



**FTN SERIES**



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

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

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

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

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

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

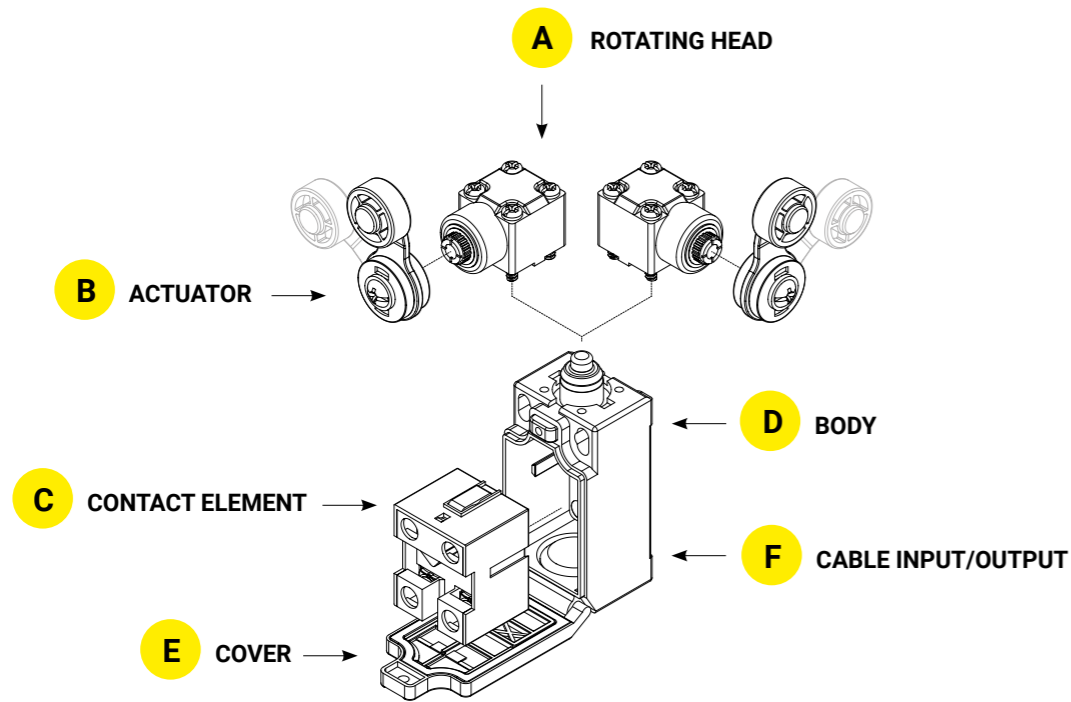
Giovenzana limit switches offer solutions for every need and are suitable for the most varied sectors of use.



**SPECIFICATIONS**

Standards		EN 60947-5-1, UL 508, EN 50047, EN 1088, EN 60204-1
Approvals		cULus, CCC, EAC, CE and UKCA marked for all applicable directives
Positive opening operation		NC contact conforming to IEC /EN 60947-5-1 ⊕
Minimum current		5 mA - 5 V DC
Thermal current	I <sub>th</sub>	10 A
Rated insulation voltage	U <sub>i</sub>	500 V
Rated impulse withstand voltage	U <sub>imp</sub>	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 <sup>7</sup> 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**

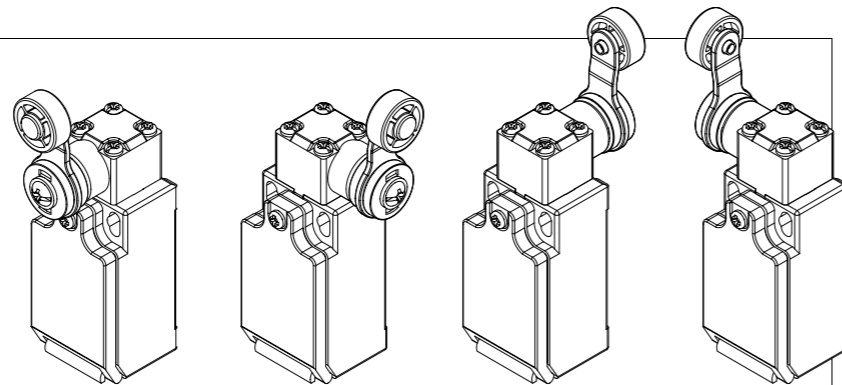


**A - ROTATING HEAD**

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**

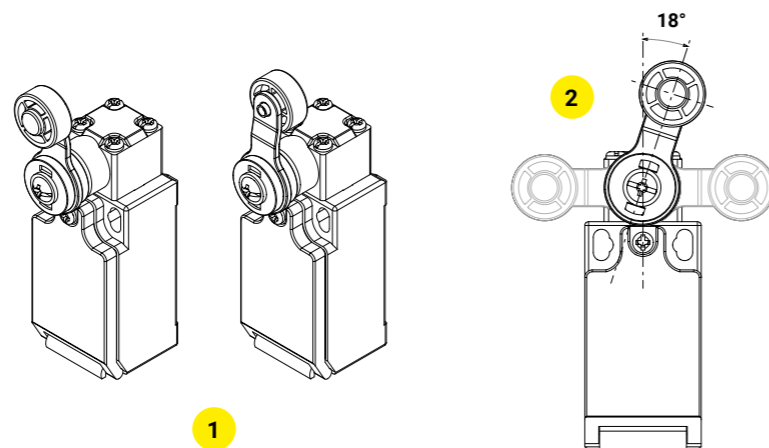
Available different types of actuators: plungers, levers, rollers and rods.

**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**

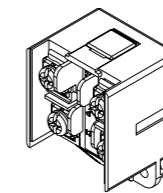
All levers are adjustable in steps of 18° over 360°, compared to the horizontal axis of the head. The positive movement transmission is always guaranteed thanks to the particular geometric coupling between the lever and the rotation shaft.



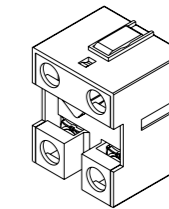
**C - CONTACT ELEMENT**

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.).

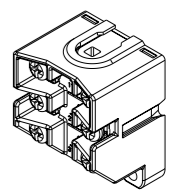
Different contact elements are available, both fast-acting and slow-acting, depending on the different application requirements.



**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)

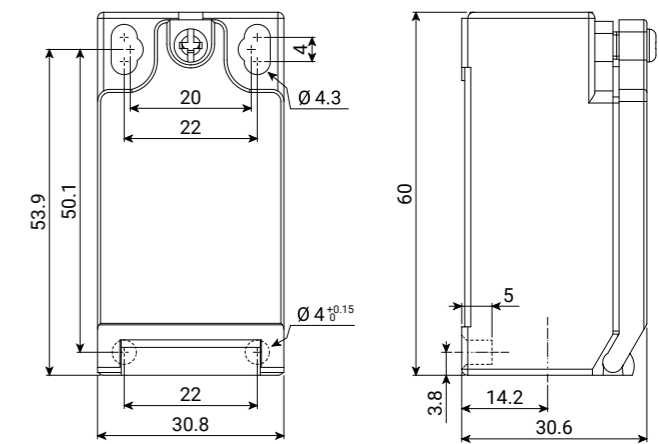
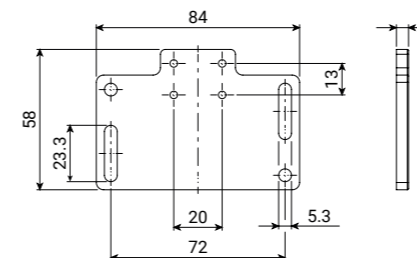
→ Not suitable for safety applications!

**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.



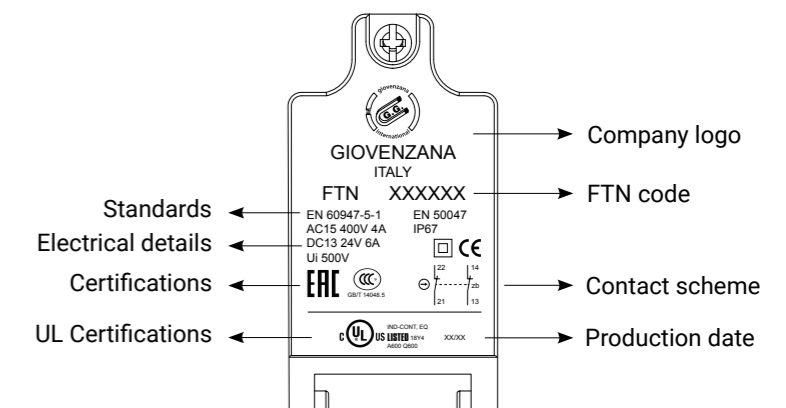
In order to provide more fixing stability, it is possible to use the basic holes of the device with dowel insertion.

**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
<b>X11</b>	1NO+1NC Slow action Zb ⊕		
<b>W02</b>	2NC Slow action Zb ⊕		
<b>W20</b>	2NO Slow action Zb Not suitable for safety applications!		
<b>Z11</b>	1NO+1NC Snap action Zb ⊕		
<b>Z02</b>	2NC Snap action Zb ⊕		
<b>W12</b>	1NO+2NC Slow action Zb ⊕		No connector
<b>W03</b>	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**

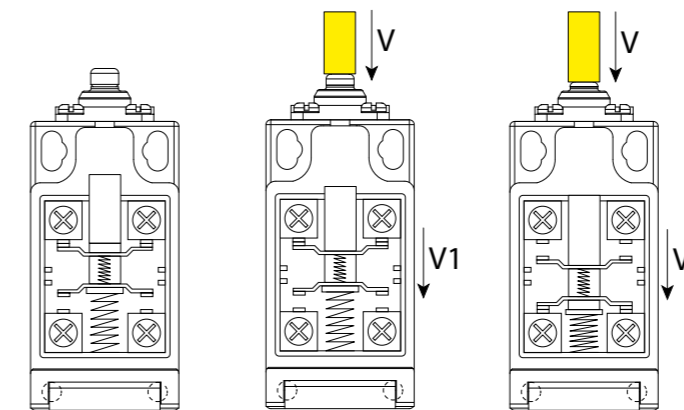
**SLOW ACTION - Contact elements direct acting**

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.



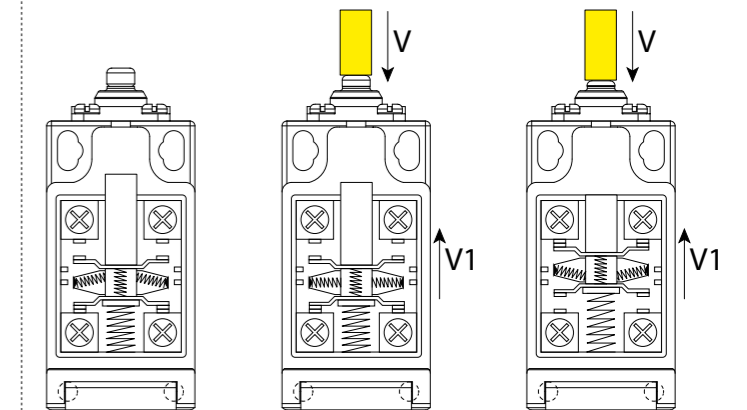
**SNAP ACTION - Contact elements acting independently**

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.

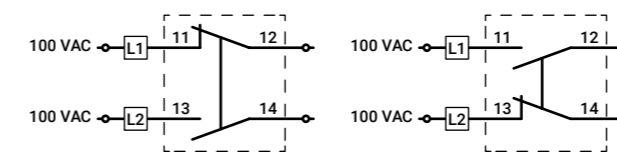
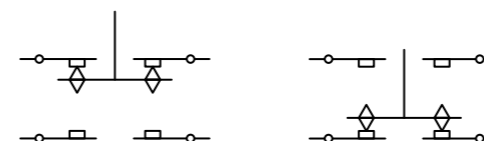
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



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

**Za contact type**

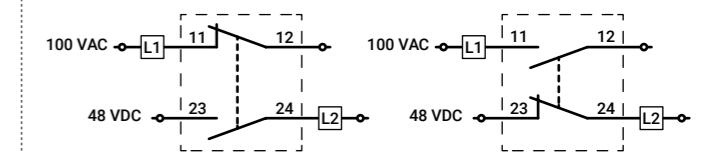
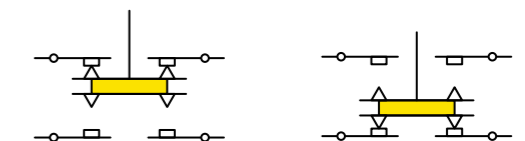
A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



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

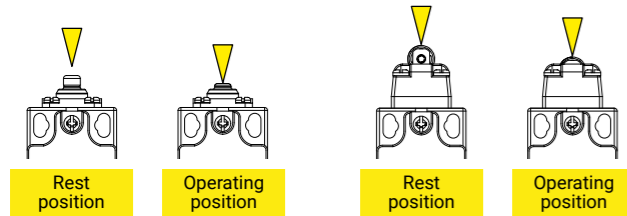
FTN series of thermoplastic limit switches is equipped with Zb contacts.



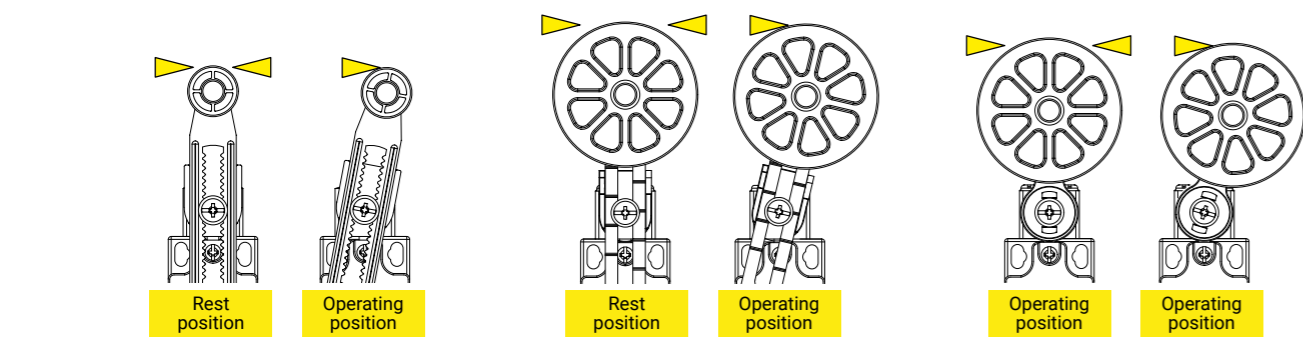
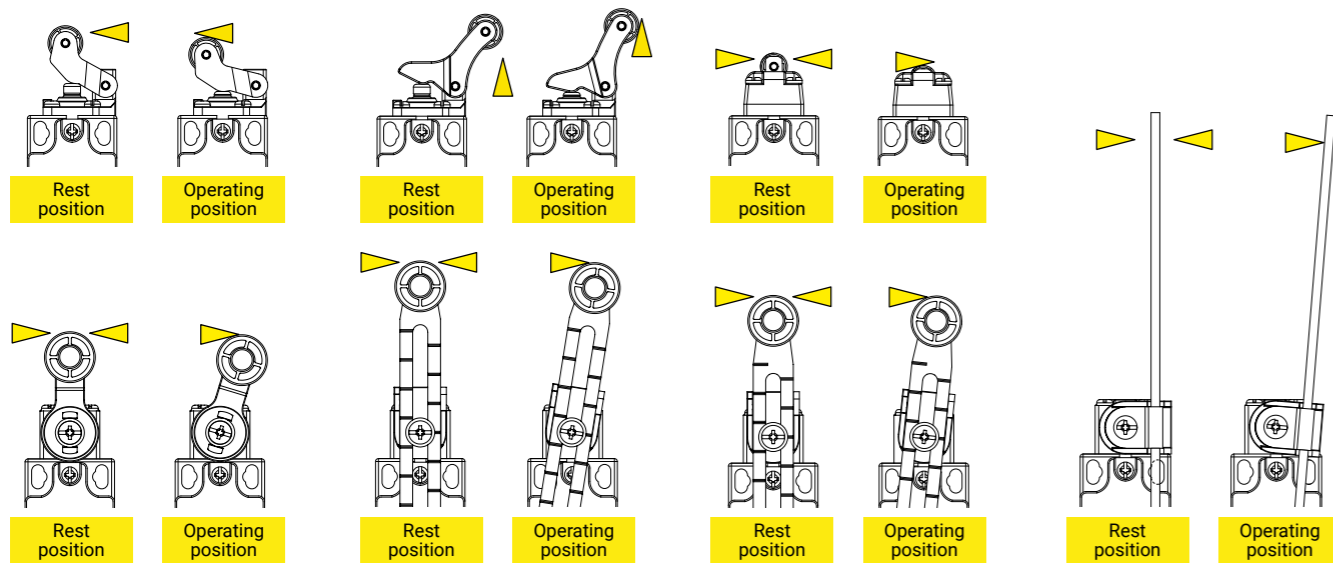
**DETECTION MOVEMENTS**

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.

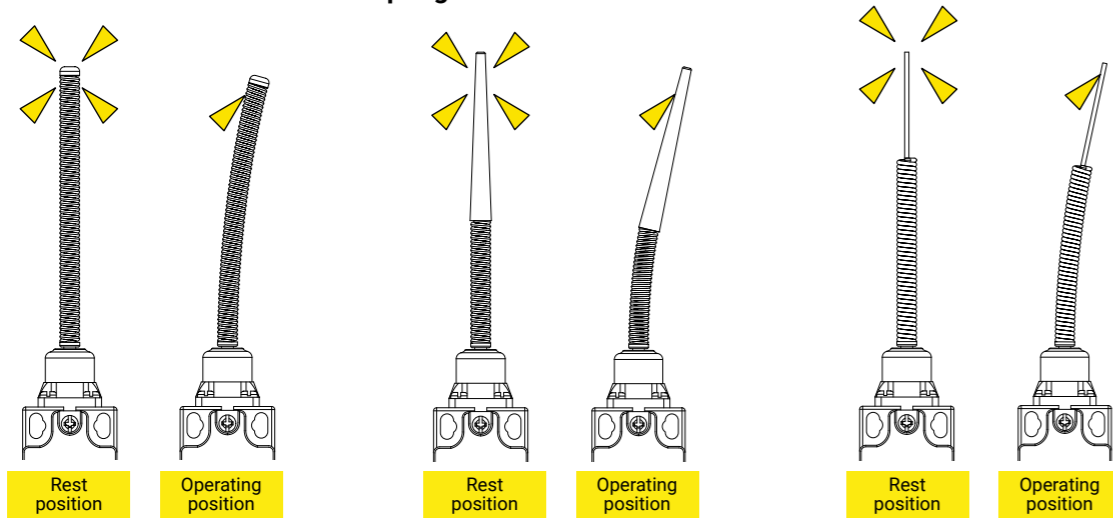
**1. Linear detection movement - Plunger**



**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:

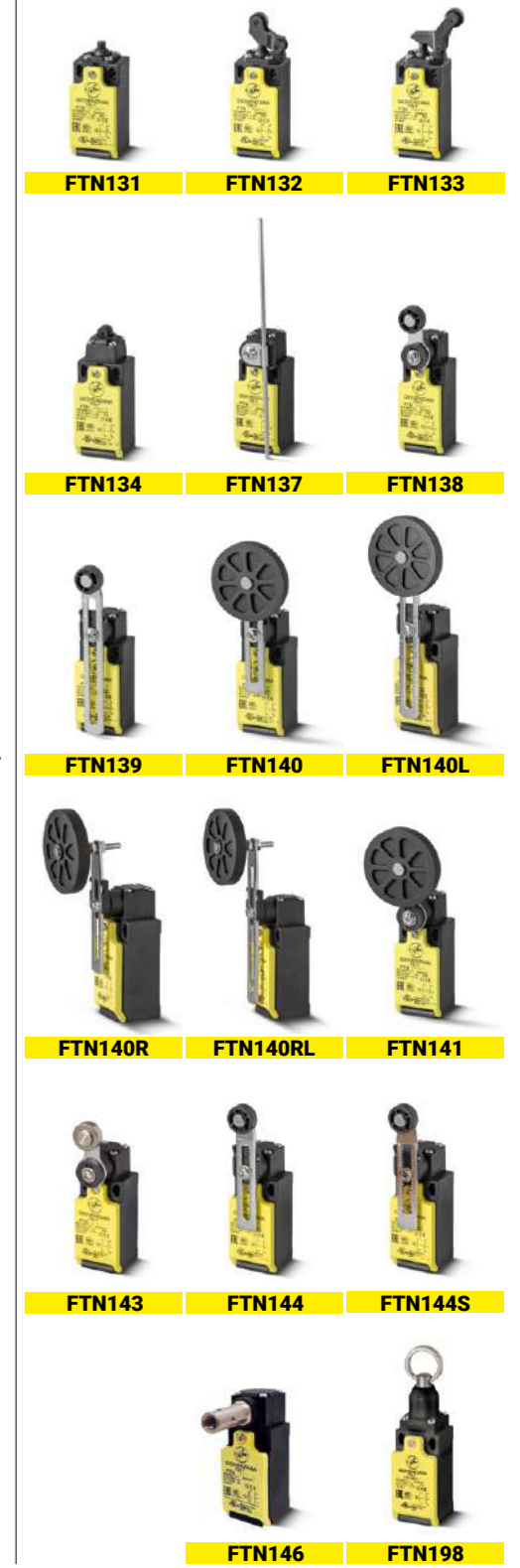
- **Systematic Capability**, i.e. the degree of reliability in terms of product design, both hardware and software (where applicable).
- **Architecture Constraints**, i.e. constraints on the architecture of the object that affect its level of security
- **PFDavg or PFH**, i.e. the probability of dangerous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

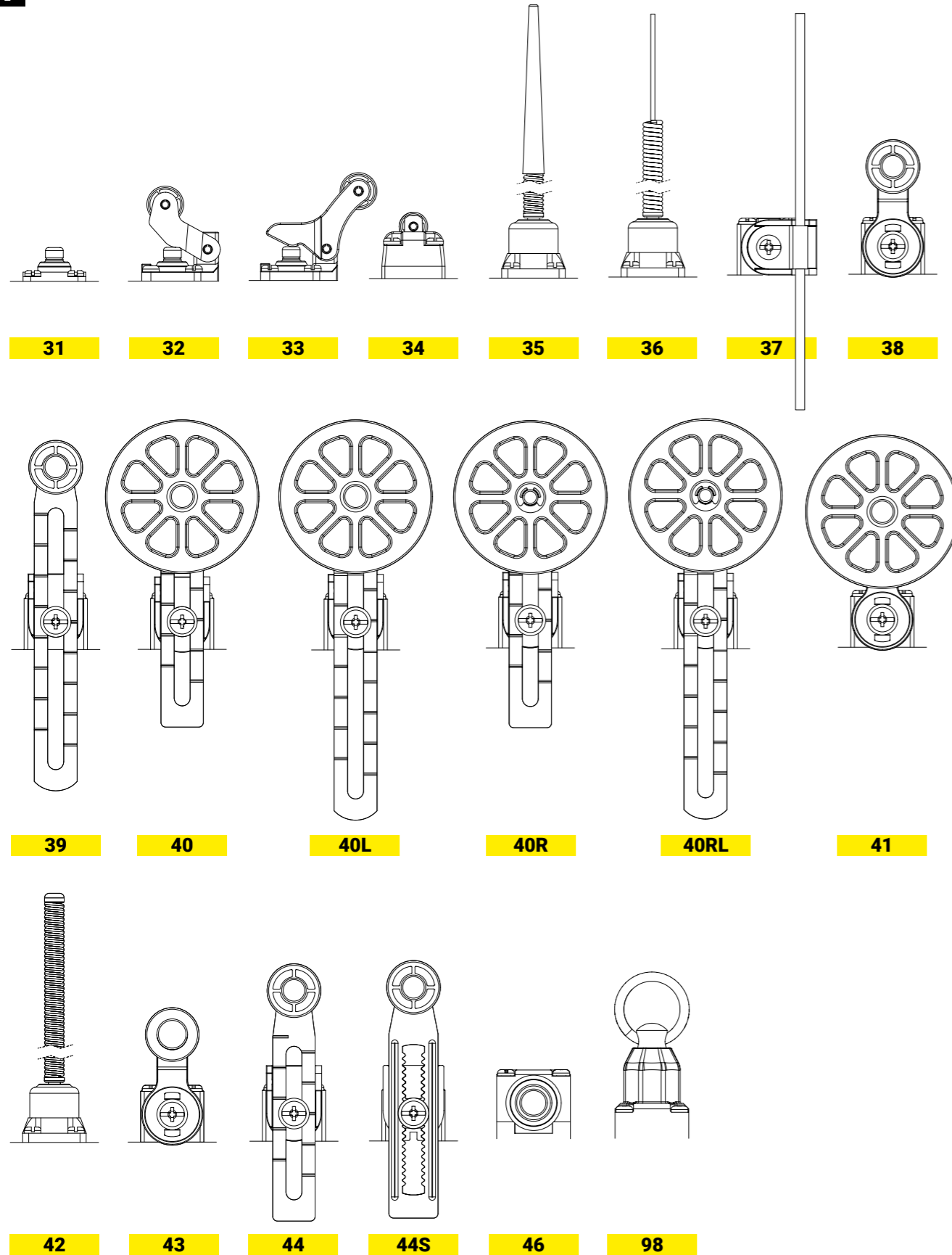
The FTN series thermoplastic limit switches are SIL 3.

**SIL<sup>3</sup>**

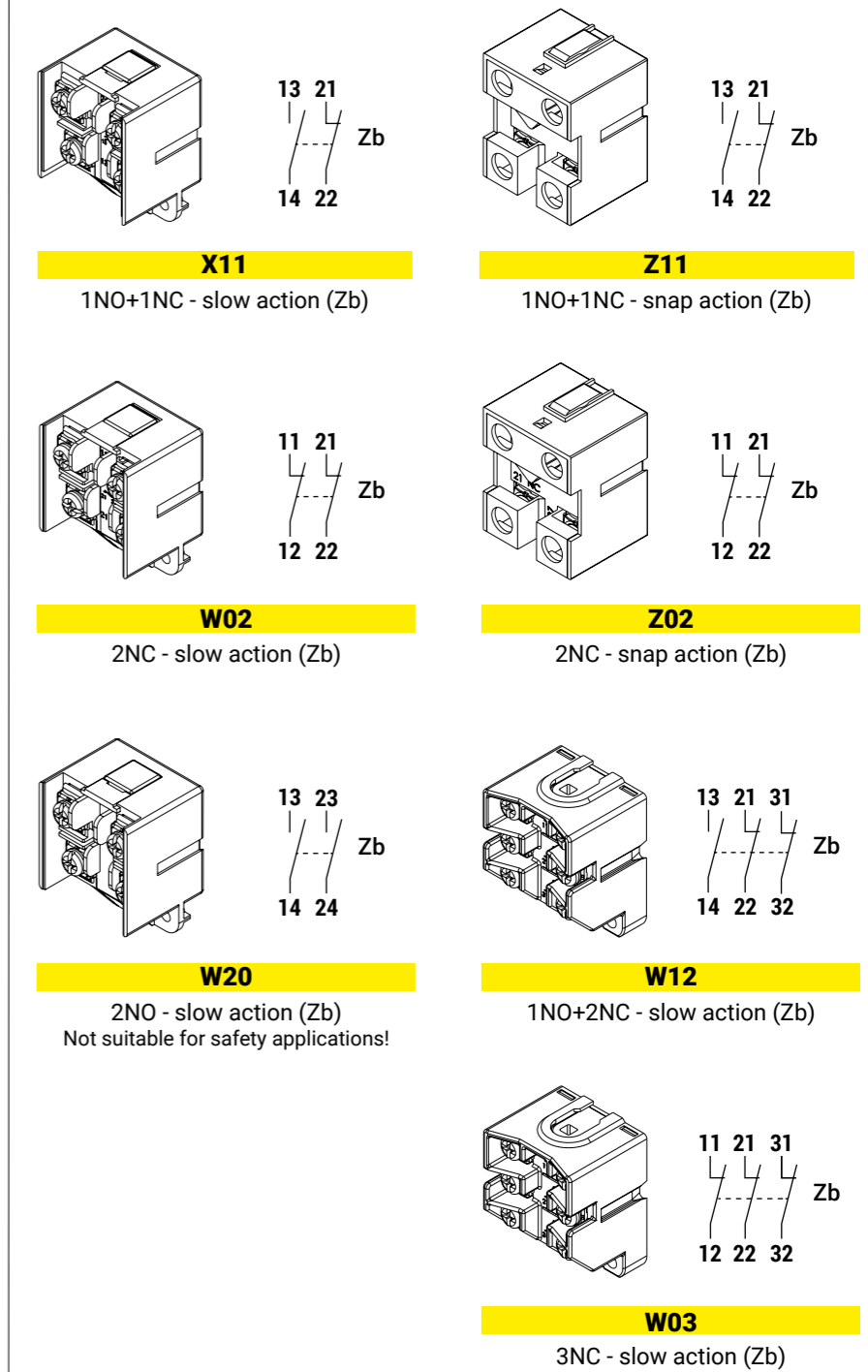


**FTN - PRODUCT SELECTION OVERVIEW**

**1 ACTUATORS**



**2 CONTACT BLOCKS**



**3 CONDUIT ENTRY**

**Threaded conduit entry**

**Standard:**  
M16 × 1.5

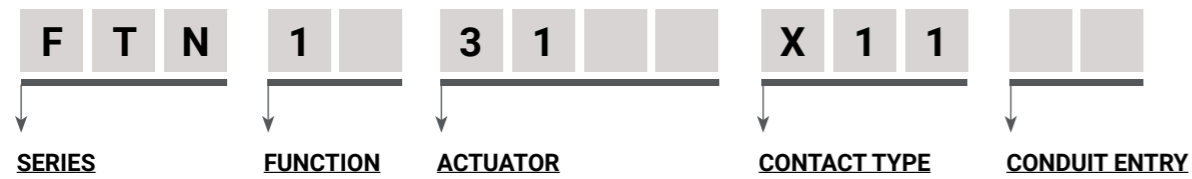
**On request:**  
M20 × 1.5  
1/2" NPT  
PG11  
PG13.5  
With connector

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**



SERIES	FUNCTION	ACTUATOR	CONTACT TYPE	CONDUIT ENTRY
<b>FTN</b> thermoplastic limit switches	<b>1</b> without reset	<b>31</b> Plastic end plunger	<b>X11</b> 1NO+1NC slow action Zb	<i>standard</i> <b>blank</b> M16 × 1.5
		<b>32</b> PA roller lever plunger, horizontal action	<b>W02</b> 2NC slow action Zb	<i>on request</i> <b>M</b> M20 × 1.5
		<b>33</b> PA roller lever plunger, vertical action	<b>W20</b> 2NO slow action Zb	<b>N</b> 1/2" NPT
		<b>34</b> PA roller plunger	<b>Z11</b> 1NO+1NC snap action Zb	<b>G1</b> PG11
		<b>35</b> spring lever with tip in PA	<b>Z02</b> 2NC snap action Zb	<b>G3</b> PG13.5
		<b>36</b> CAT'S whisker	<b>W12</b> 1NO+2NC slow action Zb	<b>C</b> male connector "A" M12 × 1
		<b>37</b> adjustable metal rod lever	<b>W03</b> 3NC slow action Zb	
		<b>38</b> Ø18 PA roller lever		
		<b>39</b> Ø18 long PA roller lever with variable length		
		<b>40</b> Ø50 rubber roller lever with variable length		
		<b>40L</b> Ø50 long rubber roller lever with variable length		
		<b>40R</b> Ø50 rubber roller lever with variable length and overhang		
		<b>40RL</b> Ø50 long rubber roller lever with variable length and overhang		
		<b>41</b> Ø50 rubber roller lever		
		<b>42</b> wobble stick		
		<b>43</b> Ø18 metal roller lever		
		<b>44</b> Ø18 PA roller lever with variable length		
		<b>44S</b> Ø18 PA roller lever with variable sawtooth length (step: 2.2 mm)		
		<b>46</b> safety-door hinge switch		
		<b>98</b> rope pull lever		

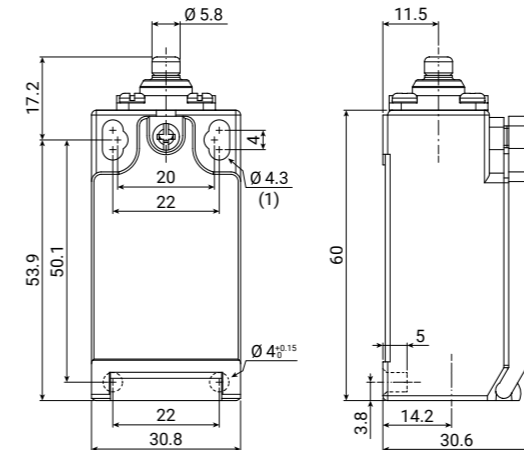
**FTN131**

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	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	2.8 mm 2.8 mm 2.4 mm	3.8 mm - -	7.3 N 7.3 N 8.2 N	3.5 mm 3.5 mm -	22 N 22 N -	6.0 mm
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	2.1 mm 2.1 mm	1.1 mm 0.9 mm	7.2 N 7.2 N	4.5 mm 4.5 mm	16.3 N 16.3 N	
W12: 1NO+2NC W03: 3NC	A300-Q300		2.6 mm 2.6 mm	3.2 mm -	7.3 N 7.3 N	3.8 mm 3.8 mm	23 N 23 N	

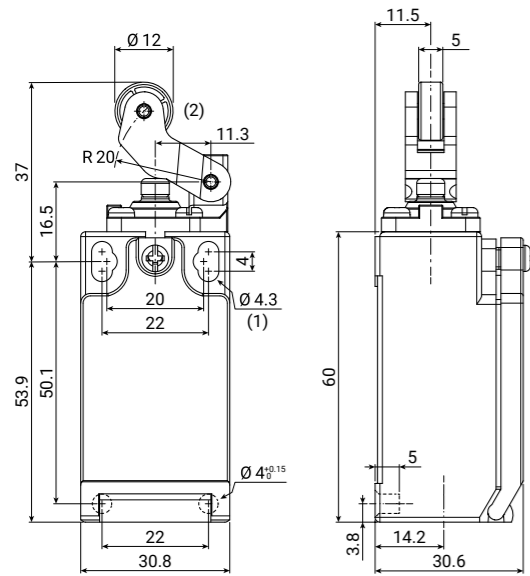
**FTN132**

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
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)	

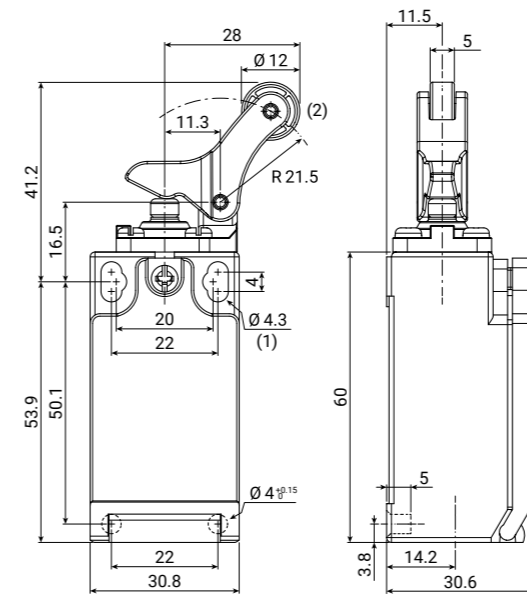
**FTN133**

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

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC W20: 2NO	A600-Q600	AC15: 400V - 4A	3.6 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	

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	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	



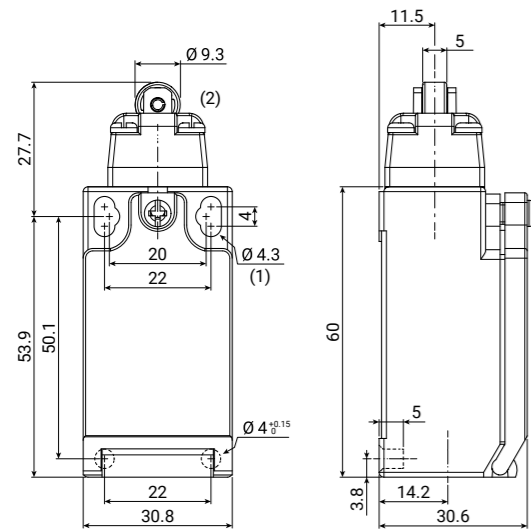
**FTN134**

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	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 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	

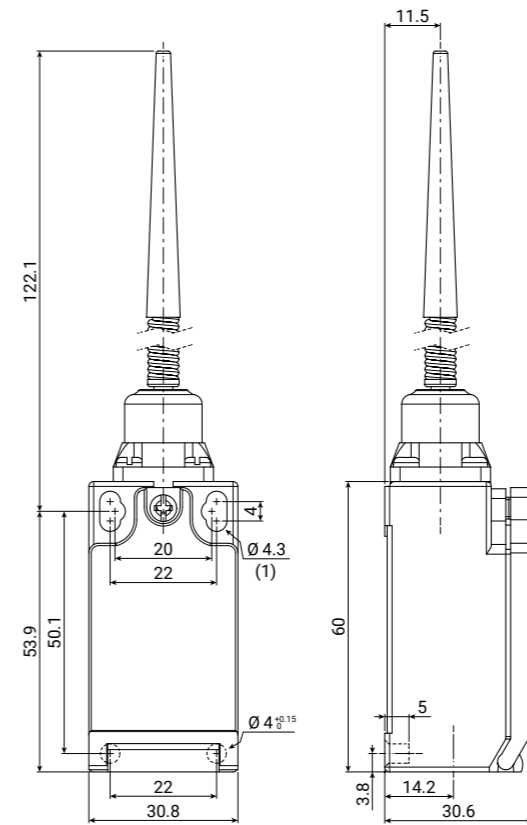
**FTN135**

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	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	N G1 G3	1/2" NPT 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	-	-	



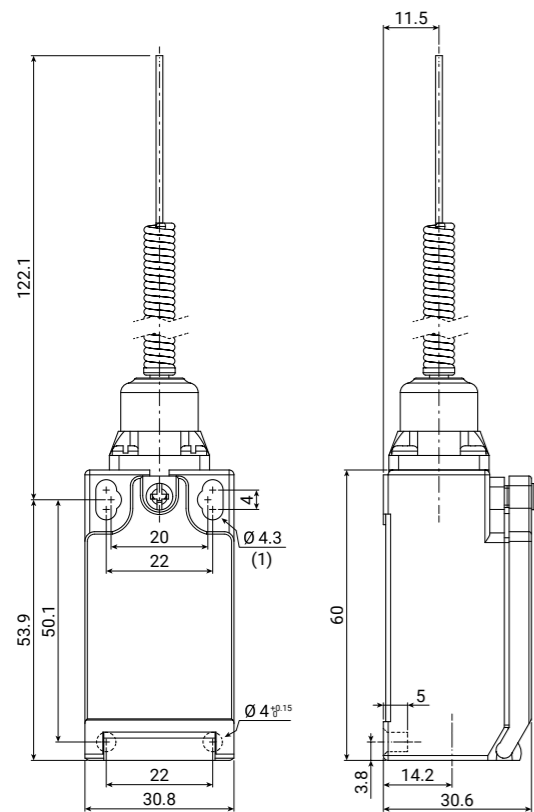
### FTN136

Limit switch with CAT'S whisker  
IP67



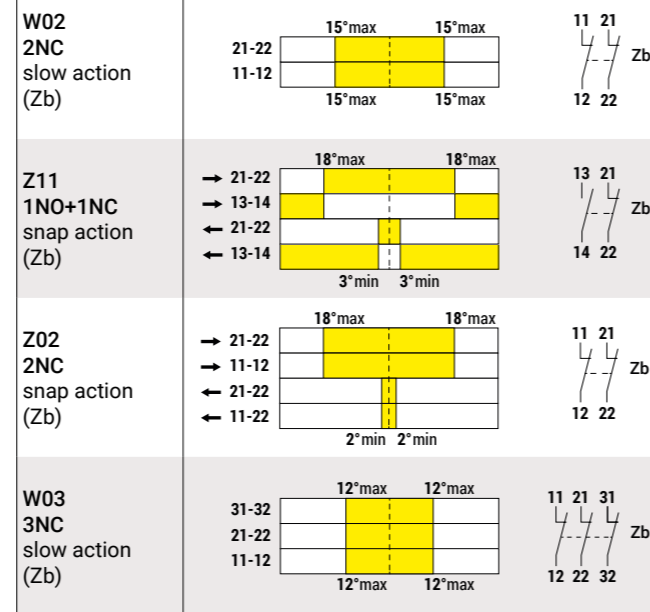
FTN series		1 function	36 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	36 CAT'S whisker	<b>W02: 2NC</b> slow action (Zb) <b>Z11: 1NO+1NC</b> snap action (Zb) <b>Z02: 2NC</b> <b>W03: 3NC</b> slow action (Zb)	<b>blank</b> M16 × 1.5 (standard) <b>M</b>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

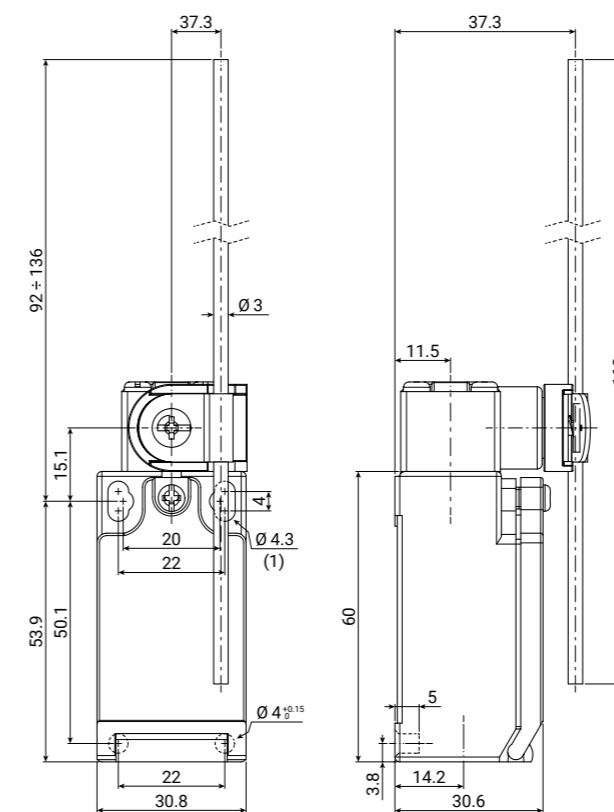
### FTN137

Limit switch with adjustable metal rod lever  
IP67



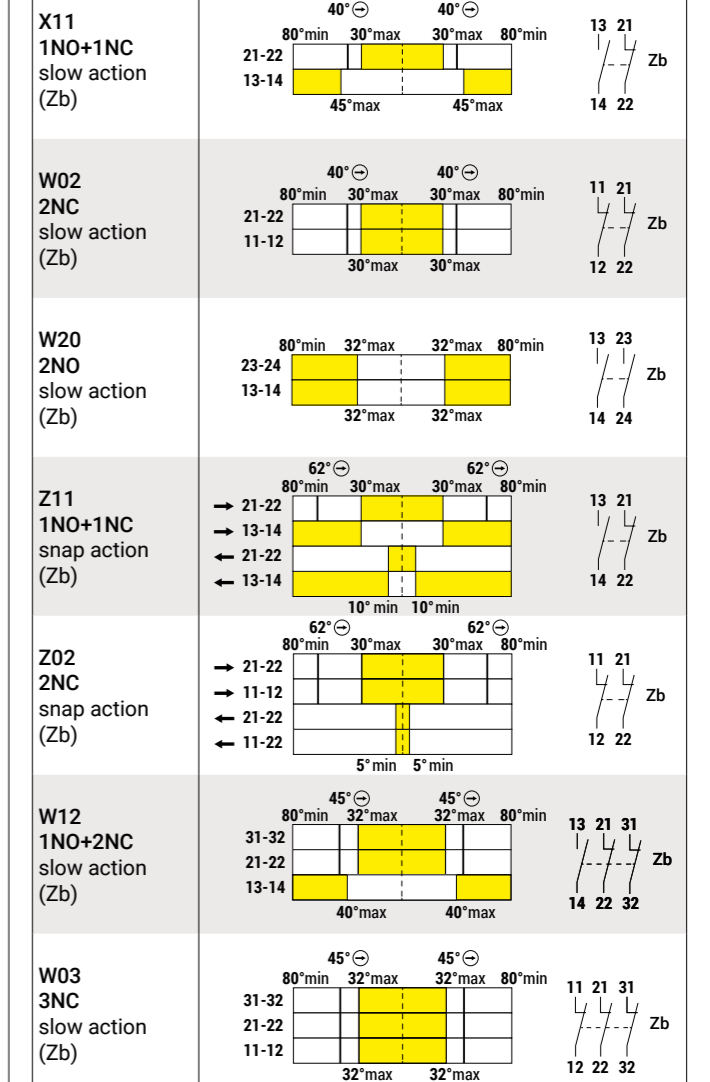
FTN series		1 function	37 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	37 adjustable metal rod lever	<b>X11: 1NO+1NC</b> slow action (Zb) <b>W02: 2NC</b> <b>Z11: 1NO+1NC</b> snap action (Zb) <b>Z02: 2NC</b> <b>W12: 1NO+2NC</b> slow action (Zb) <b>W03: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

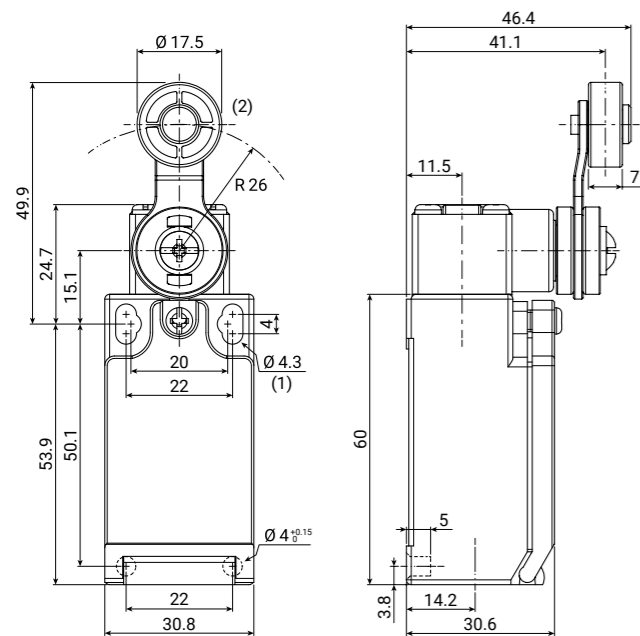
**FTN138**

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)	

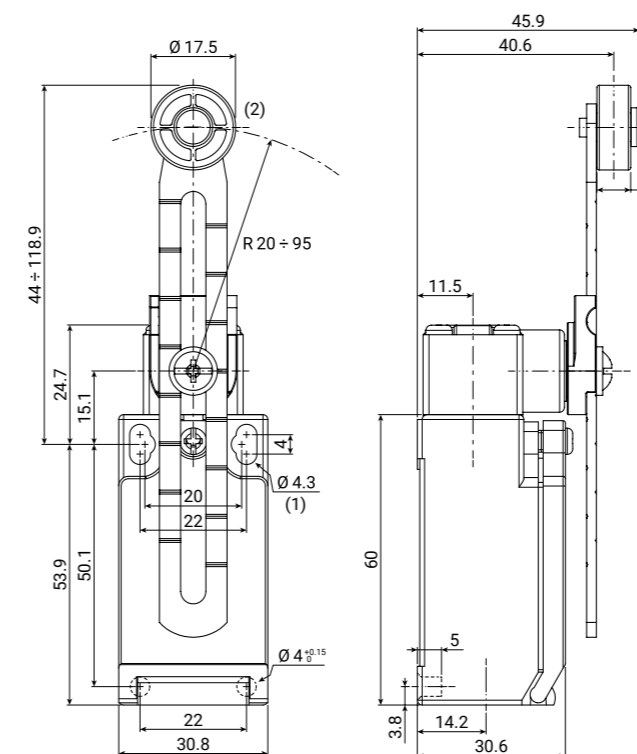
**FTN139**

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	-	-	

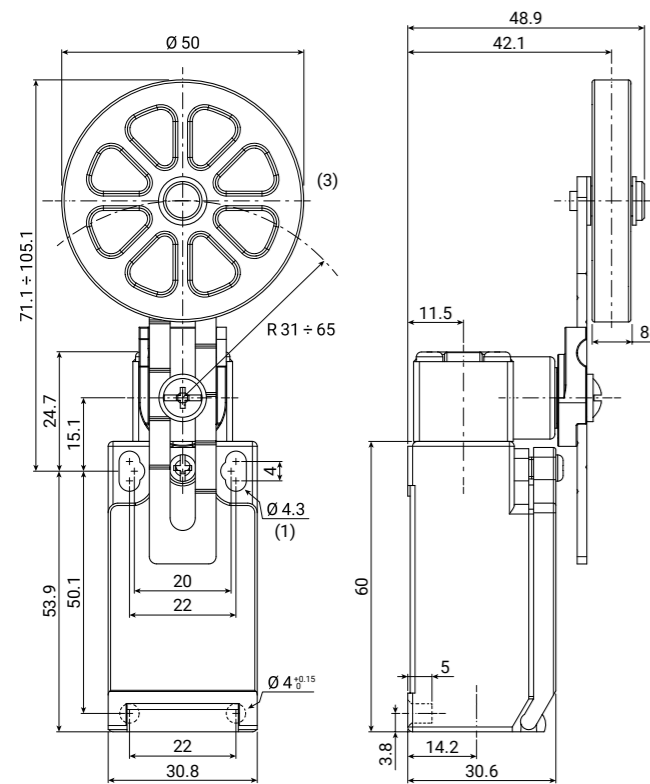
**FTN140**

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 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  
(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)	

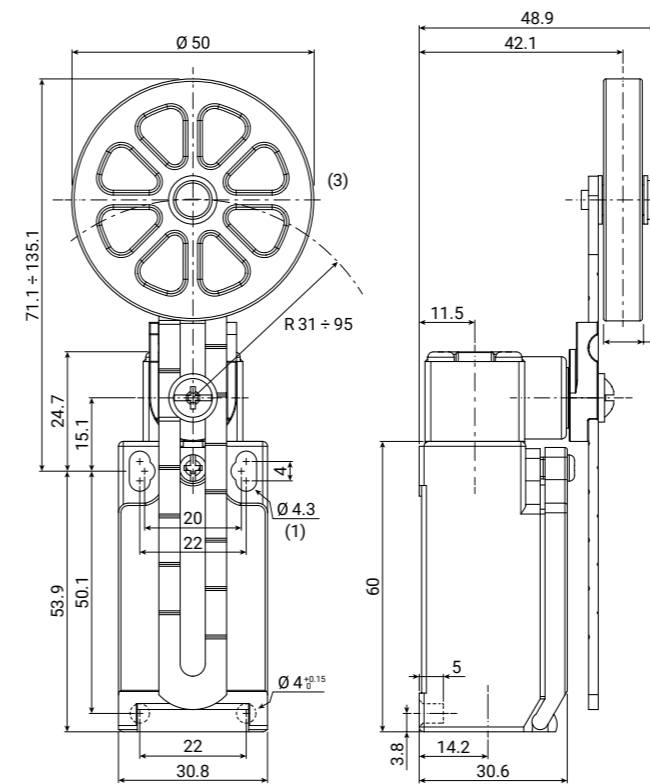
**FTN140L**

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 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  
(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	-	-	



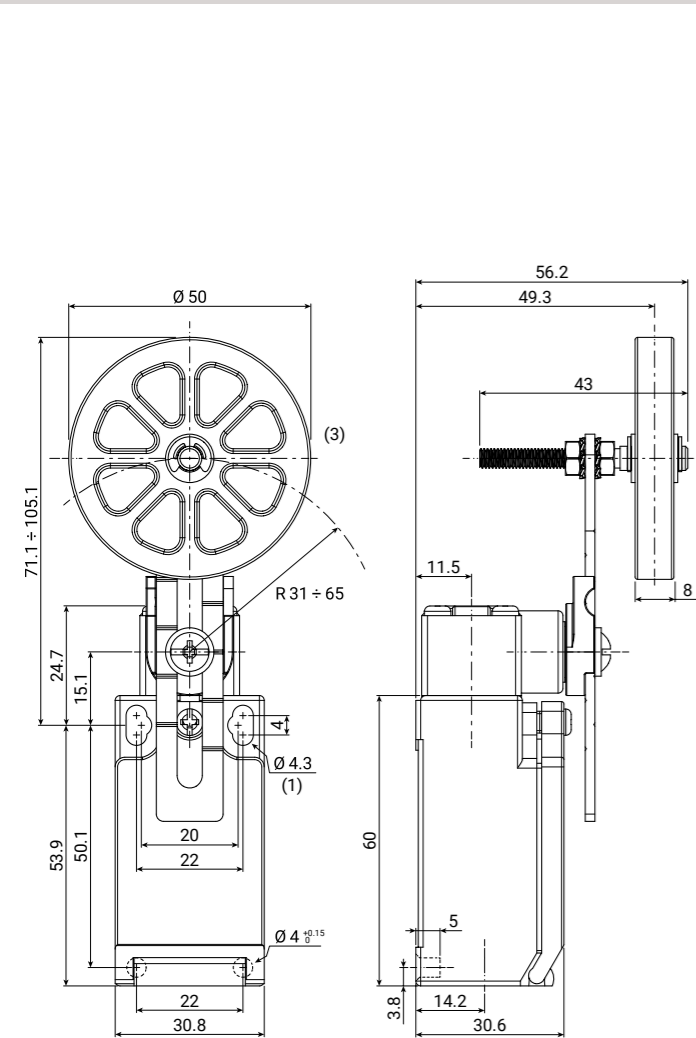
### FTN140R

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	-	-	

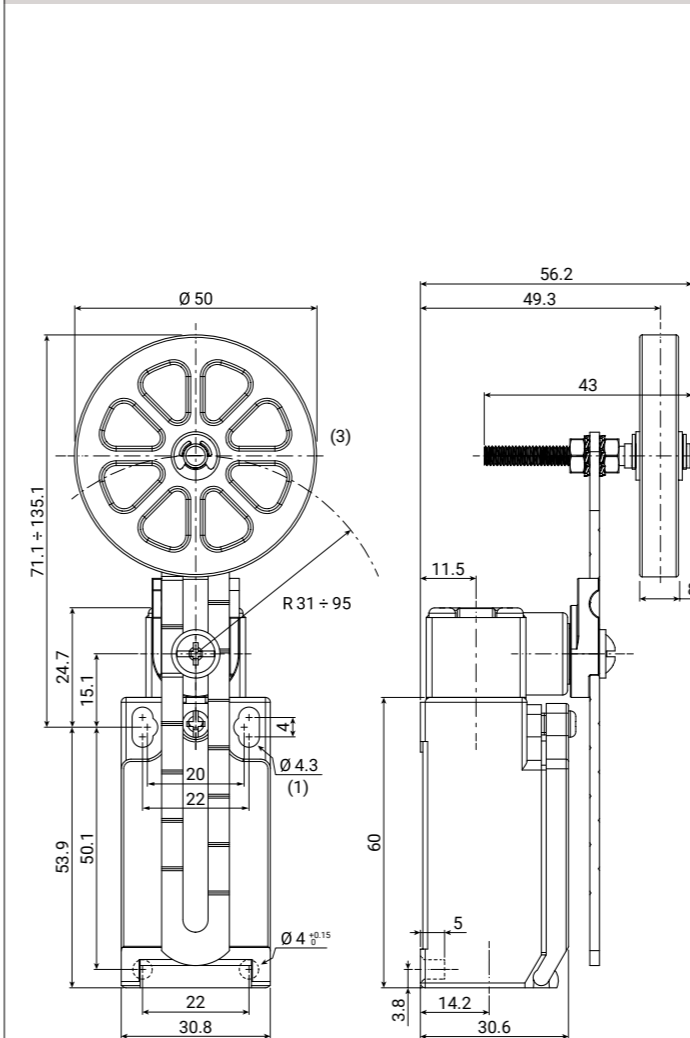
### FTN140RL

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	-	-	

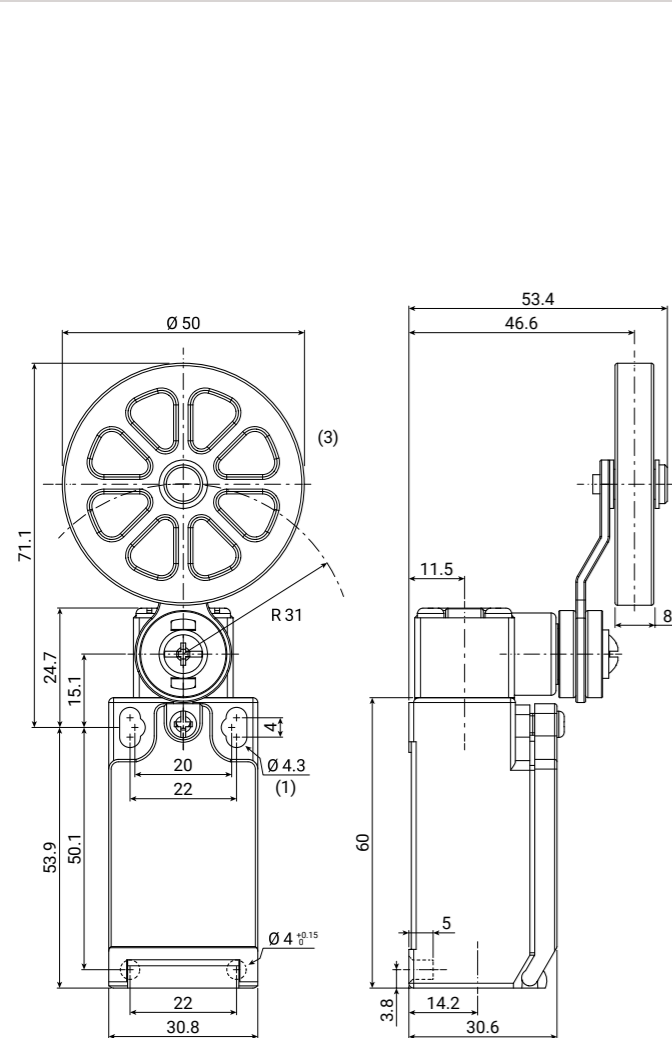
**FTN141**

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	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  
(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	-	-	

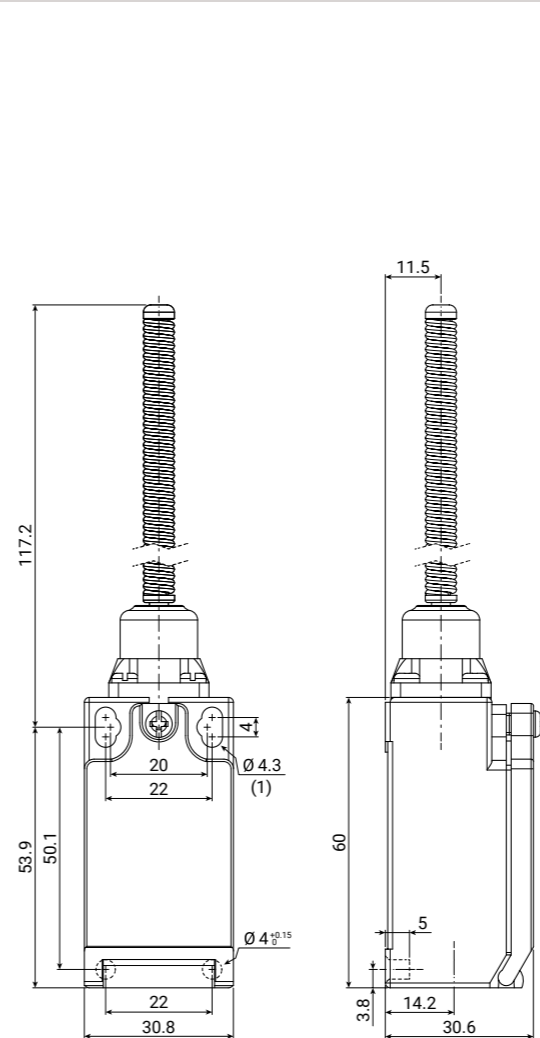
**FTN142**

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	slow action (Zb)	blank M	M16 × 1.5 (standard) M20 × 1.5
						Z11: 1NO+1NC Z02: 2NC	snap action (Zb)	N G1 G3	1/2" NPT 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	30°	-	6.5 N	-	-	-
Z11: 1NO+1NC Z02: 2NC	B600-Q600	DC13: 24V - 6A	18°	3°	5.8 N	-	-	
			18°	2°	5.8 N	-	-	
W03: 3NC	A300-Q300		32°	-	6.5 N	-	-	

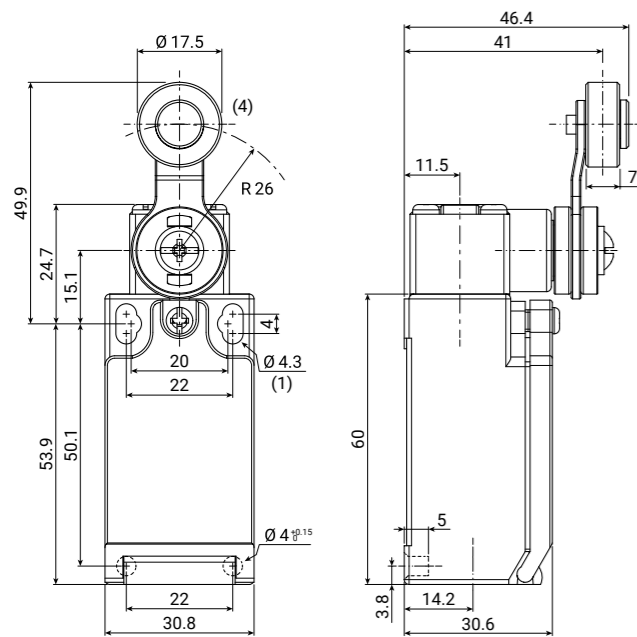
### FTN143

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	-	-	

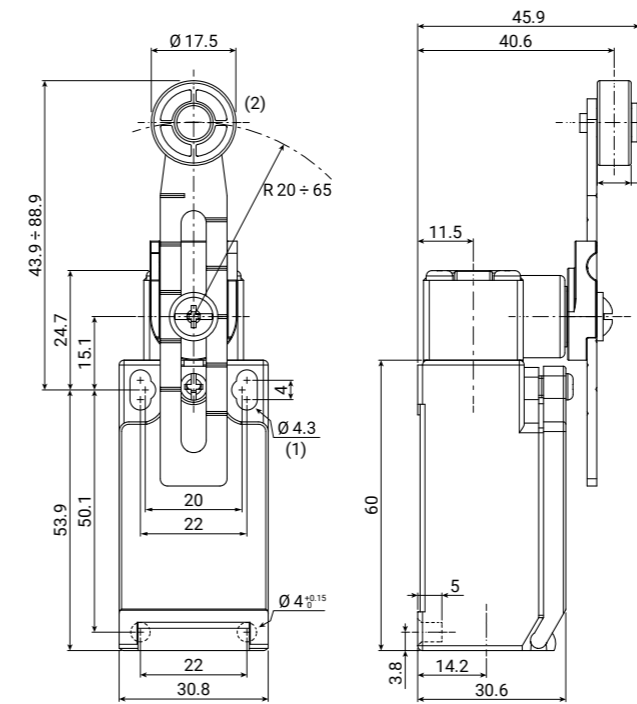
### FTN144

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	-	-	



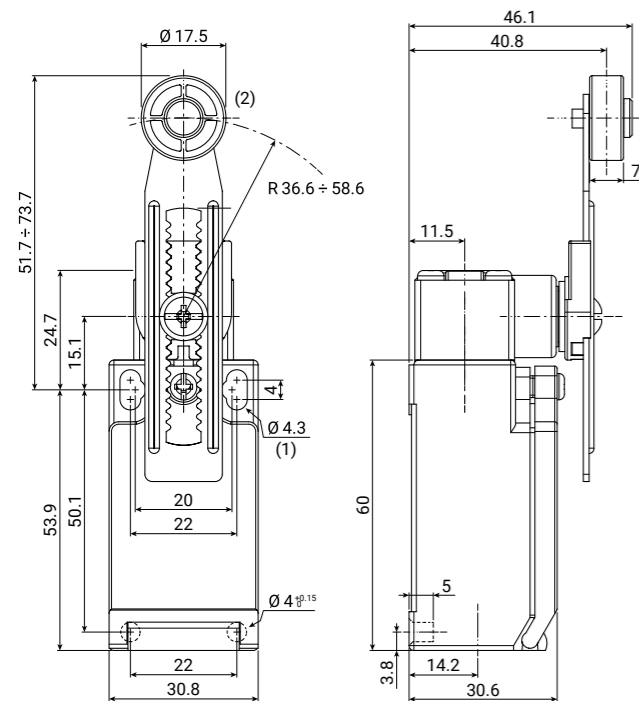
### FTN144S

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

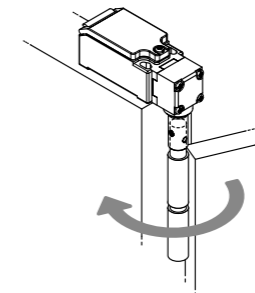


FTN series		1 function	46 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	46 safety-door hinge switch	X11: 1NO+1NC W02: 2NC W12: 1NO+2NC W03: 3NC	blank M16 × 1.5 (standard) M M20 × 1.5 N 1/2" NPT G1 PG11 G3 PG13.5 C male connector "A" M12 × 1

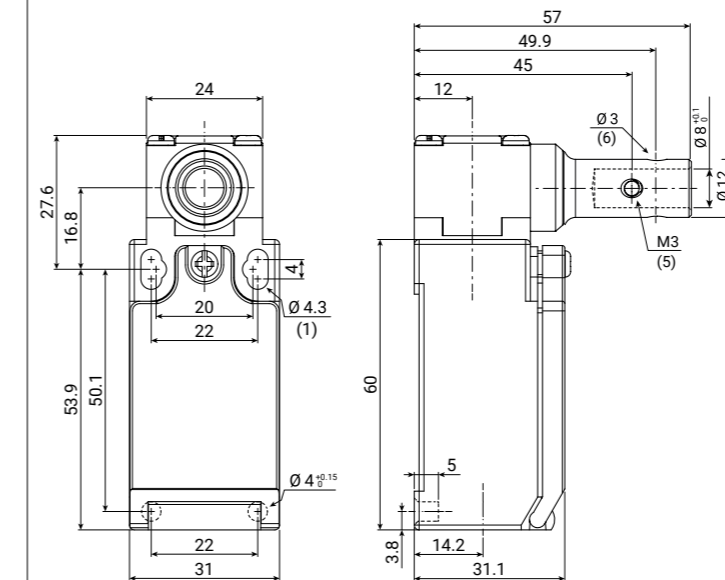
#### FTN146

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

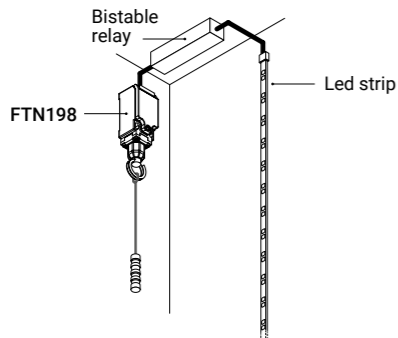
contact type	categories	ratings	operational travel		operating force OF	positive opening		total travel TT
			PT1	PT2 (slow action) RP (snap action)		POT (travel)	POF (force)	
X11: 1NO+1NC W02: 2NC	A600-Q600	AC15: 400V - 4A	10°	20°	0.06 N·m	25°	0.12 N·m	-
W12: 1NO+2NC	A300-Q300	DC13: 24V - 6A	10°	20°	0.05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

**FTN198**

Limit switch with rope pull lever  
IP67



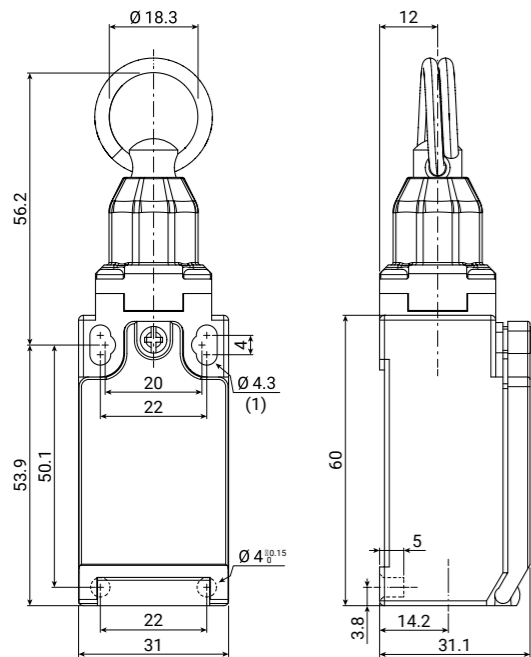
FTN series		1 function	98 actuator	XXX contact type	XX conduit entry
FTN	thermoplastic limit switch	1 without reset function	98 rope pull lever	X11: 1NO+1NC W02: 2NC W20: 2NO Z11: 1NO+1NC Z02: 2NC W12: 1NO+2NC W03: 3NC	blank M N G1 G3 C
				slow action (Zb) snap action (Zb) slow action (Zb)	M16 x 1.5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



The FTN198 hasn't a maintained operating mode.

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

technical drawing - sizes in mm



(1) mounting holes

contact type	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	-	-	

**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.

