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Technical docs

AUTOMATION - LIMIT AND MICRO SWITCHES



GIOVENZANA
INTERNATIONAL B.V.

GIOVENZANA INTERNATIONAL B.V.

Amsterdam, **THE NETHERLANDS**
Ph: +31 (0) 20.4413576
E-mail: giovenzana@giovenzana.com

G.T.R. LLC

Moscow, **RUSSIAN FEDERATION**
Ph: +7.495.6991296 / +7.499.9228548
E-mail: gtr@giovenzana.com

GIOVENZANA CONTROLS INDIA Pvt. Ltd.

Mumbai, **INDIA**
Ph: +91.22.42640071
E-mail: ggindia@giovenzana.com

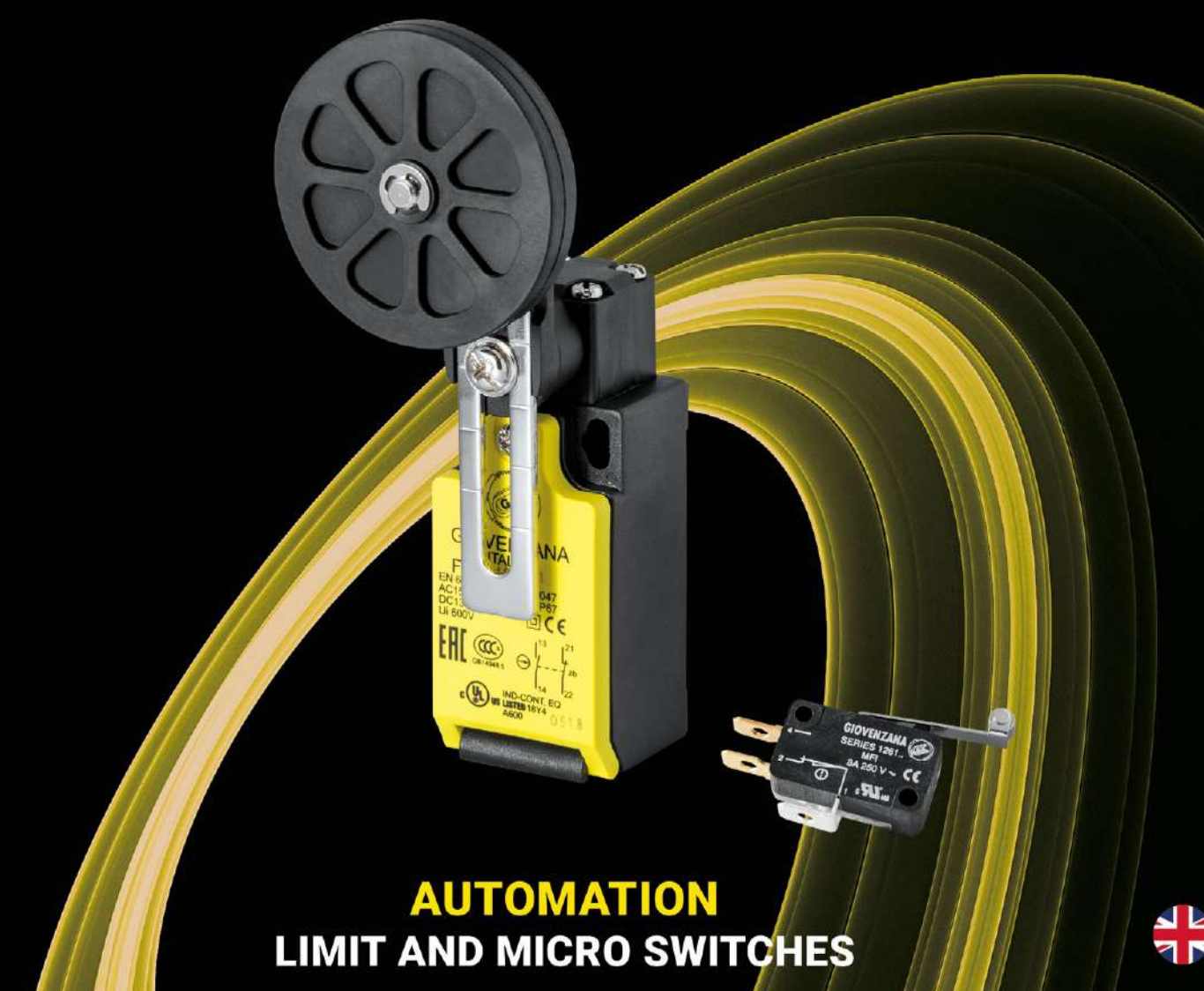
GIOVENZANA CONNECTING BRASIL LTDA

Guaíba, Rio Grande do Sul, **BRASIL**
Ph: (+55) 51 3055 1033
E-mail: gcb@giovenzana.com

GIOVENZANA INTERNATIONAL B.V. - Dubai Branch

Dubai - **U.A.E.**
Ph: +971.4.8870788
E-mail: uae@giovenzana.com

GIOVENZANA INTERNATIONAL B.V.



AUTOMATION
LIMIT AND MICRO SWITCHES



REV. 00_22

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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.



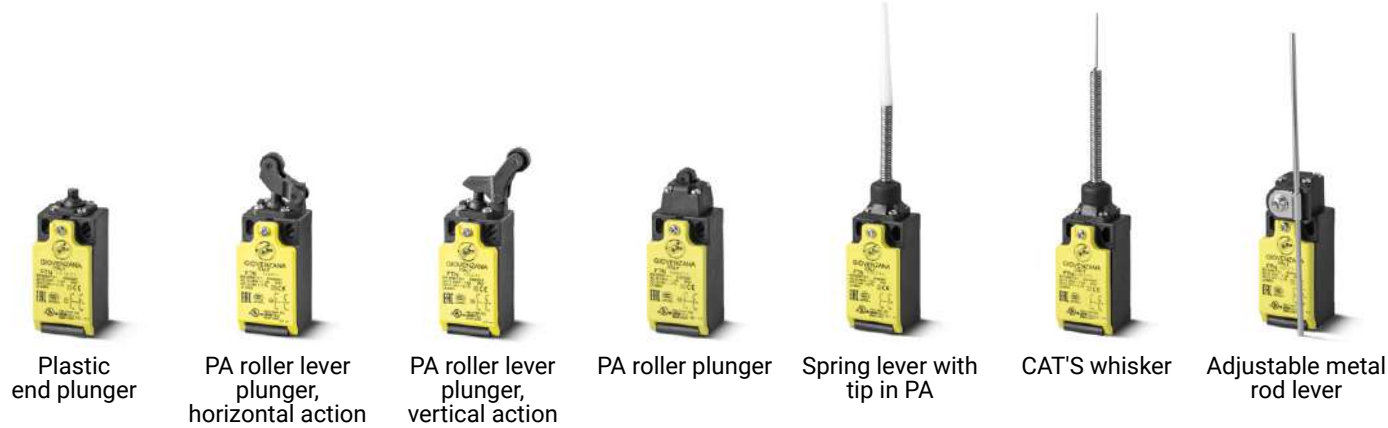
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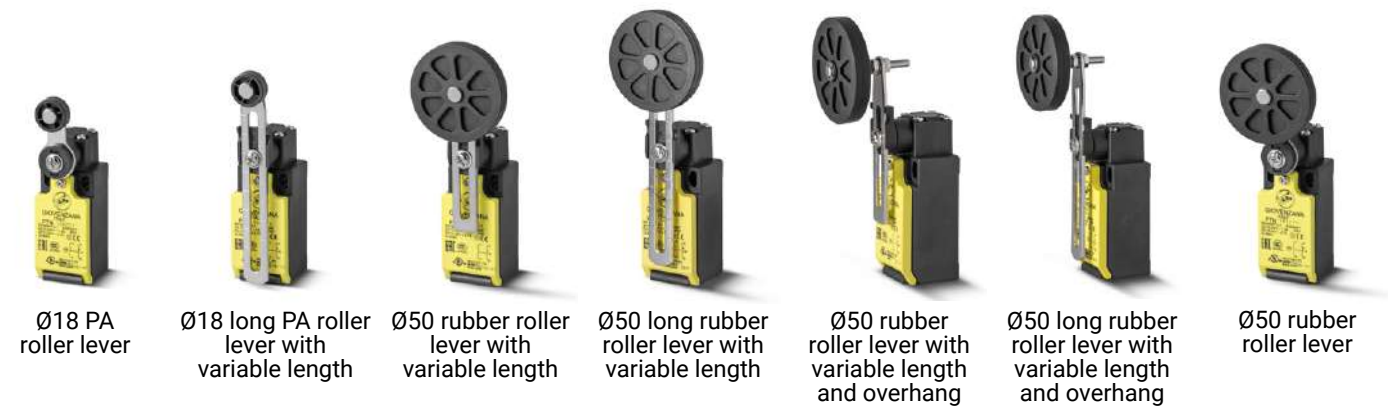
LIMIT AND MICRO SWITCHES
GIOVENZANA INTERNATIONAL B.V.®

A **FTN SERIES**
thermoplastic limit switches **10 - 41**

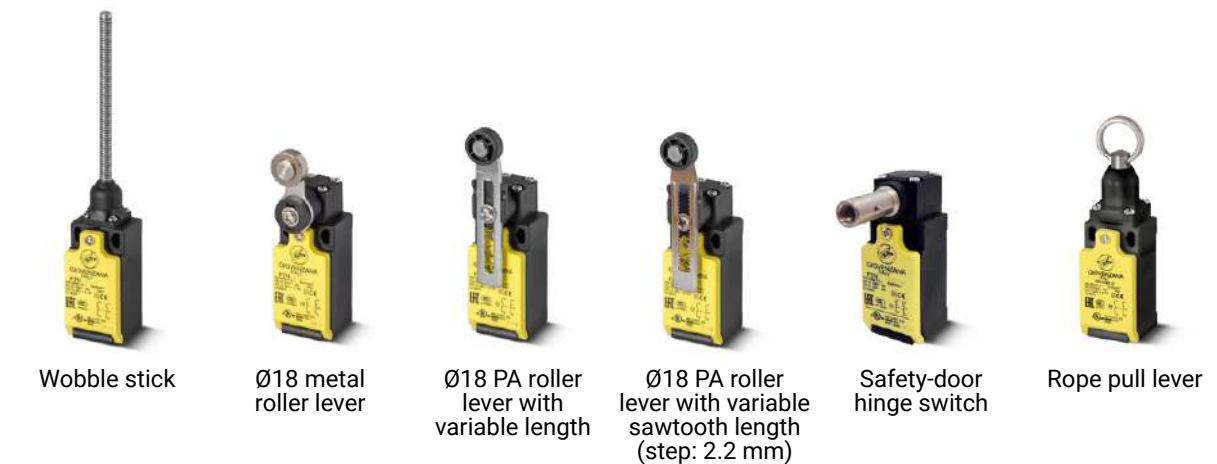
FTN131 Pag. 21	FTN132 Pag. 22	FTN133 Pag. 23	FTN134 Pag. 24	FTN135 Pag. 25	FTN136 Pag. 26	FTN137 Pag. 27
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FTN138 Pag. 28	FTN139 Pag. 29	FTN140 Pag. 30	FTN140L Pag. 31	FTN140R Pag. 32	FTN140RL Pag. 33	FTN141 Pag. 34
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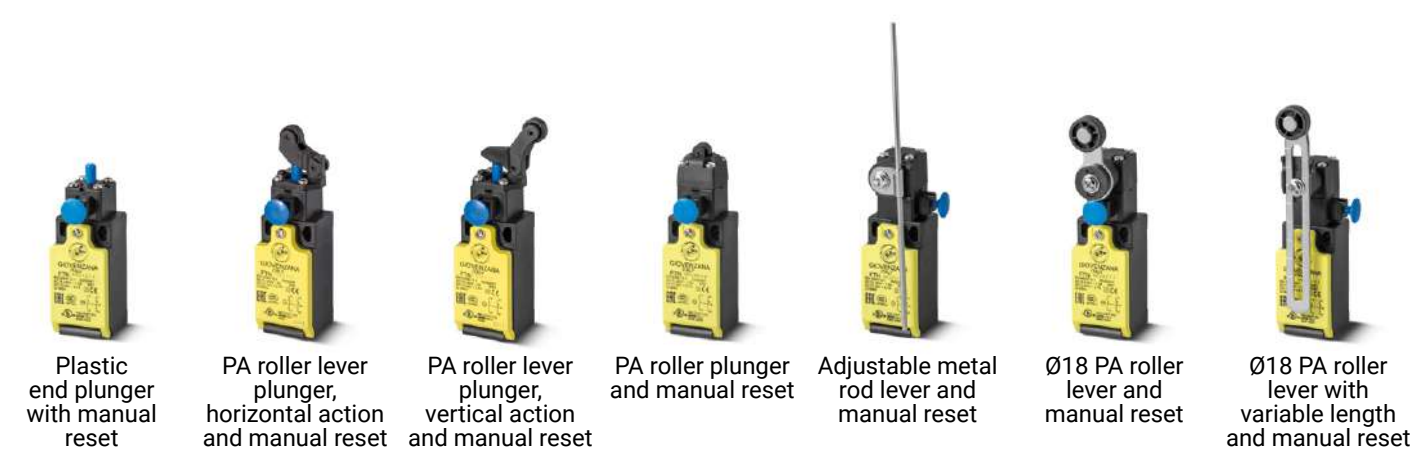


FTN142 Pag. 35	FTN143 Pag. 36	FTN144 Pag. 37	FTN144S Pag. 38	FTN146 Pag. 39	FTN198 Pag. 40 - 41
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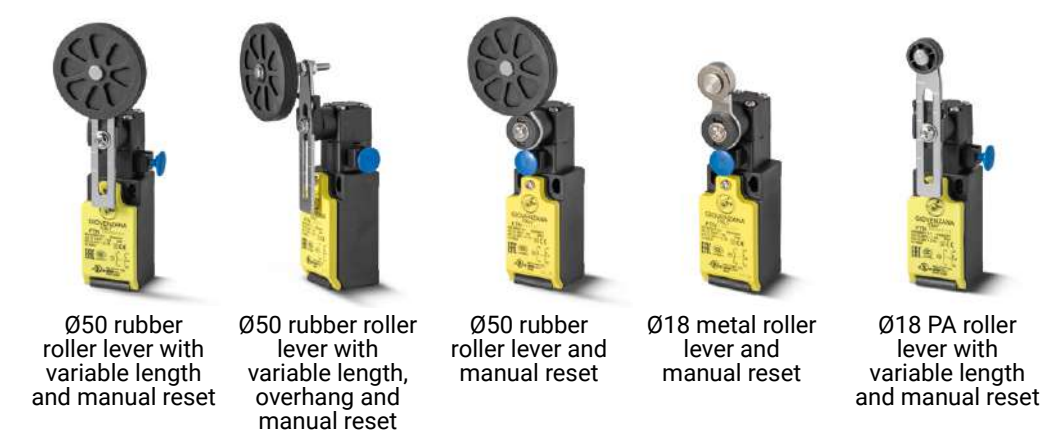


B **FTN1R SERIES**
thermoplastic limit switches with manual reset **42 - 65**

FTN1R31 Pag. 53	FTN1R32 Pag. 54	FTN1R33 Pag. 55	FTN1R34 Pag. 56	FTN1R37 Pag. 57	FTN1R38 Pag. 58	FTN1R39 Pag. 59
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FTN1R40 Pag. 60	FTN1R40R Pag. 61	FTN1R41 Pag. 62	FTN1R43 Pag. 63	FTN1R44 Pag. 64
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C FTNG SERIES
40 mm thermoplastic limit switches for heavy applications **66 - 83**

FTNG131 Pag. 77	FTNG134 Pag. 78	FTNG138 Pag. 79	FTNG139 Pag. 80	FTNG140 Pag. 81	FTNG141 Pag. 82	FTNG172 Pag. 83
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D STNK SERIES
thermoplastic safety switches with separate actuator **84 - 99**

STNK01 Pag. 93 - 94	STNK02 Pag. 95 - 96	STNK03 Pag. 97 - 99
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E FCT SERIES
M12-connected and pre-wired thermoplastic limit switches **100 - 117**

FCT01 Pag. 107	FCT02 Pag. 108	FCT03 Pag. 109	FCT04 Pag. 110	FCT05 Pag. 111	FCT06 Pag. 112
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FCT07 Pag. 113	FCT08 Pag. 114	FCT09 Pag. 115	FCT10 Pag. 116	FCT11 Pag. 117
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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

FASTON TERMINALS 6.3 x 0.8 mm + TOWER ACTUATOR WITH THREADED FLANGE

MFI.T



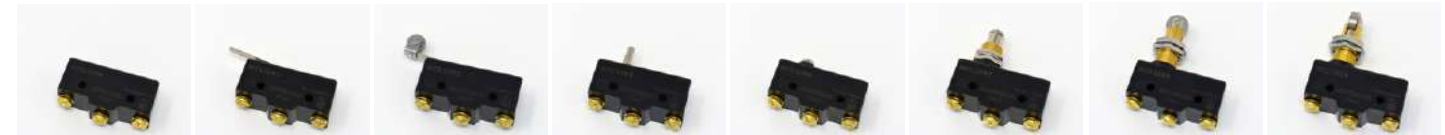
Tower actuator

G **MZ SERIES**
micro switches **124 - 136**

S 13 **SCREW TERMINALS**

MZS1300 **MZS1301** **MZS1303** **MZS1305** **MZS1306** **MZS1307** **MZS1308** **MZS1318**

Pag. 128 - 129



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**

Pag. 130 - 131



Hinge lever Short hinge lever Hinge roller lever Short hinge roller lever Unidirectional hinge roller lever

ACCESSORY

MZA8000

Pag. 136

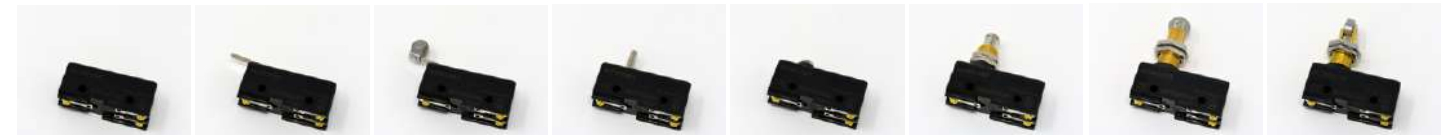


Terminal enclosure

W 13 **SOLDER TERMINALS**

MZW1300 **MZW1301** **MZW1303** **MZW1305** **MZW1306** **MZW1307** **MZW1308** **MZW1318**

Pag. 132 - 133



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.

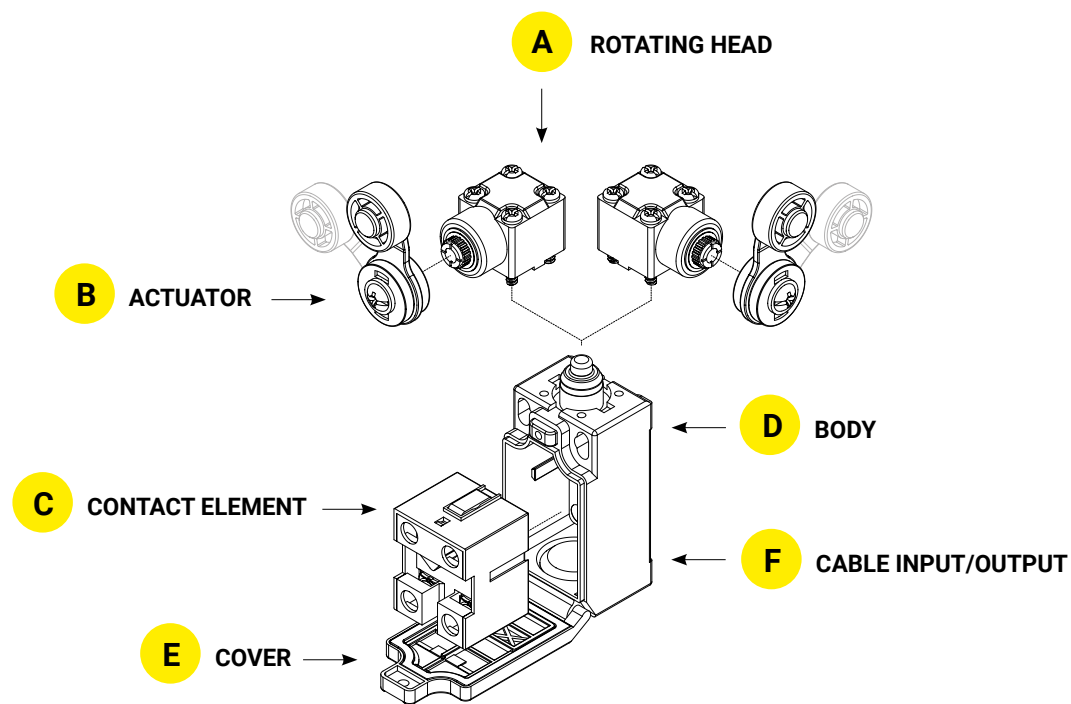
Giovanzana limit switches offer solutions for every need and are suitable for the most varied sectors of use.



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	I _{th}	10 A
Rated insulation voltage	U _i	500 V
Rated impulse withstand voltage	U _{imp}	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

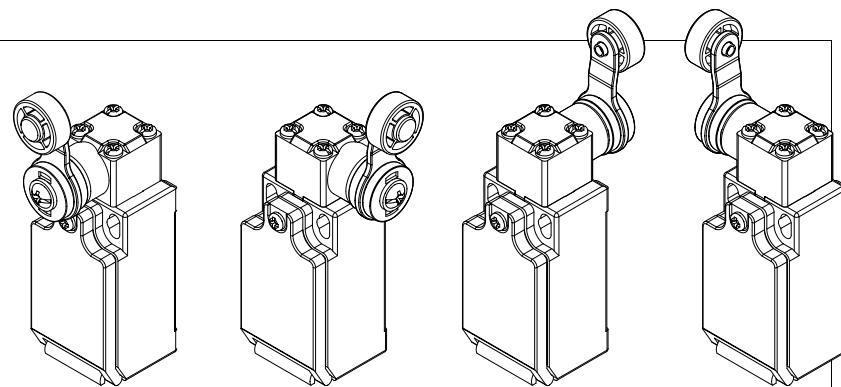


A - ROTATING HEAD

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

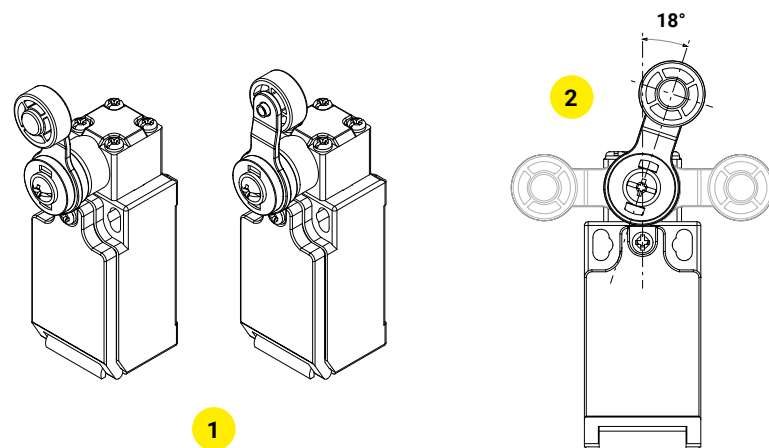
Available different types of actuators: plungers, levers, rollers and rods.

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

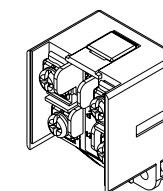
All levers are adjustable in steps of 18° over 360°, compared to the horizontal axis of the head. The positive movement transmission is always guaranteed thanks to the particular geometric coupling between the lever and the rotation shaft.



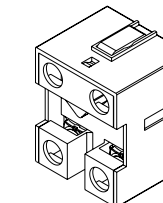
C - CONTACT ELEMENT

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.).

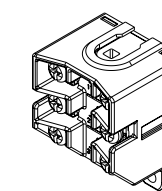
Different contact elements are available, both fast-acting and slow-acting, depending on the different application requirements.



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)

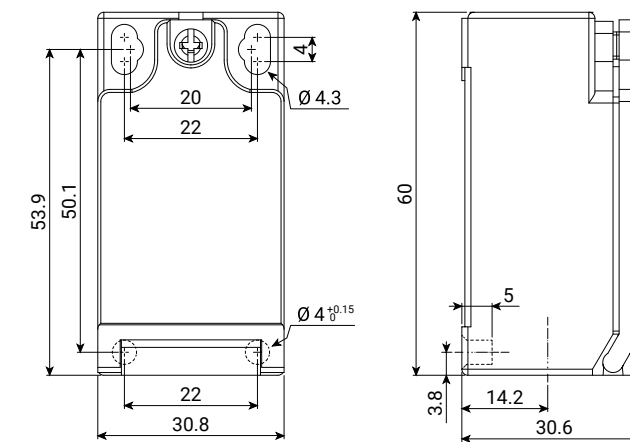
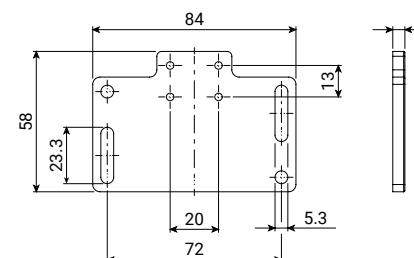
→ Not suitable for safety applications!

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

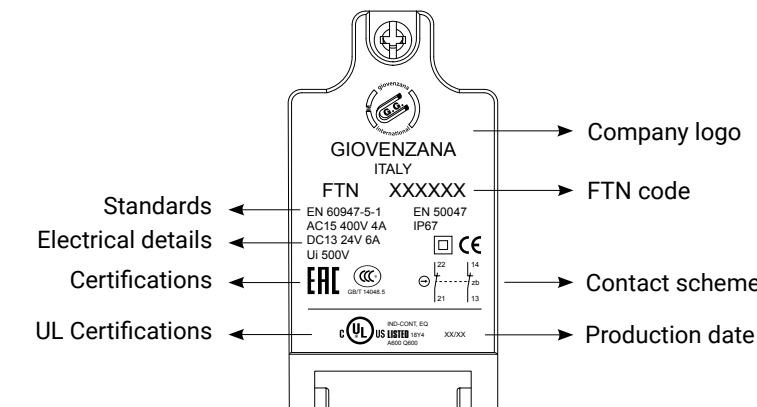
Material conforming to the RoHS Directive.

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

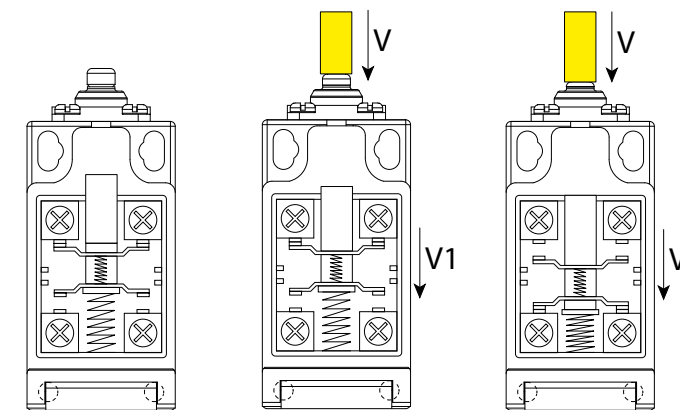
SLOW ACTION - Contact elements direct acting

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.



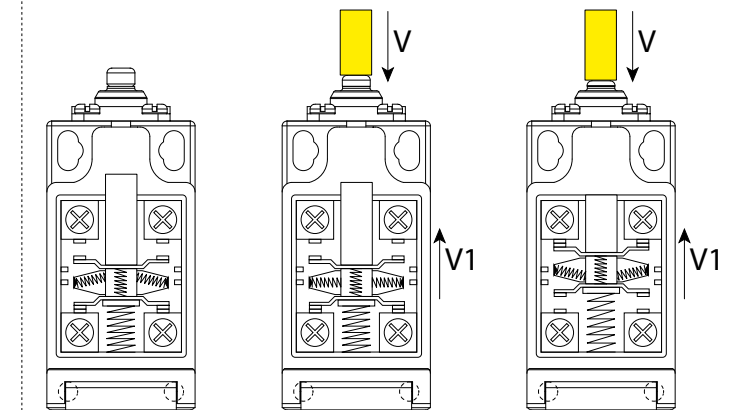
SNAP ACTION - Contact elements acting independently

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.

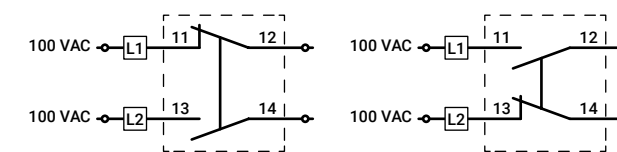
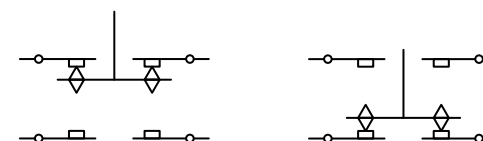
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



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

Za contact type

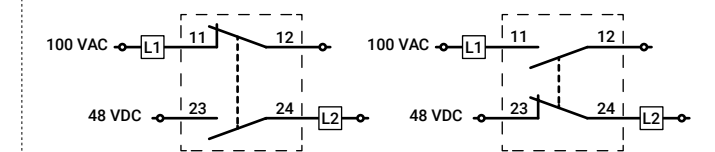
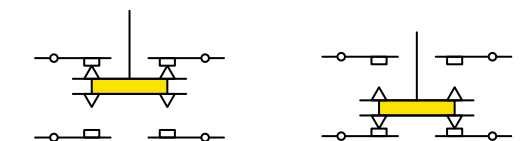
A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



L1: load 1
L2: load 2

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.



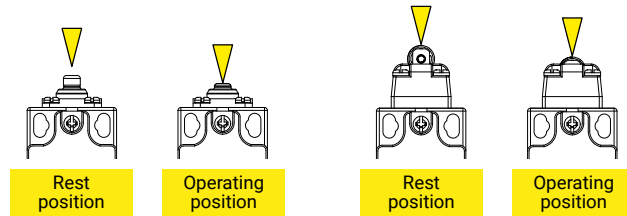
L1: load 1
L2: load 2

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

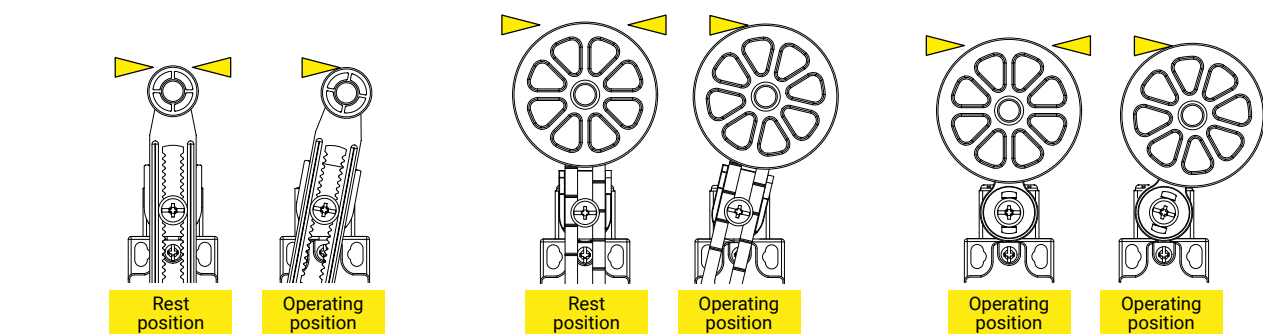
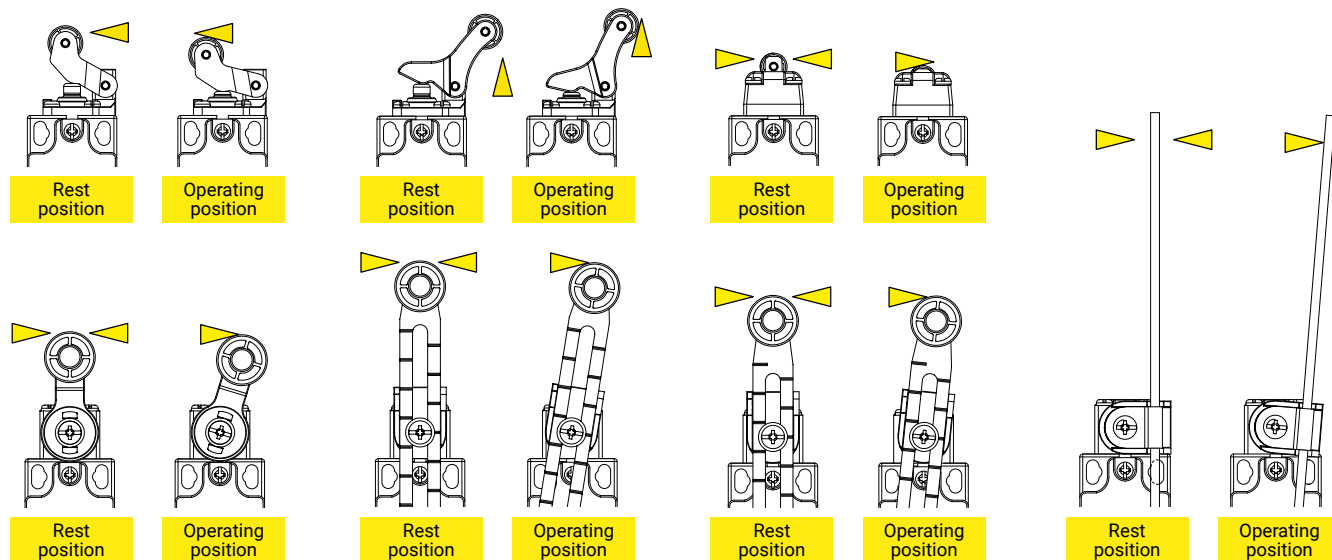
DETECTION MOVEMENTS

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.

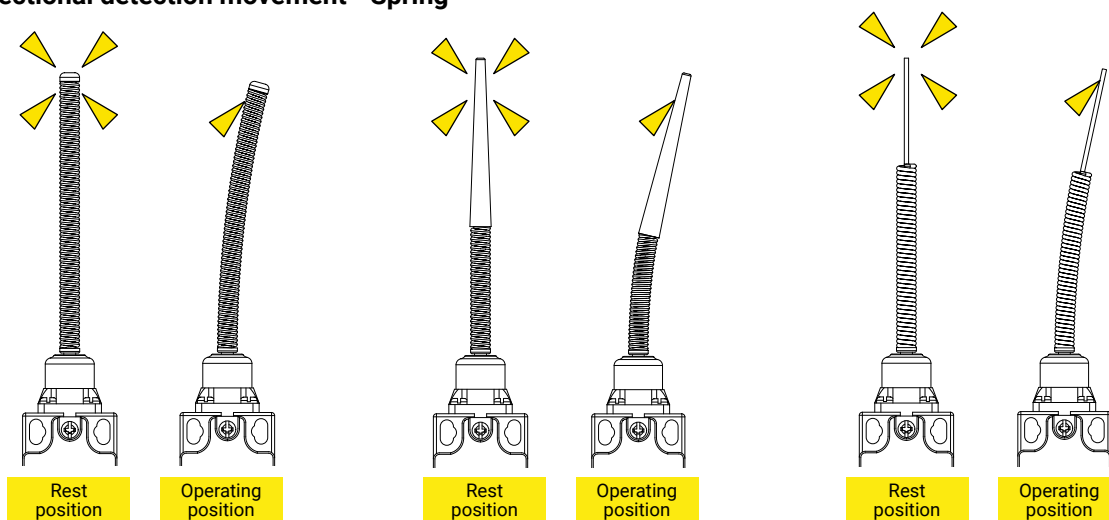
1. Linear detection movement - Plunger



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.

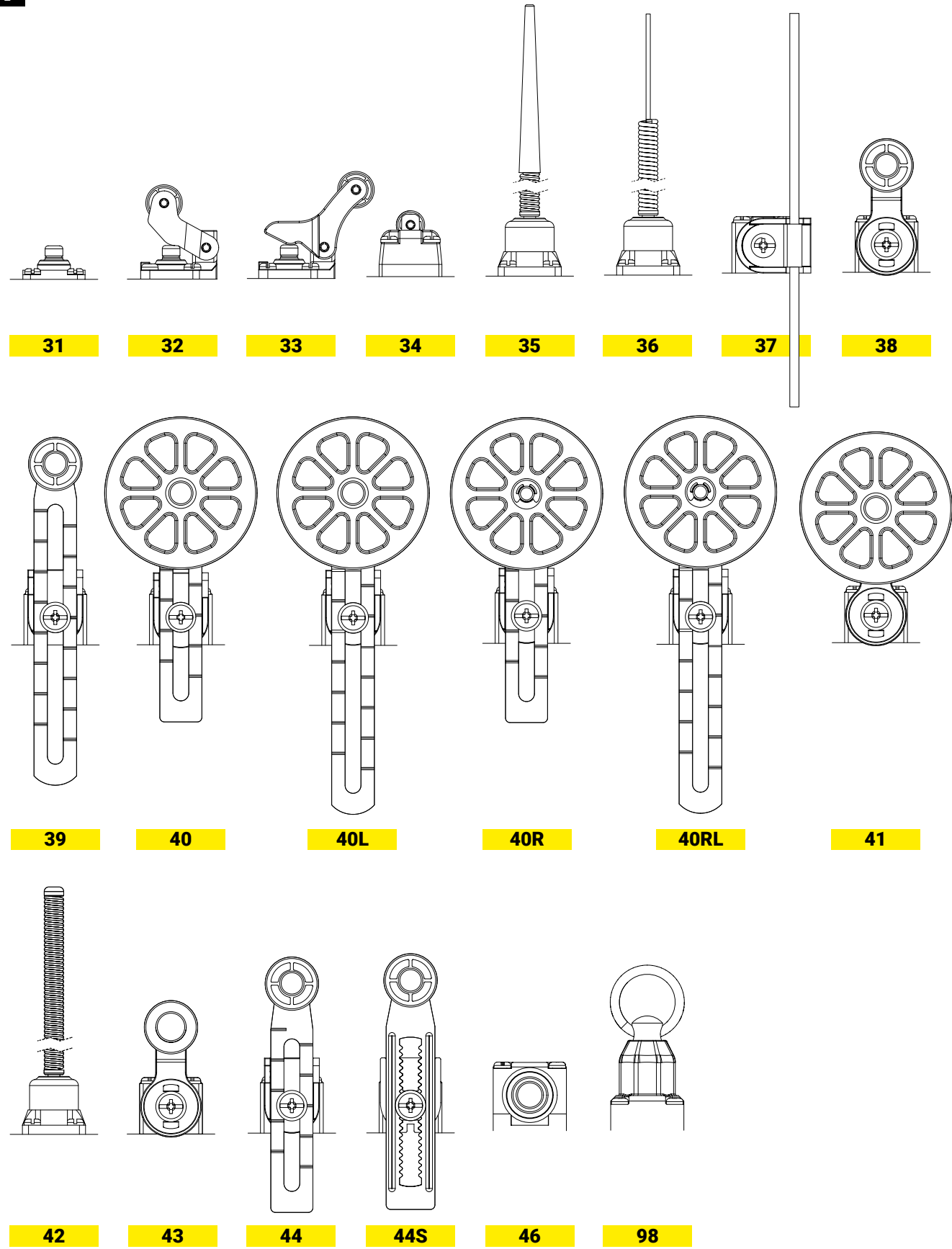
The FTN series thermoplastic limit switches are SIL 3.

SIL³

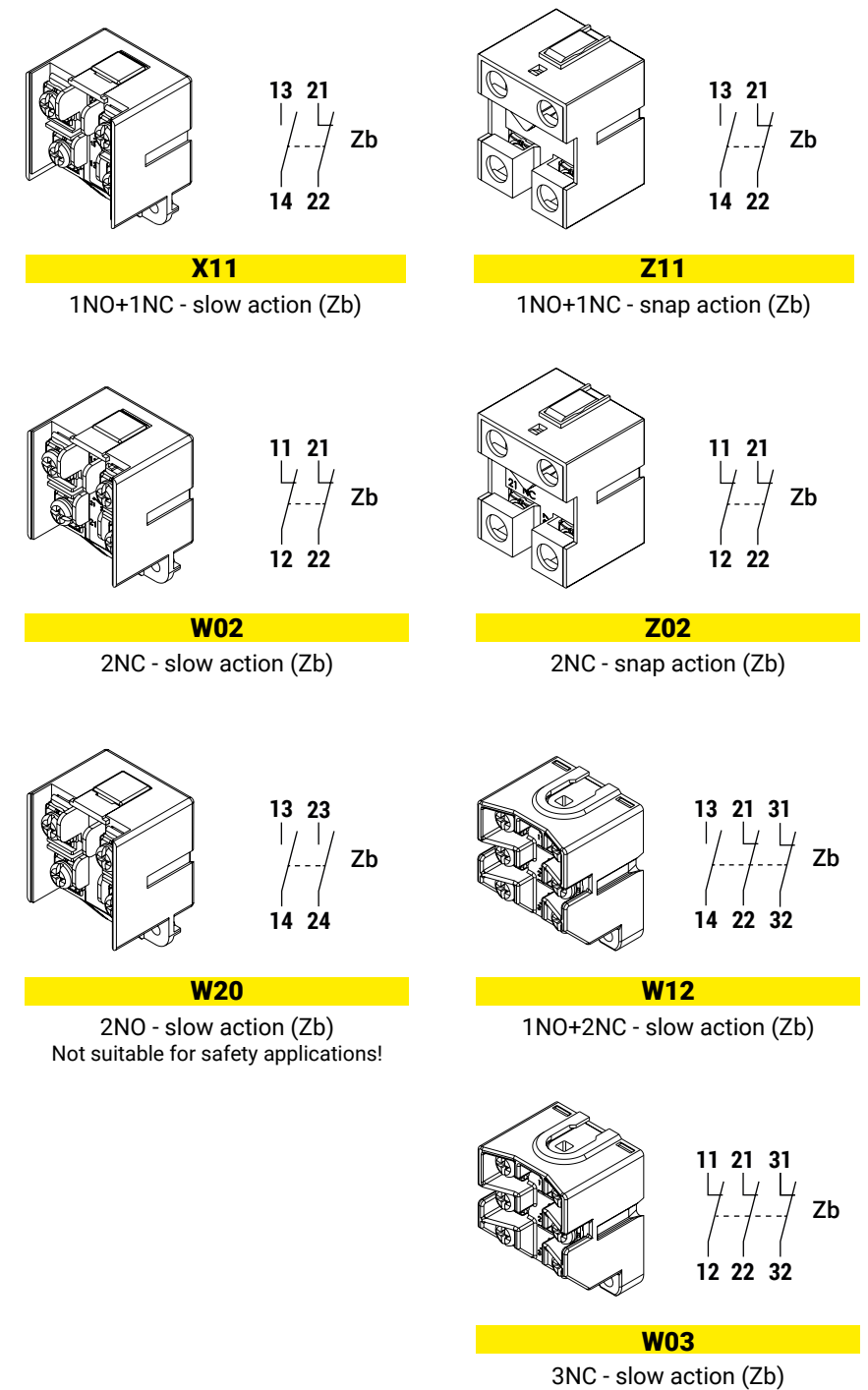


FTN - PRODUCT SELECTION OVERVIEW

1 ACTUATORS



2 CONTACT BLOCKS



3 CONDUIT ENTRY

Threaded conduit entry

Standard:
M16 × 1.5

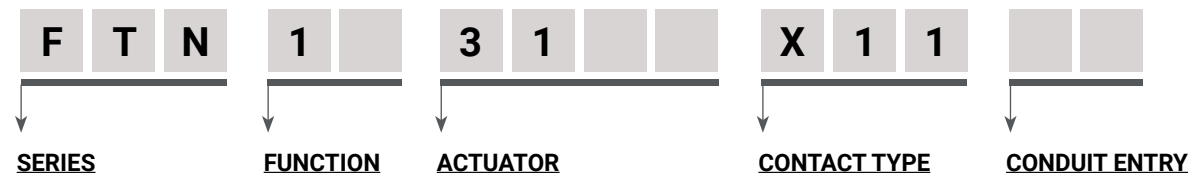
On request:
M20 × 1.5
1/2" NPT
PG11
PG13.5
With connector

CONTACT TYPES		CATEGORIES	RATINGS
X11	1NO+1NC	slow action (Zb)	A600 Q600
W02	2NC		
Z11	1NO+1NC	snap action (Zb)	B600 Q600
Z02	2NC		
W12	1NO+2NC	slow action (Zb)	A300 Q300
W03	3NC		

AC15:
400 V - 4 A

DC13:
24V - 6 A

FTN - CODE SELECTION OVERVIEW



- | | | | | |
|--|-----------------------------------|---|--|---|
| <p>FTN
thermoplastic limit switches</p> | <p>1
without reset</p> | <p>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 length (step: 2.2 mm)
46
safety-door hinge switch
98
rope pull lever</p> | <p>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</p> | <p><i>standard</i>
blank M16 × 1.5</p> <p><i>on request</i>
M M20 × 1.5
N 1/2" NPT
G1 PG11
G3 PG13.5
C male connector "A" M12 × 1</p> |
|--|-----------------------------------|---|--|---|

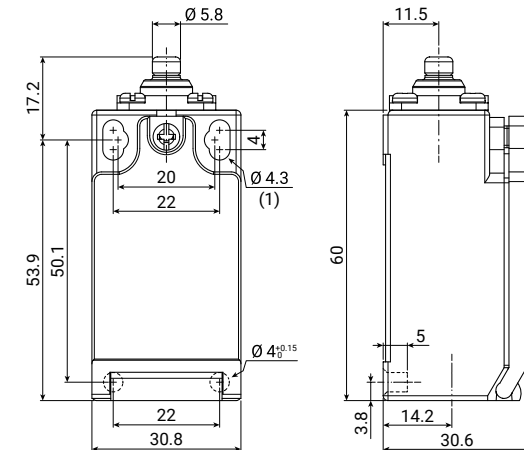
FTN131

Limit switch with plastic end plunger
IP67



FTN series	1 function	31 actuator	XXX contact type	XX conduit entry
FTN thermoplastic limit switch	1 without reset function	31 plastic end plunger	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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

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 OF	positive opening		total travel TT
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	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	B600-Q600	DC13: 24V - 6A	2.1 mm	1.1 mm	7.2 N	4.5 mm	16.3 N	6.0 mm
			2.1 mm	0.9 mm	7.2 N	4.5 mm	16.3 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		2.6 mm	3.2 mm	7.3 N	3.8 mm	23 N	6.0 mm
			2.6 mm	-	7.3 N	3.8 mm	23 N	

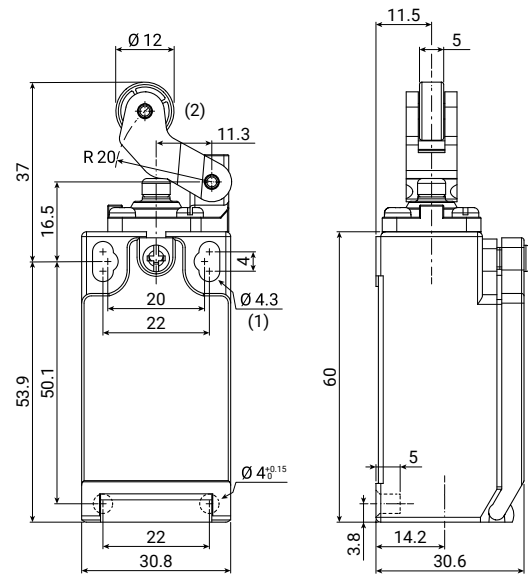
FTN132

Limit switch with PA roller lever plunger, horizontal action
IP67



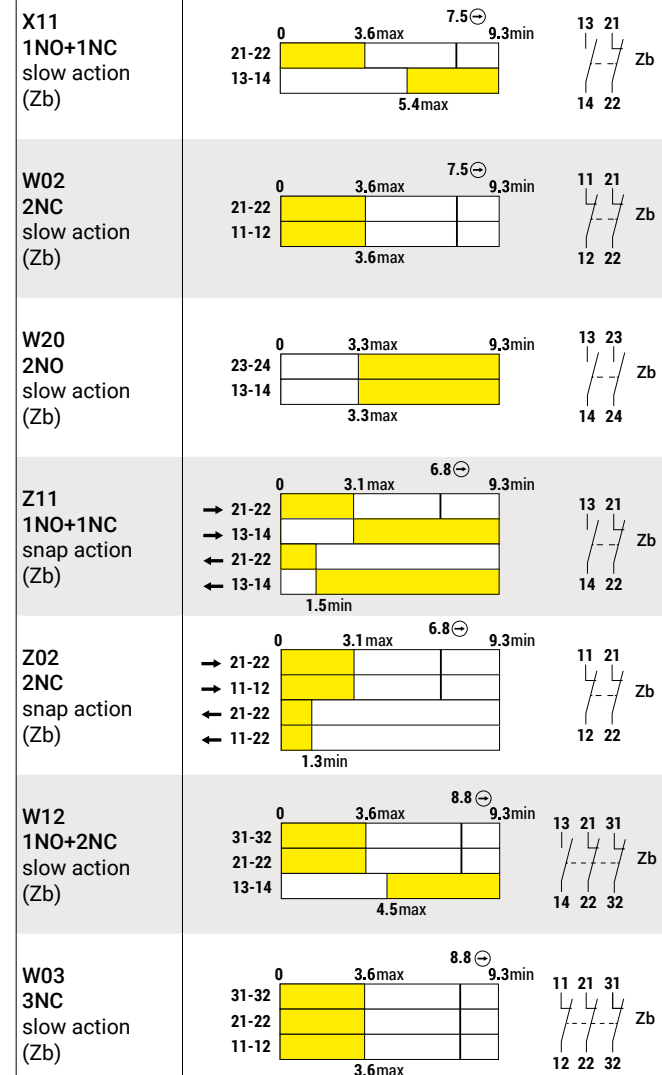
FTN series		1 function		32 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1	without reset function	32	PA roller lever plunger, horizontal action	X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	blank M	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (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
(2) PA roller

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)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	3.6 mm 3.6 mm 3.3 mm	5.4 mm - -	5.3 N 5.3 N 5.7 N	7.5 mm 7.5 mm -	13.5 N 13.5 N -	9.3 mm
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	3.1 mm 3.1 mm	1.5 mm 1.3 mm	5.0 N 5.0 N	6.8 mm 6.8 mm	10.4 N 10.4 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		3.6 mm 3.6 mm	4.5 mm -	5.3 N 5.3 N	8.8 mm 8.8 mm	15 N 15 N	

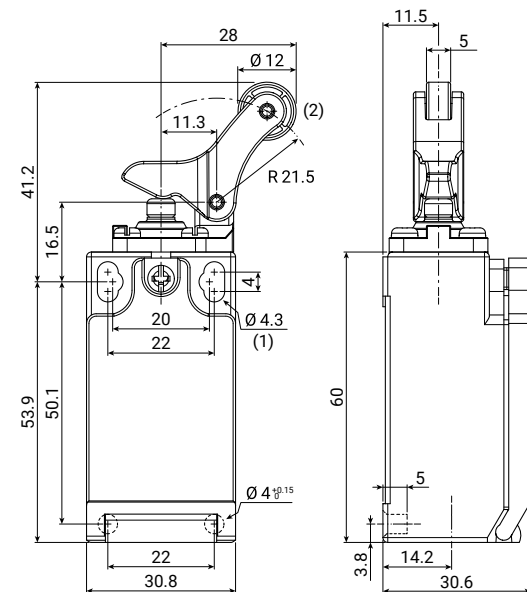
FTN133

Limit switch with PA roller lever plunger, vertical action
IP67



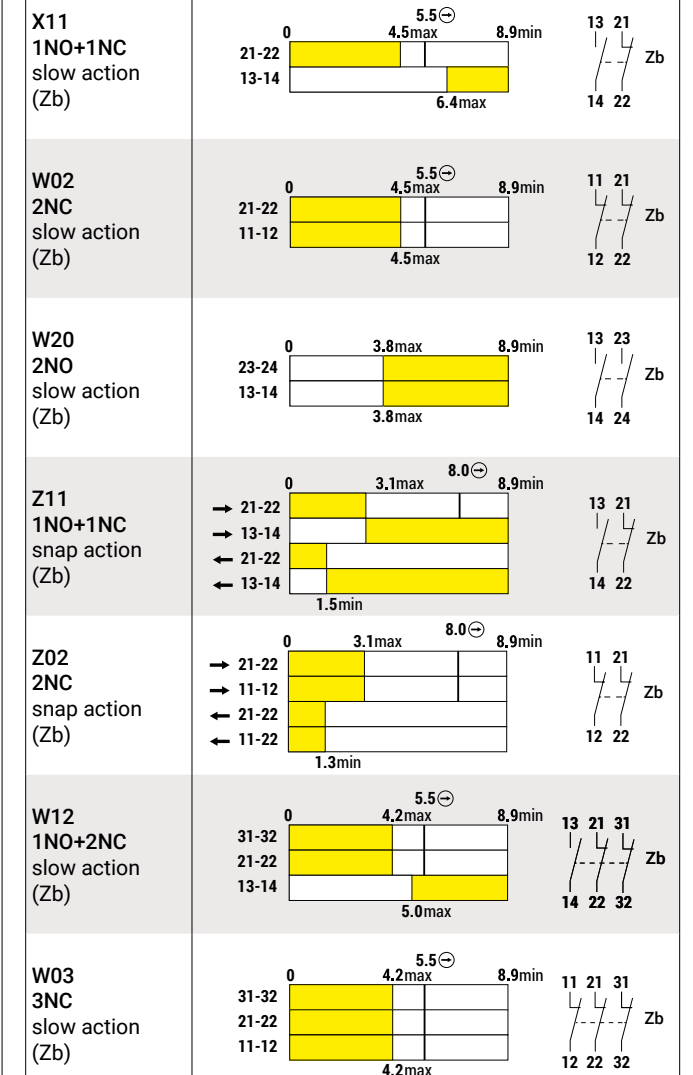
FTN series		1 function		33 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1	without reset function	33	PA roller lever plunger, vertical action	X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	blank M	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	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
(2) PA roller

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)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	4.5 mm 4.5 mm 3.8 mm	6.4 mm - -	7.0 N 7.0 N 7.0 N	5.5 mm 5.5 mm -	15 N 15 N -	8.9 mm
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	3.7 mm 3.7 mm	1.8 mm 1.6 mm	4.2 N 4.2 N	8.0 mm 8.0 mm	8.3 N 8.3 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		4.2 mm 4.2 mm	5.0 mm -	7.0 N 7.0 N	5.5 mm 5.5 mm	17 N 17 N	

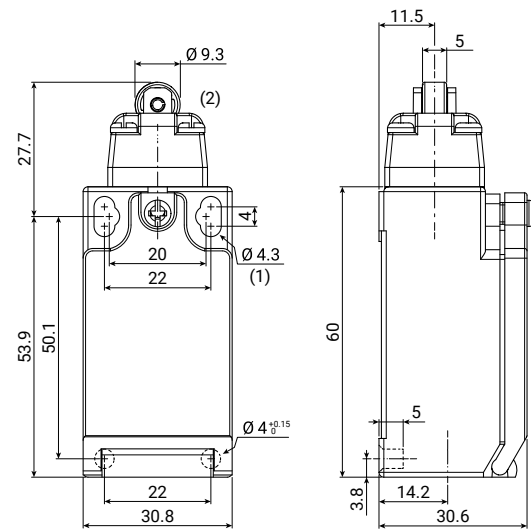
FTN134

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	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
(2) PA roller

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

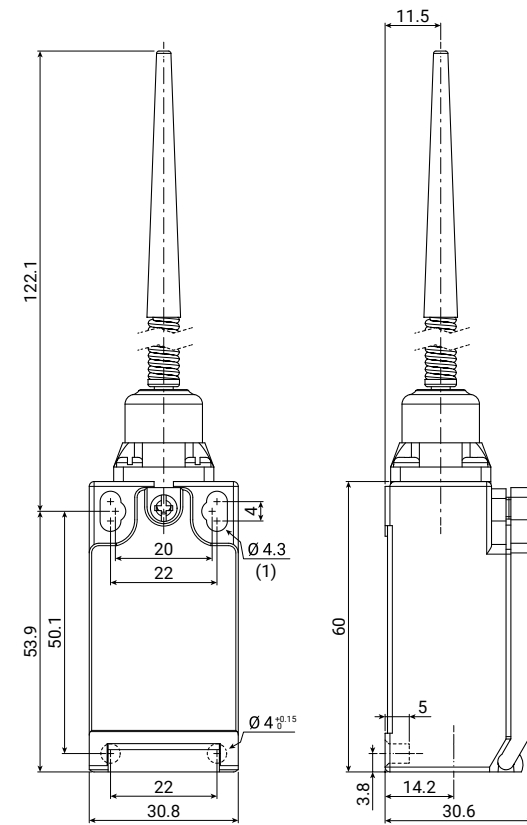
FTN135

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	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
						W03: 3NC	slow action (Zb)	C	male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes

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

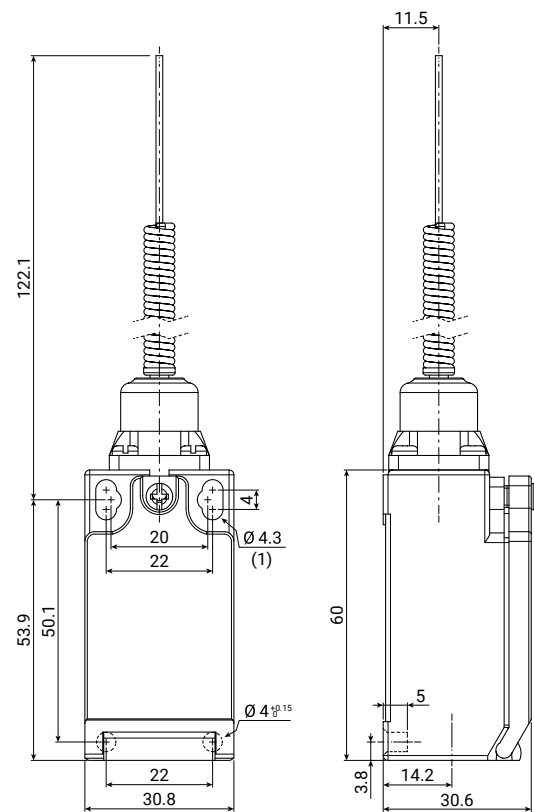
FTN136

Limit switch with CAT'S whisker
IP67



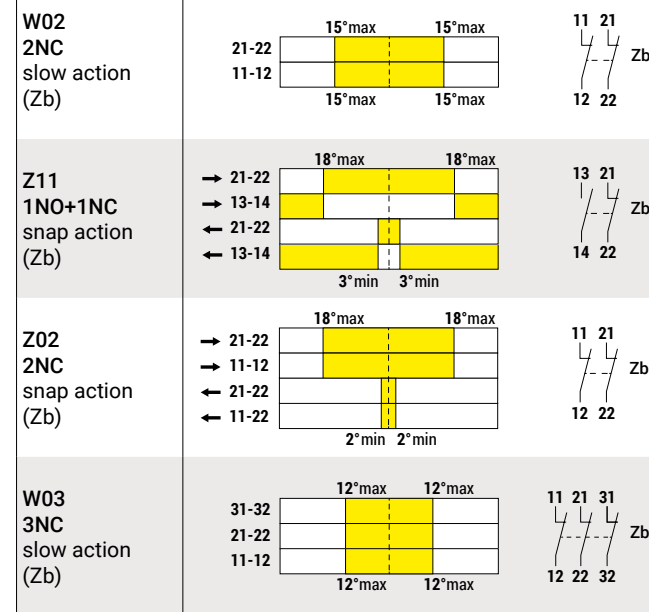
FTN series		1 function	36 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	36 CAT'S whisker	W02: 2NC slow action (Zb) Z11: 1NO+1NC snap action (Zb) Z02: 2NC W03: 3NC slow action (Zb)	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5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

technical drawing - sizes in mm



(1) mounting holes

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)	
W02: 2NC	slow action (Zb)	A600-Q600	AC15: 15°	-	6.5 N	-	-	-
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	400V - 4A DC13: 18°	3° 2°	5.8 N 5.8 N	-	-	-
W03: 3NC	slow action (Zb)	A300-Q300	24V - 6A	12°	6.5 N	-	-	-

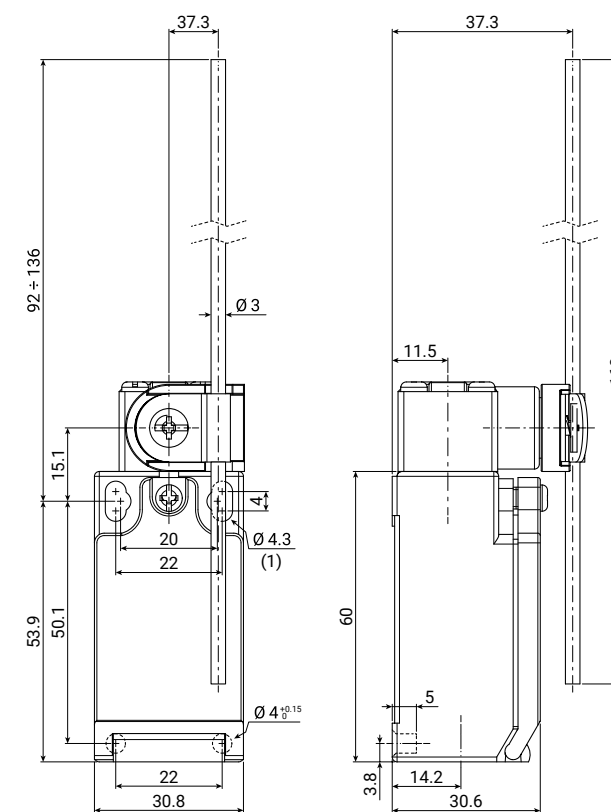
FTN137

Limit switch with adjustable metal rod lever
IP67



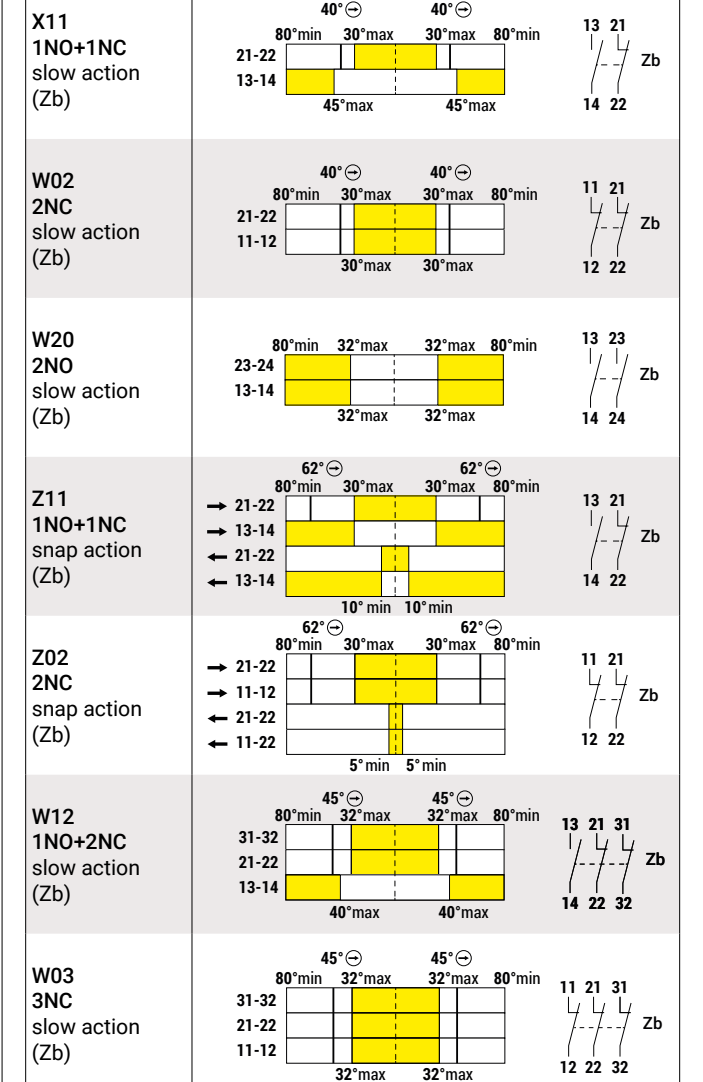
FTN series		1 function	37 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	37 adjustable metal rod lever	X11: 1NO+1NC slow action (Zb) W02: 2NC Z11: 1NO+1NC snap action (Zb) Z02: 2NC W12: 1NO+2NC slow action (Zb) W03: 3NC slow action (Zb)	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male code "A" 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)	
X11: 1NO+1NC	slow action (Zb)	A600-Q600	30°	45°	1.8 N	40°	6 N	-
W02: 2NC	-	400V - 4A	30°	-	1.8 N	40°	6 N	-
W20: 2NO	-	-	32°	-	1.8 N	-	-	-
Z11: 1NO+1NC	snap action (Zb)	B600-Q600	30°	10°	2.1 N	62°	5.5 N	80°
Z02: 2NC	-	DC13: 24V - 6A	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	-

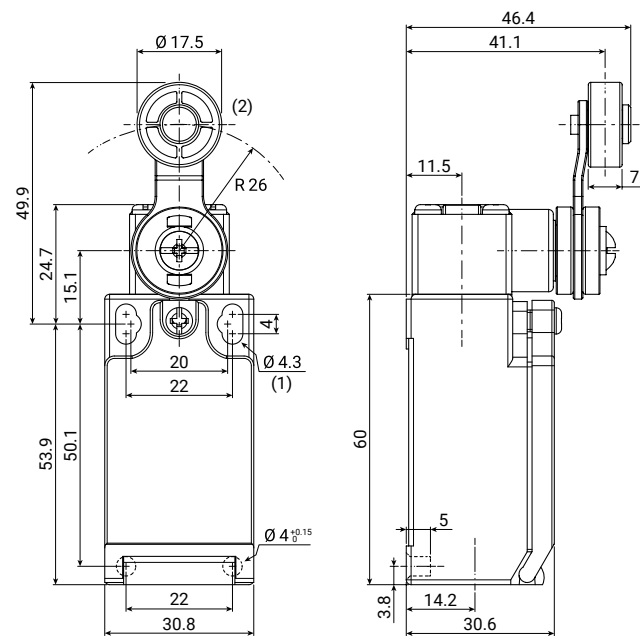
FTN138

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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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

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)	

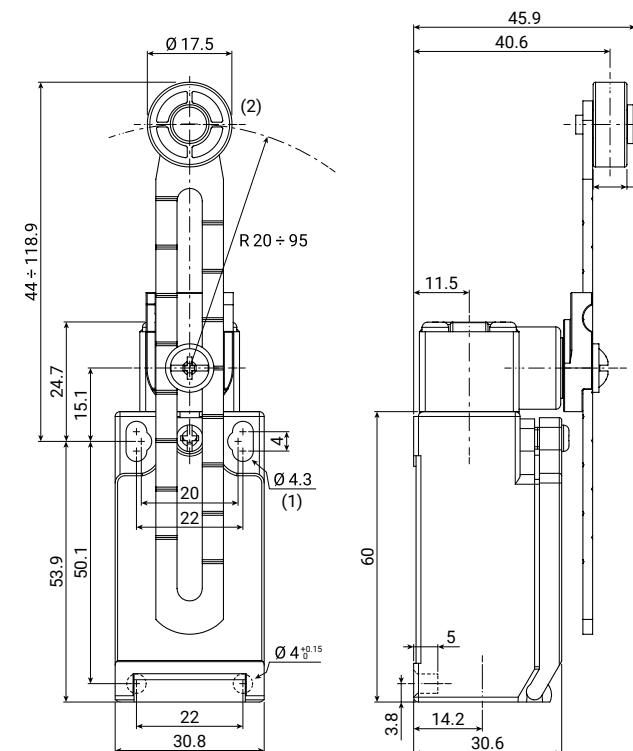
FTN139

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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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

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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 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°
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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	

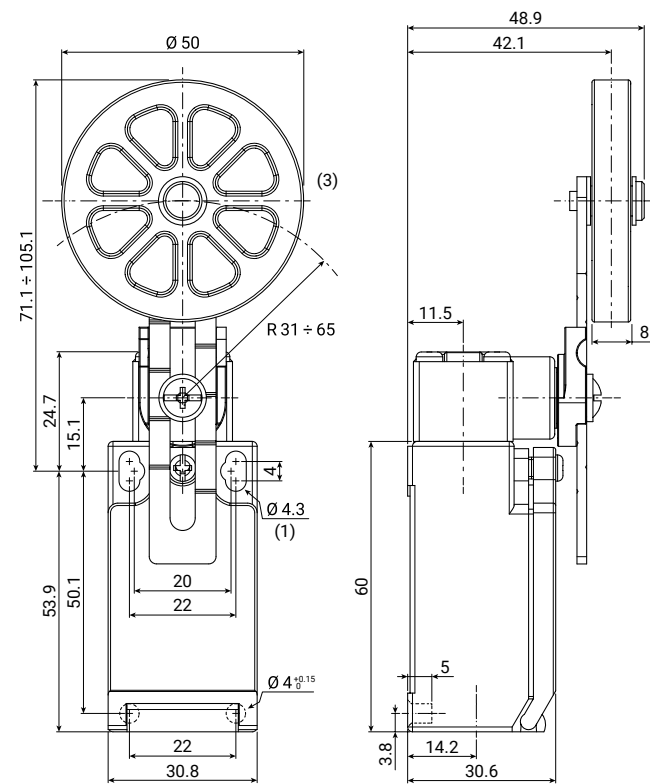
FTN140

Limit switch with Ø50 rubber roller lever with variable length
IP67



FTN series		1 function	40 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	40 Ø50 rubber roller lever with variable length	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(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)	

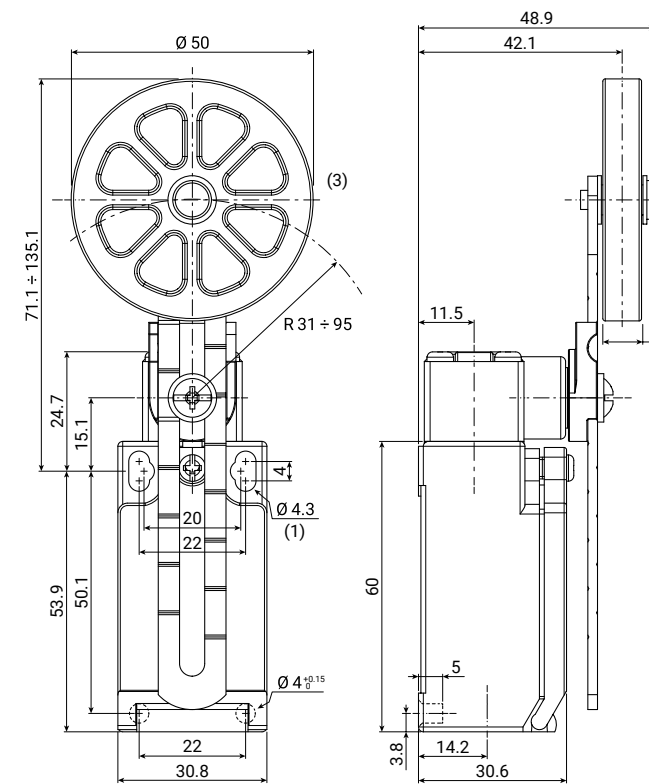
FTN140L

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



FTN series		1 function	40L actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	40L Ø50 long rubber roller lever with variable length	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(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	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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 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°
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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	

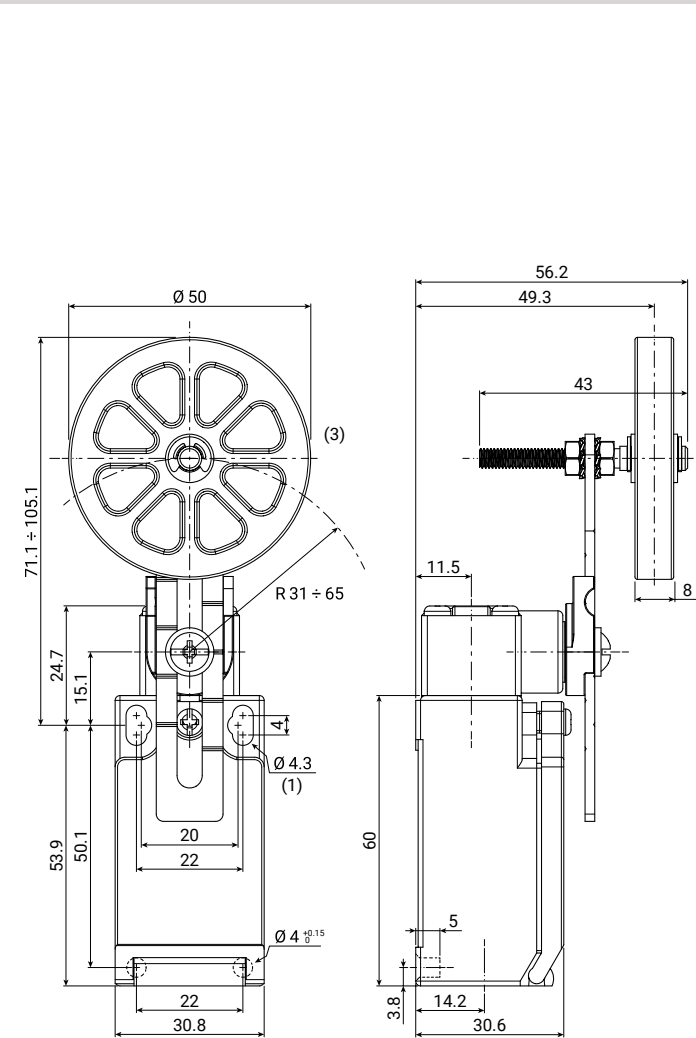
FTN140R

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	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(3) rubber roller

contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	

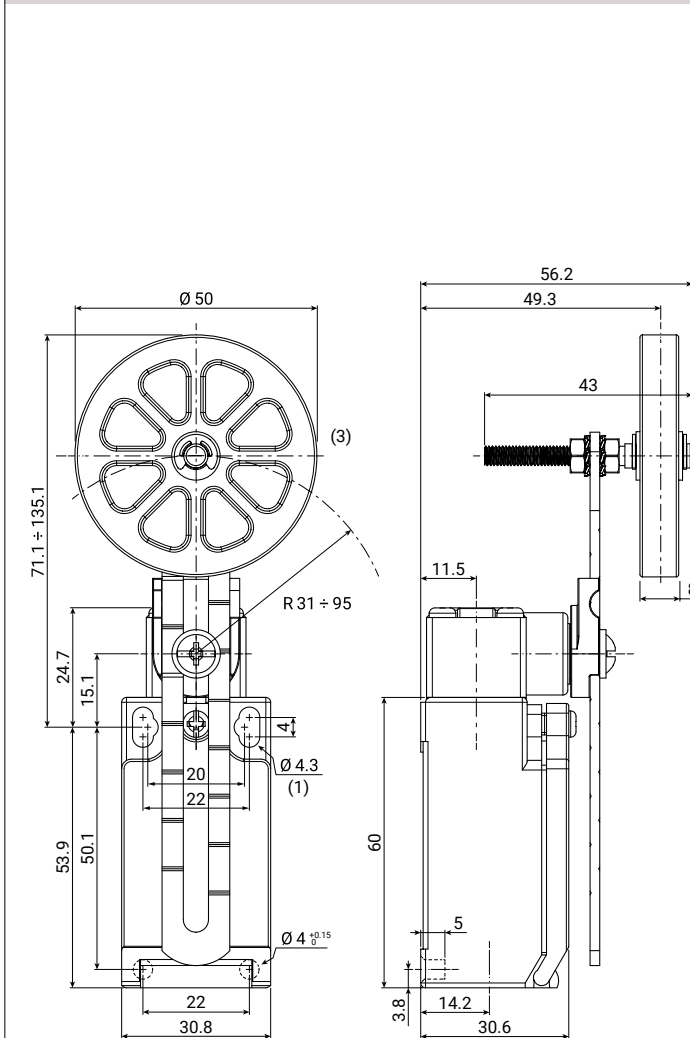
FTN140RL

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	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(3) rubber roller

contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	

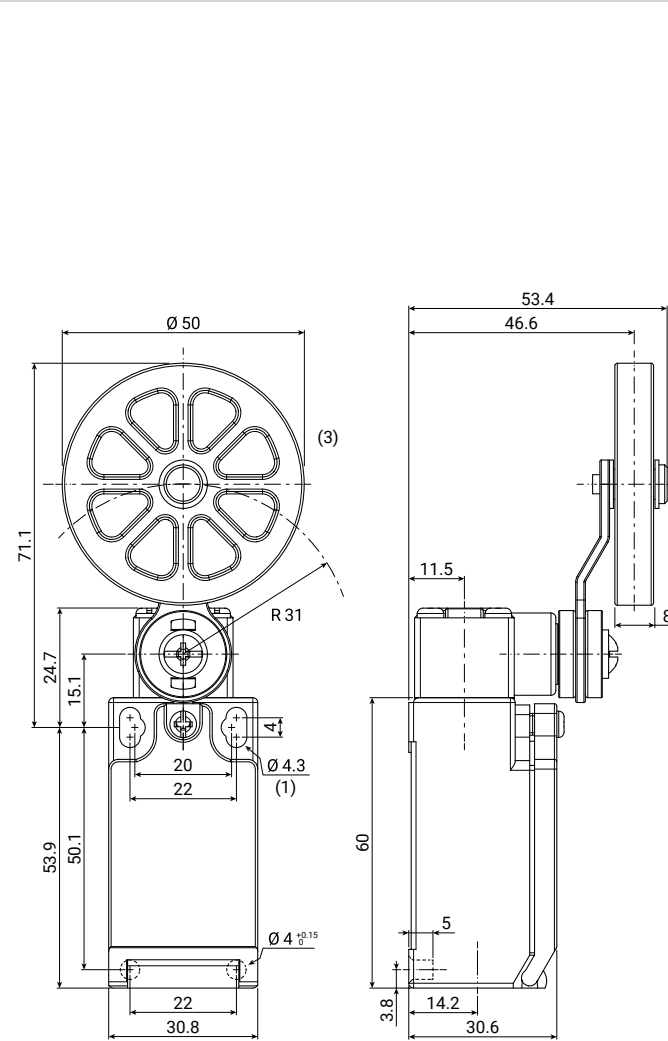
FTN141

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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(3) rubber roller

contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			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	
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	30°	10°	2.1 N	62°	5.5 N	80°
			30°	5°	2.1 N	62°	5.5 N	
W12: 1NO+2NC W03: 3NC	A300-Q300	24V - 6A	32°	40°	6.5 N	45°	5.4 N	80°
			32°	-	6.5 N	45°	5.4 N	

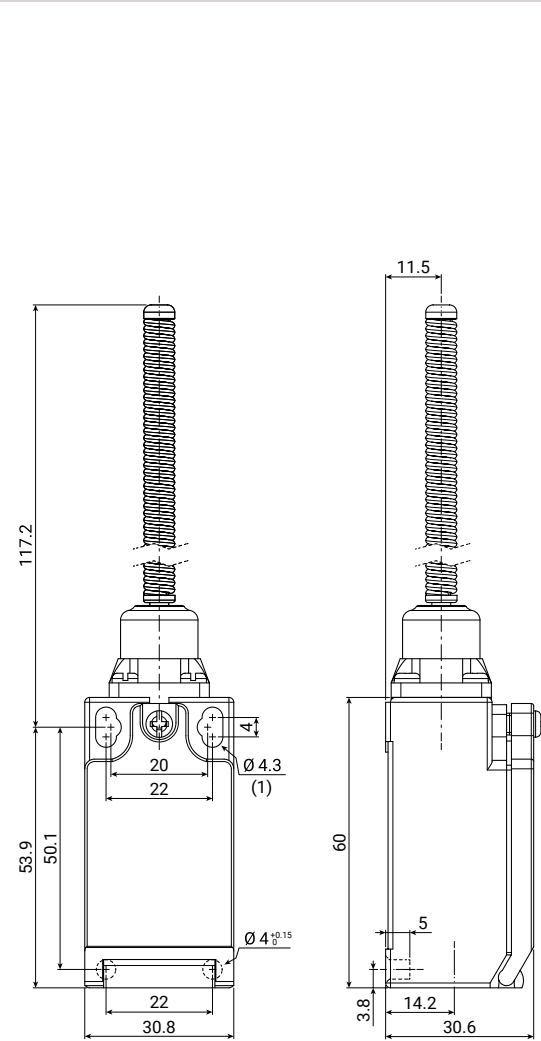
FTN142

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 Z11: 1NO+1NC Z02: 2NC W03: 3NC	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

contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			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	-	-
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13: 24V - 6A	18°	3°	5.8 N	-	-
				18°	2°	5.8 N	-	-
W03: 3NC	slow action (Zb)	A300-Q300	24V - 6A	32°	-	6.5 N	-	-

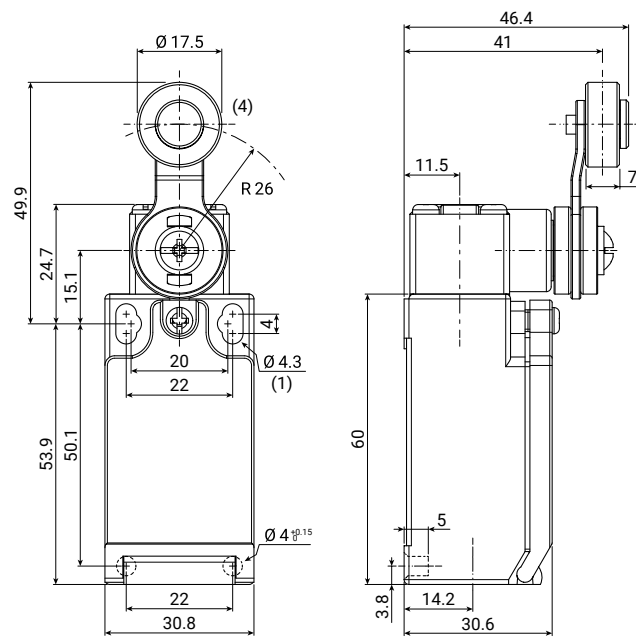
FTN143

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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(4) metal roller

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		OF	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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	

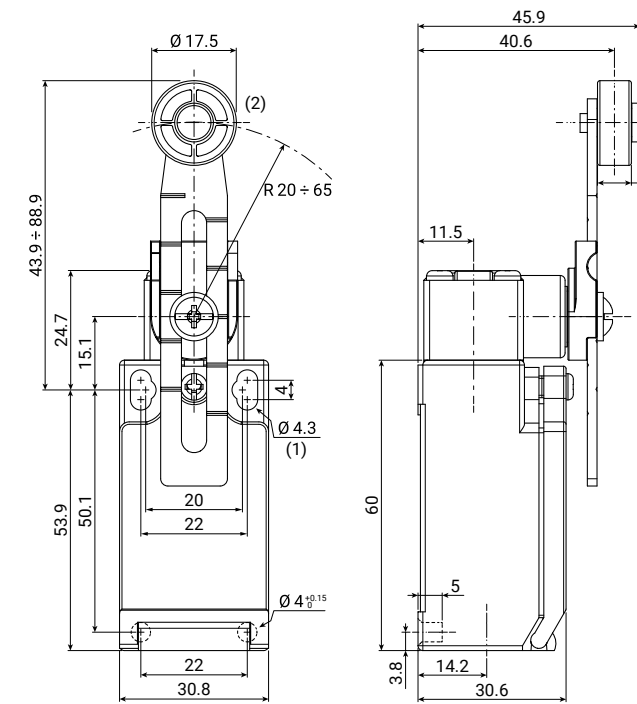
FTN144

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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		OF	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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	

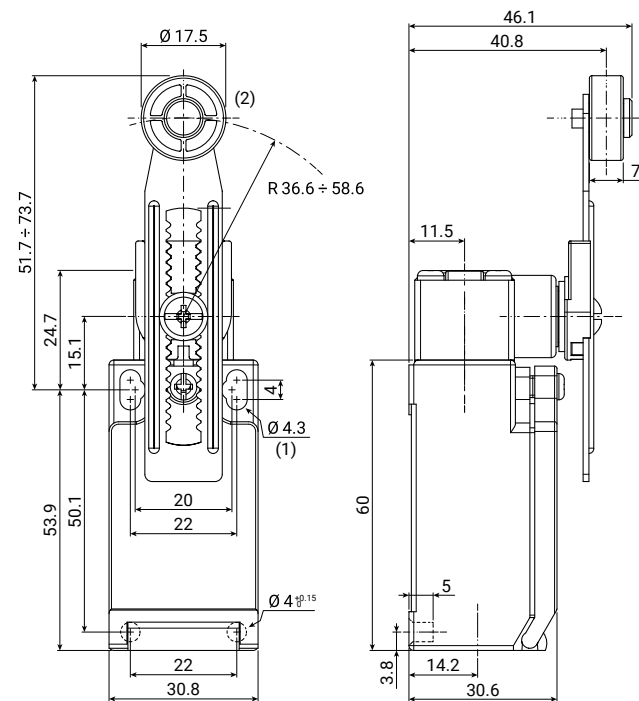
FTN144S

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 W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			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		32°	40°	6.5 N	45°	5.4 N	
			32°	-	6.5 N	45°	5.4 N	
			30°	-	6.5 N	40°	6 N	
			32°	-	6.5 N	-	-	

FTN146

Safety-door hinge switch
IP65

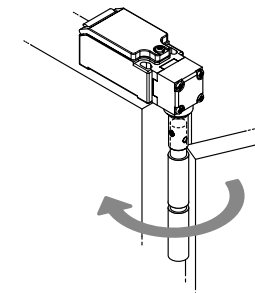


FTN series		1 function	46 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	46 safety-door hinge switch	X11: 1NO+1NC W02: 2NC W12: 1NO+2NC W03: 3NC	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 × 1

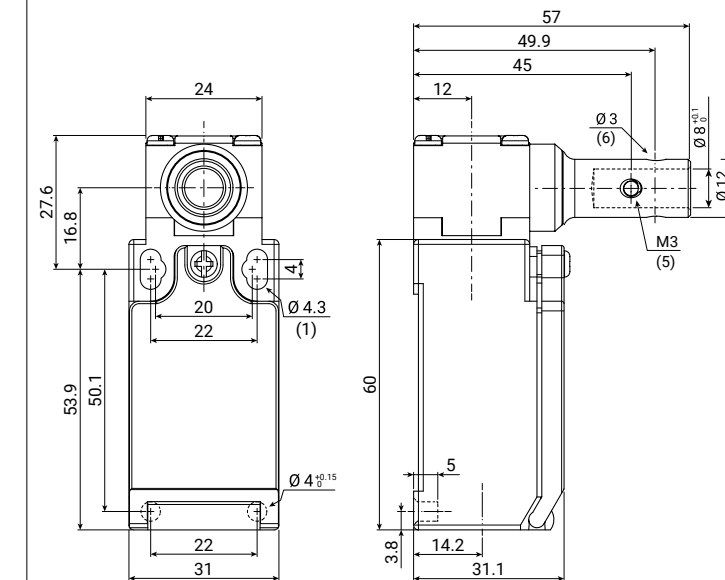
FTN146

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

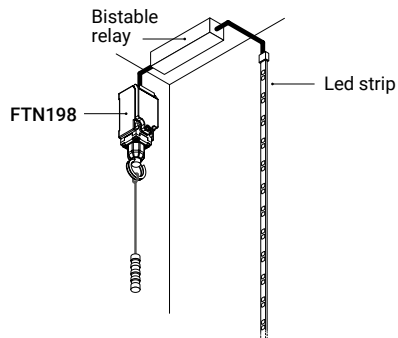
contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W12: 1NO+2NC W03: 3NC	A600-Q600	AC15: 400V - 4A	10°	20°	0.06 N·m	25°	0.12 N·m	-
		DC13: 24V - 6A	10°	-	0.06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

FTN198

Limit switch with rope pull lever
IP67



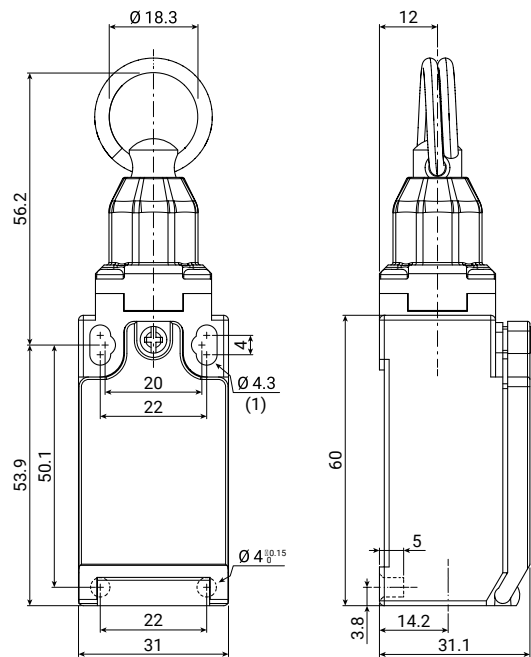
FTN series		1 function	98 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	98 rope pull lever	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	blank M16 x 1.5 (standard) M M20 x 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector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



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

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)	

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

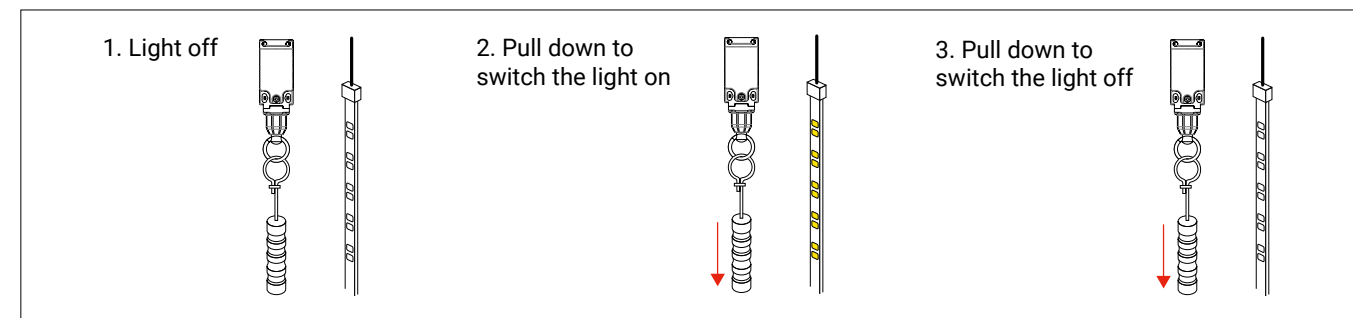
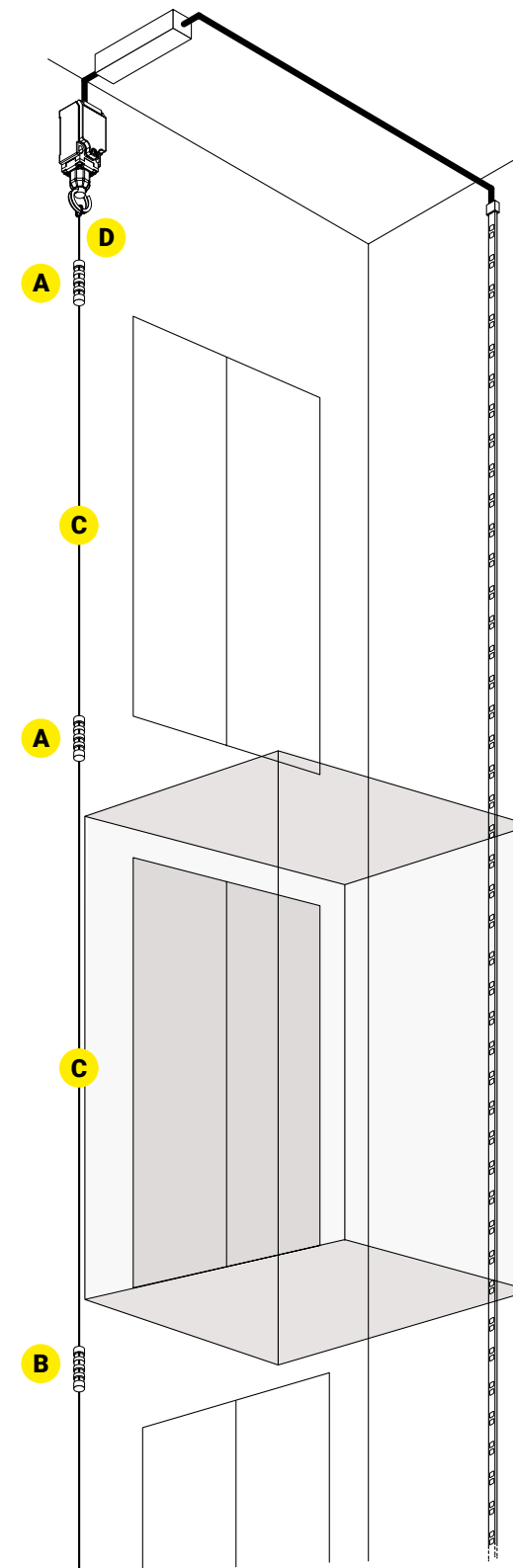


D 11001003

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.

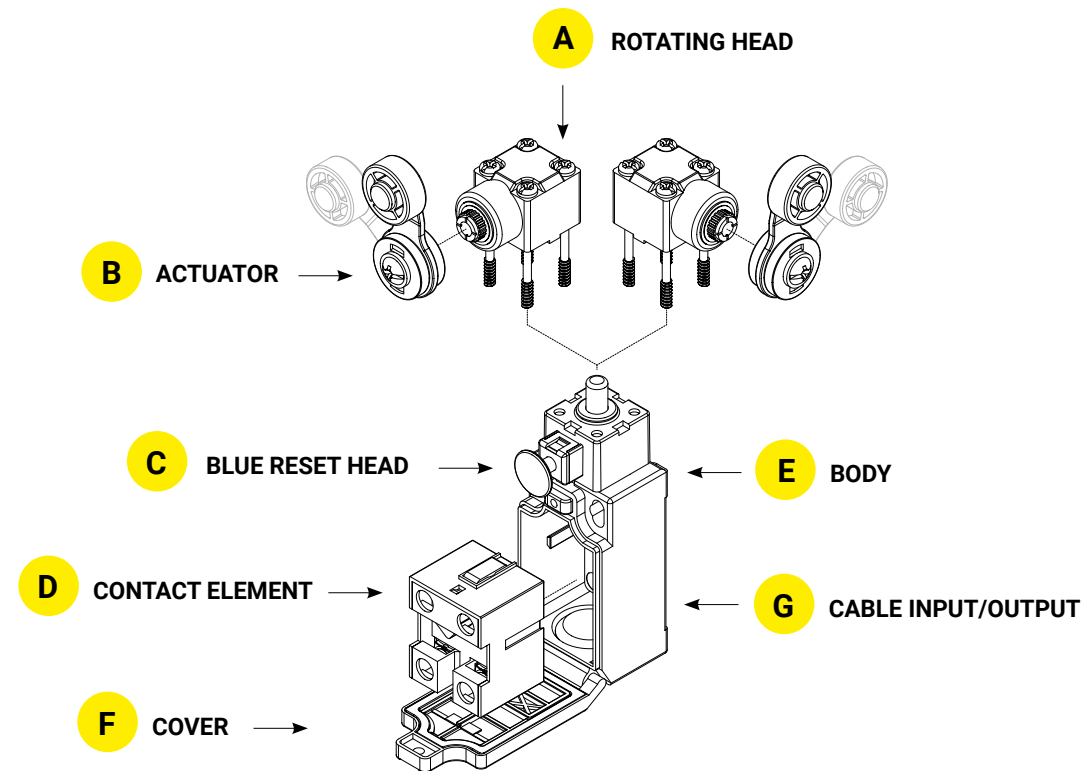
Giovenzana limit switches are suitable for every requirement and can be used in a wide range of sectors.



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	I _{th}	10 A
Rated insulation voltage	U _i	500 V
Rated impulse withstand voltage	U _{imp}	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) □
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

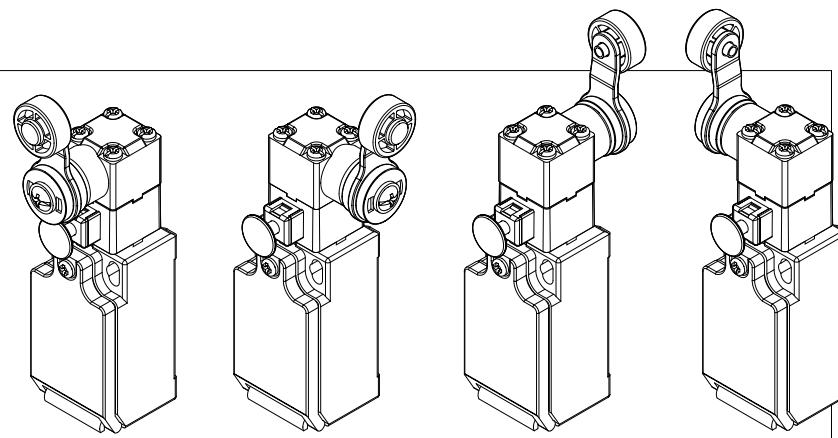


A - ROTATING HEAD

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

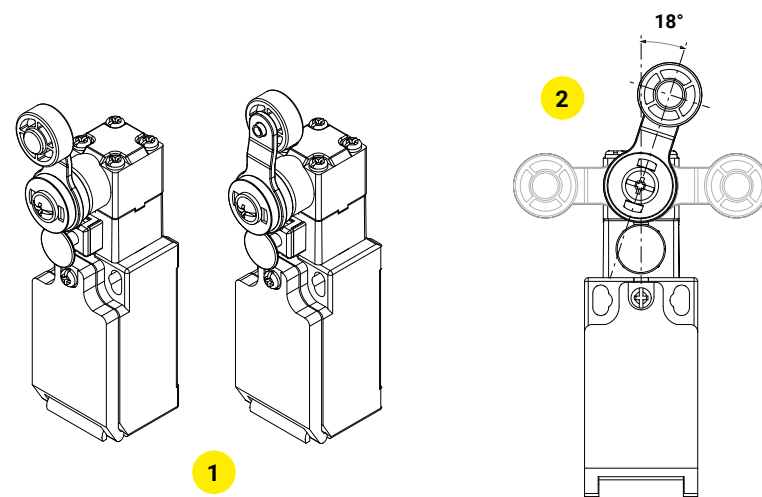
Available different types of actuators: plungers, levers, rollers and rods.

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.

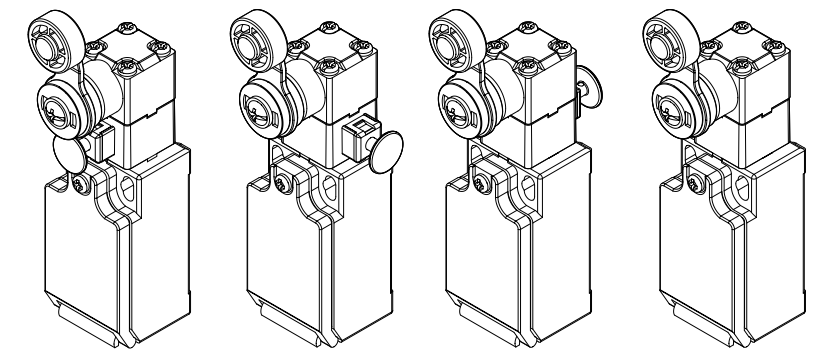


C - RESET HEAD

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

The manual reset mechanism is blue.

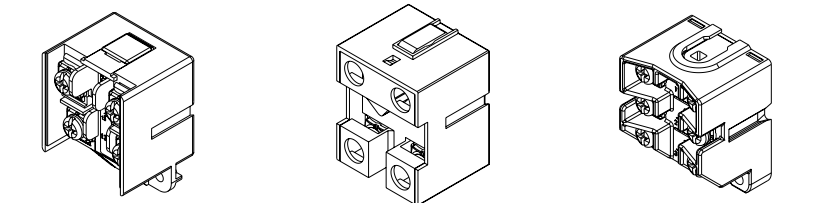
The direction of the reset head can be adjusted to any of the four directions.



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)

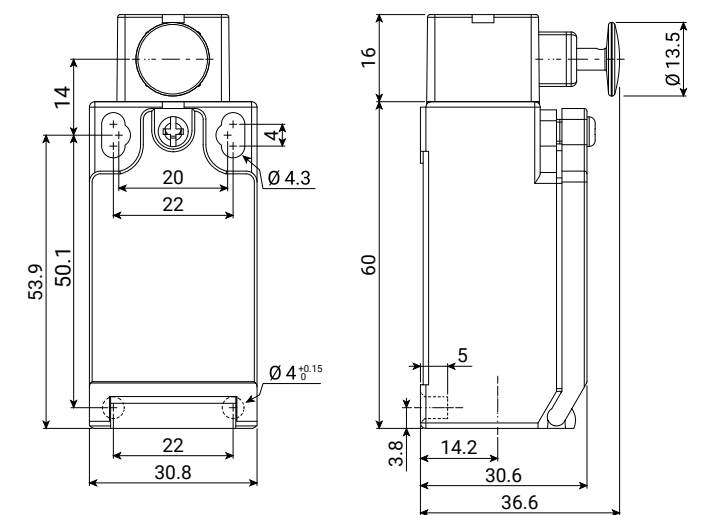
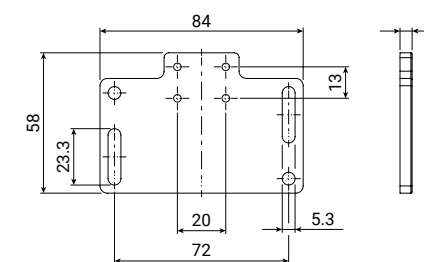
→ Not suitable for safety applications!

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

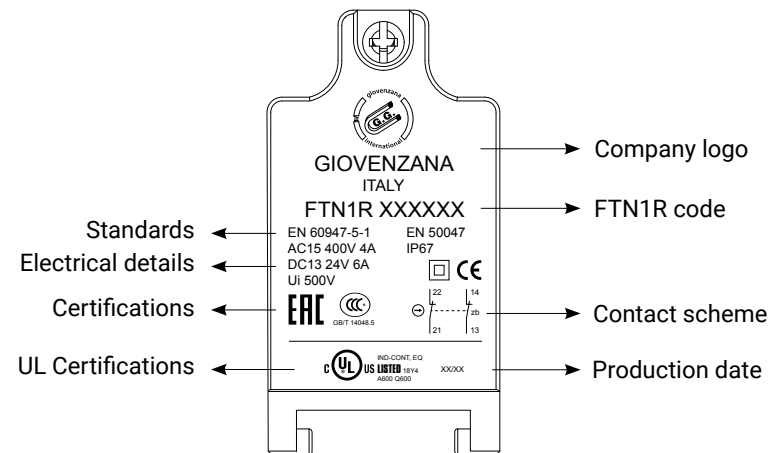
Material conforming to the RoHS Directive.

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

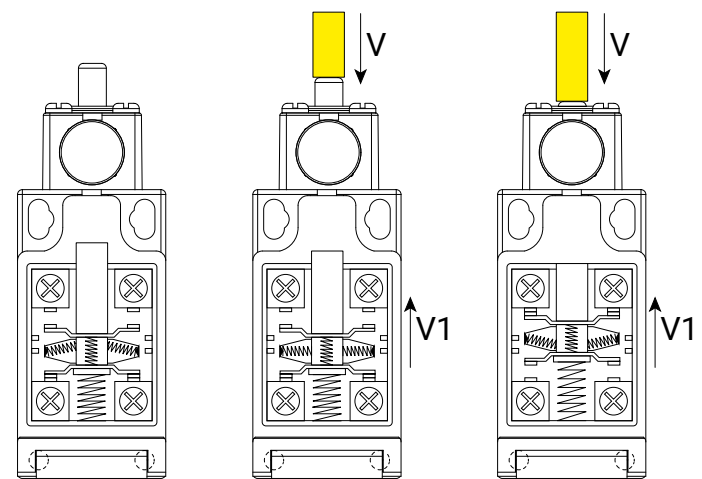
SLOW ACTION - Contact elements direct acting

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.



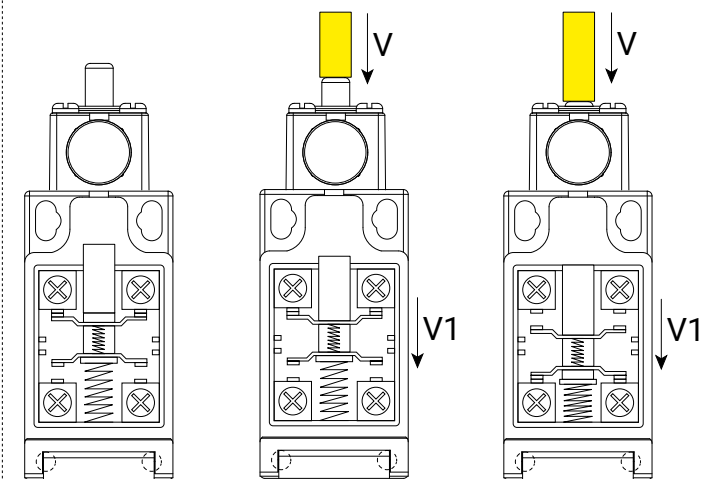
SNAP ACTION - Contact elements acting independently

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.

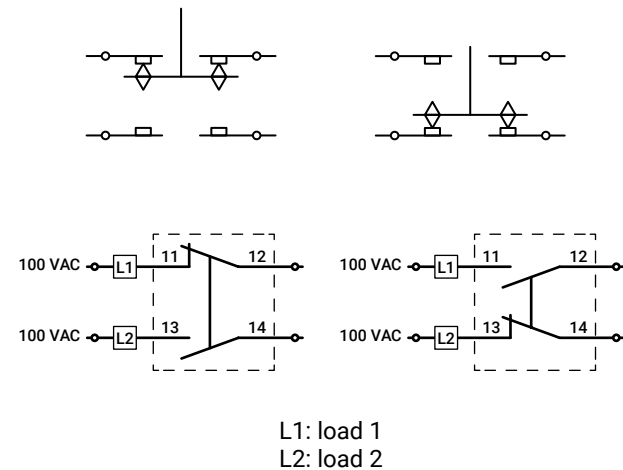
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



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

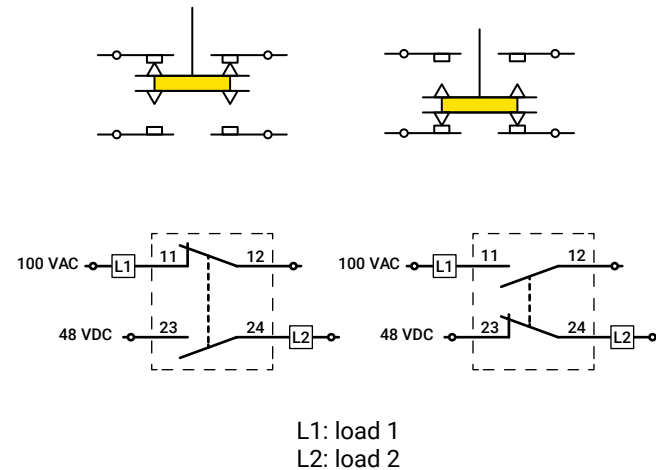
Za contact type

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.

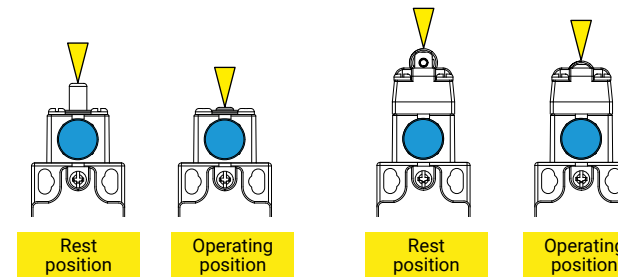


FTN1R series of thermoplastic limit switches with manual reset is equipped with Zb contacts.

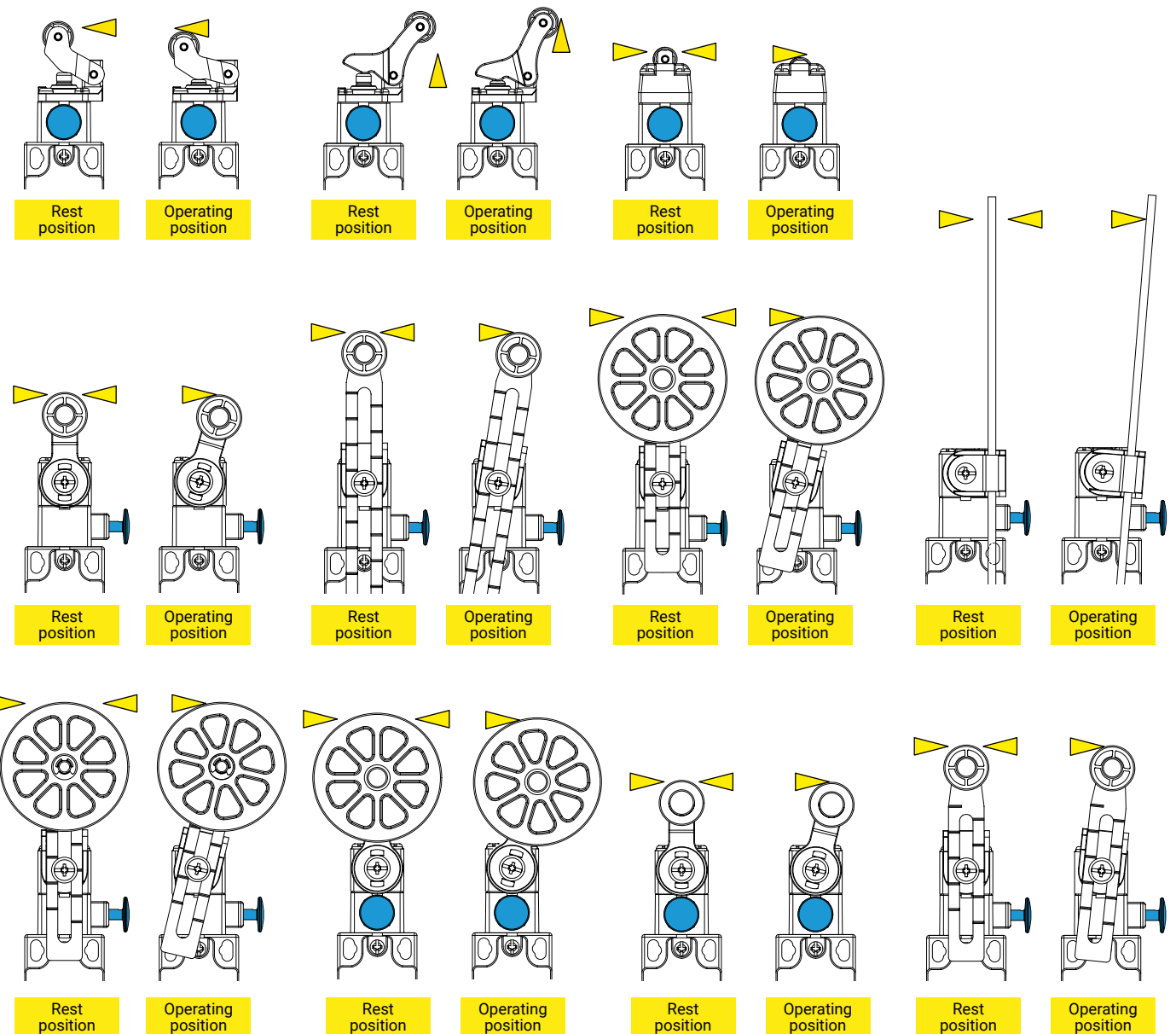
DETECTION MOVEMENTS

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

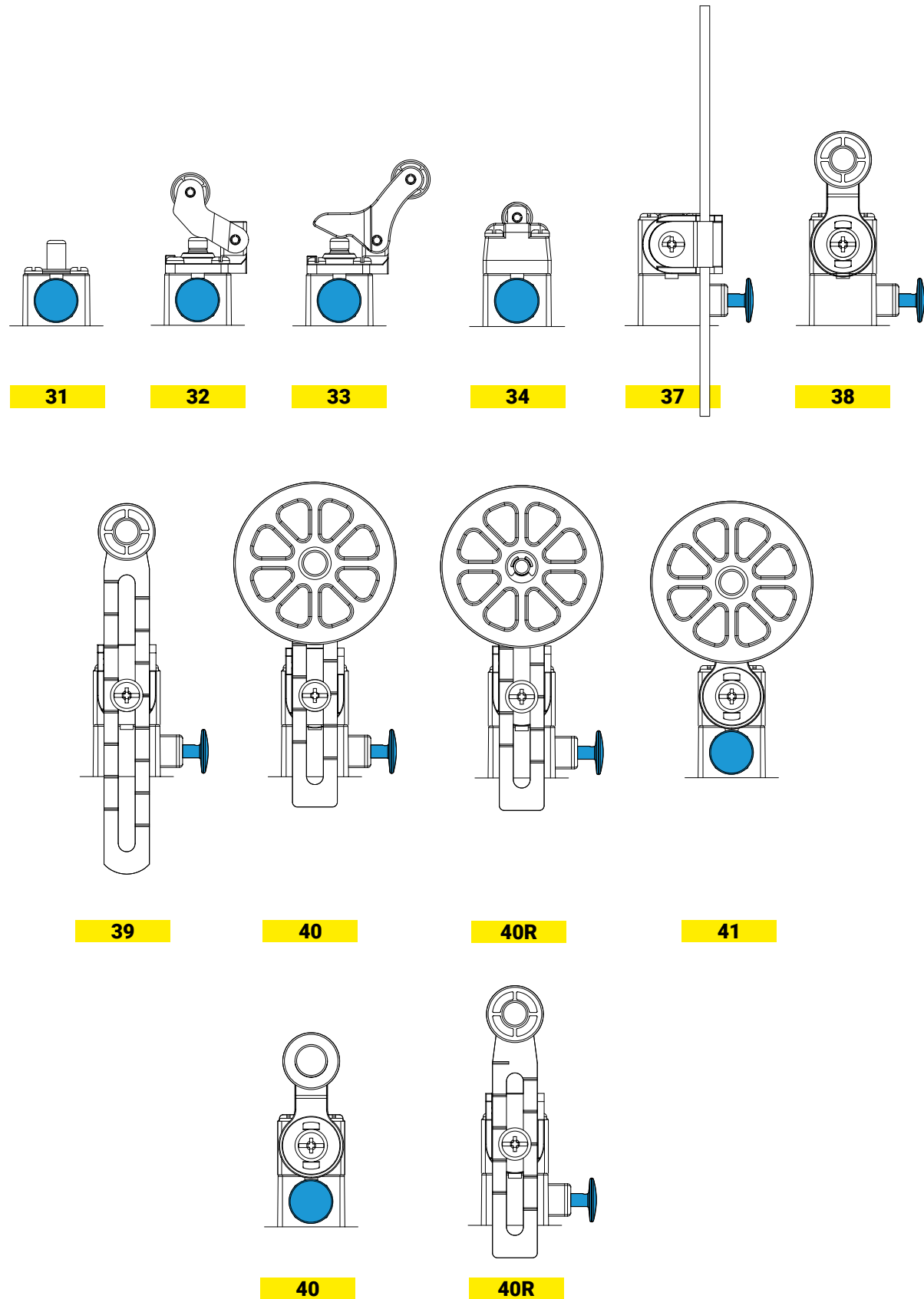


2. Rotary detection movement - Lever

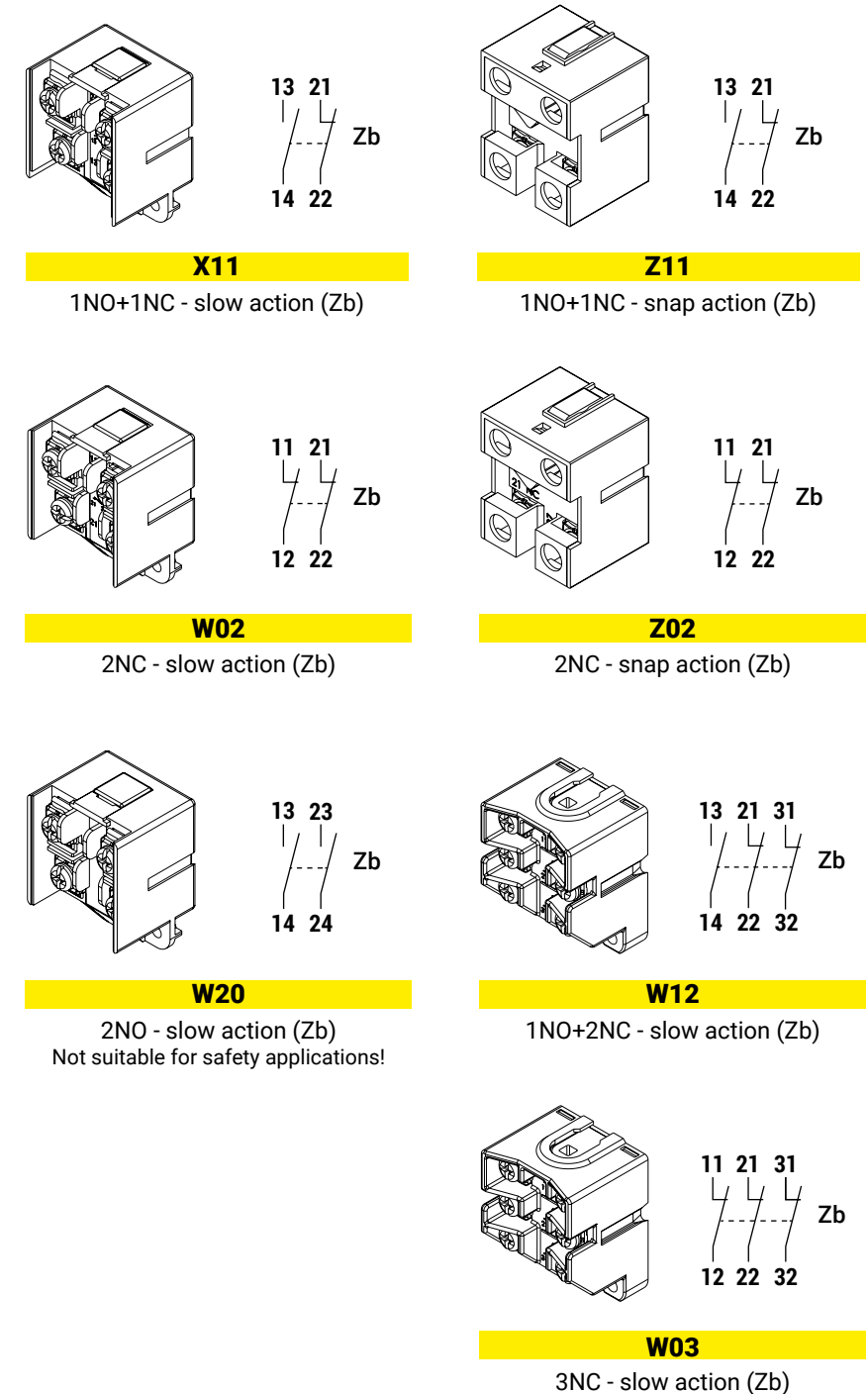


FTN1R - PRODUCT SELECTION OVERVIEW

1 HEADS + ACTUATORS



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	
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 thermoplastic limit switches	1R with manual reset	31 plastic end plunger 32 PA roller lever plunger, horizontal action 33 PA roller lever plunger, vertical action 34 PA roller plunger 37 adjustable metal rod lever 38 Ø18 PA roller lever 39 Ø18 PA roller lever with variable length 40 Ø50 rubber roller lever with variable length 40R Ø50 rubber roller lever with variable length and overhang 41 Ø50 rubber roller lever 43 Ø18 metal roller lever 44 Ø18 PA roller lever with variable length	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 M16 × 1.5 <i>on request</i> M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 × 1

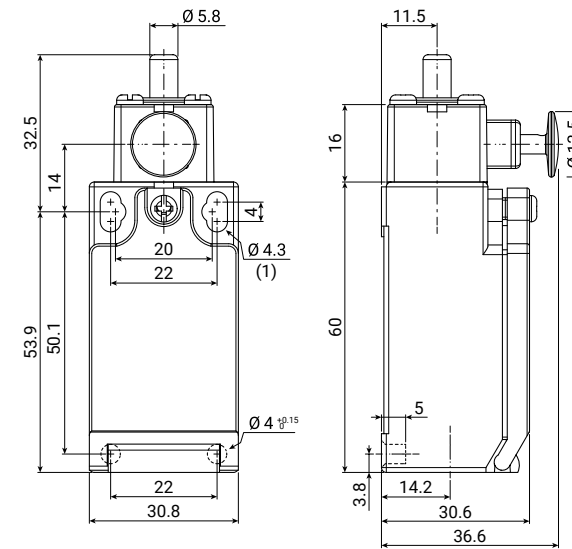
FTN1R31

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 W20: 2NO Z11: 1NO+1NC 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	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	B600-Q600	DC13: 24V - 6A	2.0 mm	1.0 mm	8.5 N	4.4 mm	16.5 N	4.0 mm	6.0 mm
			2.0 mm	0.8 mm	8.5 N	4.4 mm	16.5 N		
W12: 1NO+2NC W03: 3NC	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		

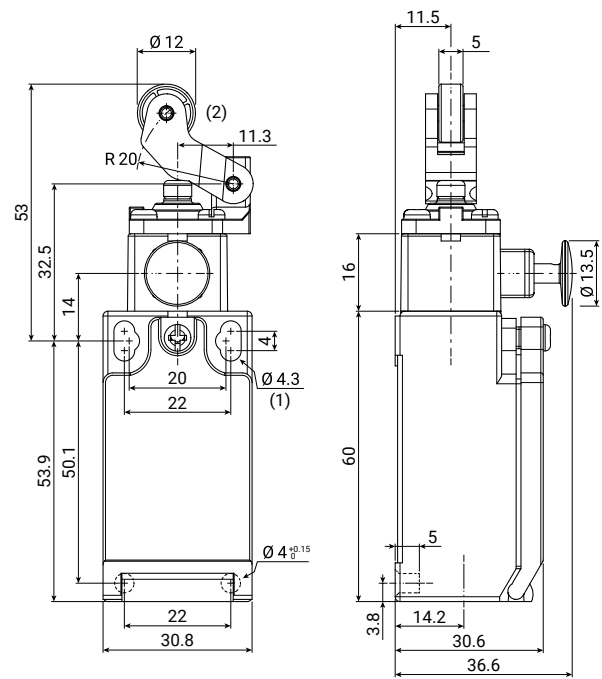
FTN1R32

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 W02: 2NC W20: 2NO	slow action (Zb)	blank M	M16 × 1.5 (standard) M20 × 1.5
						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
(2) PA roller

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	3.5 mm	5.0 mm	5.3 N	7.5 mm	13.5 N	5.7 mm	9.0 mm
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	2.7 mm	1.3 mm	5.9 N	6.6 mm	10.8 N		
W12: 1NO+2NC W03: 3NC	A300-Q300		3.5 mm	4.5 mm	5.3 N	8.8 mm	15 N		
			3.5 mm	-	5.3 N	8.8 mm	15 N		
			3.5 mm	-	5.3 N	7.5 mm	13.5 N		
			3.5 mm	-	7.2 N	-	-		

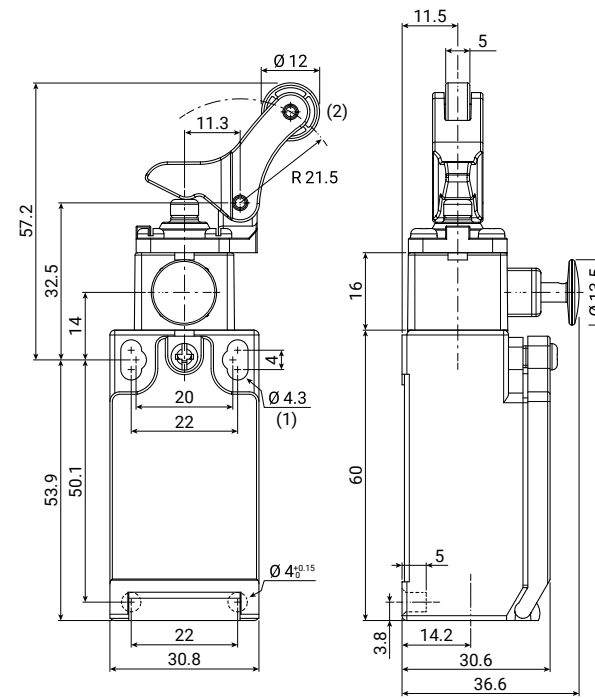
FTN1R33

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 W02: 2NC W20: 2NO	slow action (Zb)	blank M	M16 × 1.5 (standard) M20 × 1.5
						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
(2) PA roller

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	4.0 mm	6.0 mm	6.4 N	5.0 mm	15 N	6.8 mm	9.5 mm
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	3.3 mm	1.6 mm	5.0 N	7.7 mm	10 N		
W12: 1NO+2NC W03: 3NC	A300-Q300		4.0 mm	6.0 mm	6.4 N	5.3 mm	17 N		
			4.0 mm	-	6.5 N	5.3 mm	17 N		
			4.0 mm	-	7.0 N	5.0 mm	15 N		
			3.0 mm	-	5.8 N	-	-		

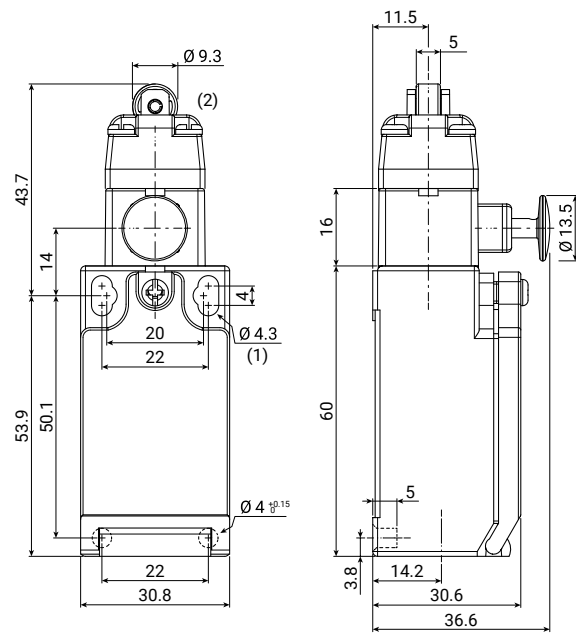
FTN1R34

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)	blank M	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	G1 G3	1/2" NPT PG13.5
						W12: 1NO+2NC W03: 3NC	slow action (Zb)	C	male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

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	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	B600-Q600	DC13: 24V - 6A	2.0 mm	1.0 mm	8.5 N	4.4 mm	16.5 N	4.0 mm	6.0 mm
			2.0 mm	0.8 mm	8.5 N	4.4 mm	16.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300	24V - 6A	2.3 mm	3.0 mm	7.5 N	3.0 mm	23 N	4.0 mm	6.0 mm
			2.3 mm	-	7.5 N	3.0 mm	23 N		

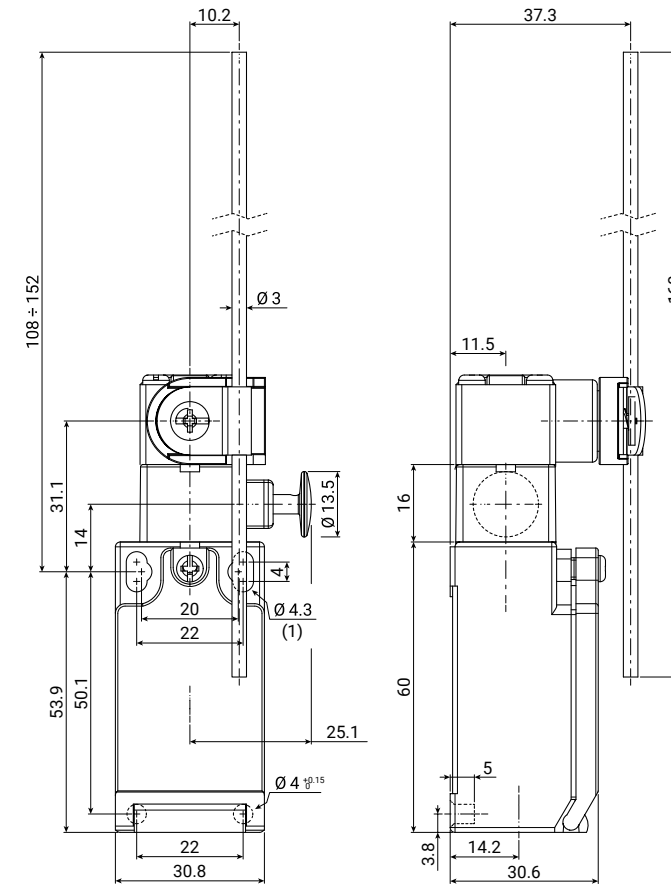
FTN1R37

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)	blank M	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	G1 G3	1/2" NPT PG13.5
						W12: 1NO+2NC W03: 3NC	slow action (Zb)	C	male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes

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°	1.8 N	45°	6 N	55°	80°
			35°	-	1.8 N	45°	6 N		
			35°	-	1.8 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	24V - 6A	32°	40°	1.8 N	45°	5.4 N	55°	80°
			32°	-	1.8 N	45°	5.4 N		

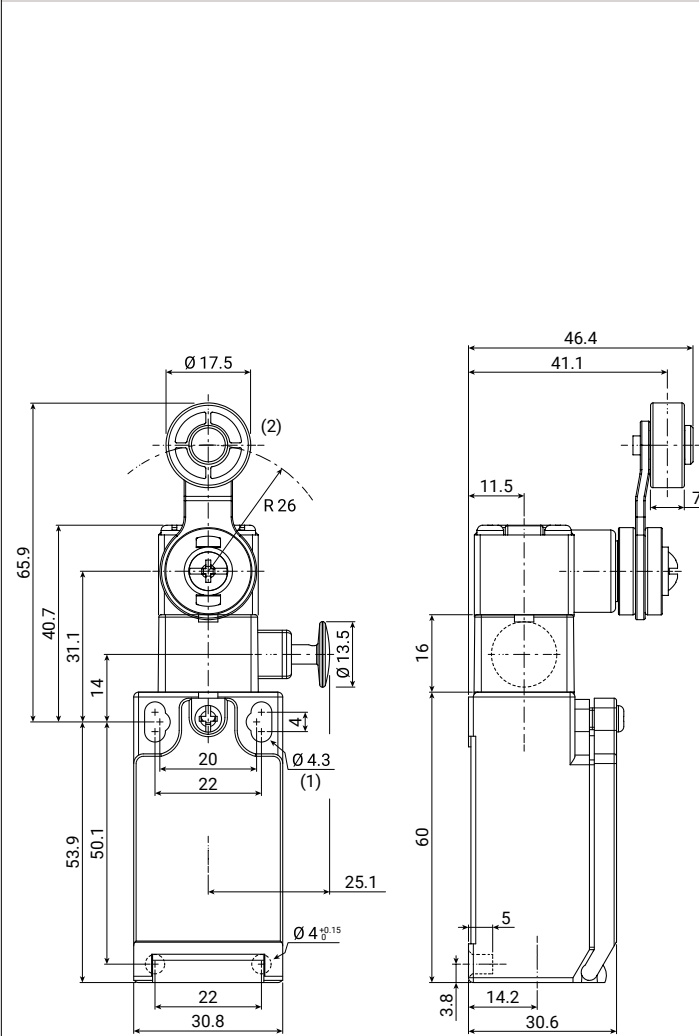
FTN1R38

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)	blank M	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	G1 G3	1/2" NPT PG13.5
						W12: 1NO+2NC W03: 3NC	slow action (Zb)	C	male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

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	55°	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	35°	9°	5.9 N	60°	5.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300		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		

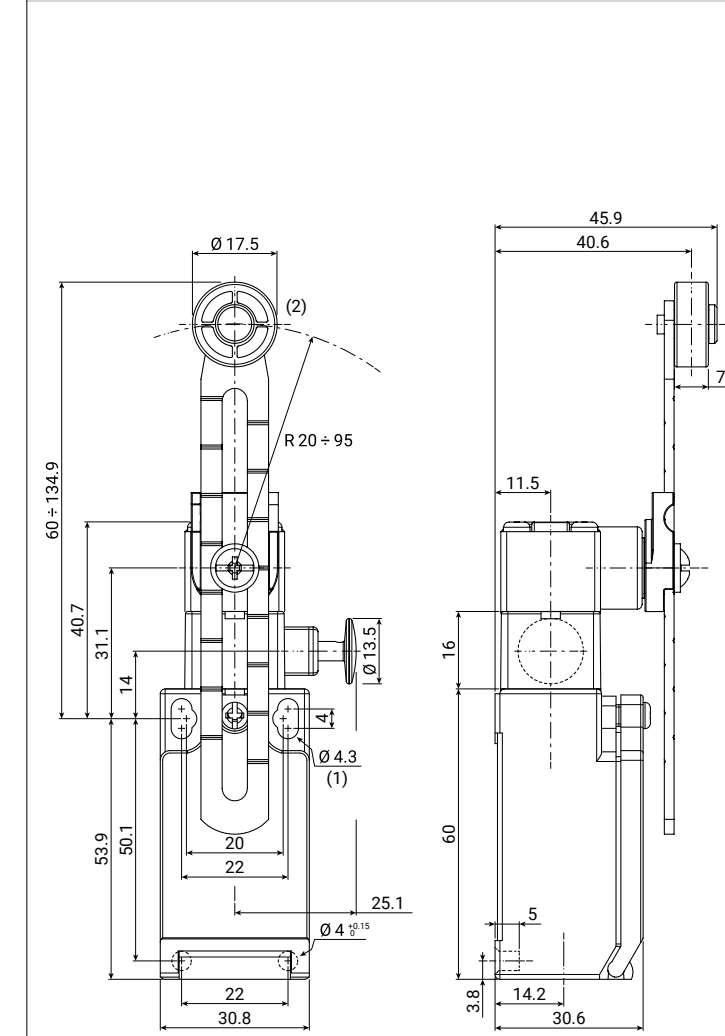
FTN1R39

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)	blank M	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	G1 G3	1/2" NPT PG13.5
						W12: 1NO+2NC W03: 3NC	slow action (Zb)	C	male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

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	55°	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	35°	9°	5.9 N	60°	5.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300		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		

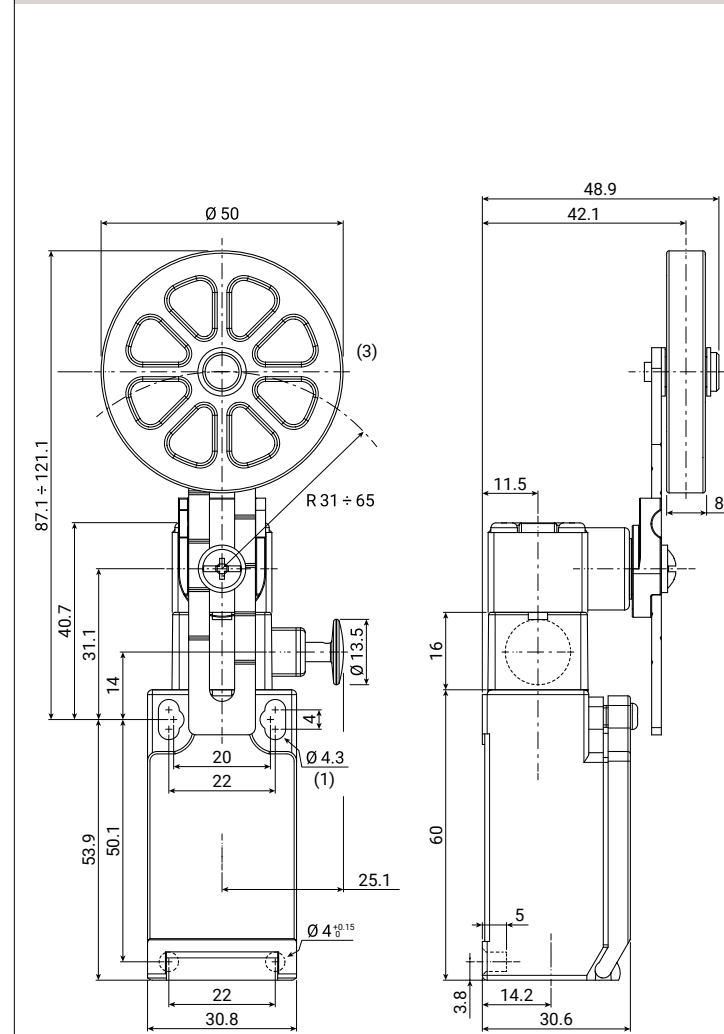
FTN1R40

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



FTN series		1R function	40 actuator	XXX contact type	XX 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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(3) rubber roller

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:	35°	50°	6.5 N	45°	6 N	55°	80°
			400V - 4A	35°	-	6.5 N	45°	6 N		
				35°	-	6.5 N	-	-		
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13:	35°	9°	5.9 N	60°	5.5 N	55°	80°
			24V - 6A	35°	4°	5.9 N	64°	5.5 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		32°	40°	6.5 N	45°	5.4 N	55°	80°
				32°	-	6.5 N	45°	5.4 N		

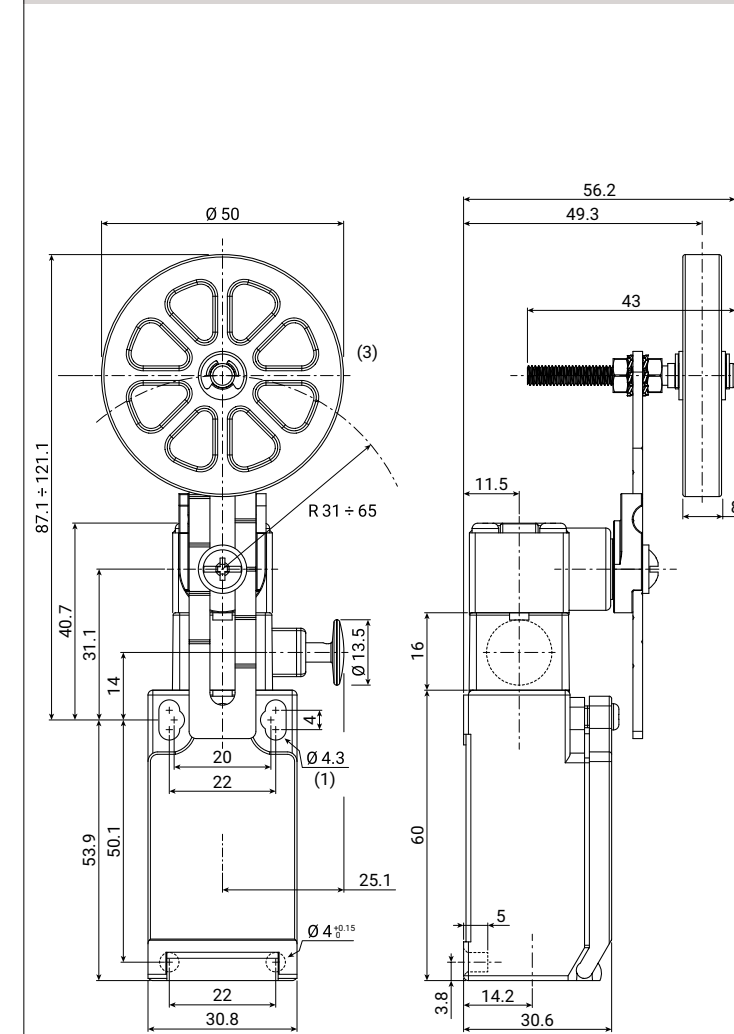
FTN1R40R

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



FTN series		1R function	40R actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1R with manual reset function	40R Ø50 rubber roller lever with variable length and overhang	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(3) rubber roller

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:	35°	50°	6.5 N	45°	6 N	55°	80°
			400V - 4A	35°	-	6.5 N	45°	6 N		
				35°	-	6.5 N	-	-		
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	DC13:	35°	9°	5.9 N	60°	5.5 N	55°	80°
			24V - 6A	35°	4°	5.9 N	64°	5.5 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		32°	40°	6.5 N	45°	5.4 N	55°	80°
				32°	-	6.5 N	45°	5.4 N		

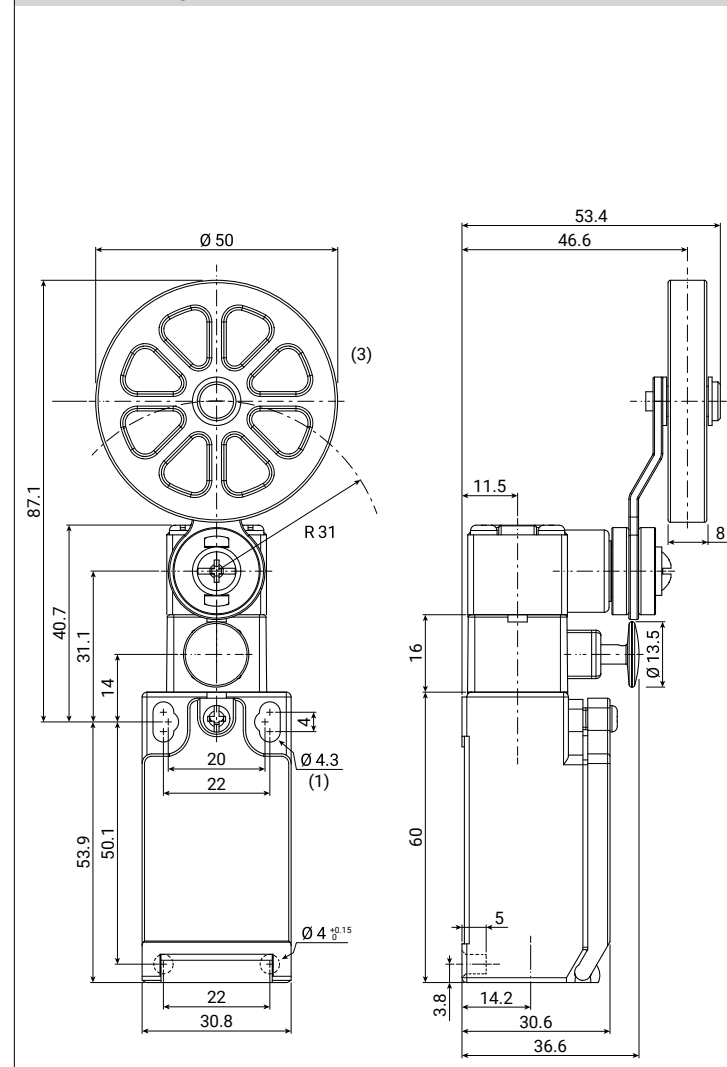
FTN1R41

Limit switch with Ø50 rubber roller lever and manual reset
IP67



FTN series		1R function		41 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1R	with manual reset function	41	Ø50 rubber roller lever	X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	blank M	M16 × 1.5 (standard) M20 × 1.5
						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

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	55°	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13:	35°	9°	5.9 N	60°	5.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300	24V - 6A	35°	4°	5.9 N	64°	5.5 N		
			40°	-	6.5 N	45°	5.4 N		
			32°	-	6.5 N	45°	5.4 N		

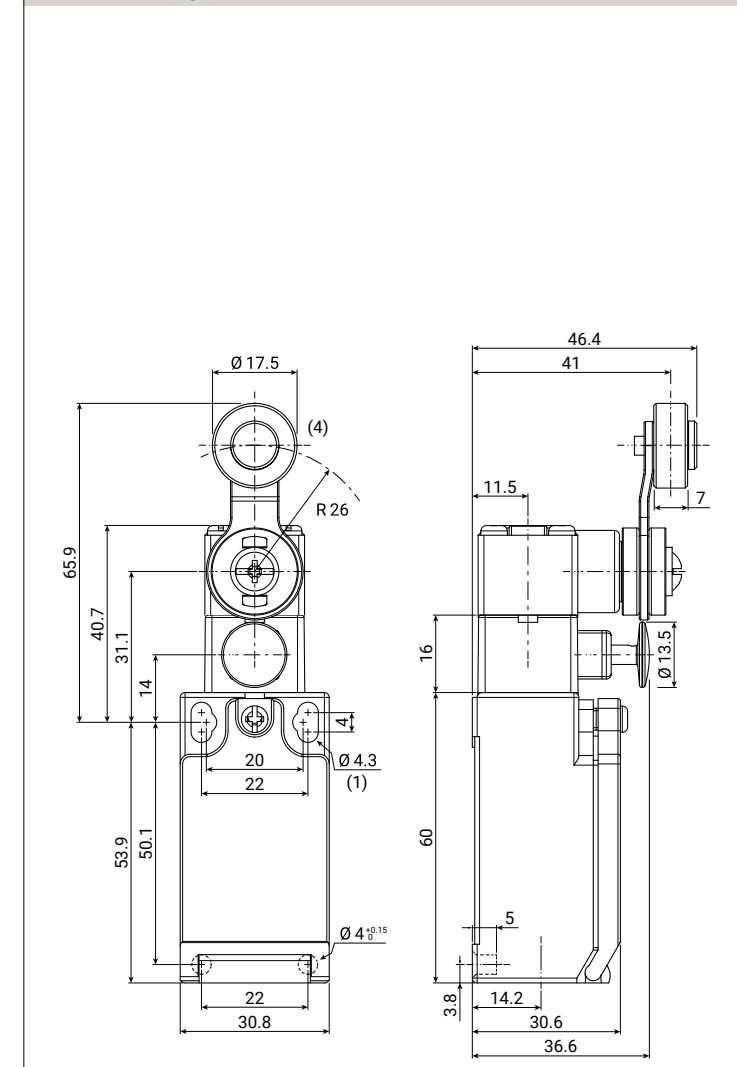
FTN1R43

Limit switch with Ø18 metal roller lever and manual reset
IP67



FTN series		1R function		43 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1R	with manual reset function	43	Ø18 metal roller lever	X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)	blank M	M16 × 1.5 (standard) M20 × 1.5
						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
(4) metal roller

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	55°	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13:	35°	9°	5.9 N	60°	5.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300	24V - 6A	35°	4°	5.9 N	64°	5.5 N		
			40°	-	6.5 N	45°	5.4 N		
			32°	-	6.5 N	45°	5.4 N		

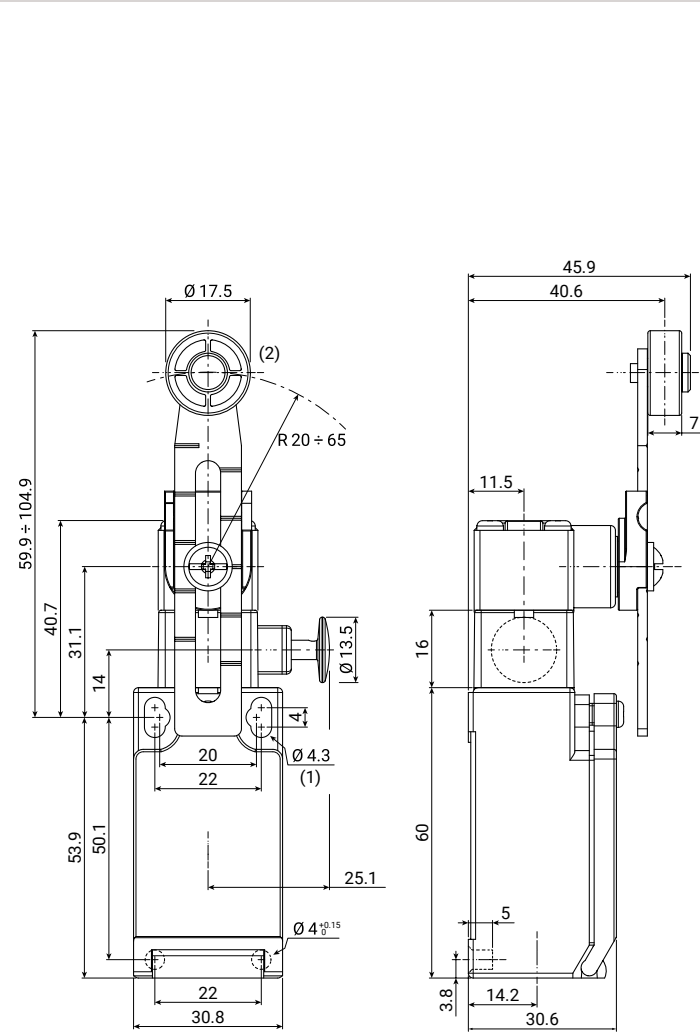
FTN1R44

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



FTN series		1R function		44 actuator		XXX contact type		XX conduit entry	
FTN	thermoplastic limit switch	1R	with manual reset function	44	Ø18 PA 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 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)		POT (travel)	POF (force)		
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	35°	50°	6.5 N	45°	6 N	55°	80°
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	35°	9°	5.9 N	60°	5.5 N		
W12: 1NO+2NC W03: 3NC	A300-Q300		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		



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 x 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.

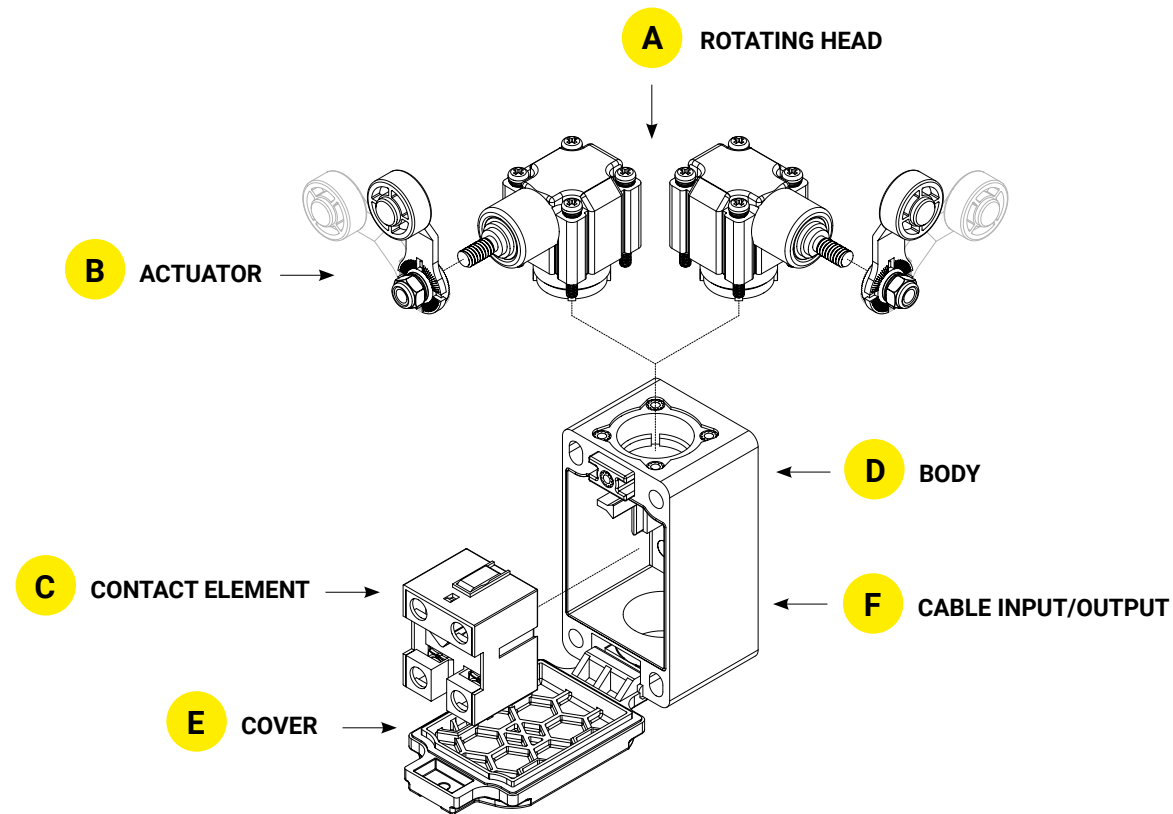
Giovanzana limit switches offer solutions for every need and are suitable for the most varied sectors of use.



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	I _{th}	10 A
Rated insulation voltage	U _i	500 V
Rated impulse withstand voltage	U _{imp}	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

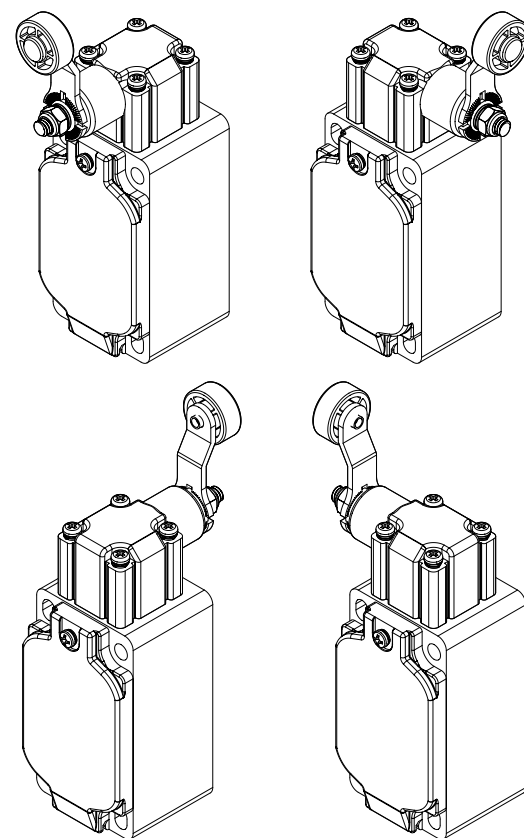


A - ROTATING HEAD

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

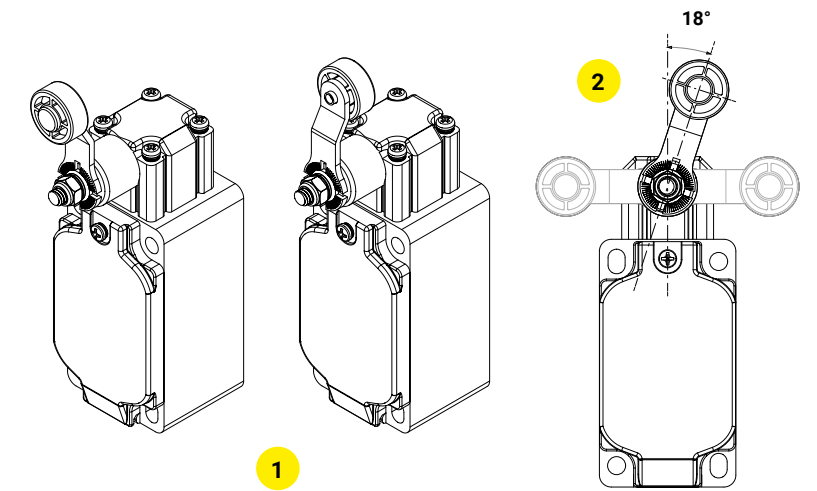
Available different types of actuators: plungers, levers, rollers and rods.

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

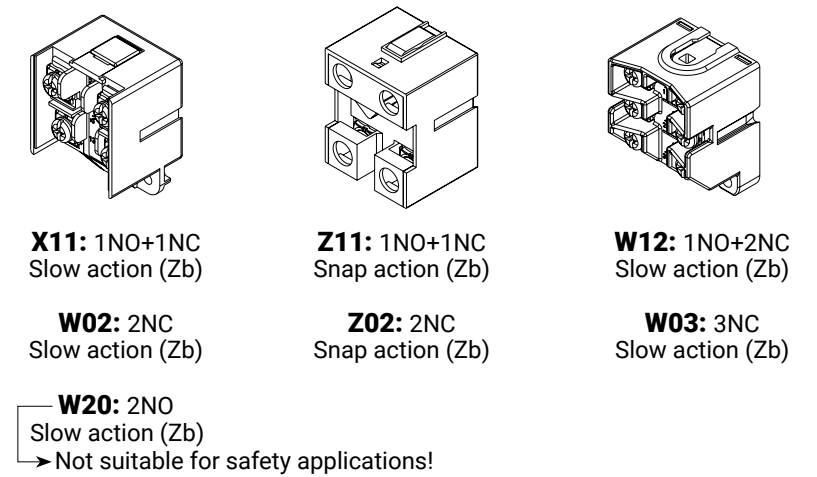
All levers are adjustable in steps of 18° over 360°, compared to the horizontal axis of the head. The positive movement transmission is always guaranteed thanks to the particular geometric coupling between the lever and the rotation shaft.



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.).

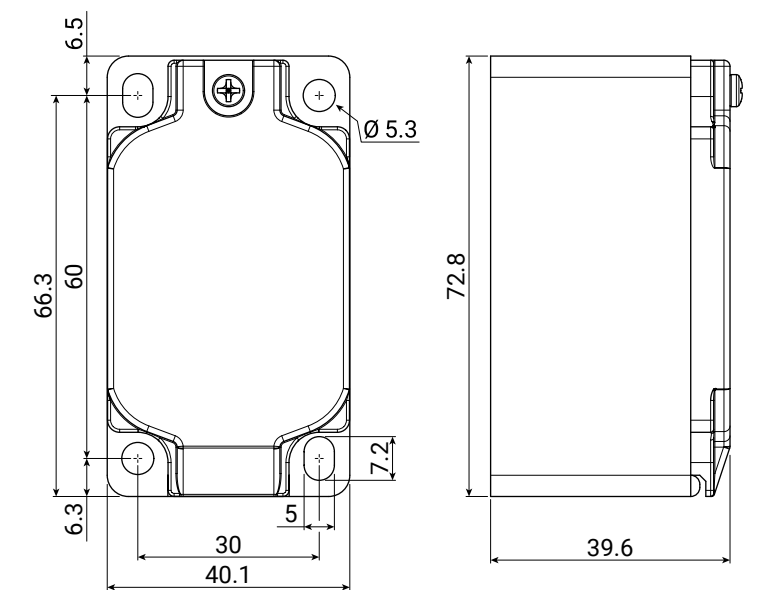
Different contact elements are available, both fast-acting and slow-acting, depending on the different application requirements.



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

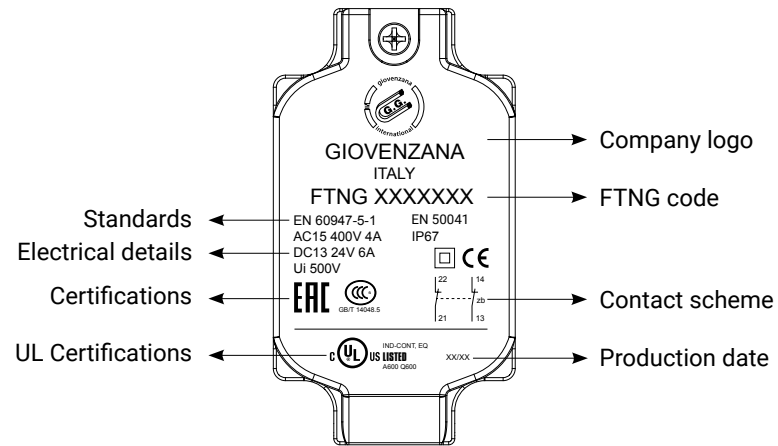
Material conforming to the RoHS Directive.

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

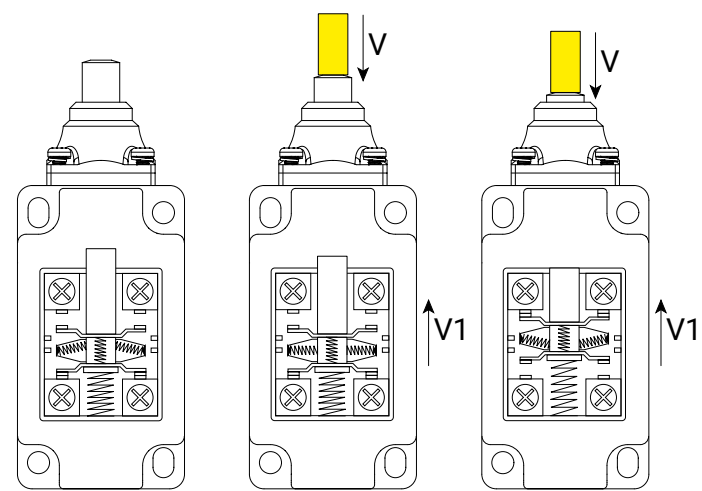
SLOW ACTION - Contact elements direct acting

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

The contact movement speed (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.



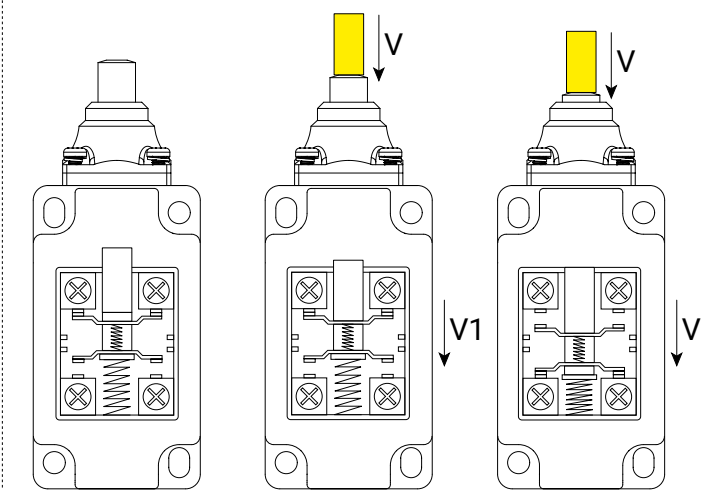
SNAP ACTION - Contact elements acting independently

Snap-action contact blocks are characterised by non-coincident switching and reset 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.

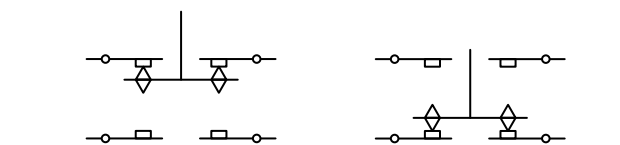
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



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

Za contact type

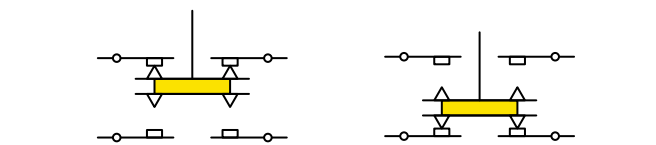
A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



L1: load 1
L2: load 2

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.



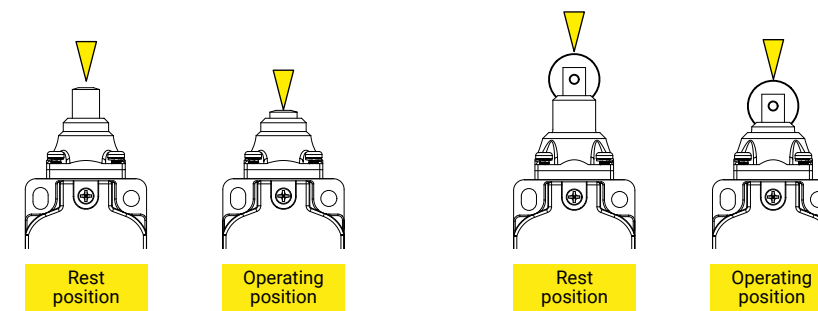
L1: load 1
L2: load 2

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

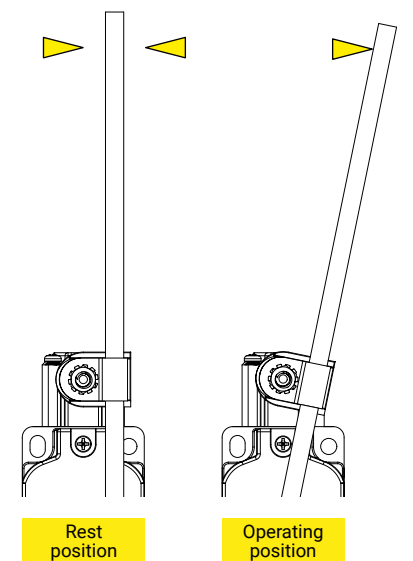
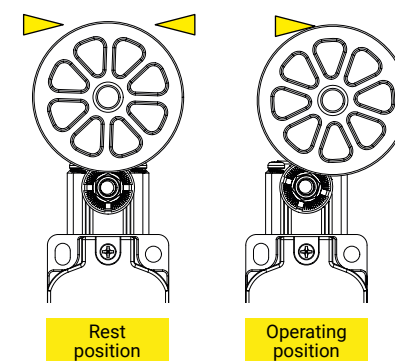
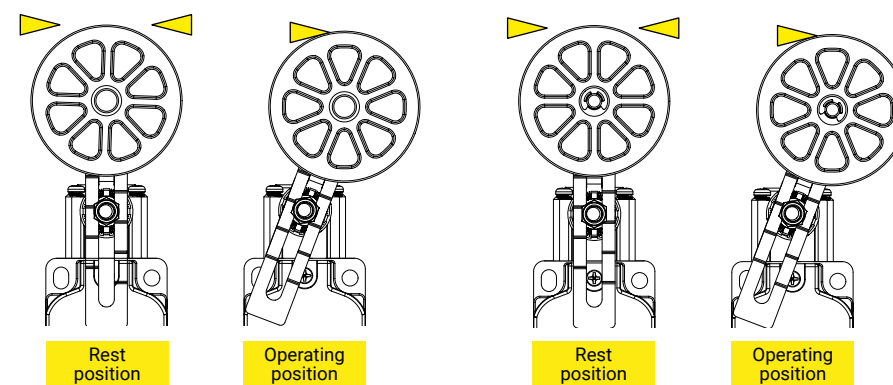
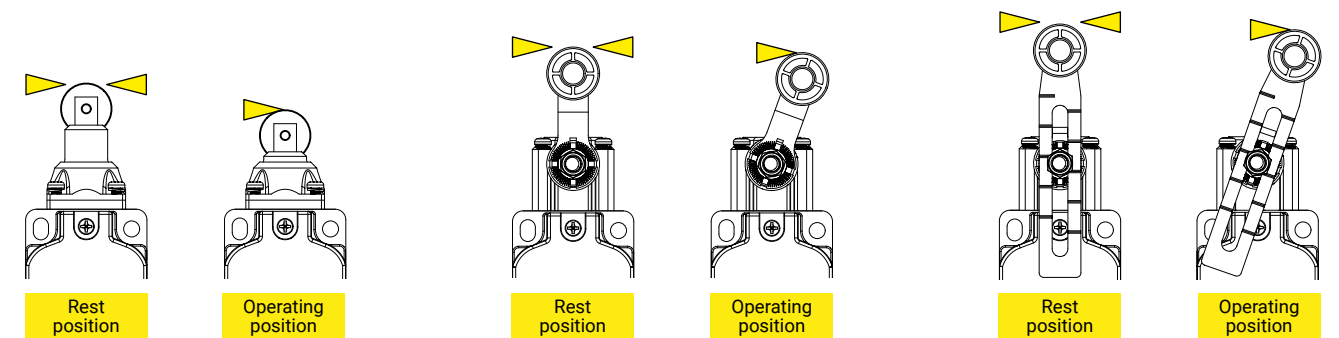
DETECTION MOVEMENTS

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

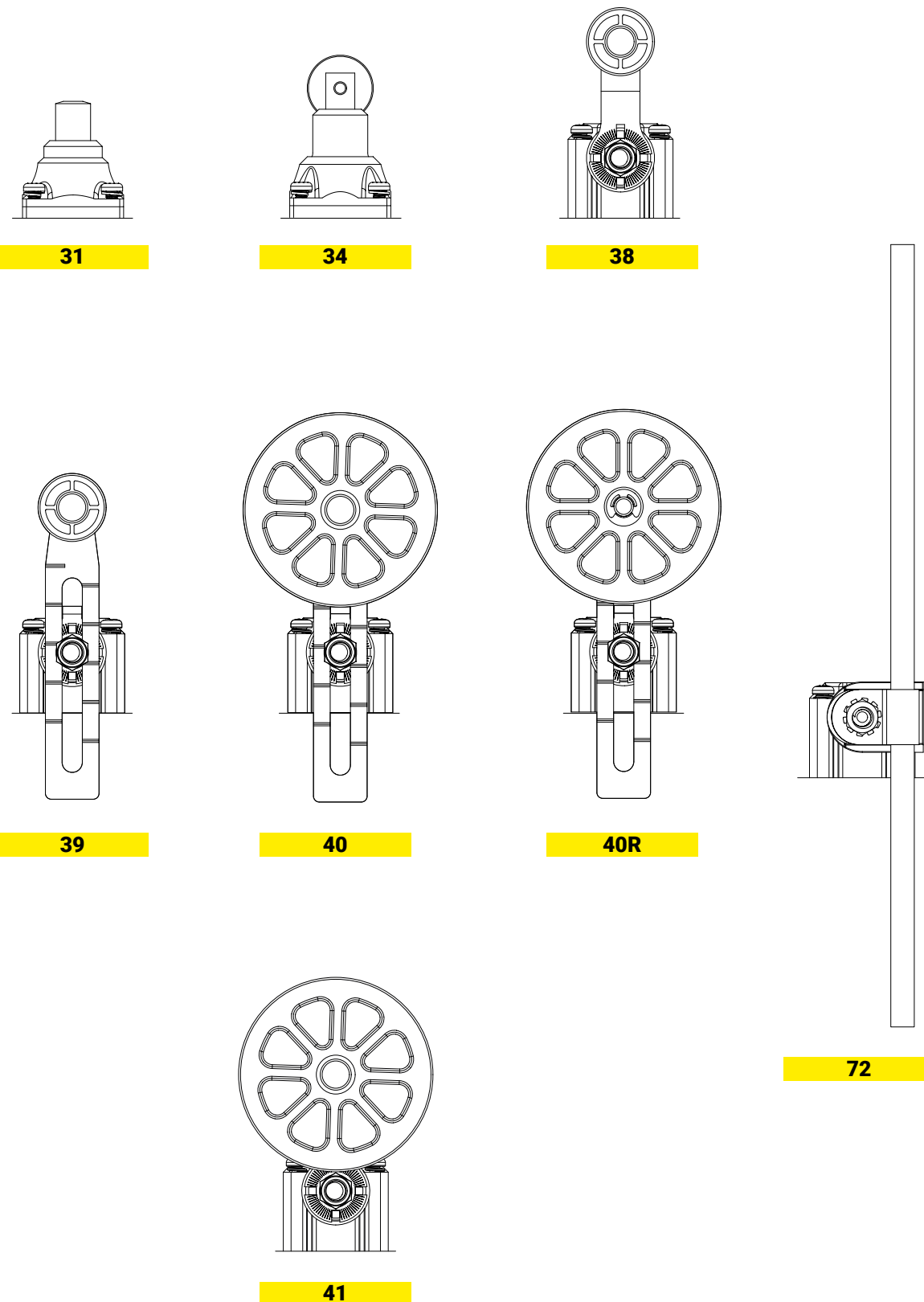


2. Rotary detection movement - Lever

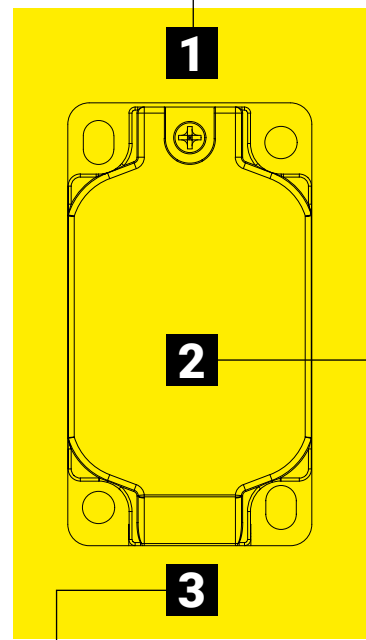
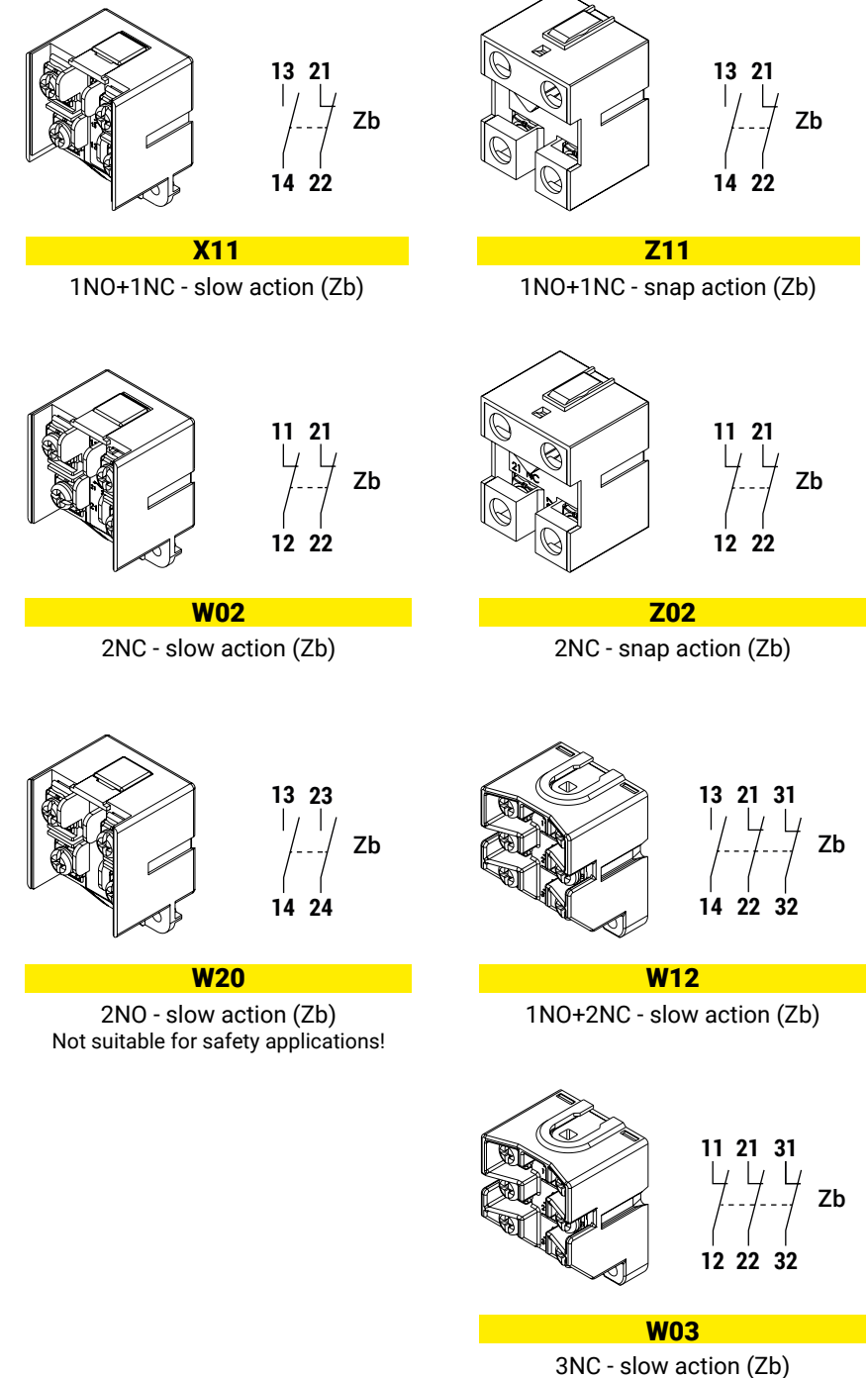


FTNG - PRODUCT SELECTION OVERVIEW

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

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



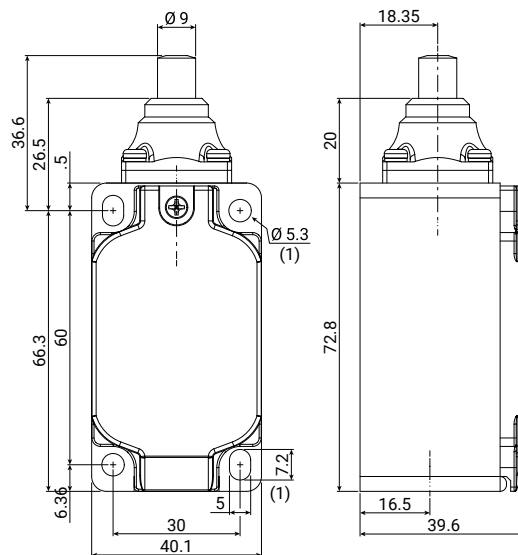
FTNG131

Limit switch with metal end plunger
IP67



FTNG series	1 function	31 actuator	XXX contact type	XX conduit entry
FTNG	40 mm thermoplastic limit switches for heavy applications	1 without reset function	31 metal end plunger	
			X11: 1NO+1NC W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	slow action (Zb)
			W12: 1NO+2NC W03: 3NC	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



(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	2.6 mm	3.8 mm	11.6 N	6.0 mm	28 N	7.0 mm
			2.6 mm	-	11.6 N	6.0 mm	28 N	
			2.6 mm	-	11.4 N	-	-	
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	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	
W12: 1NO+2NC W03: 3NC	A300-Q300		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	

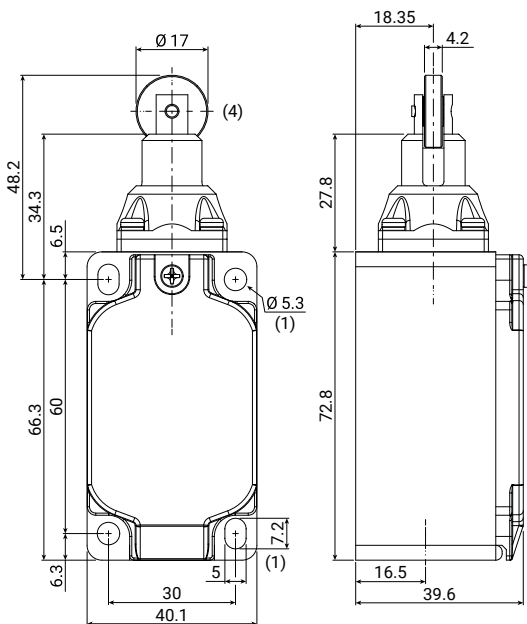
FTNG134

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 W20: 2NO Z11: 1NO+1NC snap action (Zb) Z02: 2NC W12: 1NO+2NC slow action (Zb) W03: 3NC	blank M20 × 1.5 (standard) N 1/2" NPT G3 PG13.5 C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(4) steel roller

contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			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	2.5 mm	1.2 mm	10.4 N	4.9 mm	22 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		2.8 mm	3.5 mm	9.4 N	5.0 mm	10 N	
			2.6 mm	-	11.6 N	6.0 mm	28 N	
			2.6 mm	-	11.4 N	-	-	
			2.5 mm	1.2 mm	8.6 N	4.9 mm	22 N	

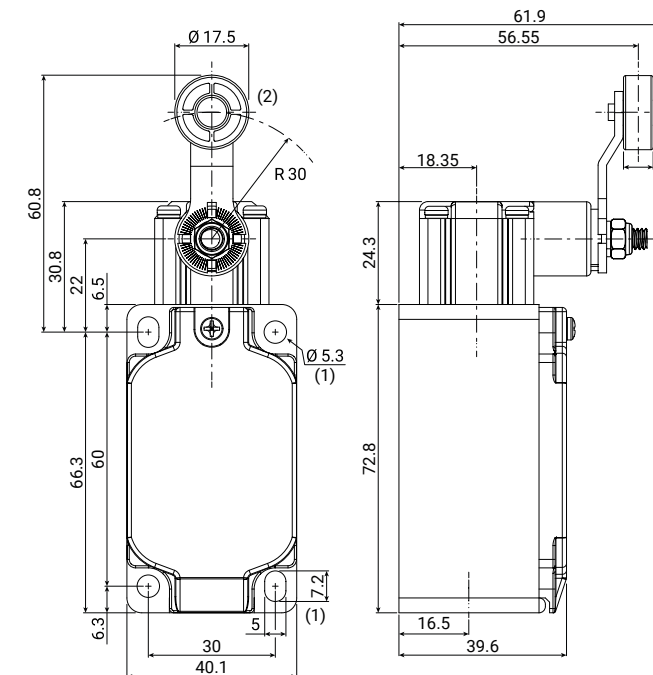
FTNG138

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 W20: 2NO Z11: 1NO+1NC snap action (Zb) Z02: 2NC W12: 1NO+2NC slow action (Zb) W03: 3NC	blank M20 × 1.5 (standard) N 1/2" NPT G3 PG13.5 C male connector "A" M12 × 1

technical drawing - sizes in mm



(1) mounting holes
(2) PA roller

contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			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	35°	15°	5.5 N	65°	13.2 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		35°	42°	6.5 N	50°	8 N	
			33°	-	6.5 N	45°	8.5 N	
			33°	-	6.5 N	-	-	
			35°	15°	5.5 N	65°	13.2 N	

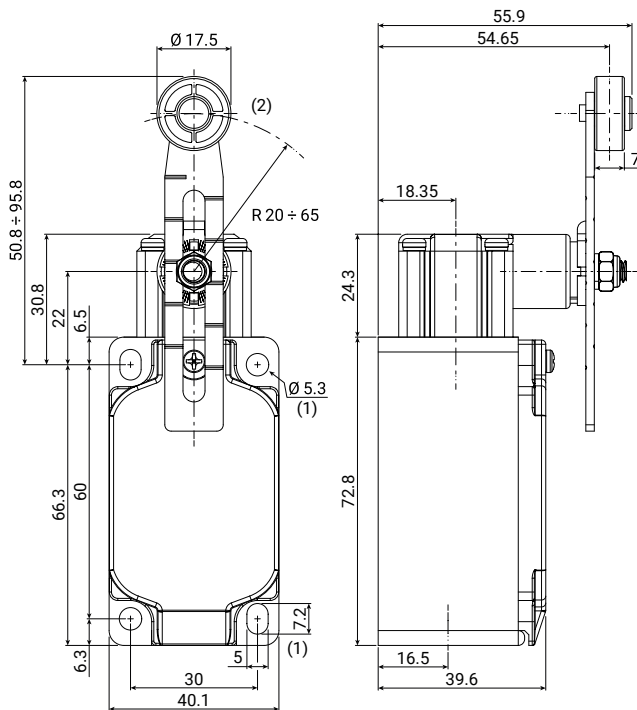
FTNG139

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	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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)	

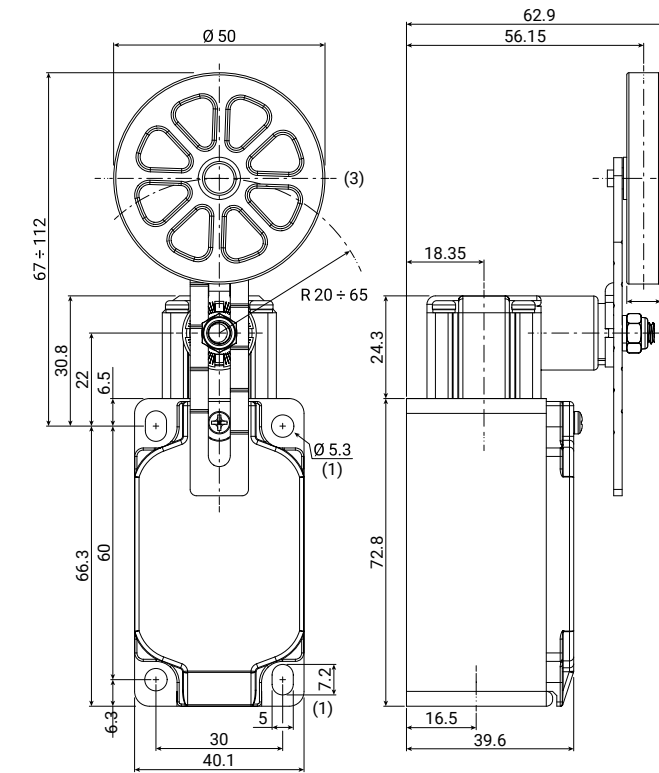
FTNG140

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	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(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	80°
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	80°
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	80°
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	80°
W03: 3NC			35°	-	6.5 N	50°	8 N	

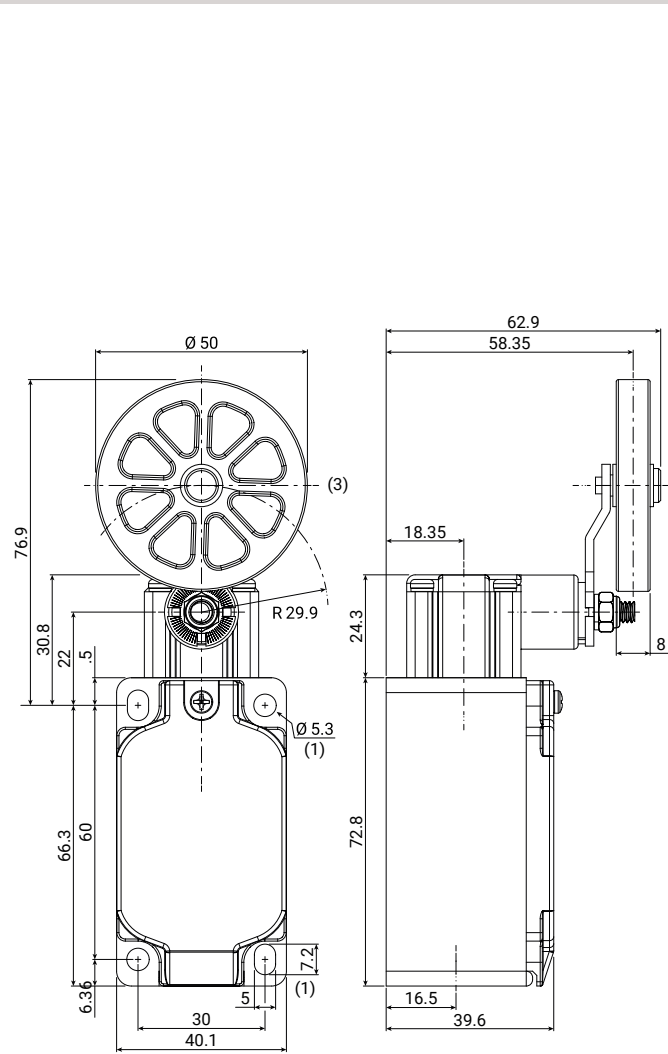
FTNG141

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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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
(3) rubber roller

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 W20: 2NO	slow action (Zb)	A600-Q600	AC15:	33°	45°	6.5 N	45°	8.5 N	80°
			400V - 4A	33°	-	6.5 N	45°	8.5 N	
			DC13:	35°	15°	5.5 N	65°	13.2 N	
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	24V - 6A	35°	15°	5.5 N	65°	13.2 N	80°
			35°	42°	6.5 N	50°	8 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		35°	-	6.5 N	50°	8 N	
				35°	-	6.5 N	50°	8 N	

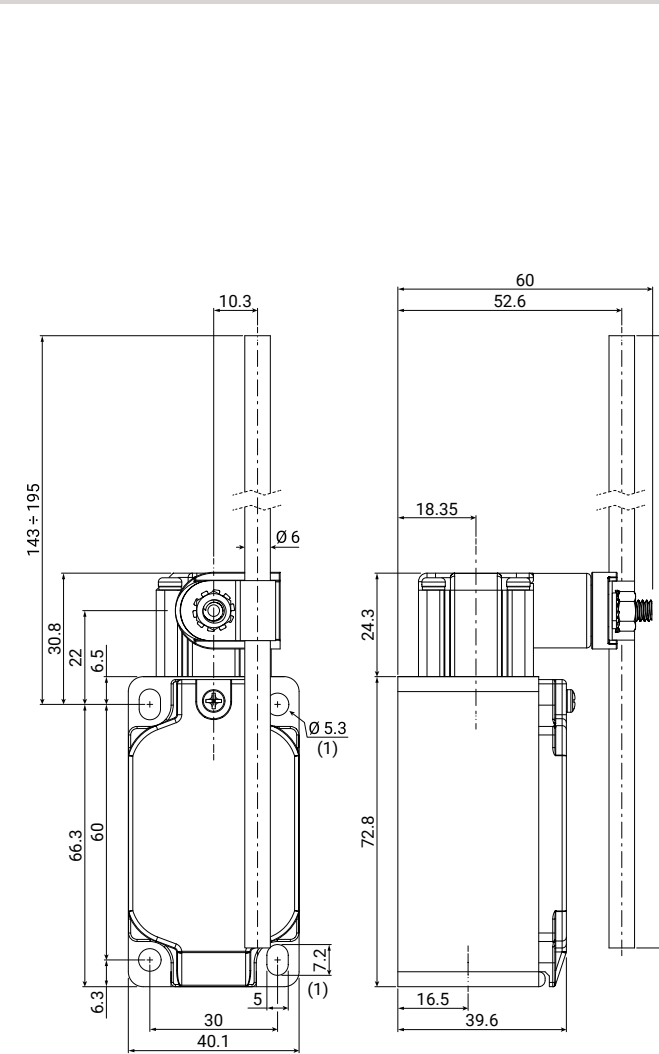
FTNG172

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 Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	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

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 W20: 2NO	slow action (Zb)	A600-Q600	AC15:	33°	45°	6.5 N	45°	8.5 N	80°
			400V - 4A	33°	-	6.5 N	45°	8.5 N	
			DC13:	35°	15°	5.5 N	65°	13.2 N	
Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	B600-Q600	24V - 6A	35°	15°	5.5 N	65°	13.2 N	80°
			35°	42°	6.5 N	50°	8 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300		35°	-	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**.

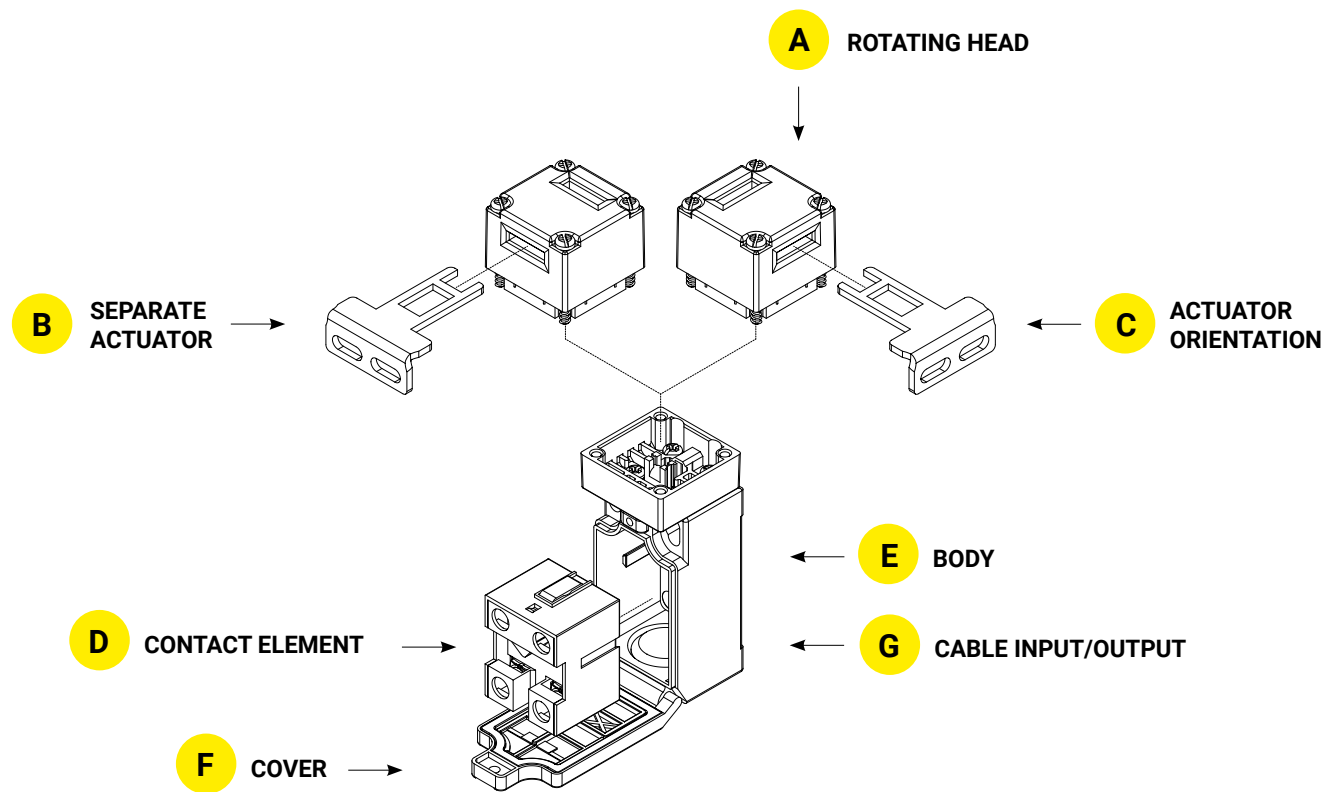
All models in the series are **IP65-rated**.



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	I _{th}	10 A
Rated insulation voltage	U _i	500 V AC
Rated impulse withstand voltage	U _{imp}	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



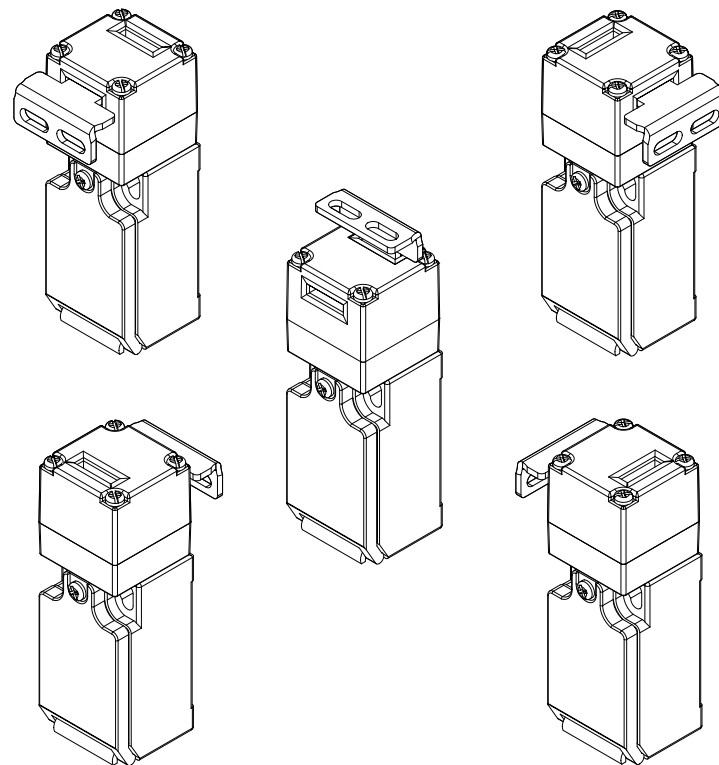
A - ROTATING HEAD

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.

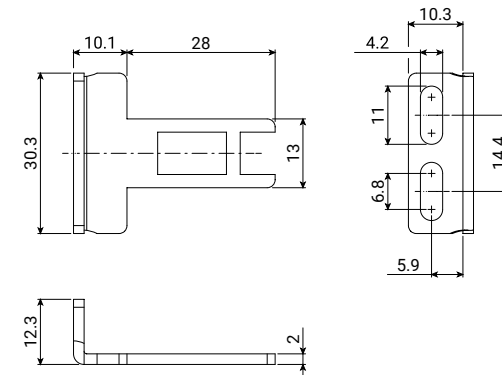
The direction of the switch head can be varied in one of four directions by loosening the screws at the four corners of the head.

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

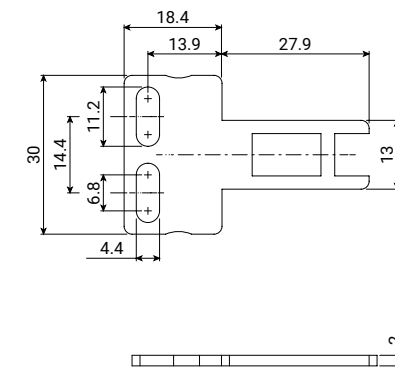


B - SEPARATE ACTUATOR

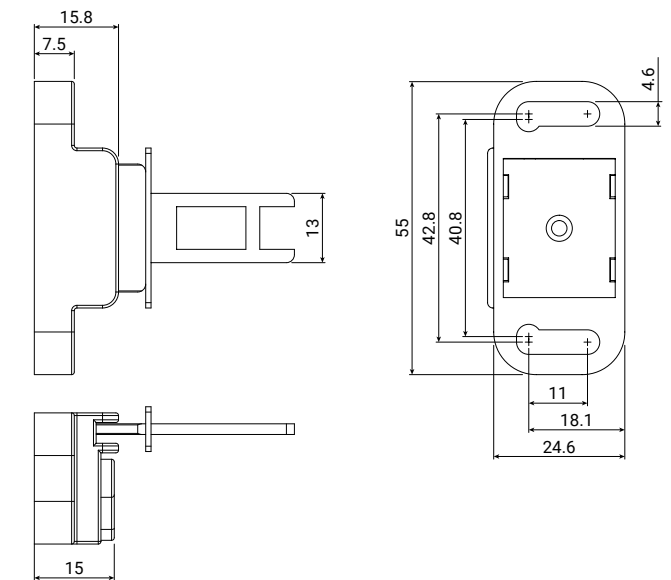
01 Angled actuator



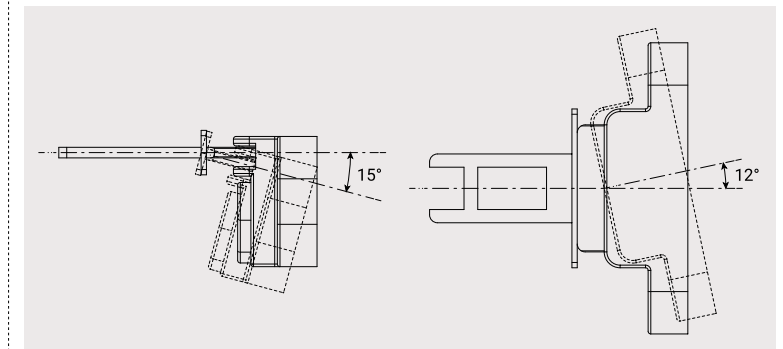
02 Straight actuator



03 Jointed actuator



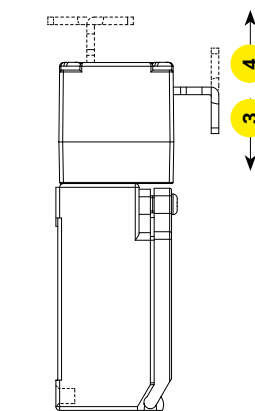
The actuator can flex in four directions for applications where the protection alignment is not precise.



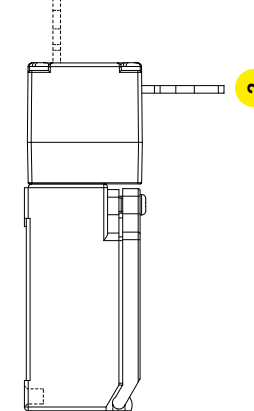
C - ACTUATOR ORIENTATION

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

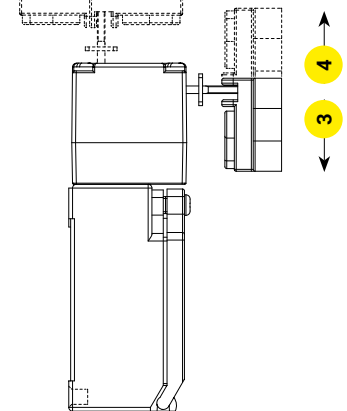
The keys can be inserted in both housings by choosing the orientation that suits the application.



Angled actuator



Straight actuator

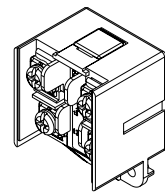


Jointed actuator

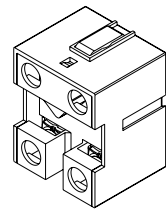
D - CONTACT ELEMENT

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

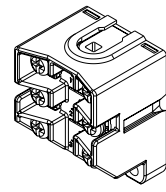
Different contact elements are available, both fast-acting and slow-acting, depending on the different application requirements.



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)

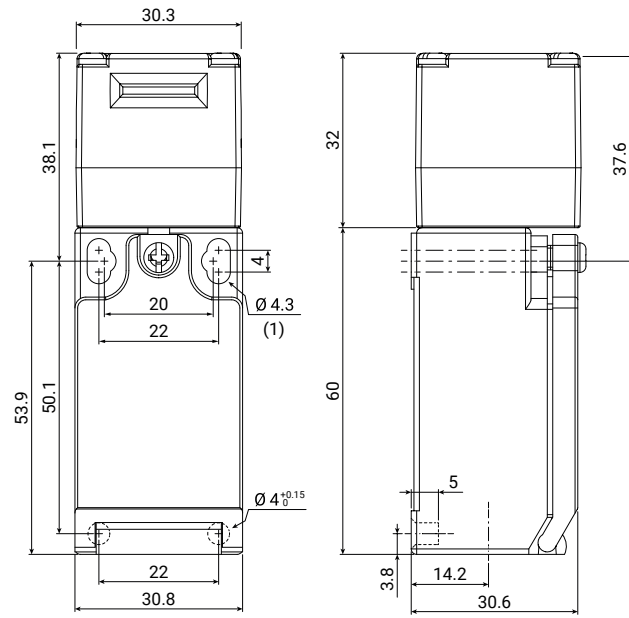
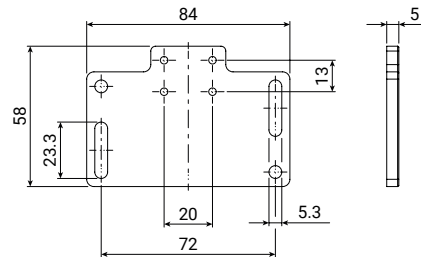
W03: 3NC
Slow action (Zb)

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.



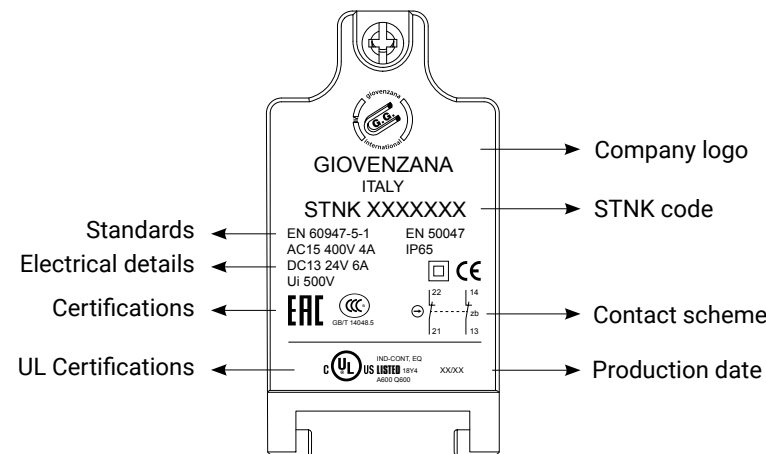
F - COVER

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

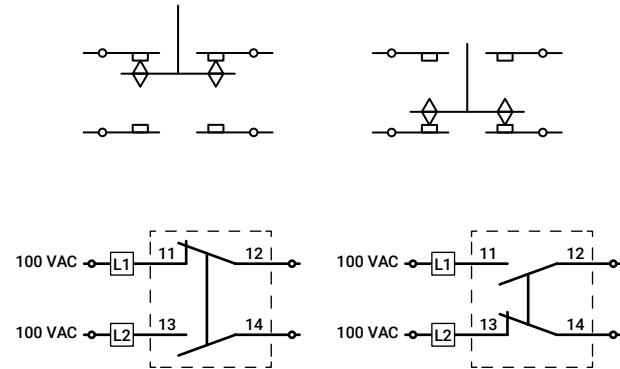
CONTACT ELEMENT - SPECIFICATIONS

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

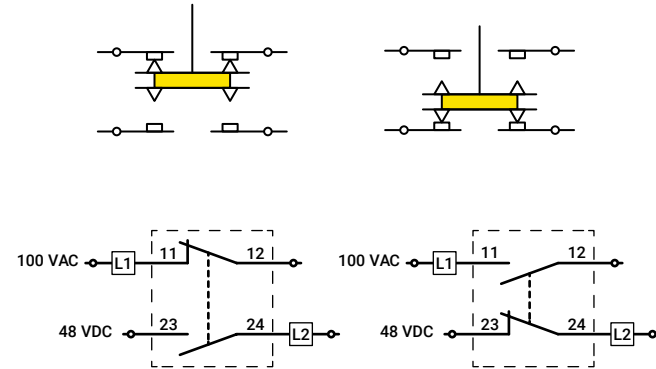
A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



L1: load 1
L2: load 2

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.



L1: load 1
L2: load 2

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

SAFETY INTEGRITY LEVEL ACCORDING TO IEC 61508

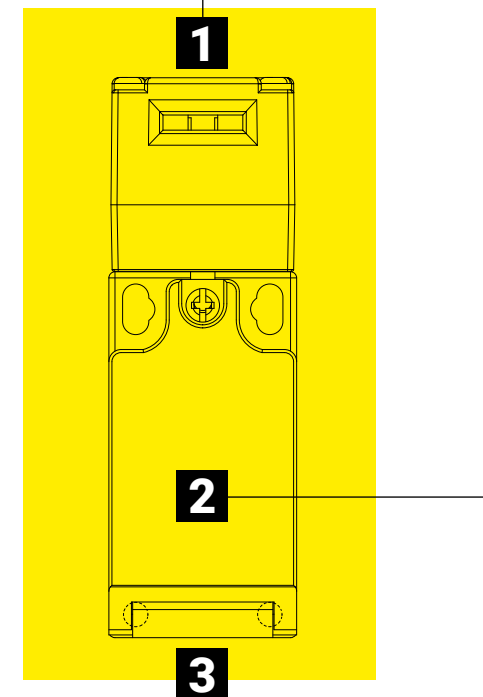
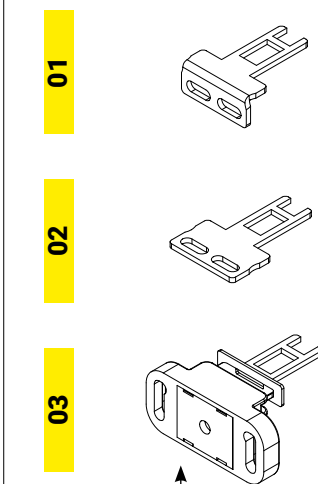
Safety Integrity Level (SIL) is the quantification of the reliability (or degree of reliability) achieved by any object that performs a safety-related function. The greater its reliability, the greater its ability to perform safety-critical functions or machine or plant availability. The determination 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.



STNK - PRODUCT SELECTION OVERVIEW

1 SEPARATE ACTUATORS



3 CONDUIT ENTRY

Threaded conduit entry

Standard:
M16 x 1.5

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

2 CONTACT BLOCKS

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

CONTACT TYPES		CATEGORIES RATINGS	
X11	1NO+1NC	slow action (Zb)	A600
W02	2NC		Q600
Z11	1NO+1NC	snap action (Zb)	B600
Z02	2NC		Q600
W12	1NO+2NC	slow action (Zb)	A300
W03	3NC		Q300

AC15:
400 V - 4 A

DC13:
24V - 6 A

STNK - CODE SELECTION OVERVIEW

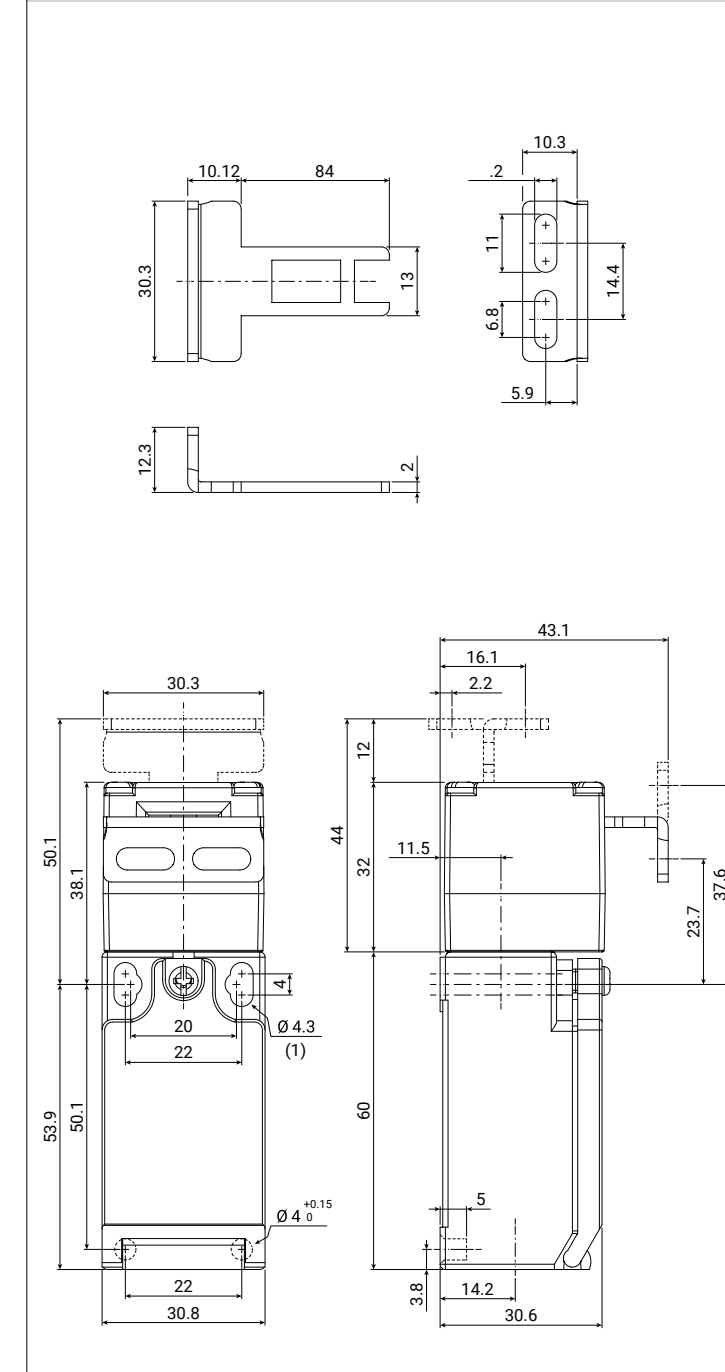
S T N K	0 1	X 1 1	
SERIES	SEPARATE ACTUATOR	CONTACT TYPE	CONDUIT ENTRY
STNK thermoplastic safety switches with separate actuator	01 angled actuator 02 straight actuator 03 jointed actuator	X11 1NO+1NC slow action Zb W02 2NC slow action Zb Z11 1NO+1NC snap action Zb Z02 2NC snap action Zb W12 1NO+2NC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

STNK01

Thermoplastic safety switch with angled actuator
IP65



technical drawing - sizes in mm



(1) mounting holes

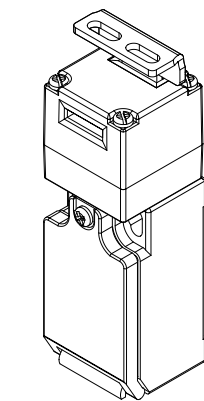
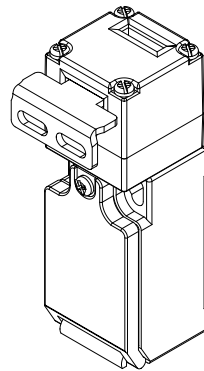
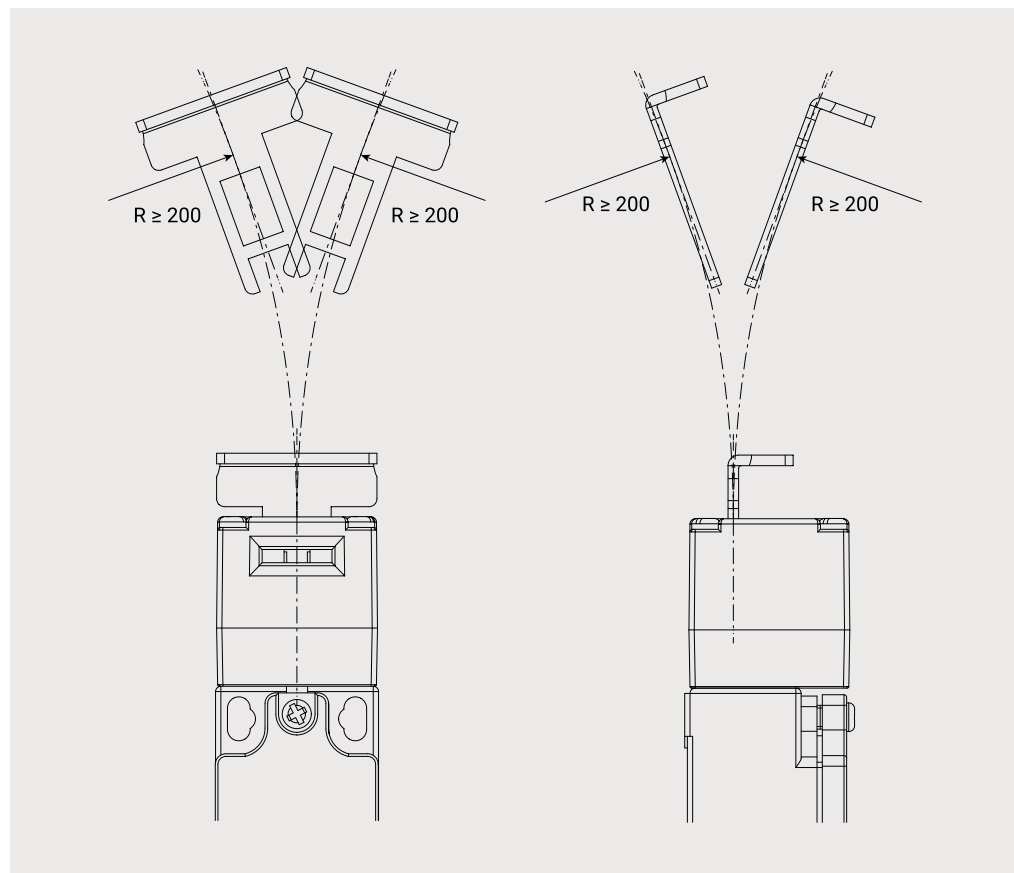
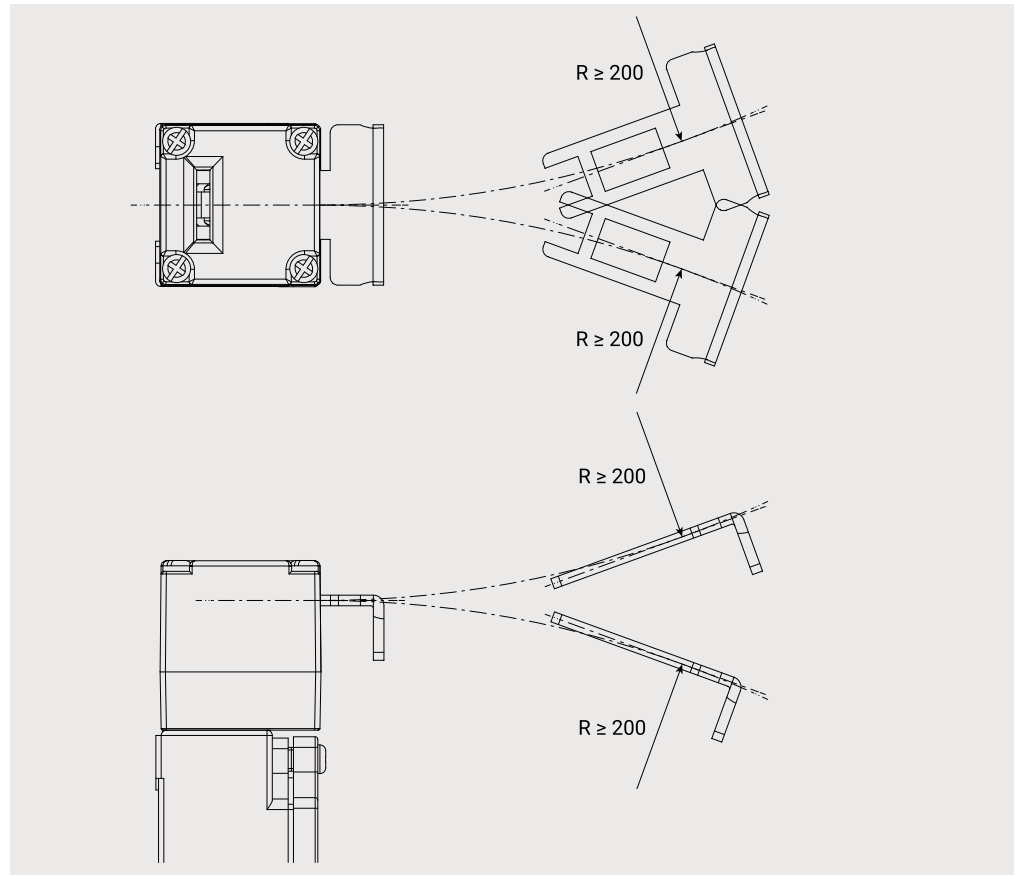
STNK series	01 actuator	XXX contact type	XX conduit entry
STNK thermoplastic safety switch	with angled actuator	X11: 1NO+1NC slow action (Zb) W02: 2NC Z11: 1NO+1NC snap action (Zb) Z02: 2NC W12: 1NO+2NC slow action (Zb) W03: 3NC	blank M16 x 1.5 (standard) M M20 x 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 x 1

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 slow action (Zb)	A600-Q600	AC15: 400V - 4A	7.4 mm	8.4 mm	25 N	8.1 mm	60 N	∞
W02: 2NC			7.4 mm	-	25 N	8.1 mm	60 N	
Z11: 1NO+1NC snap action (Zb)	B600-Q600	DC13: 24V - 6A	6.5 mm	4.8 mm	14 N	8.0 mm	26 N	
Z02: 2NC			6.5 mm	4.5 mm	14 N	8.0 mm	26 N	
W12: 1NO+2NC slow action (Zb)	A300-Q300		7.2 mm	8.0 mm	25 N	8.2 mm	60 N	
W03: 3NC			7.2 mm	-	25 N	8.2 mm	60 N	

STNK01

Thermoplastic safety switch with angled actuator
IP65

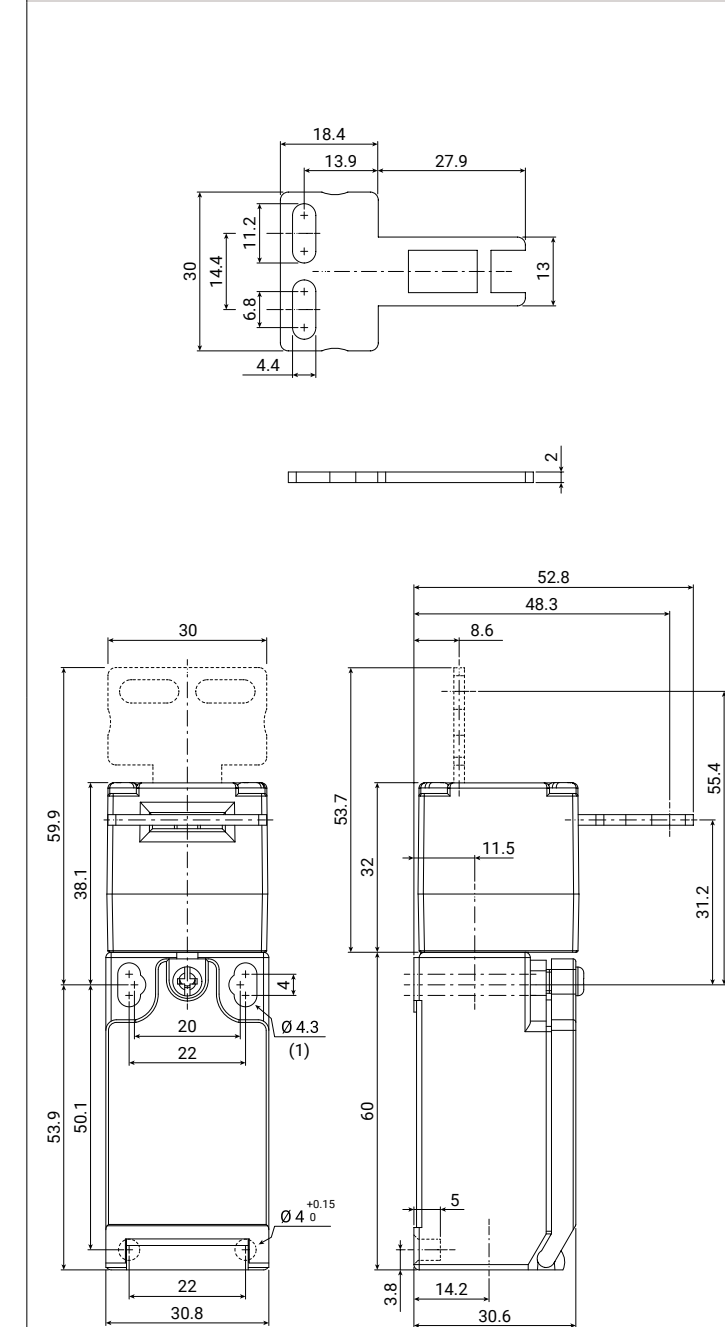


STNK02

Thermoplastic safety switch with straight actuator
IP65



technical drawing - sizes in mm



(1) mounting holes

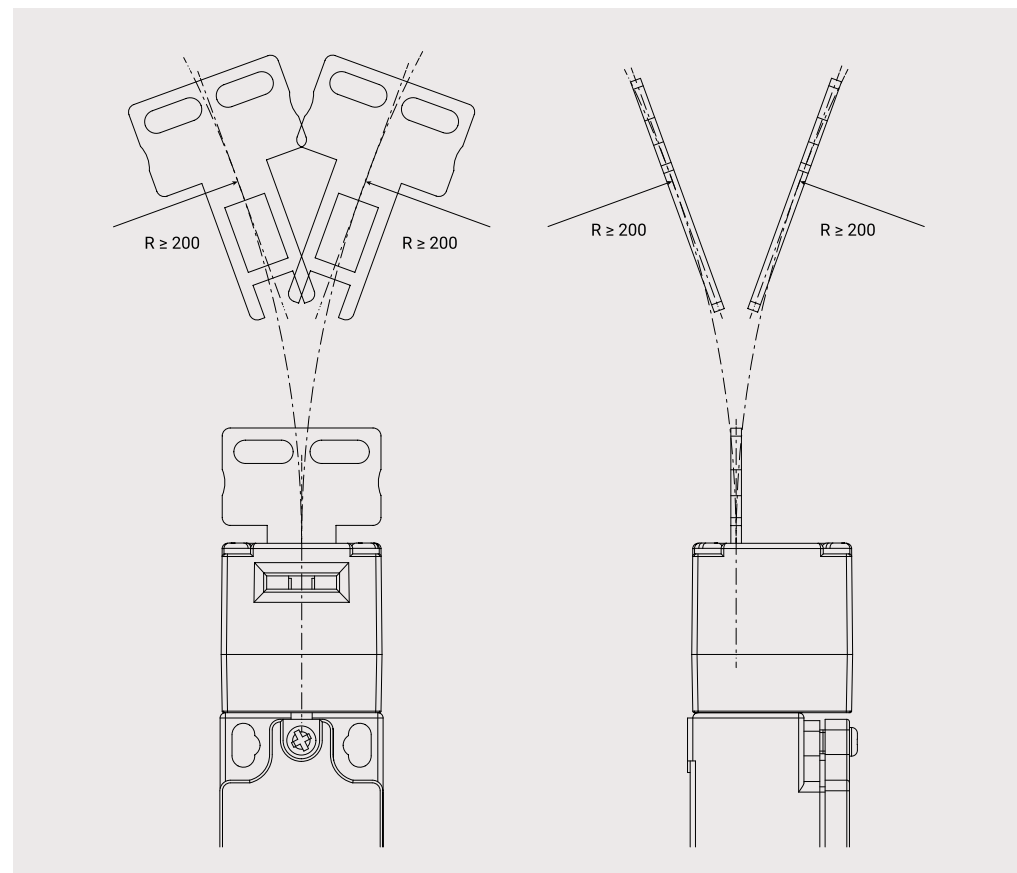
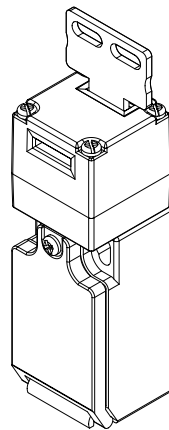
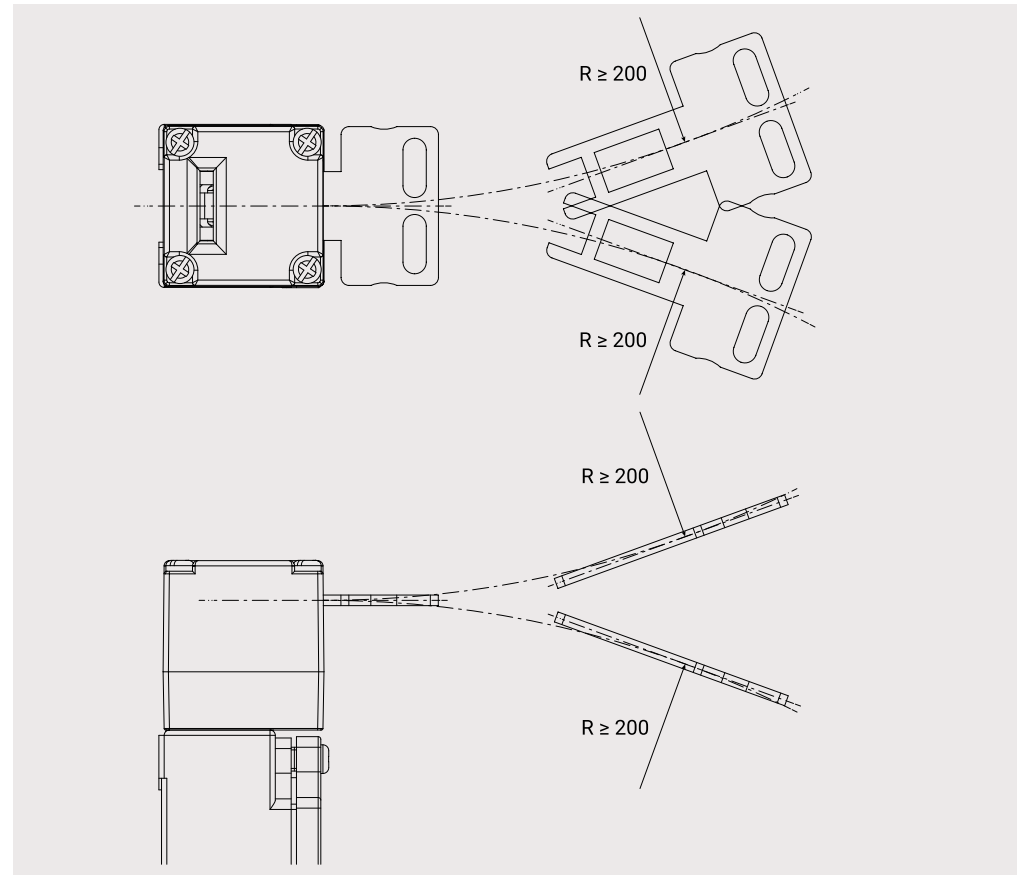
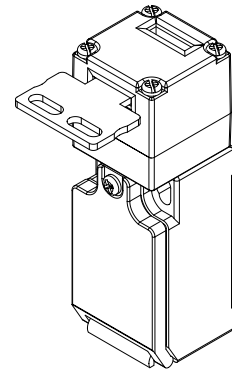
STNK series	02 actuator	XXX contact type	XX conduit entry
STNK thermoplastic safety switch	with straight actuator	X11: 1NO+1NC W02: 2NC Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	blank M N G1 G3 C M16 × 1.5 (standard) M20 × 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 × 1

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

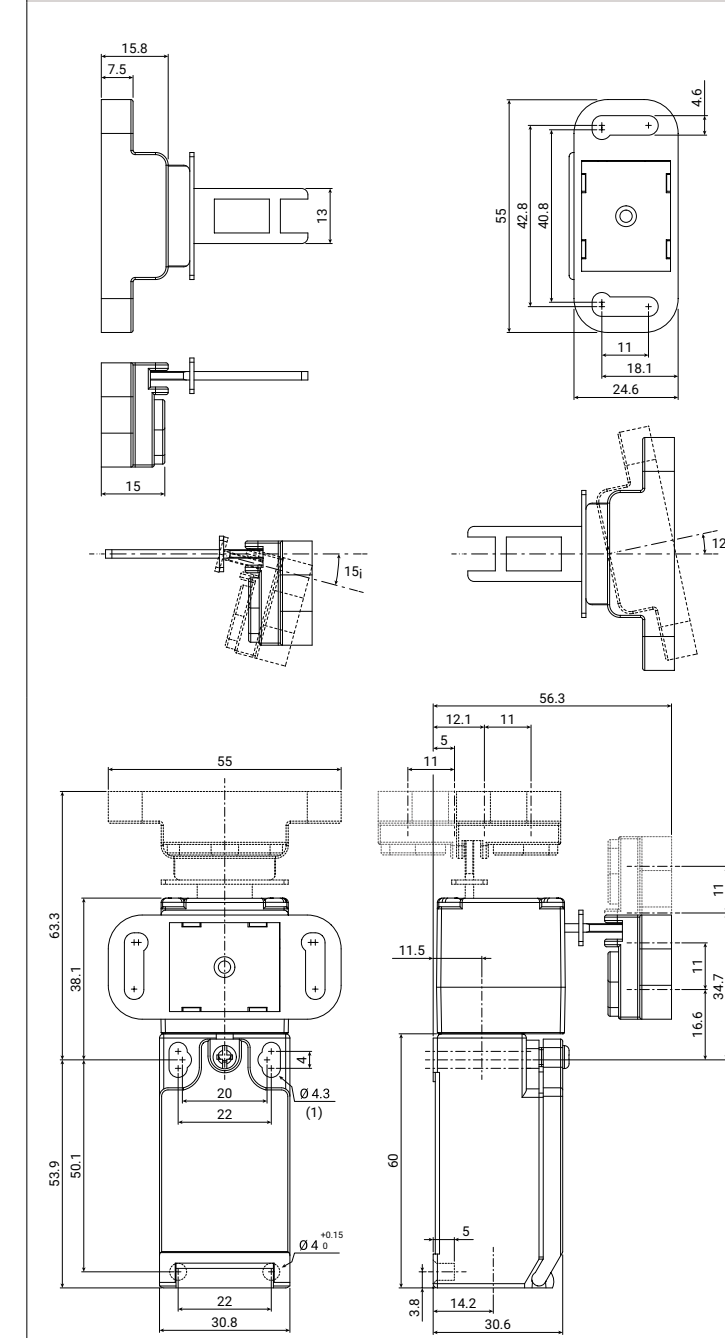


STNK03

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 x 1.5 (standard) M20 x 1.5 1/2" NPT PG11 PG13.5 male connector "A" M12 x 1

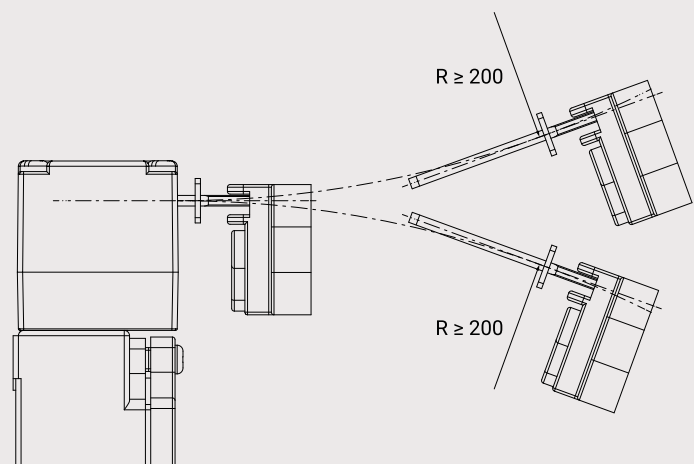
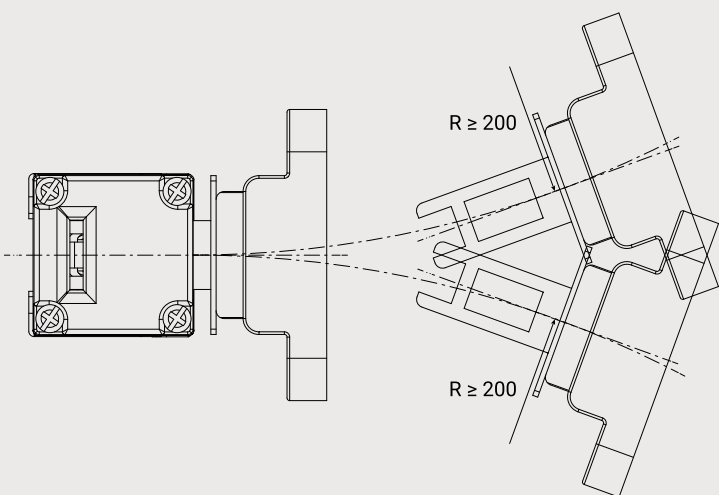
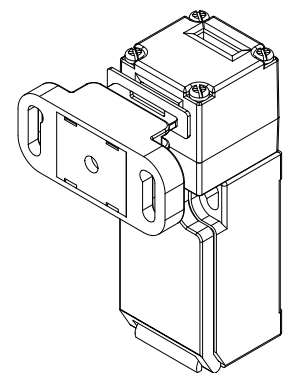
contact type	operation diagrams
X11 1NO+1NC slow action (Zb)	
W02 2NC slow action (Zb)	
Z11 1NO+1NC snap action (Zb)	
Z02 2NC snap action (Zb)	
W12 1NO+2NC slow action (Zb)	
W03 3NC slow action (Zb)	

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



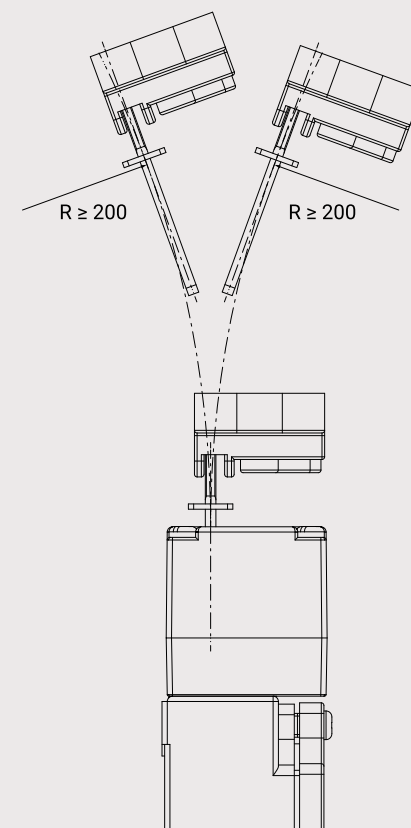
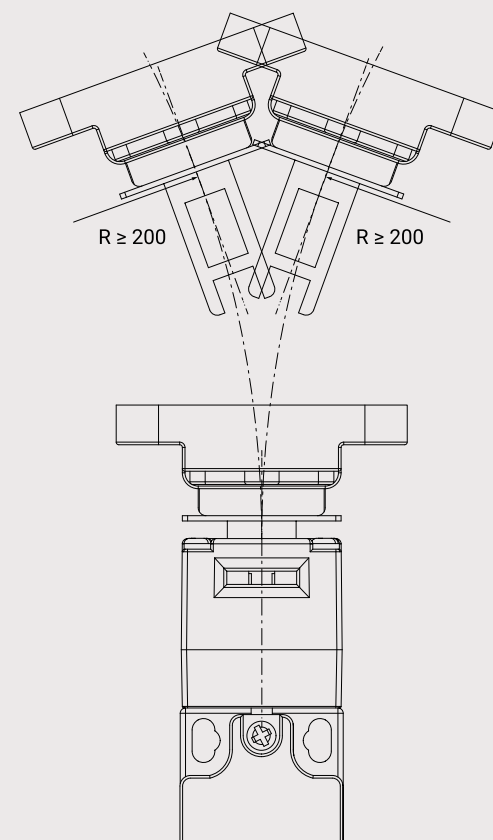
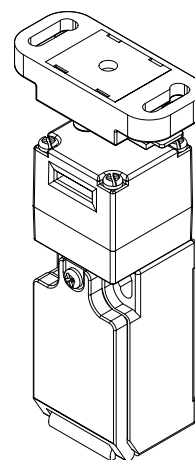
STNK03

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.

Giovanzana 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 Only for M12-connected available also cRUus
Positive opening operation		NC contacts conforming to IEC /EN 60947-5-1 ⊖
Rated thermal current	Ith	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

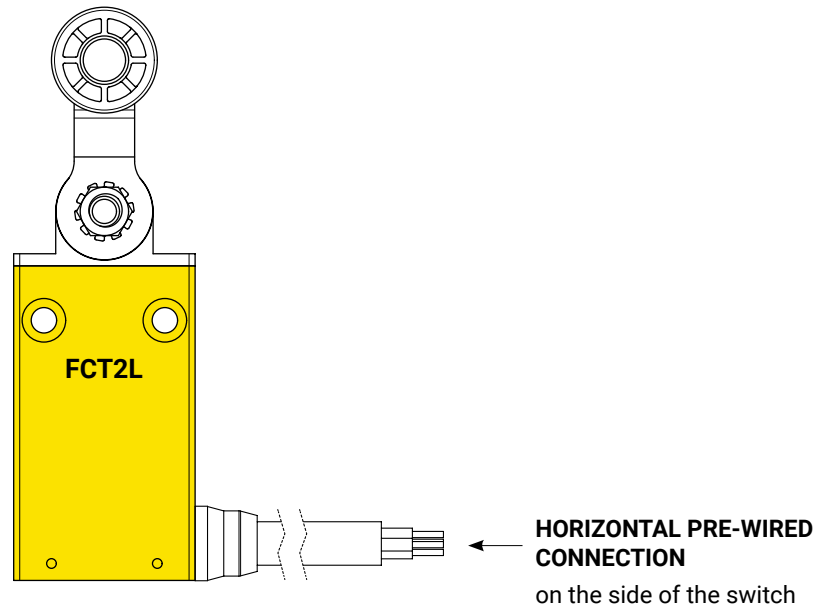
STRUCTURE DESCRIPTION

PRE-WIRED CONNECTION

L HORIZONTAL PRE-WIRED CONNECTION

ACTUATORS →
Available:
plunger, lever, roller, rod, spring

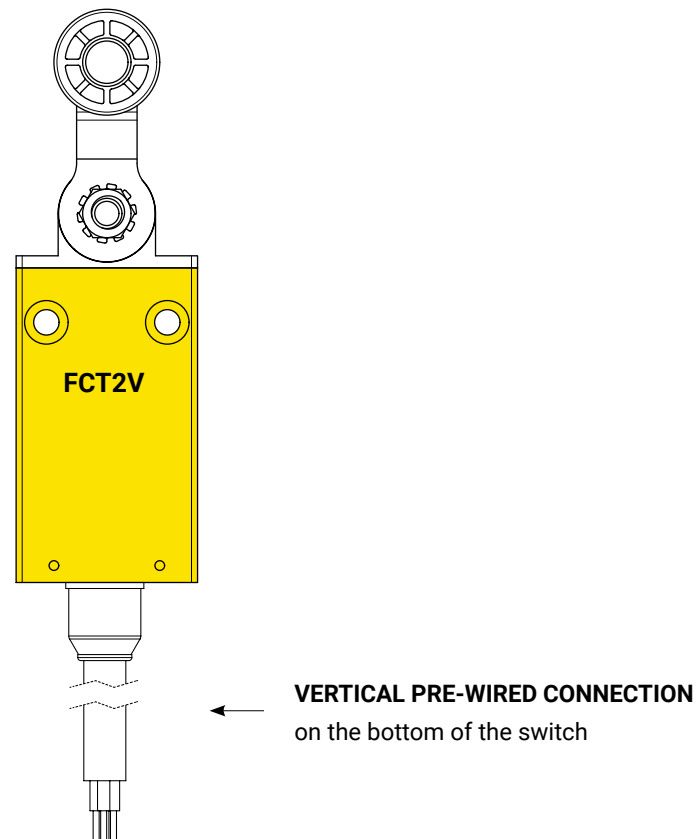
INTERNAL CONTACT ELEMENTS →
X11: 1NO+1NC - slow action (Za)
Z11: 1NO+1NC - snap action (Zb)



V VERTICAL PRE-WIRED CONNECTION

ACTUATORS →
Available:
plunger, lever, roller, rod, spring

INTERNAL CONTACT ELEMENTS →
X11: 1NO+1NC - slow action (Za)
Z11: 1NO+1NC - snap action (Zb)



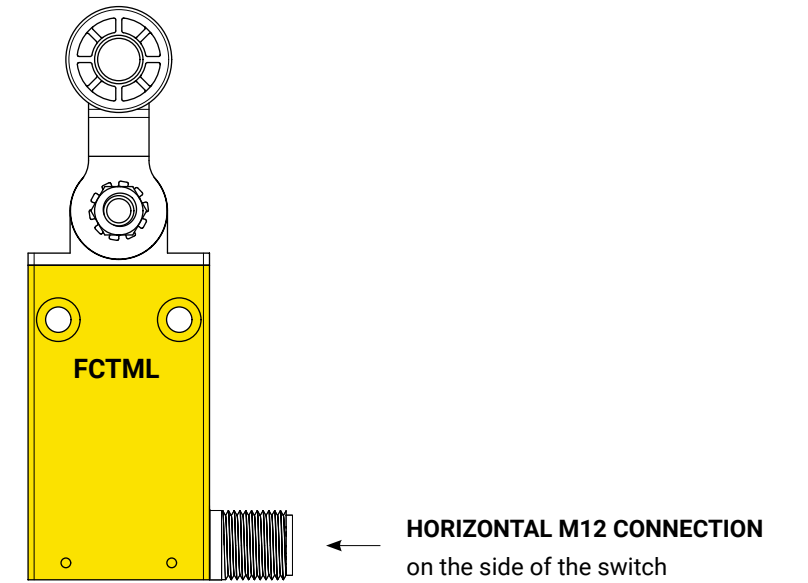
STRUCTURE DESCRIPTION

M12 CONNECTION

L HORIZONTAL M12 CONNECTION

ACTUATORS →
Available:
plunger, lever, roller, rod, spring

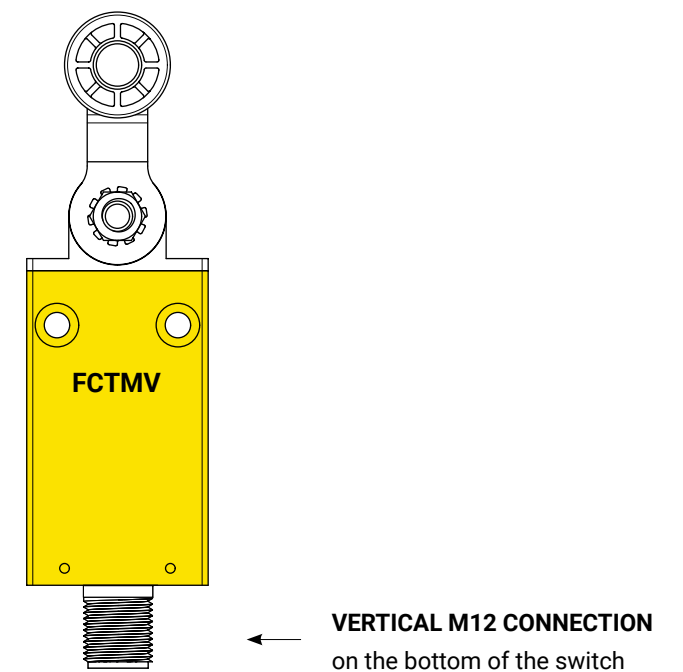
INTERNAL CONTACT ELEMENTS →
X11: 1NO+1NC - slow action (Za)
Z11: 1NO+1NC - snap action (Zb)



V VERTICAL M12 CONNECTION

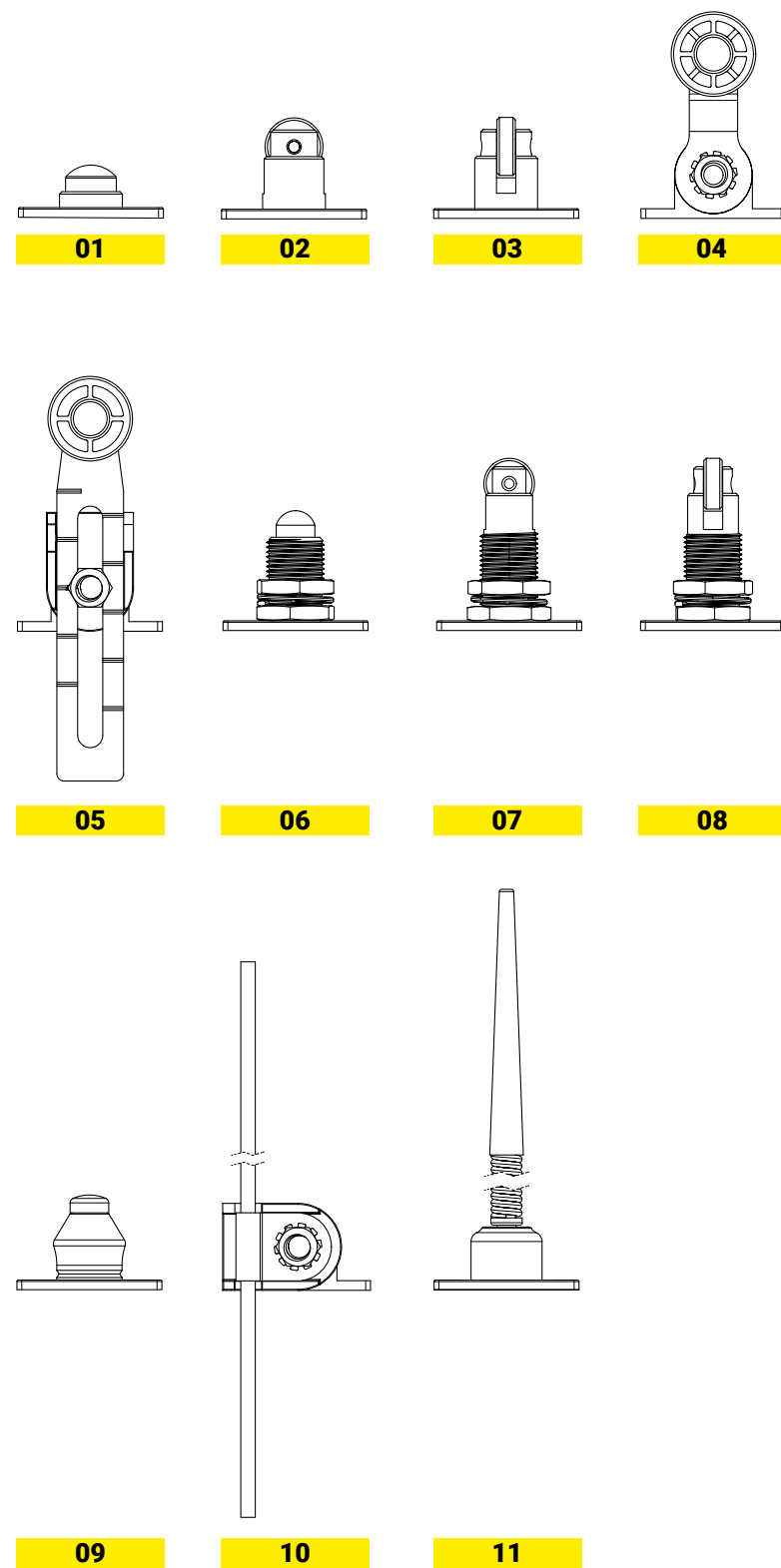
ACTUATORS →
Available:
plunger, lever, roller, rod, spring

INTERNAL CONTACT ELEMENTS →
X11: 1NO+1NC - slow action (Za)
Z11: 1NO+1NC - snap action (Zb)

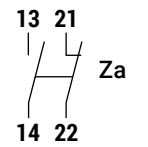
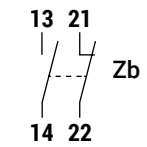


FCT - PRODUCT SELECTION OVERVIEW

1 ACTUATORS



2 CONTACT BLOCKS



X11

1NO+1NC - slow action (Zb)

Z11

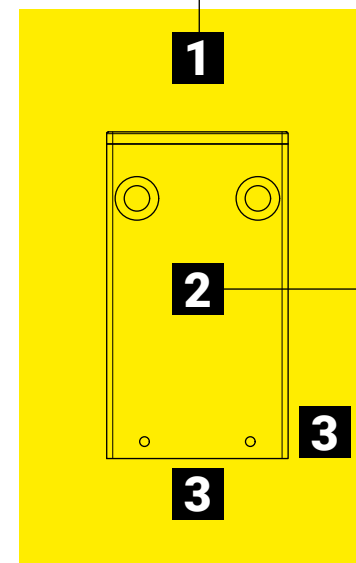
1NO+1NC - snap action (Za)

CONTACT TYPES

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

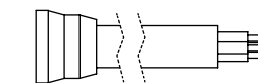
CATEGORIES

A300 Q300	AC15:	120 V - 3 A
		240 V - 1.5 A
	DC13:	125 V - 0.55 A
		240 V - 0.27 A



3 CONNECTION TYPE

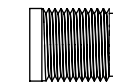
PRE-WIRED



Pre-wired connection
(standard with 2 m cable)

Custom pre-wired connection
(with custom cable length)

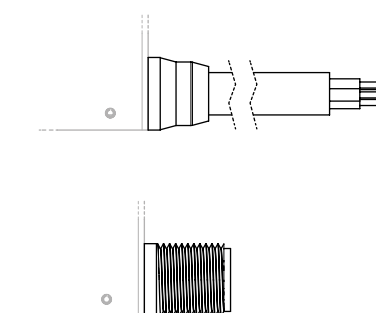
M12-CONNECTED



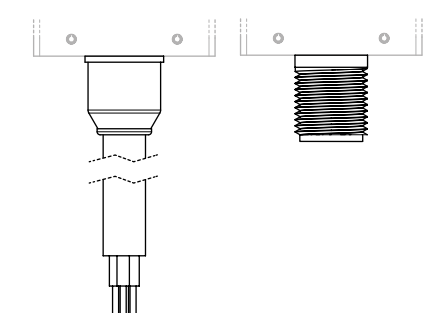
M12 connection

3 CONNECTION ORIENTATION

L = horizontal
(side connection)



V = vertical
(bottom connection)

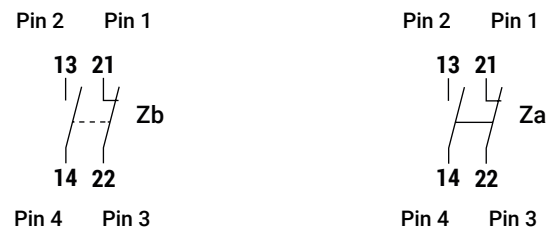


FCT - CODE SELECTION OVERVIEW

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 length (length = 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

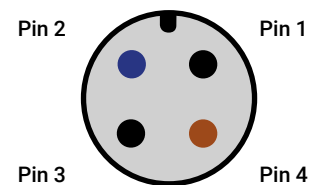


X11
1NO+1NC - slow action (Zb)

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

WIRING

CONNECTOR PIN ASSIGNMENT



PIN	CABLE COLOUR
1	BLACK
2	BLUE
3	BLACK
4	BROWN

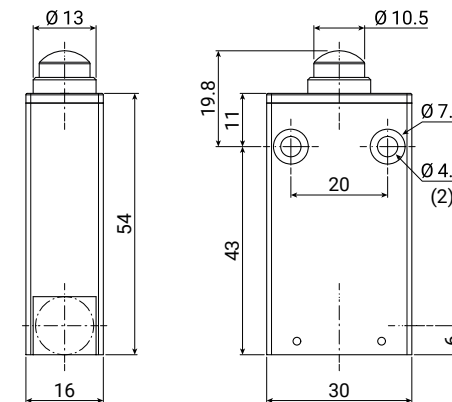
FCT01

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 length	V vertical output		Z11: 1NO+1NC snap action (Za)	
	M M12-connected				

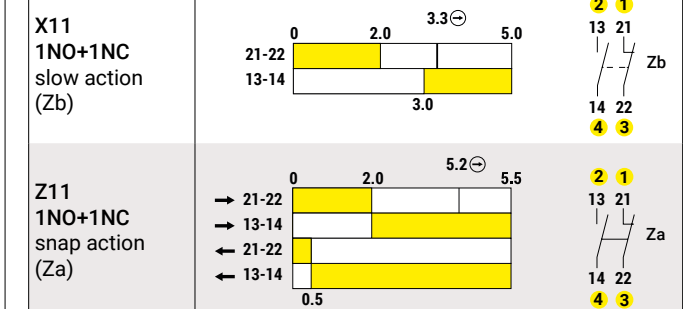
technical drawing - sizes in mm



(2) mounting holes

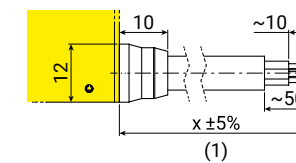
contact type

operation diagrams

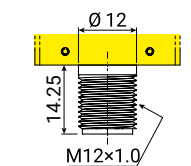
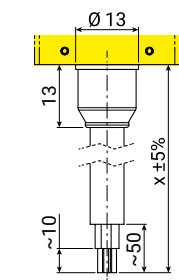
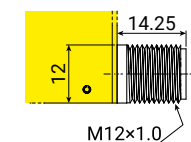


technical drawing connection output - sizes in mm

PRE-WIRED



M12-CONNECTED



(1) x = cable length in meters

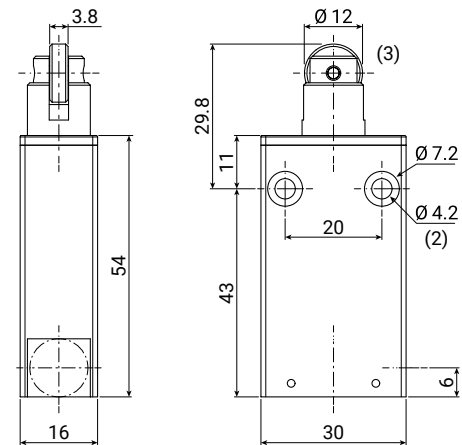
contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			PT1	PT2 (slow action)		POT (travel)	POF (force)	
X11: 1NO+1NC slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC snap action (Za)		DC13: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

FCT02

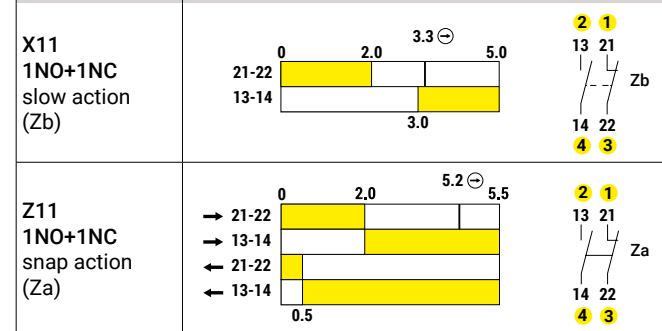
 Thermoplastic pre-wired or M12-connected limit switch with steel roller plunger
IP67


FCT series	X connection type	X connection orientation	02 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	L horizontal output V vertical output	02 steel roller plunger 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

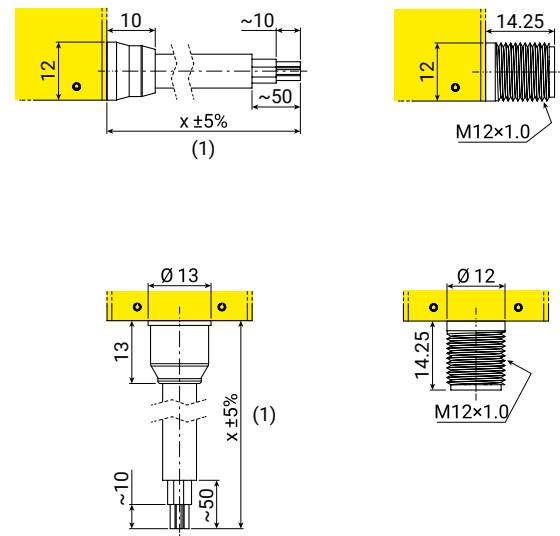

 (2) mounting holes
(3) steel roller

contact type operation diagrams



technical drawing connection output - sizes in mm

PRE-WIRED M12-CONNECTED



(1) x = cable length in meters

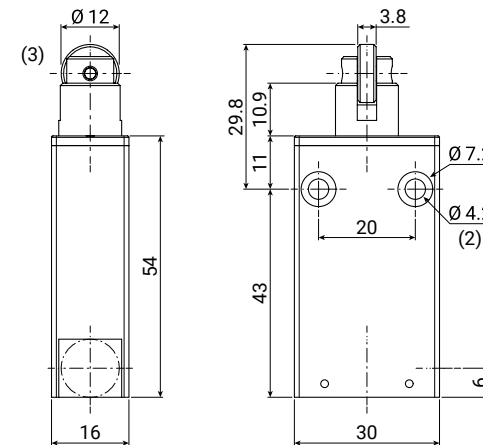
contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			PT1	PT2 (slow action)		POT (travel)	POF (force)	
X11: 1NO+1NC slow action (Zb)	A300 Q300	AC15: 120 V - 3 A 240 V - 1.5 A	2.0 mm	3.0 mm	12 N	3.3 mm	20 N	5.0 mm
Z11: 1NO+1NC snap action (Za)		DC13: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

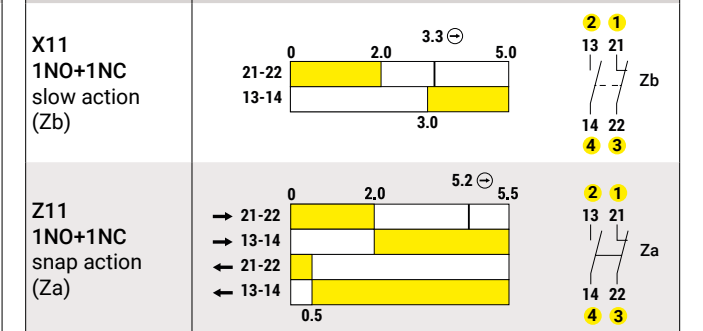
 Thermoplastic pre-wired or M12-connected limit switch with 90° steel roller plunger
IP67


FCT series	X connection type	X connection orientation	03 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	L horizontal output V vertical output	03 90° steel roller plunger 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

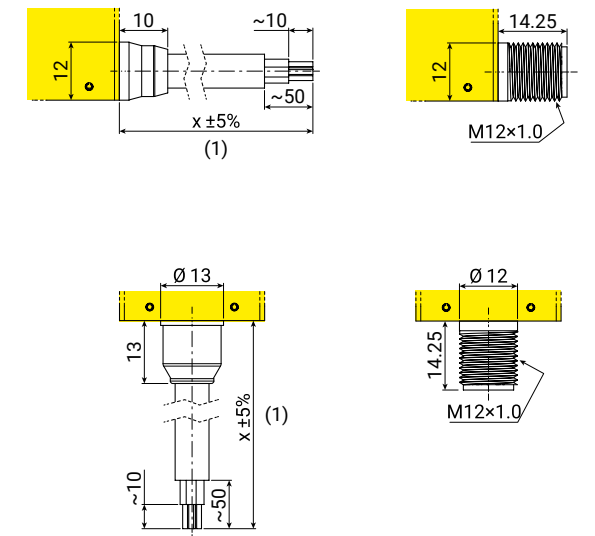

 (2) mounting holes
(3) steel roller

contact type operation diagrams



technical drawing connection output - sizes in mm

PRE-WIRED M12-CONNECTED



(1) x = cable length 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

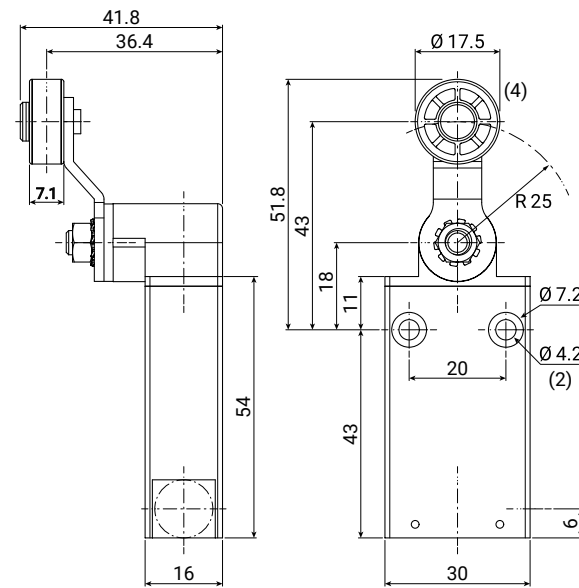
FCT04

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

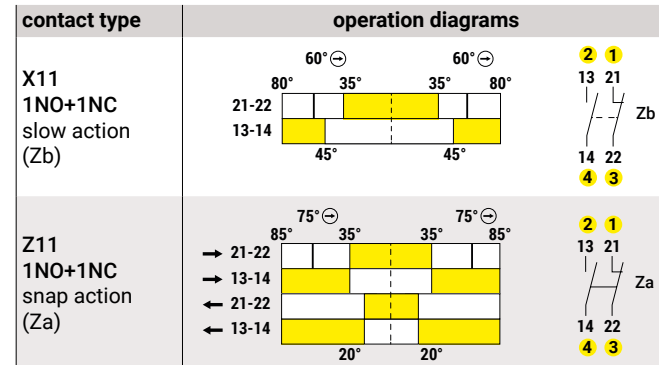


FCT series	X connection type	X connection orientation	04 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	L horizontal output V vertical output	04 metal revolving lever with Ø17.5 nylon roller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

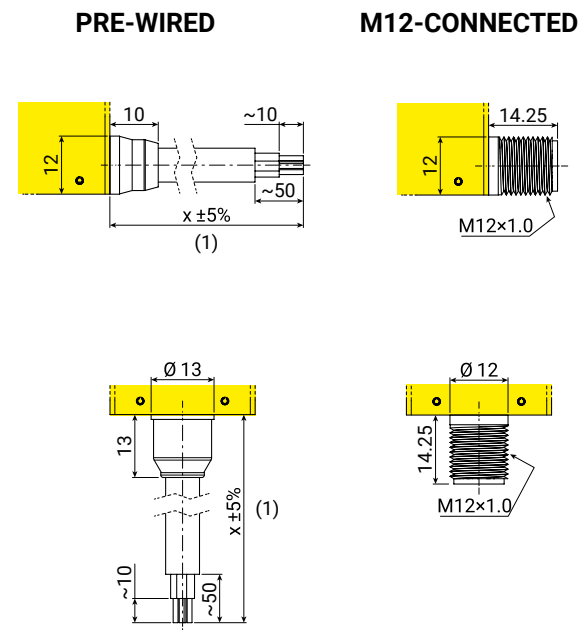
technical drawing - sizes in mm



(2) mounting holes
(4) nylon roller



technical drawing connection output - sizes in mm



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 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°	

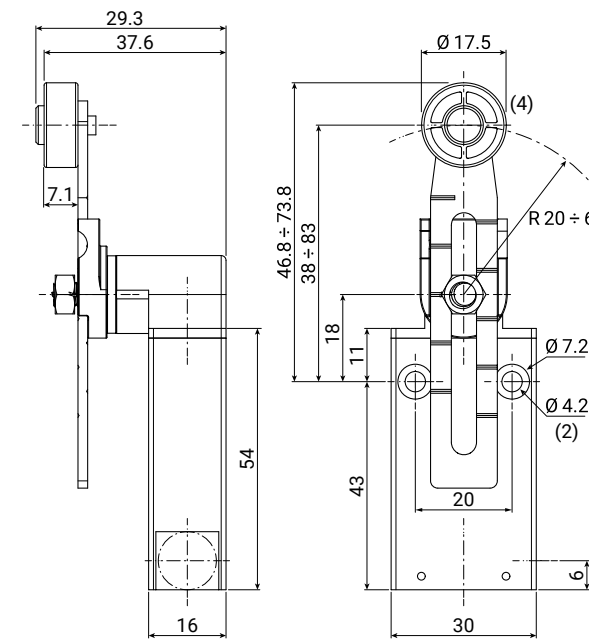
FCT05

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

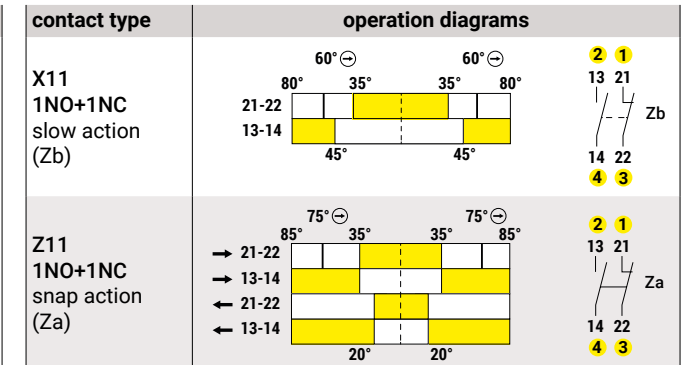


FCT series	X connection type	X connection orientation	05 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	L horizontal output V vertical output	05 adjustable metal revolving lever with Ø17.5 nylon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

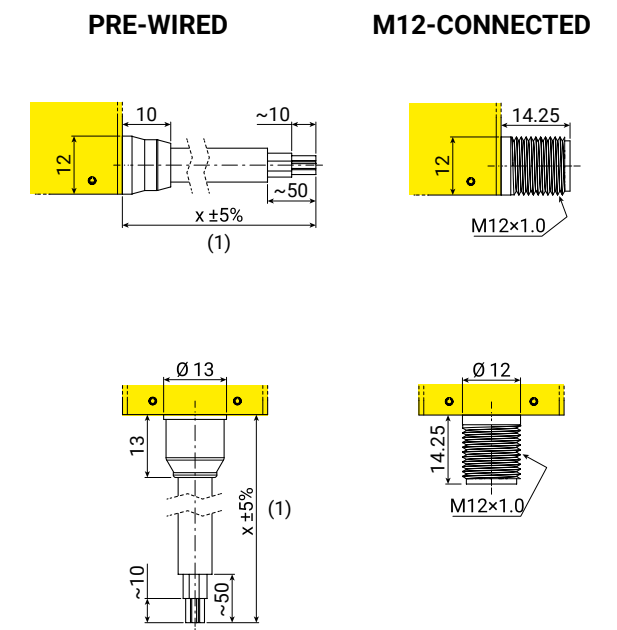
technical drawing - sizes in mm



(2) mounting holes
(4) nylon roller



technical drawing connection output - sizes in mm



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 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°	

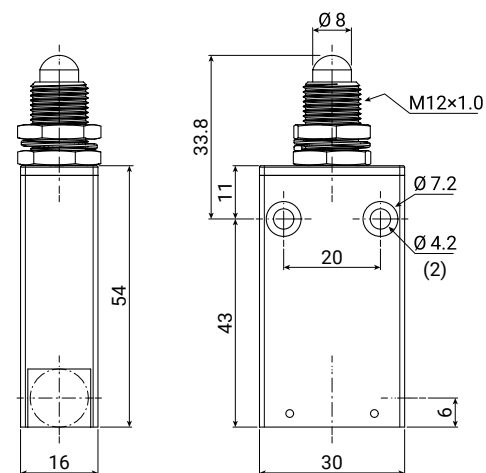
FCT06

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



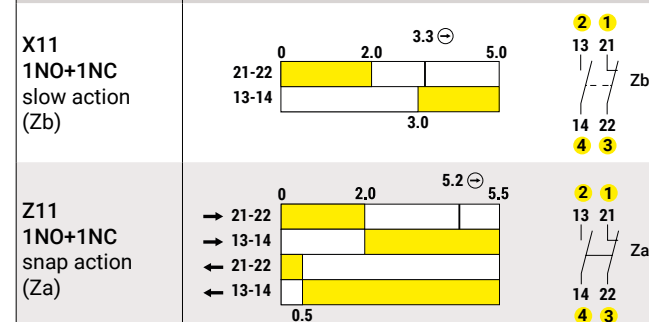
FCT series	X connection type	X connection orientation	06 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	L horizontal output V vertical output	06 metal end plunger with threaded flange X11: 1NO+1NC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

technical drawing - sizes in mm

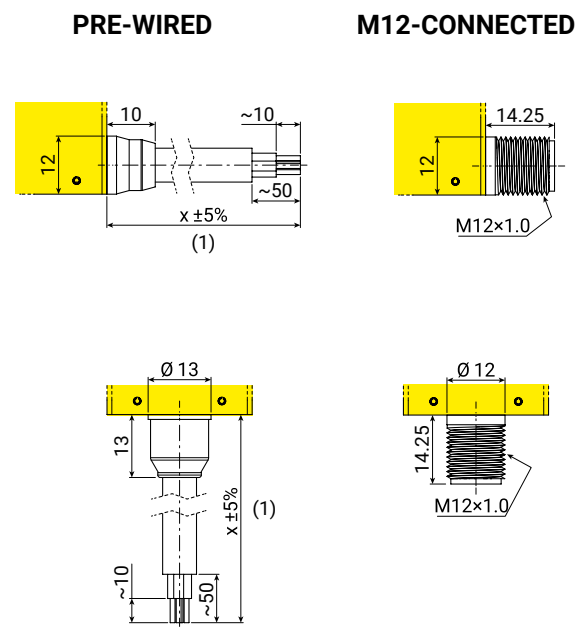


(2) mounting holes

contact type operation diagrams



technical drawing connection output - sizes in mm



(1) x = cable length 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

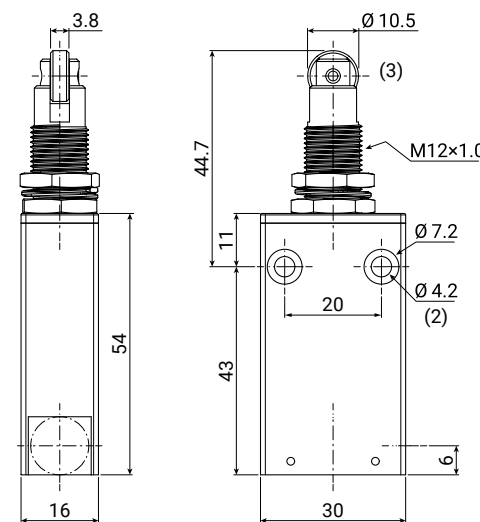
FCT07

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



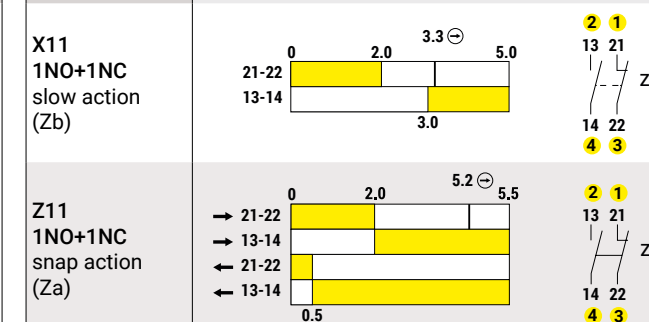
FCT series	X connection type	X connection orientation	07 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	L horizontal output V vertical output	07 steel roller plunger with threaded flange X11: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

technical drawing - sizes in mm

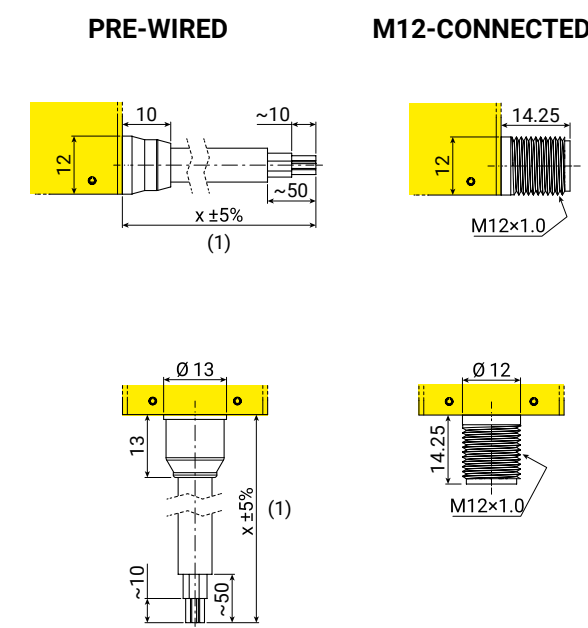


(2) mounting holes
(3) steel roller

contact type operation diagrams



technical drawing connection output - sizes in mm



(1) x = cable length 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

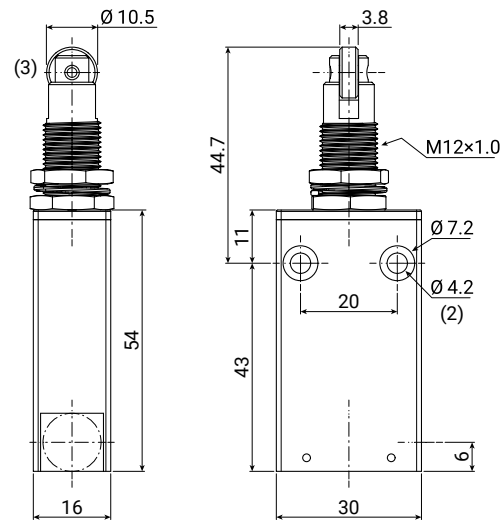
FCT08

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



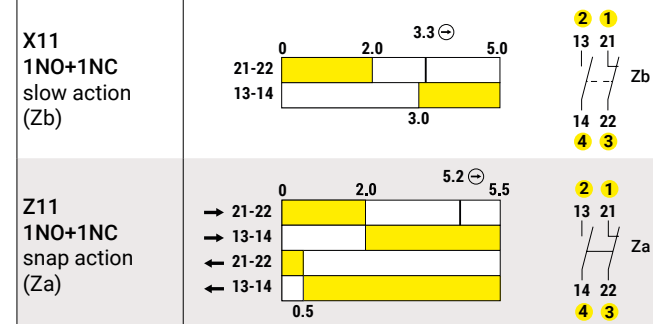
FCT series	X connection type	X connection orientation	08 actuator	XXX contact type	D housing	
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	L horizontal output V vertical output	08 90° steel roller plunger with threaded flange	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

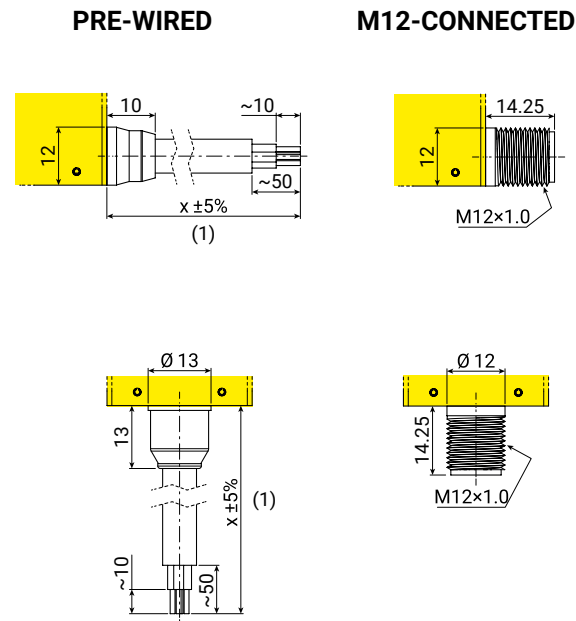


(2) mounting holes
(3) steel roller

contact type operation diagrams



technical drawing connection output - sizes in mm



(1) x = cable length 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

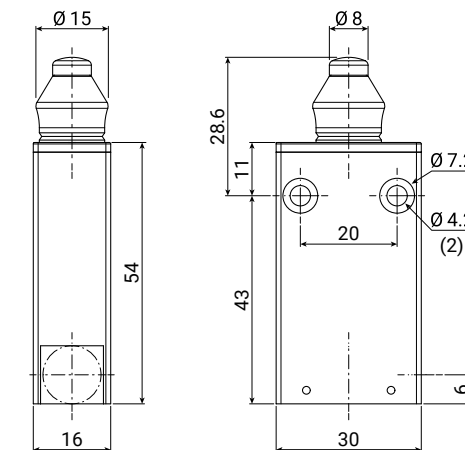
FCT09

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



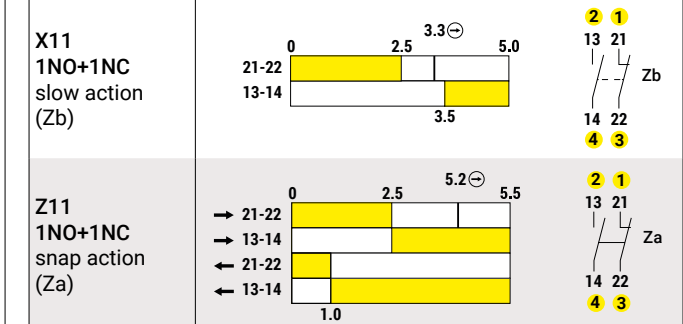
FCT series	X connection type	X connection orientation	09 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard) x pre-wired with custom cable length M M12-connected	09 steel roller plunger with threaded flange	X11: 1NO+1NC slow action (Zb) Z11: 1NO+1NC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

technical drawing - sizes in mm

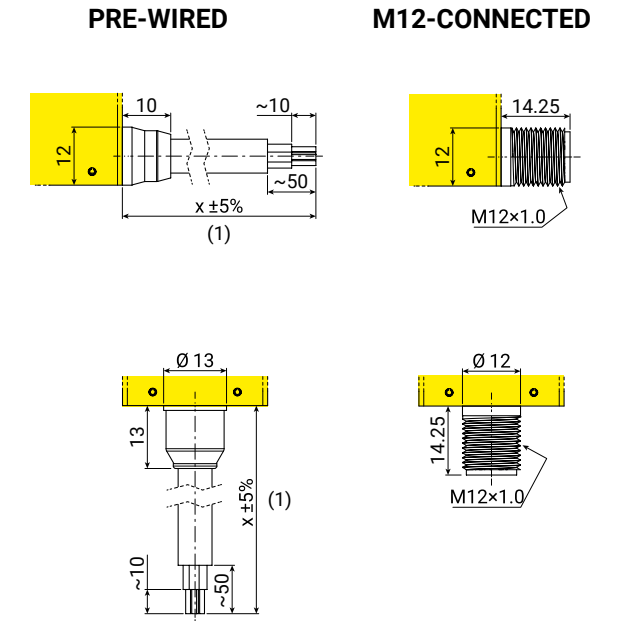


(2) mounting holes

contact type operation diagrams



technical drawing connection output - sizes in mm



(1) x = cable length 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	2.5 mm	3.5 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	2.5 mm	1.0 mm	9.8 N	5.2 mm	24 N	5.5 mm

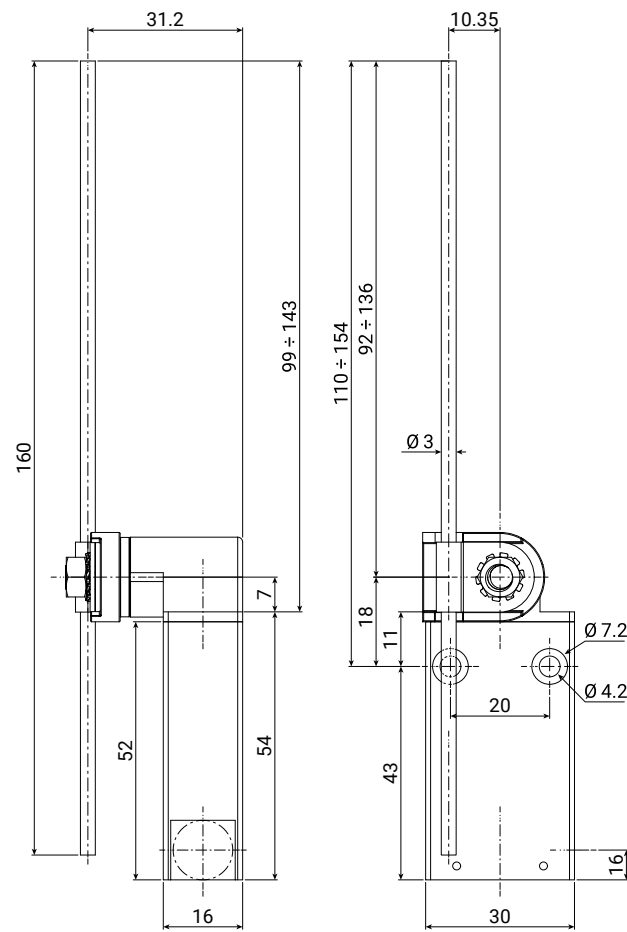
FCT10

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



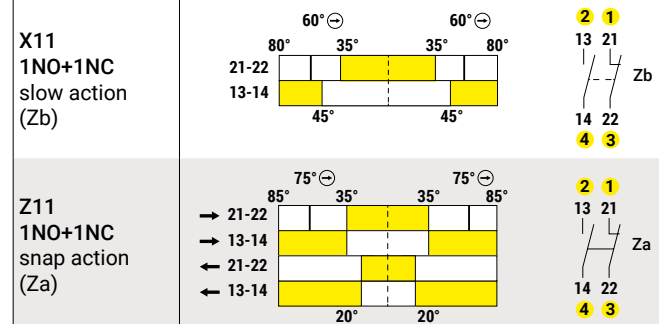
FCT series	X connection type	X connection orientation	10 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard)	L horizontal output	X11: 1NO+1NC slow action (Zb)	D plastic with 20 mm fixing holes spacing
	x	pre-wired with custom cable length	V vertical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

technical drawing - sizes in mm

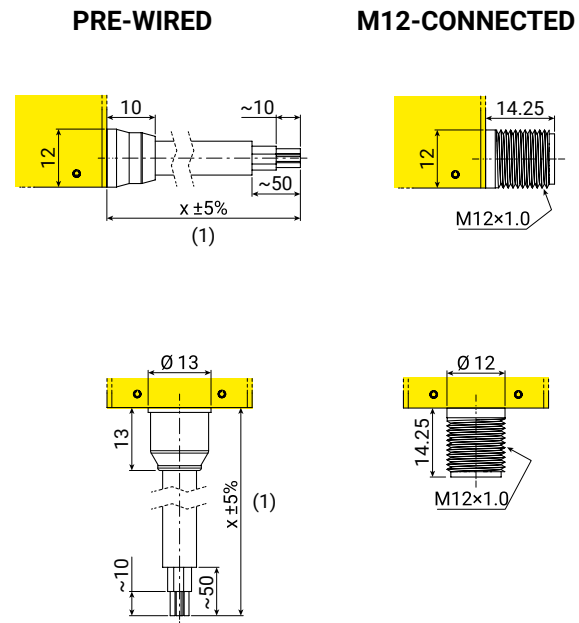


(2) mounting holes

contact type operation diagrams



technical drawing connection output - sizes in mm



(1) x = cable length 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	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°

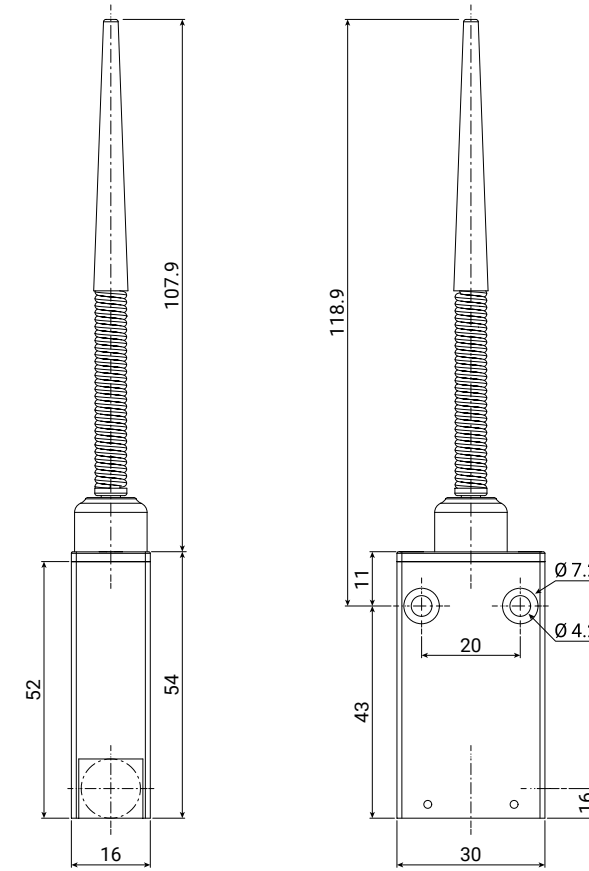
FCT11

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



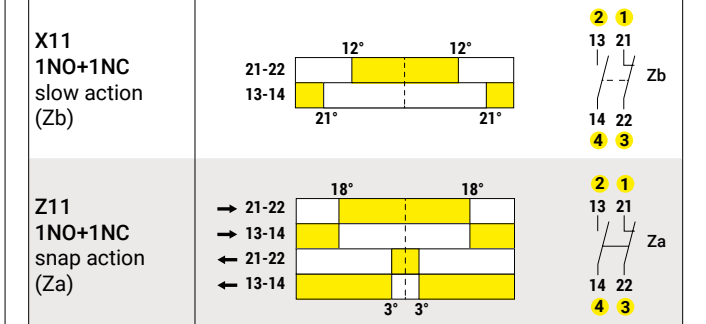
FCT series	X connection type	X connection orientation	11 actuator	XXX contact type	D housing
FCT	thermoplastic limit switch	2 pre-wired with 2 m cable (standard)	L horizontal output	X11: 1NO+1NC slow action (Zb)	D plastic with 20 mm fixing holes spacing
	x	pre-wired with custom cable length	V vertical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

technical drawing - sizes in mm

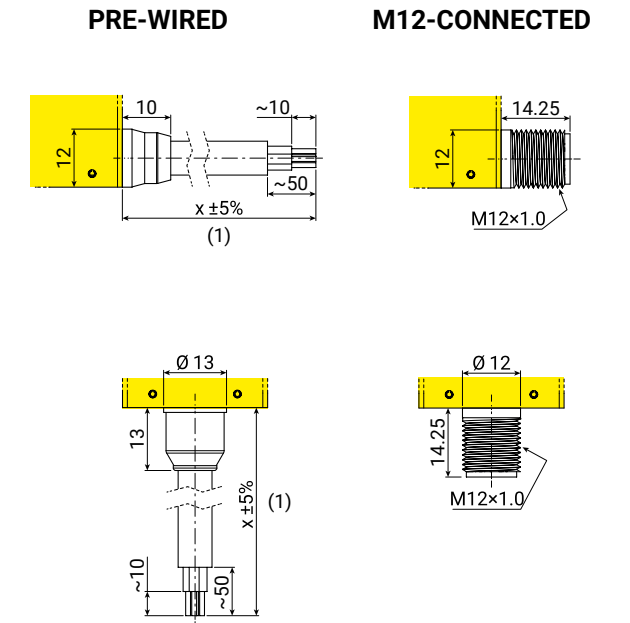


(2) mounting holes

contact type operation diagrams

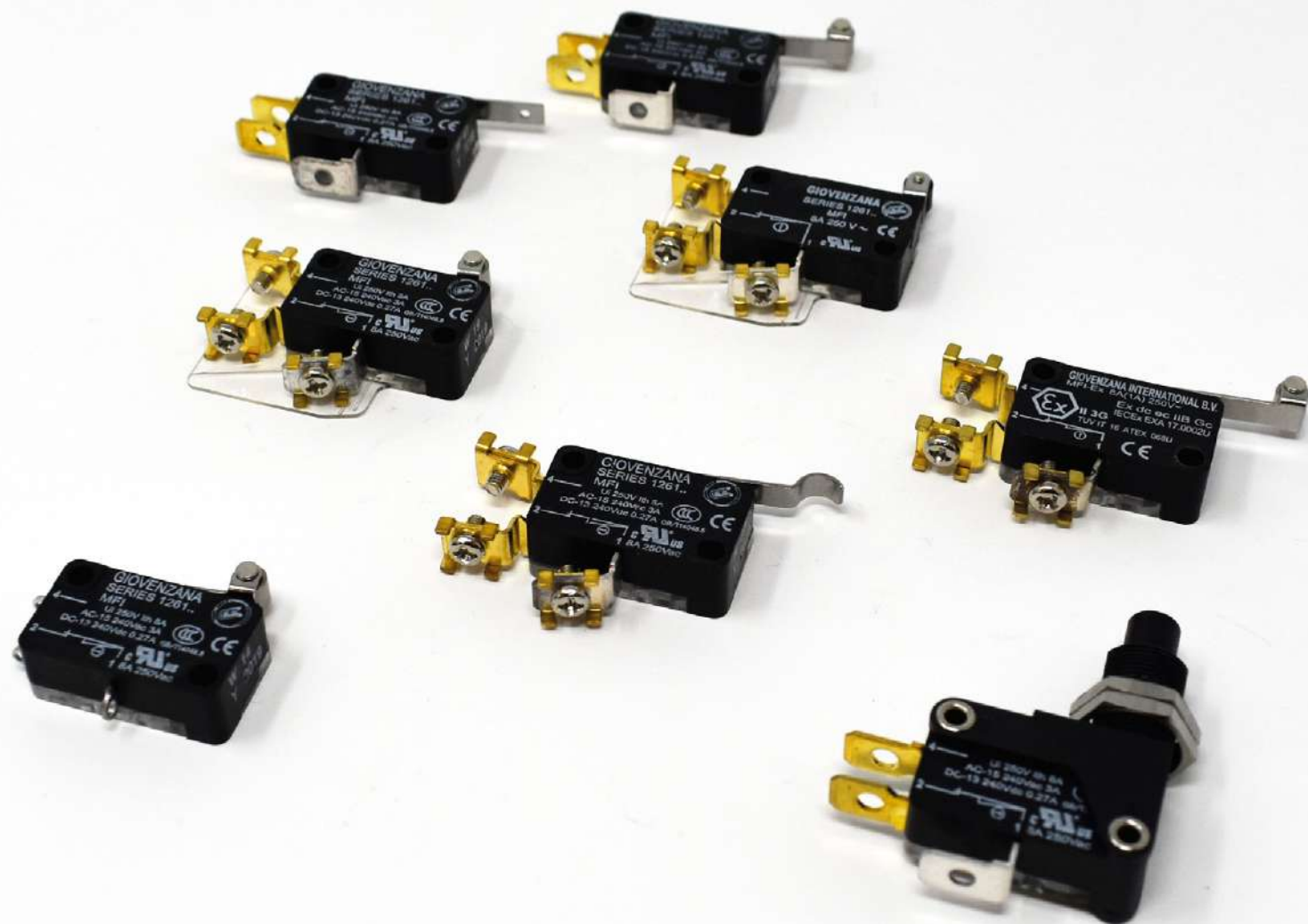


technical drawing connection output - sizes in mm



(1) x = cable length 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	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

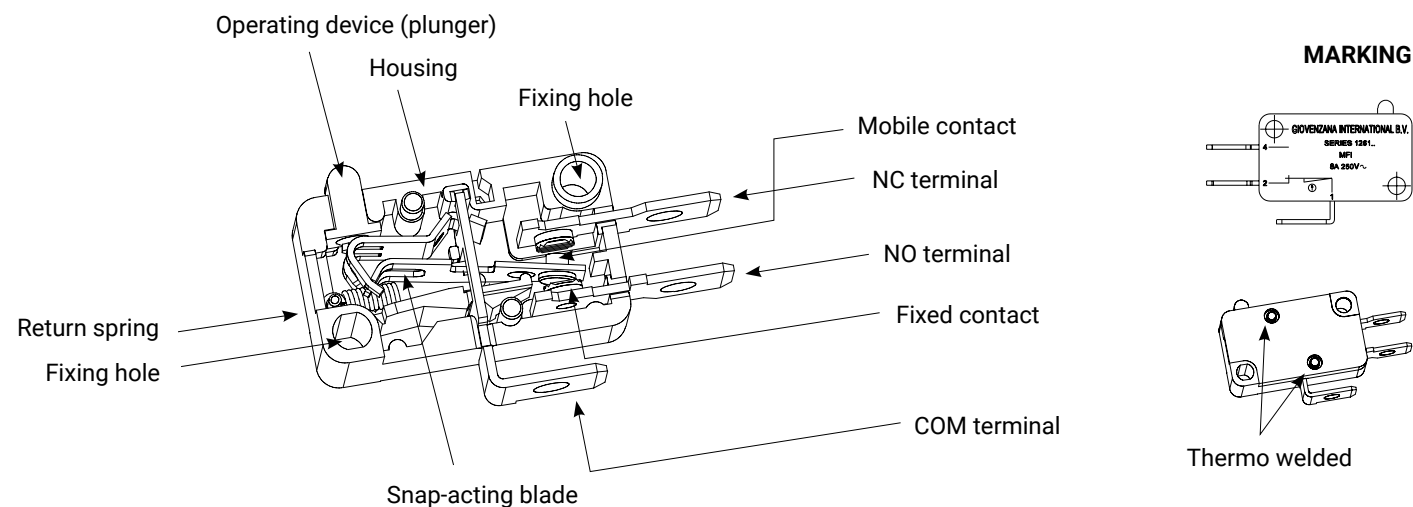
- Fast and reliable switching, independent from actuating speed.
- High electrical ratings with small dimensions.
- High repetition accuracy of switching points and forces.
- Low operating force.
- NC positive opening. ⊕
- Very long service life.
- Equipped with self-cleaning silver alloy switching contacts.
- 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)

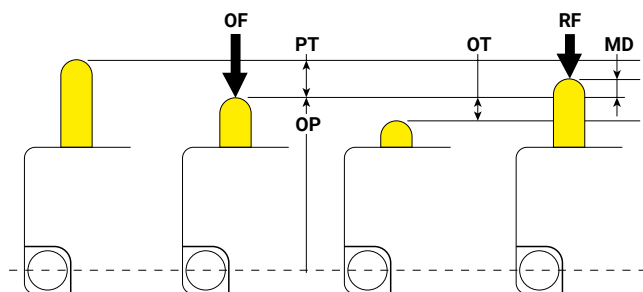
Applying force to the trigger of a snap switch releases the snap mechanism, which in turn triggers the switching operation.

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

M	F	I	.			
SERIES		ACTUATOR		TERMINAL TYPE		
MFI micro switches		blank pin plunger 1 long roller lever 2 simulated roller lever 3 roller lever 4 long lever 5 medium lever 6 short lever 7 16 mm roller lever		blank 6.3 × 0.8 mm faston S solder ST screw STP screw + plate protection T tower actuator with threaded flange		
				OF [N]	Operating Force	
				RF [N]	Release force	
				PT [mm]	Pretravel	
				OT [mm]	Overtravel	
				MD [mm]	Differential movement	
				OP [mm]	Operating position	

Pin plunger

MFI	MFI.S	MFI.ST	MFI.STP
OF	max	5.1 N	
RF	min	1.9 N	
PT	max	1.4 mm	
OT	min	0.8 mm	
MD	max	0.3 mm	
OP		14.4 ± 0.5 mm	

Long roller lever

MFI.1	MFI.1S	MFI.1ST	MFI.1STP
OF	max	3.2 N	
RF	min	1.0 N	
PT	max	3.3 mm	
OT	min	0.8 mm	
MD	max	0.8 mm	
OP		17.4 ± 0.8 mm	

Simulated roller lever

MFI.2	MFI.2S	MFI.2ST	MFI.2STP
OF	max	3.2 N	
RF	min	1.0 N	
PT	max	3.3 mm	
OT	min	0.8 mm	
MD	max	0.8 mm	
OP		17.4 ± 0.8 mm	

Roller lever

MFI.3	MFI.3S	MFI.3ST	MFI.3STP
OF	max	5.1 N	
RF	min	1.9 N	
PT	max	1.4 mm	
OT	min	0.6 mm	
MD	max	0.6 mm	
OP		20.3 ± 0.8 mm	

Long lever

MFI.4	MFI.4S	MFI.4ST	MFI.4STP
OF	max	1.3 N	
RF	min	0.15 N	
PT	max	7.6 mm	
OT	min	2.2 mm	
MD	max	2.2 mm	
OP		15.1 ± 2.6 mm	

(1) Stainless steel lever (2) Plastic material roller (3) Stainless steel roller

Medium lever

MFI.5	MFI.5S	MFI.5ST	MFI.5STP
OF	max	3.2 N	
RF	min	1.2 N	
PT	max	3.3 mm	
OT	min	0.8 mm	
MD	max	0.8 mm	
OP		15.1 ± 1.2 mm	

Short lever

MFI.6	MFI.6S	MFI.6ST	MFI.6STP
OF	max	5.1 N	
RF	min	1.9 N	
PT	max	1.6 mm	
OT	min	0.6 mm	
MD	max	0.6 mm	
OP		15.1 ± 0.6 mm	

16 mm roller lever

MFI.7	MFI.7S	MFI.7ST	MFI.7STP
OF	max	4.5 N	
RF	min	1.9 N	
PT	max	1.8 mm	
OT	min	0.8 mm	
MD	max	0.6 mm	
OP		21.1 ± 0.6 mm	

Tower actuator with threaded flange

MFI.T	OF	max	6.0 N
	RF	min	2.0 N
	PT	max	2.2 mm
	OT	min	3.3 mm
	MD	max	0.5 mm
	OP		21.2 ± 0.8 mm

FASTON TERMINALS **SOLDER 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

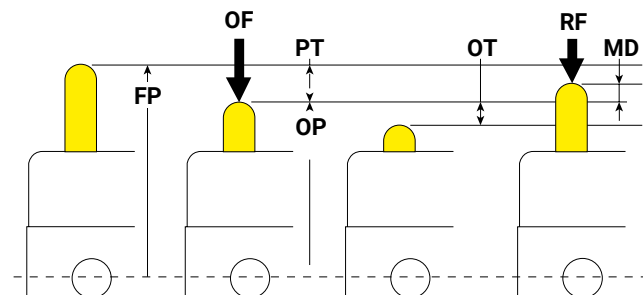
Approvals		CE, UL and UKCA			
Rating					
Rated contact voltage	UL 61058	125 V AC	250 V AC	125 V DC	250 V DC
Maximum contact current		15 A	15 A	0.5 A	0.25 A
Electrical characteristics					
Maximum contact resistance	initial	15 mΩ			
Minimum insulation resistance	at 500 V DC	100 MΩ			
Dielectric withstanding 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
		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

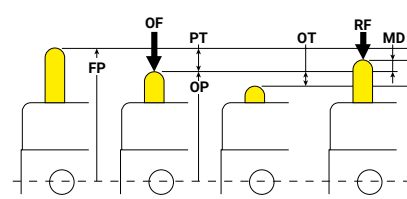
SCREW TERMINALS		SOLDER TERMINALS	
MZS13	MZS17	MZW13	MZW17

MZS13 SCREW TERMINALS - CODE SELECTION OVERVIEW

M	Z	S	1	3
SERIES	TERMINAL TYPE	BODY CONFIGURATION	ACTUATOR TYPE	
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

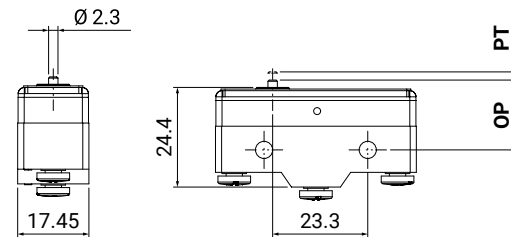
OF	[N]	Operating Force
RF	[N]	Release force
PT	[mm]	Pretravel
OT	[mm]	Overtravel
MD	[mm]	Differential movement
FP	[mm]	Initial position
OP	[mm]	Operating position



Short plunger Ø2.3

MZS1300

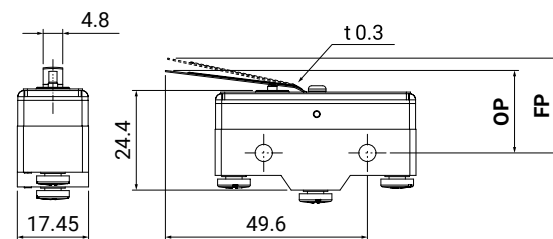
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	0.13 mm
MD	max	0.10 mm
FP	max	-
OP		15.9 ± 0.4 mm



Bending lever

MZS1301

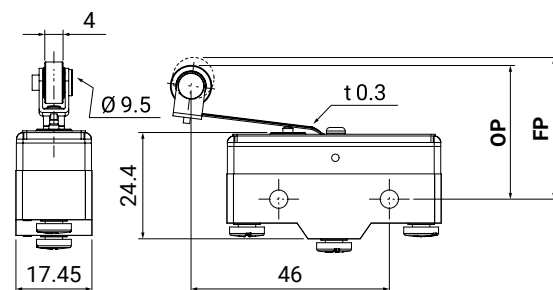
OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	20.6 mm
OP		17.4 ± 0.8 mm



Bending roller lever

MZS1303

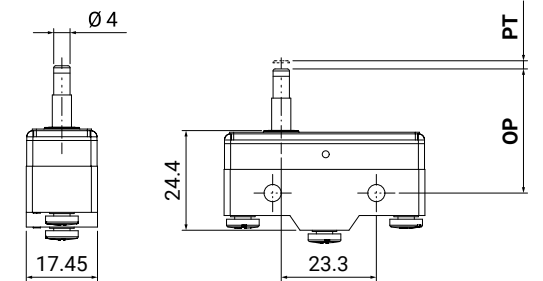
OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	31.8 mm
OP		28.6 ± 0.8 mm



Long plunger Ø4

MZS1305

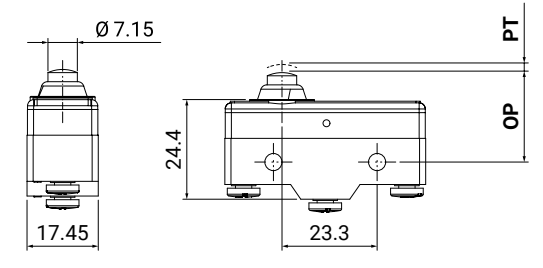
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		28.2 ± 0.5 mm



Short plunger Ø7.2

MZS1306

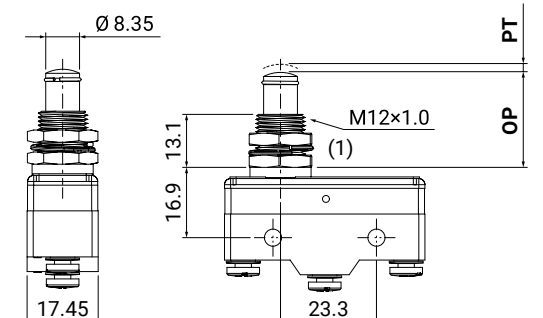
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		21.5 ± 0.5 mm



Panel mount plunger

MZS1307

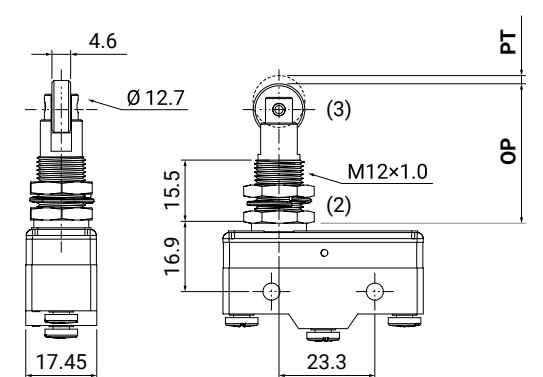
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	5.5 mm
MD	max	0.10 mm
FP	max	-
OP		21.8 ± 0.8 mm



Panel mount roller plunger

MZS1308

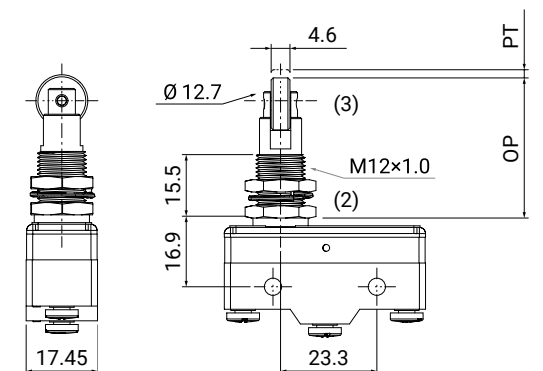
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	3.58 mm
MD	max	0.10 mm
FP	max	-
OP		33.4 ± 1.2 mm



Panel mount cross roller plunger

MZS1318

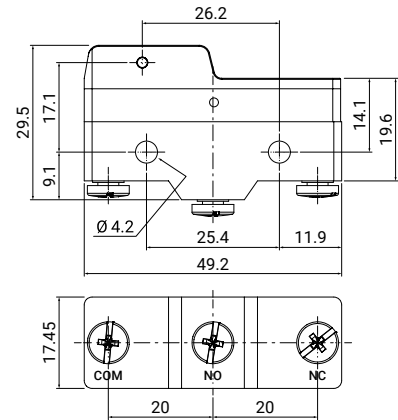
OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	3.58 mm
MD	max	0.10 mm
FP	max	-
OP		33.4 ± 1.2 mm



(1) 2 hexagonal brass nuts 3x15 mm (2) 2 hexagonal brass nuts 3x17 mm (3) Stainless steel roller

(1) 2 hexagonal brass nuts 3x15 mm (2) 2 hexagonal brass nuts 3x17 mm (3) Stainless steel roller

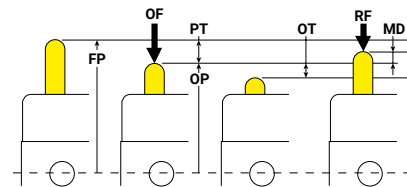
MZS17 SCREW TERMINALS - CODE SELECTION OVERVIEW



M Z	S	1 7	
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

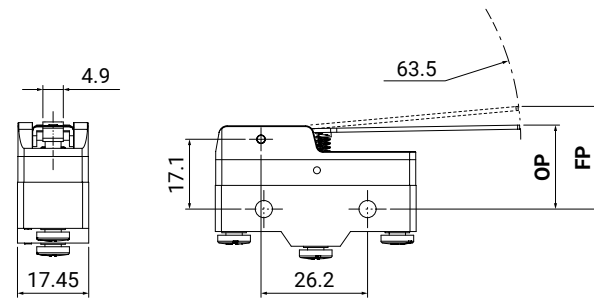
OF	[N]	Operating Force
RF	[N]	Release force
PT	[mm]	Pretravel
OT	[mm]	Overtravel
MD	[mm]	Differential movement
FP	[mm]	Initial position
OP	[mm]	Operating position



Hinge lever



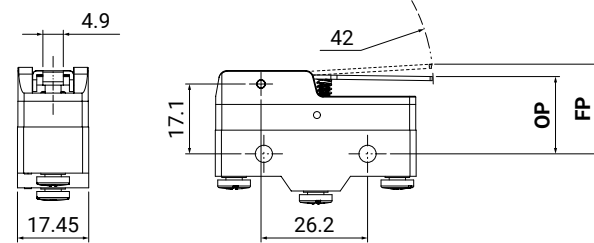
OF	max	70 g
RF	min	14 g
PT	max	10 mm
OT	min	5.6 mm
MD	max	1.27 mm
FP	max	28.2 mm
OP		19 ± 0.8 mm



Short hinge lever



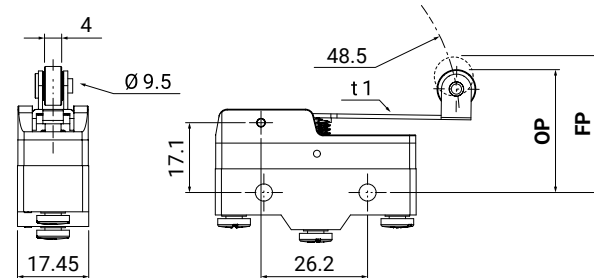
OF	max	90 g
RF	min	18 g
PT	max	7 mm
OT	min	3.5 mm
MD	max	1 mm
FP	max	26.2 mm
OP		19.8 ± 0.8 mm



Hinge roller lever



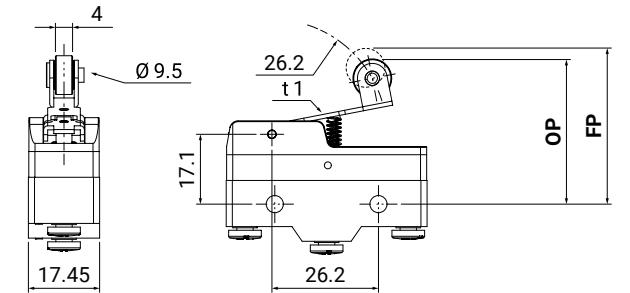
OF	max	100 g
RF	min	22 g
PT	max	7.1 mm
OT	min	4 mm
MD	max	1.02 mm
FP	max	36.5 mm
OP		30.2 ± 0.8 mm



Short hinge roller lever



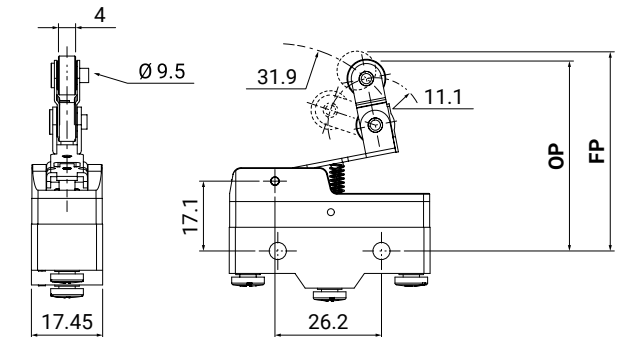
OF	max	160 g
RF	min	42 g
PT	max	2.7 mm
OT	min	2.4 mm
MD	max	0.5 mm
FP	max	32.5 mm
OP		30.2 ± 0.4 mm

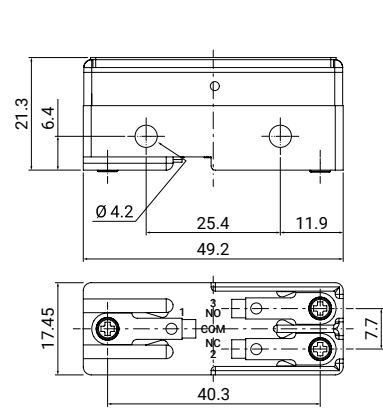


Unidirectional hinge roller lever



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

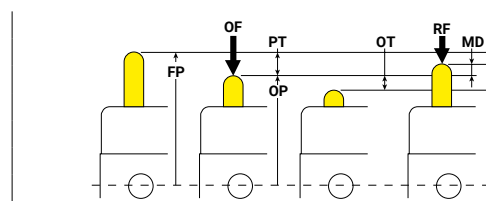


MZW13 SOLDER TERMINALS - CODE SELECTION OVERVIEW


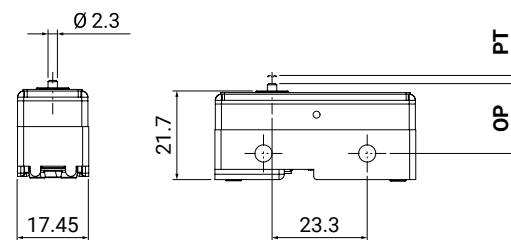
M Z	W	1 3	
SERIES	TERMINAL TYPE	BODY CONFIGURATION	ACTUATOR TYPE
MZ micro switches	W solder terminals	13 standard	00 short plunger Ø2.3 01 bending lever 03 bending roller lever 05 long plunger Ø4 06 short plunger Ø7.2 07 panel mount plunger 08 panel mount roller plunger 18 panel mount cross roller plunger

TRAVELS AND ACTUATING FORCES

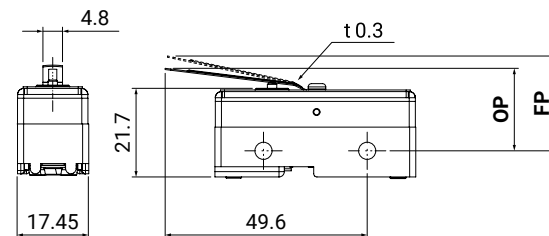
OF [N]	Operating Force
RF [N]	Release force
PT [mm]	Pretravel
OT [mm]	Overtravel
MD [mm]	Differential movement
FP [mm]	Initial position
OP [mm]	Operating position


Short plunger Ø2.3

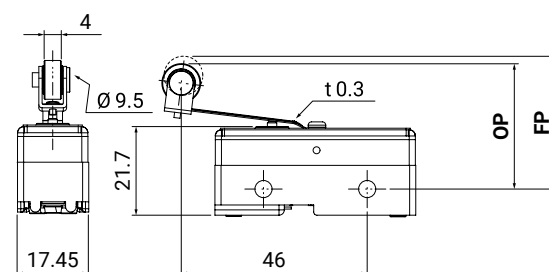

OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	0.13 mm
MD	max	0.10 mm
FP	max	-
OP		15.9 ± 0.4 mm


Bending lever

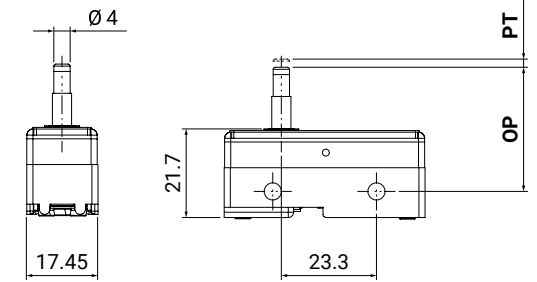

OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	20.6 mm
OP		17.4 ± 0.8 mm


Bending roller lever

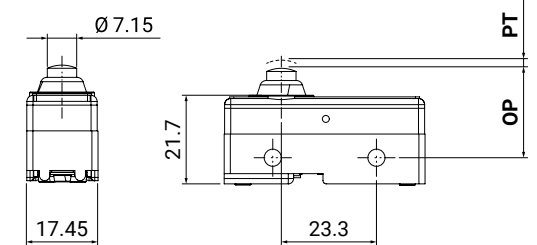

OF	max	141 g
RF	min	14 g
PT	max	4 mm
OT	min	1.6 mm
MD	max	1.3 mm
FP	max	31.8 mm
OP		28.6 ± 0.8 mm


Long plunger Ø4

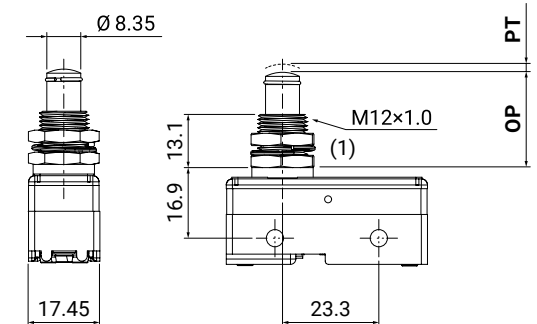

OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		28.2 ± 0.5 mm


Short plunger Ø7.2

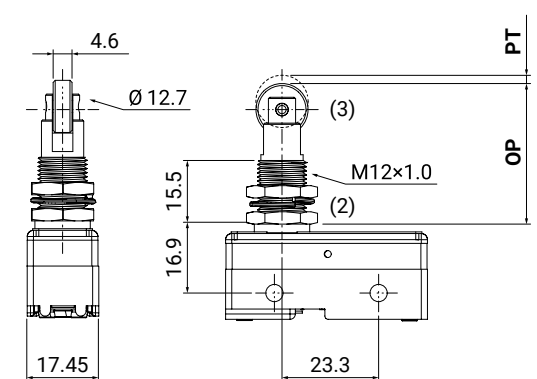

OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	1.6 mm
MD	max	0.10 mm
FP	max	-
OP		21.5 ± 0.5 mm


Panel mount plunger

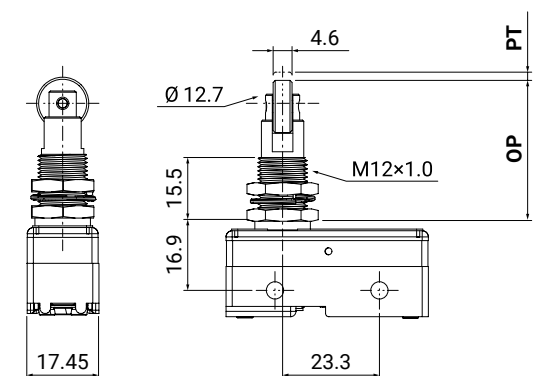

OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	5.5 mm
MD	max	0.10 mm
FP	max	-
OP		21.8 ± 0.8 mm


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

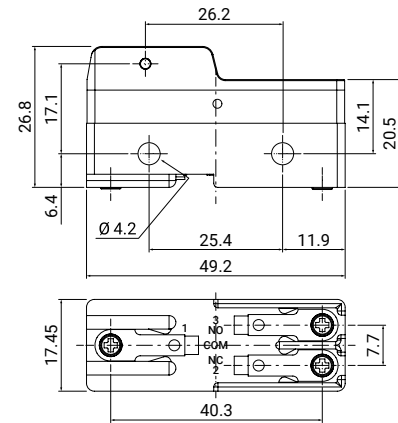

OF	max	250 .. 350 g
RF	min	114 g
PT	max	0.4 mm
OT	min	3.58 mm
MD	max	0.10 mm
FP	max	-
OP		33.4 ± 1.2 mm



(1) 2 hexagonal brass nuts 3x15 mm (2) 2 hexagonal brass nuts 3x17 mm (3) Stainless steel roller

(1) 2 hexagonal brass nuts 3x15 mm (2) 2 hexagonal brass nuts 3x17 mm (3) Stainless steel roller

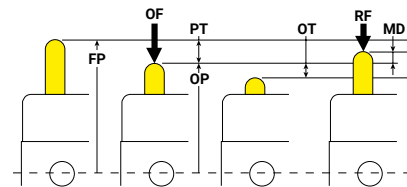
MZW17 SOLDER TERMINALS - CODE SELECTION OVERVIEW



M Z	W	1 7	
SERIES	TERMINAL TYPE	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

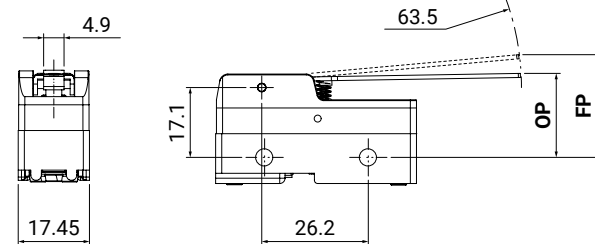
OF	[N]	Operating Force
RF	[N]	Release force
PT	[mm]	Pretravel
OT	[mm]	Overtravel
MD	[mm]	Differential movement
FP	[mm]	Initial position
OP	[mm]	Operating position



Hinge lever



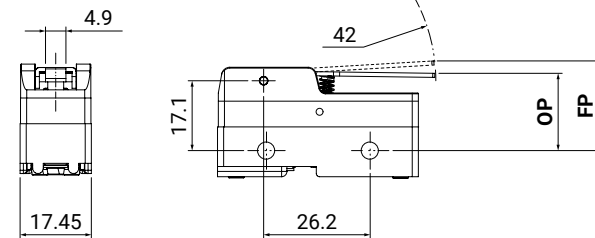
OF	max	70 g
RF	min	14 g
PT	max	10 mm
OT	min	5.6 mm
MD	max	1.27 mm
FP	max	28.2 mm
OP		19 ± 0.8 mm



Short hinge lever



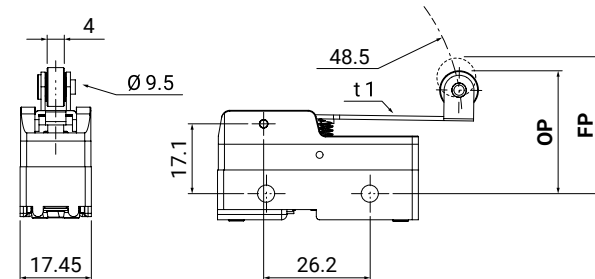
OF	max	90 g
RF	min	18 g
PT	max	7 mm
OT	min	3.5 mm
MD	max	1 mm
FP	max	26.2 mm
OP		19.8 ± 0.8 mm



Hinge roller lever



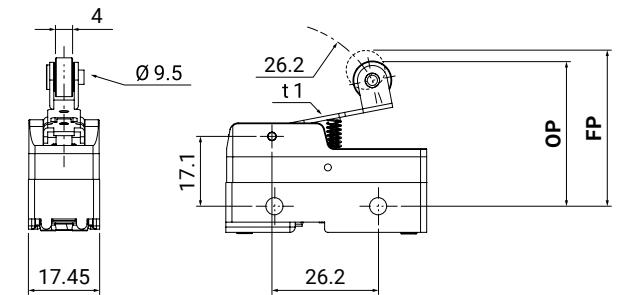
OF	max	100 g
RF	min	22 g
PT	max	7.1 mm
OT	min	4 mm
MD	max	1.02 mm
FP	max	36.5 mm
OP		30.2 ± 0.8 mm



Short hinge roller lever



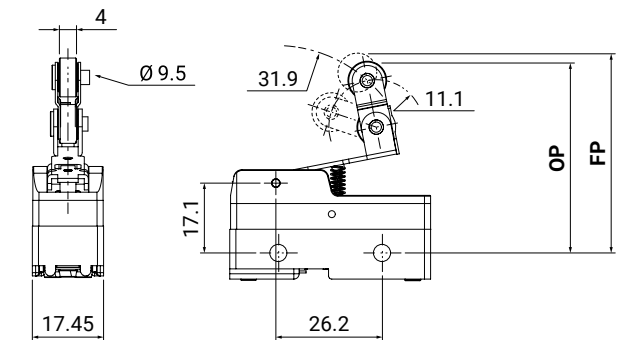
OF	max	160 g
RF	min	42 g
PT	max	2.7 mm
OT	min	2.4 mm
MD	max	0.5 mm
FP	max	32.5 mm
OP		30.2 ± 0.4 mm



Unidirectional hinge roller lever

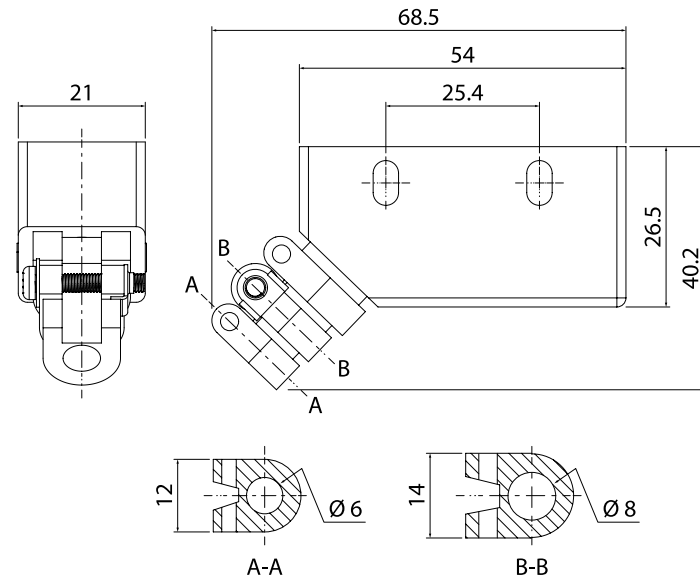
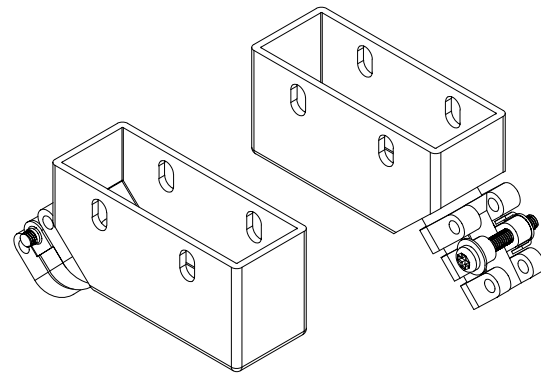


OF	max	170 g
RF	min	42 g
PT	max	2.7 mm
OT	min	2.4 mm
MD	max	0.51 mm
FP	max	43.6 mm
OP		41.3 ± 0.8 mm



MZ ACCESSORY

MZA8000 - terminal enclosure
Material: NBR



NOTES

Area for notes with horizontal dotted lines.

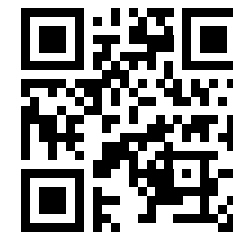


NOTES

Dotted lines for notes

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