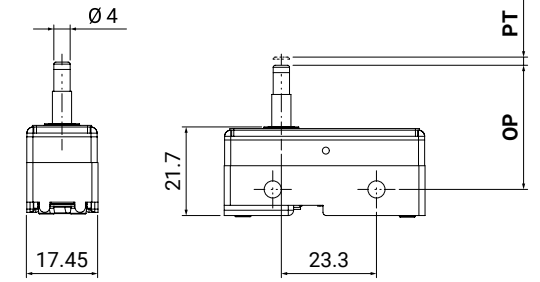
OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	31.8 mm
OP		28.6 ± 0.8 mm



Long plunger Ø4



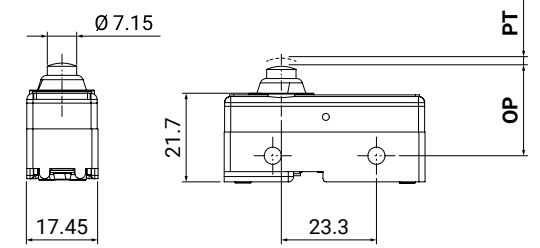
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		28.2 ± 0.5 mm



Short plunger Ø7.2



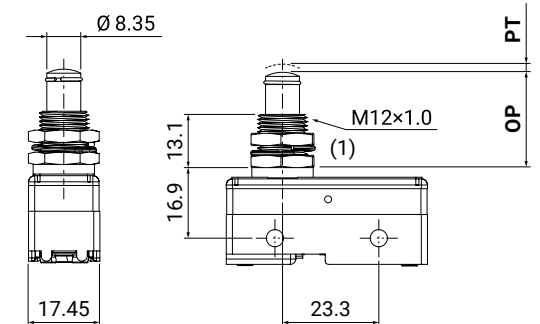
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		21.5 ± 0.5 mm



Panel mount plunger



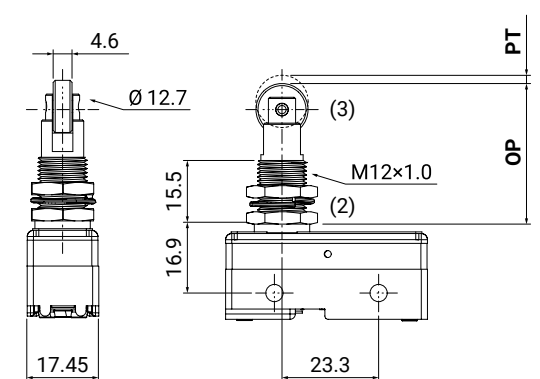
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	5.5 mm
MD	max	0.10 mm
FP	max	-
OP		21.8 ± 0.8 mm



Panel mount roller plunger



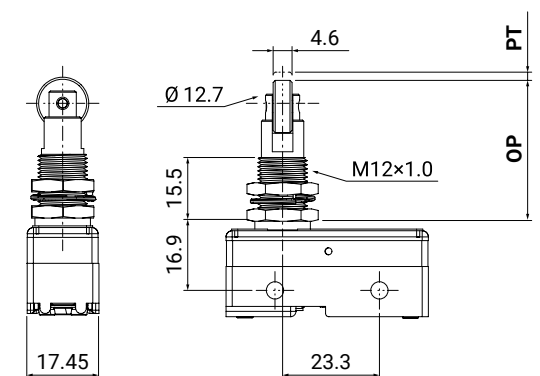
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	3.58 mm
MD	max	0.10 mm
FP	max	-
OP		33.4 ± 1.2 mm



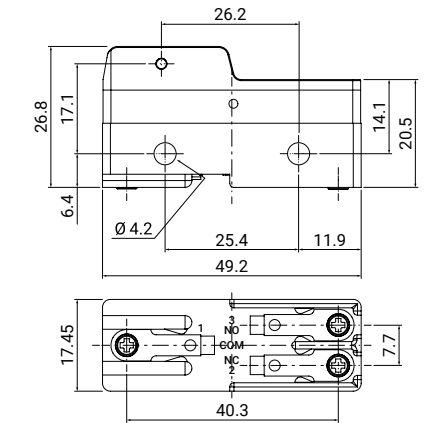
Panel mount cross roller plunger



OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	3.58 mm
MD	max	0.10 mm
FP	max	-
OP		33.4 ± 1.2 mm



MZW17 SOLDER TERMINALS - CODE SELECTION OVERVIEW



MZ

SERIES

W

TERMINAL TYPE

17

BODY CONFIGURATION

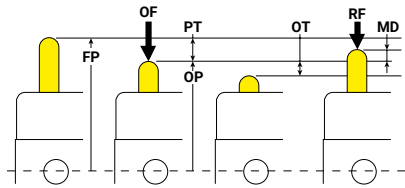
ACTUATOR TYPE

MZ micro switches W solder terminals 17 hinged

01 hinge lever
 02 short hinge lever
 03 hinge roller lever
 04 short hinge roller lever
 44 unidirectional hinge roller lever

TRAVELS AND ACTUATING FORCES

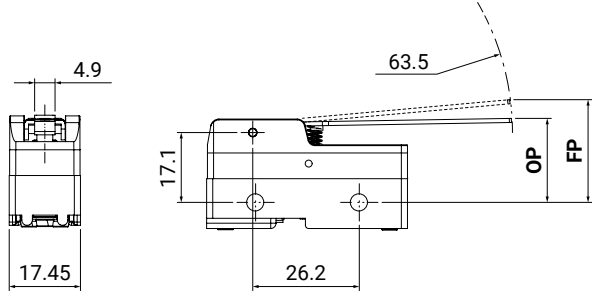
OF	[N]	Operating Force
RF	[N]	Release force
PT	[mm]	Pretravel
OT	[mm]	Overtravel
MD	[mm]	Differential movement
FP	[mm]	Initial position
OP	[mm]	Operating position



Hinge lever



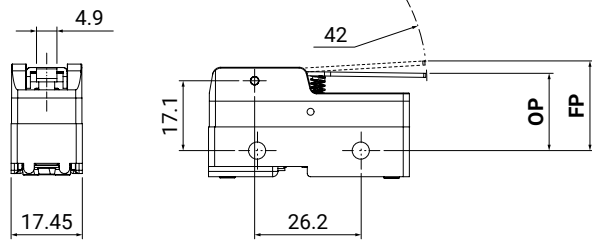
OF	max	70 g
RF	min	14 g
PT	max	10 mm
OT	min	5.6 mm
MD	max	1.27 mm
FP	max	28.2 mm
OP		19 ± 0.8 mm



Short hinge lever



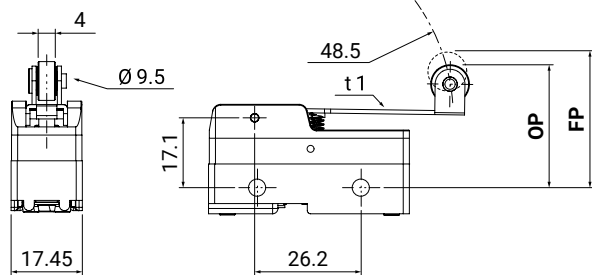
OF	max	90 g
RF	min	18 g
PT	max	7 mm
OT	min	3.5 mm
MD	max	1 mm
FP	max	26.2 mm
OP		19.8 ± 0.8 mm



Hinge roller lever



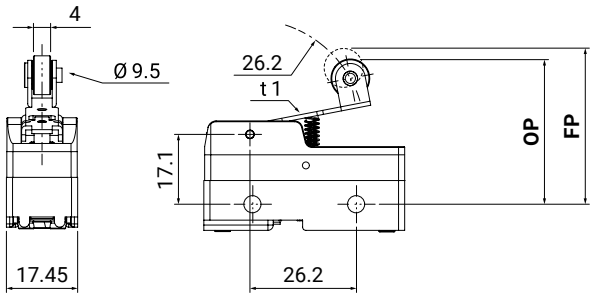
OF	max	100 g
RF	min	22 g
PT	max	7.1 mm
OT	min	4 mm
MD	max	1.02 mm
FP	max	36.5 mm
OP		30.2 ± 0.8 mm



Short hinge roller lever



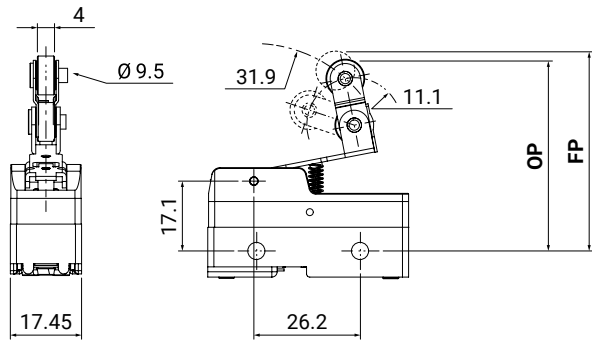
OF	max	160 g
RF	min	42 g
PT	max	2.7 mm
OT	min	2.4 mm
MD	max	0.5 mm
FP	max	32.5 mm
OP		30.2 ± 0.4 mm



Unidirectional hinge roller lever

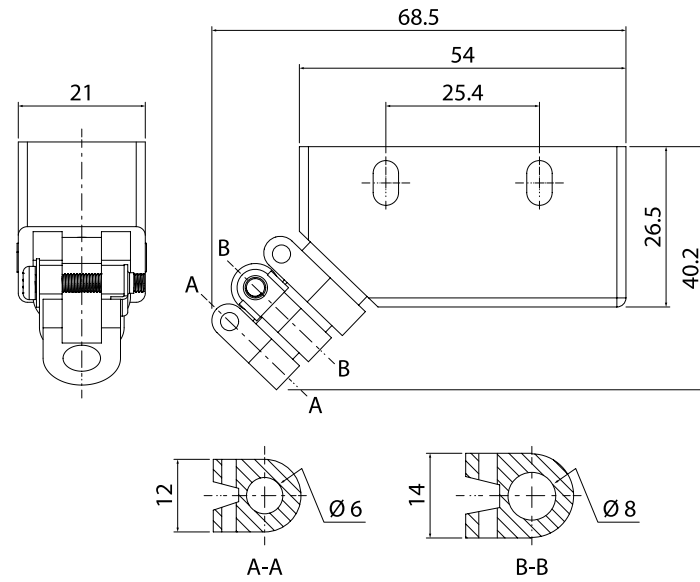
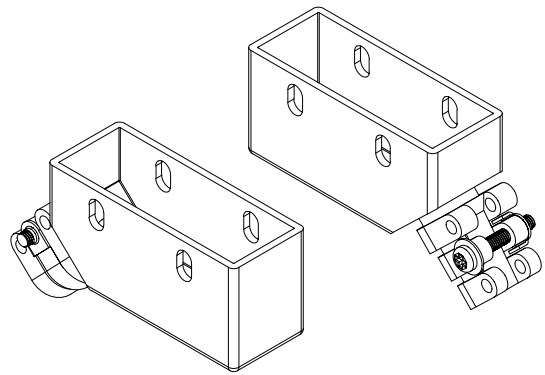


OF	max	170 g
RF	min	42 g
PT	max	2.7 mm
OT	min	2.4 mm
MD	max	0.51 mm
FP	max	43.6 mm
OP		41.3 ± 0.8 mm



MZ ACCESSORY

MZA8000 - terminal enclosure
Material: NBR



NOTES

NOTES

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TECHNICAL DOCUMENTATION**

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