



**FTNG SERIES**



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

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

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

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

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

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

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

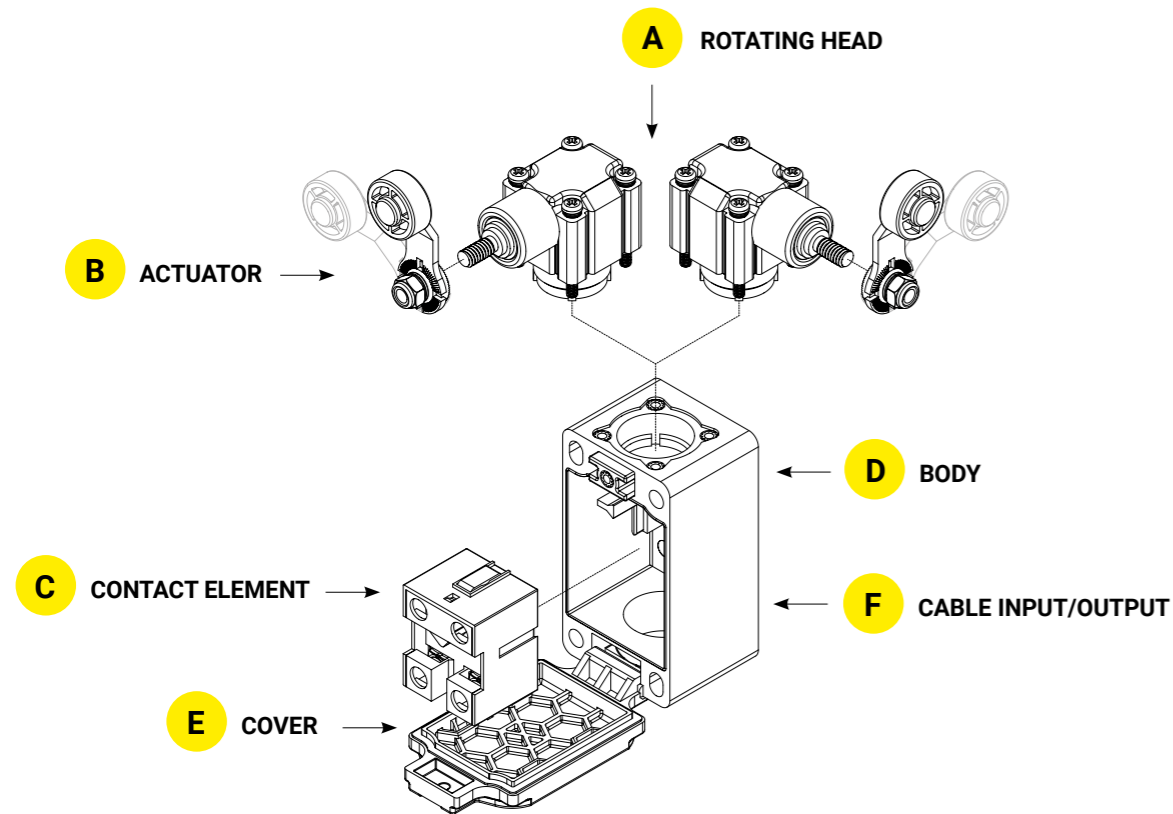
Giovanzana limit switches offer solutions for every need and are suitable for the most varied sectors of use.



**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 <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
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. 75)
Fixing		4 × M5 screws

**STRUCTURE DESCRIPTION**

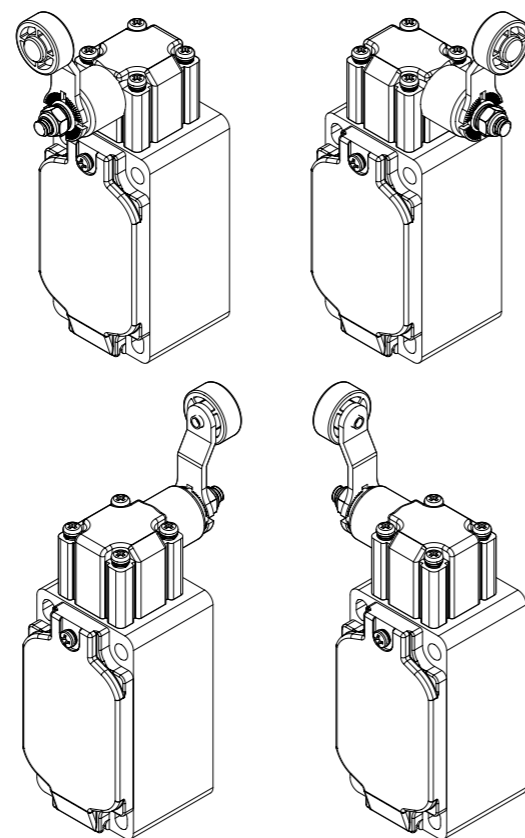


**A - ROTATING HEAD**

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

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

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



**B - ACTUATOR**

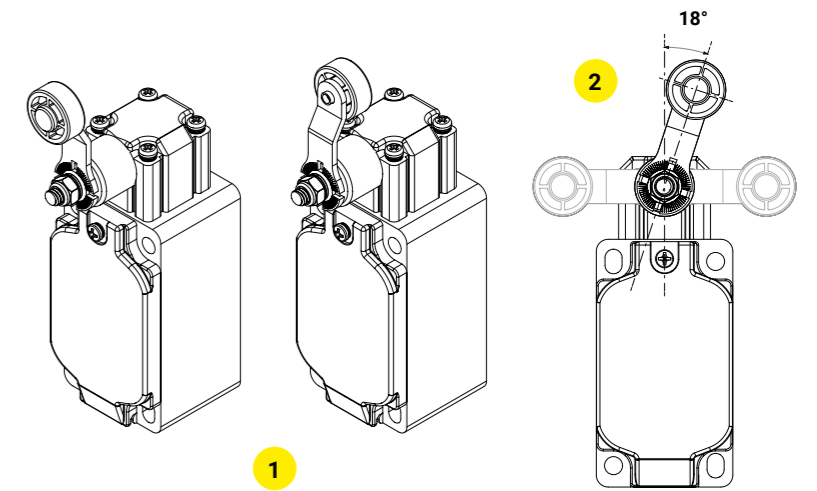
Available different types of actuators: plungers, levers, rollers and rods.

**1. Tilting levers**

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

**2. Adjustable levers**

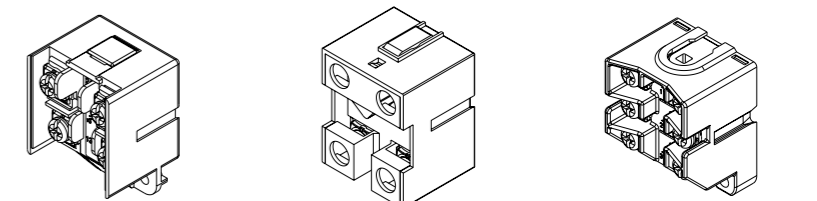
All levers are adjustable in steps of 18° over 360°, compared to the horizontal axis of the head. The positive movement transmission is always guaranteed thanks to the particular geometric coupling between the lever and the rotation shaft.



**C - CONTACT ELEMENT**

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

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



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

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

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

**W02:** 2NC  
Slow action (Zb)

**Z02:** 2NC  
Snap action (Zb)

**W03:** 3NC  
Slow action (Zb)

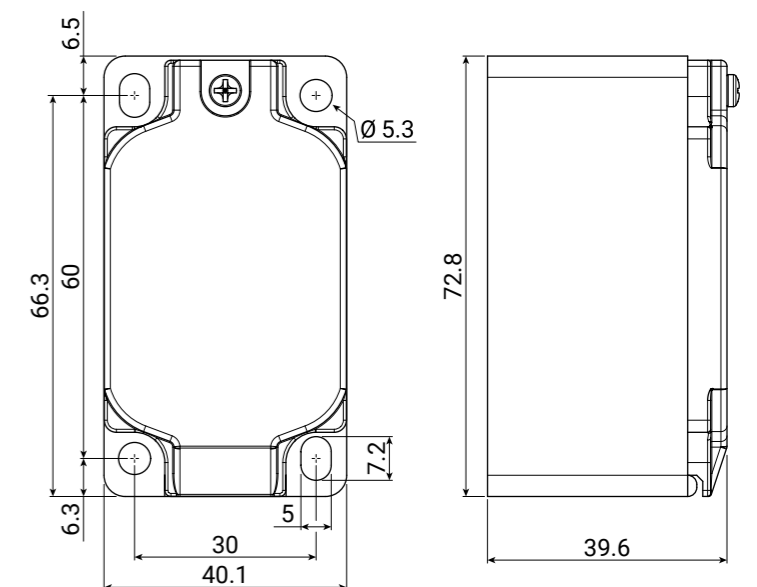
**W20:** 2NO  
Slow action (Zb)

→ Not suitable for safety applications!

**D - BODY**

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

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



**E - COVER**

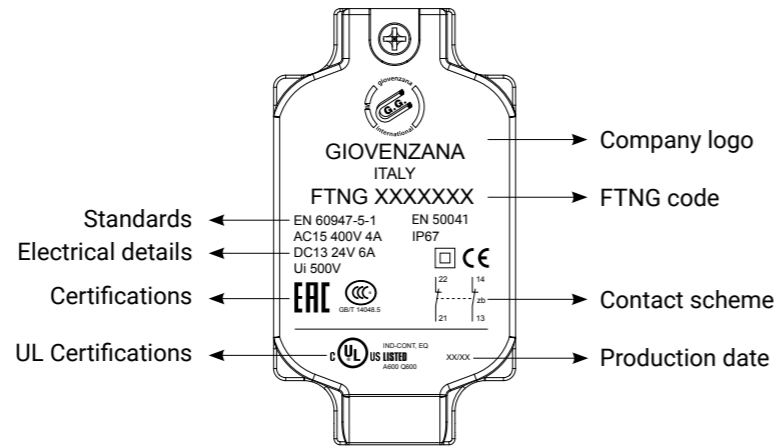
Material conforming to the RoHS Directive.

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

Some of the advantages:

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

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



**F - CABLE INPUT/OUTPUT**

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

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

**Standard: Blank: M20 × 1.5**

**On request: N: 1/2" NPT  
G3: Pg 13.5  
C: M12 connector**

**CONTACT ELEMENT - SPECIFICATIONS**

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



**CONTACT ELEMENT - OPERATING PRINCIPLE**

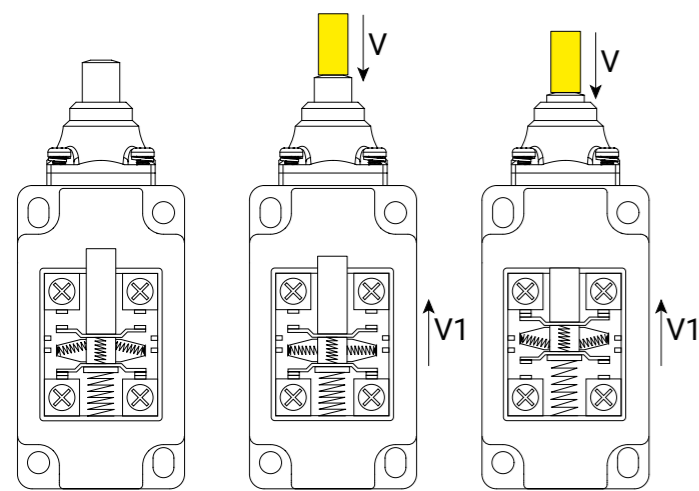
**SLOW ACTION - Contact elements direct acting**

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

The contact movement speed (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.



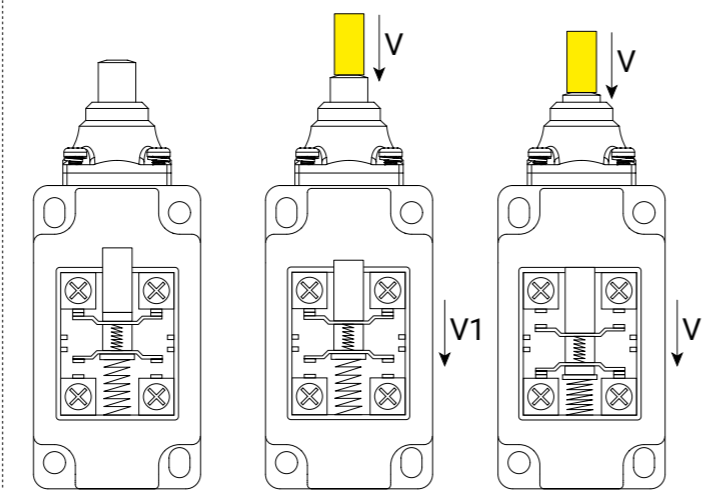
**SNAP ACTION - Contact elements acting independently**

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.

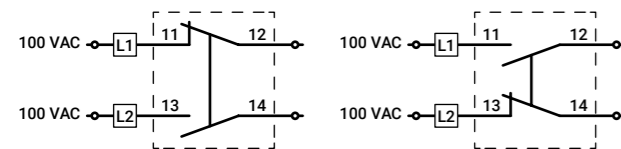
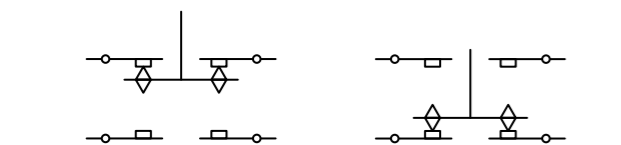
This feature ensures satisfactory electrical performance in applications involving low-speed actuators.



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

**Za contact type**

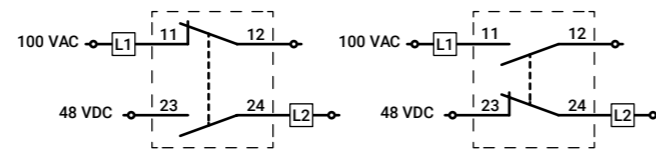
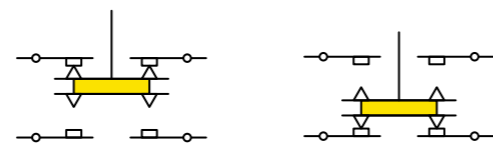
A single blade opens and closes the contacts. With this type of contact it is NOT possible to supply the circuit with different voltages and polarities.



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.



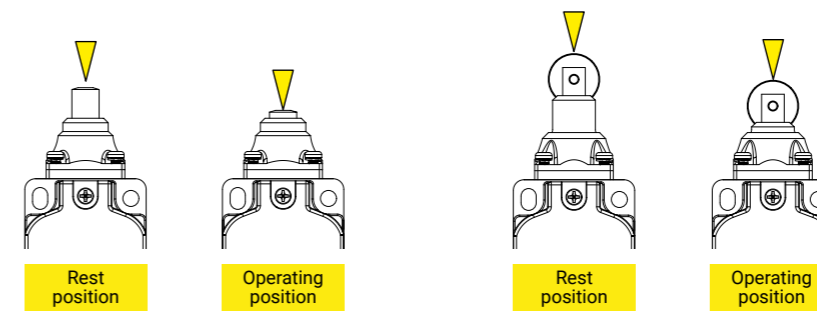
L1: load 1  
L2: load 2

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

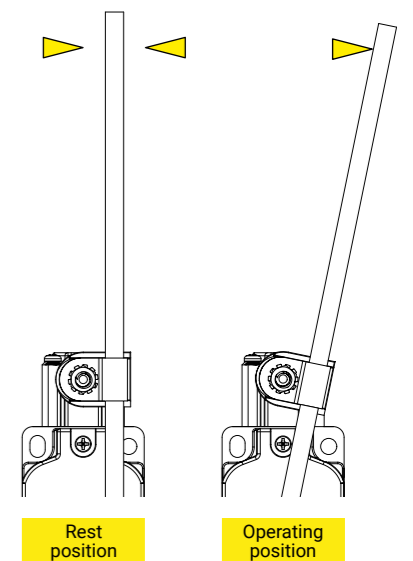
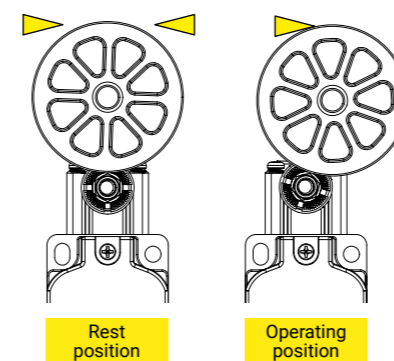
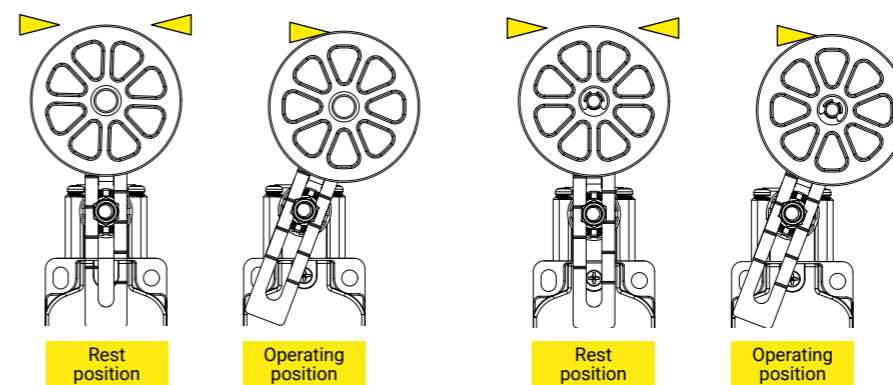
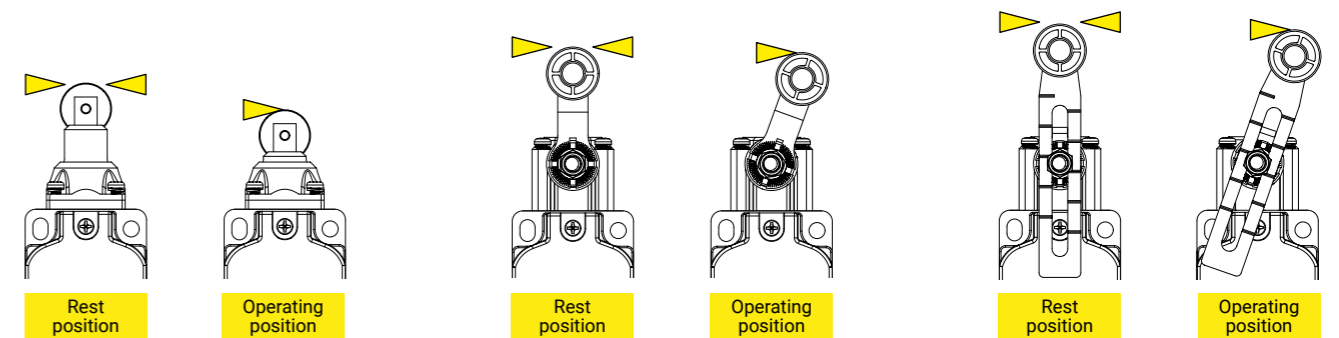
**DETECTION MOVEMENTS**

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**

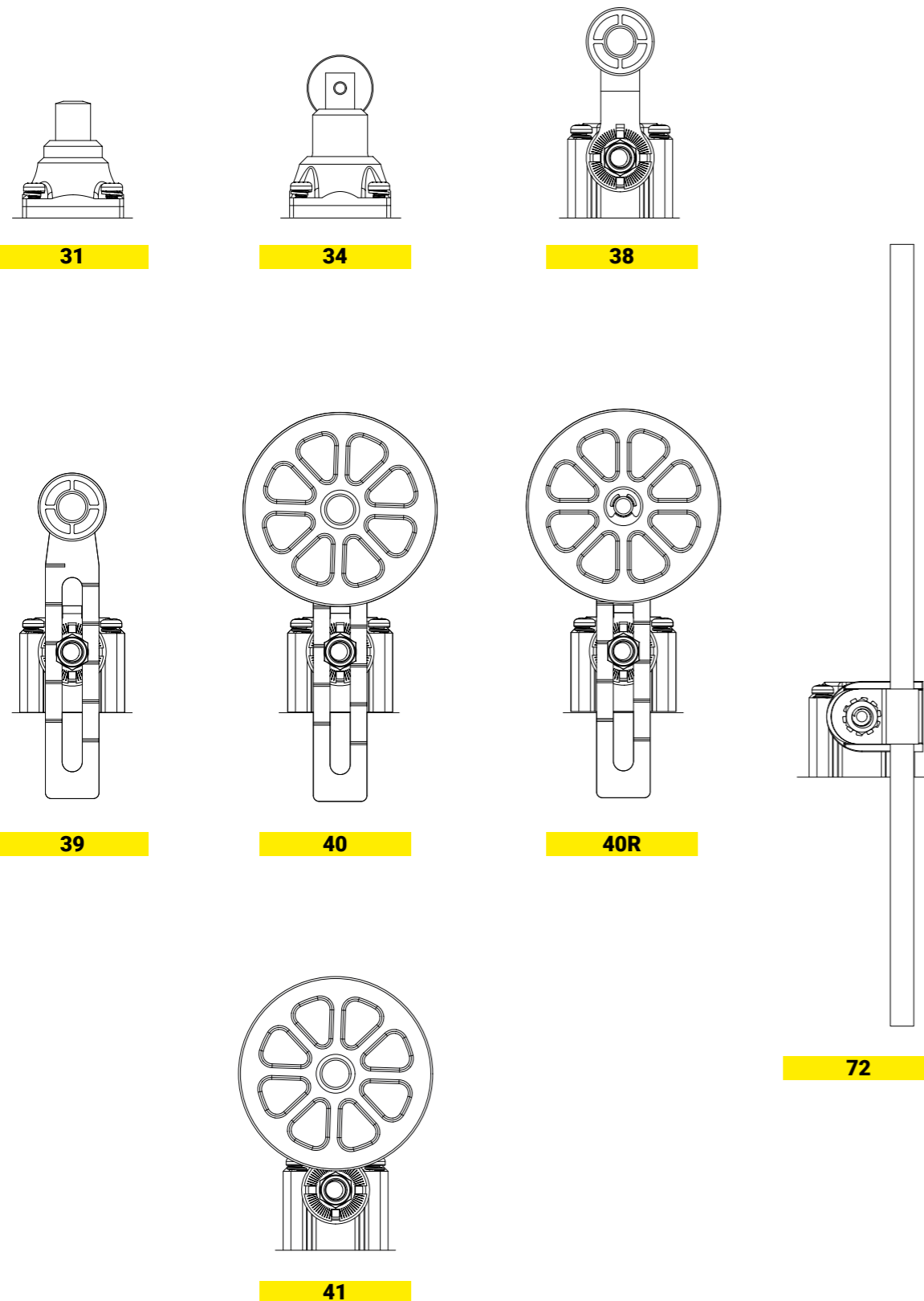


**2. Rotary detection movement - Lever**

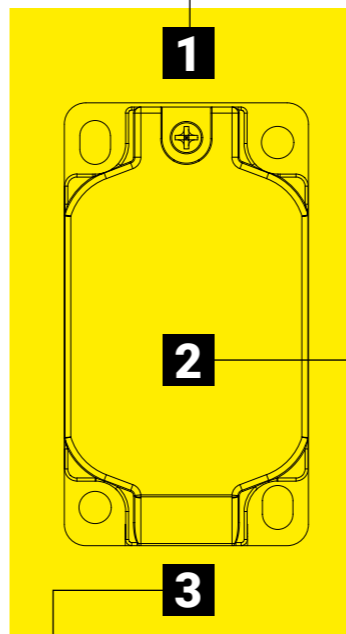
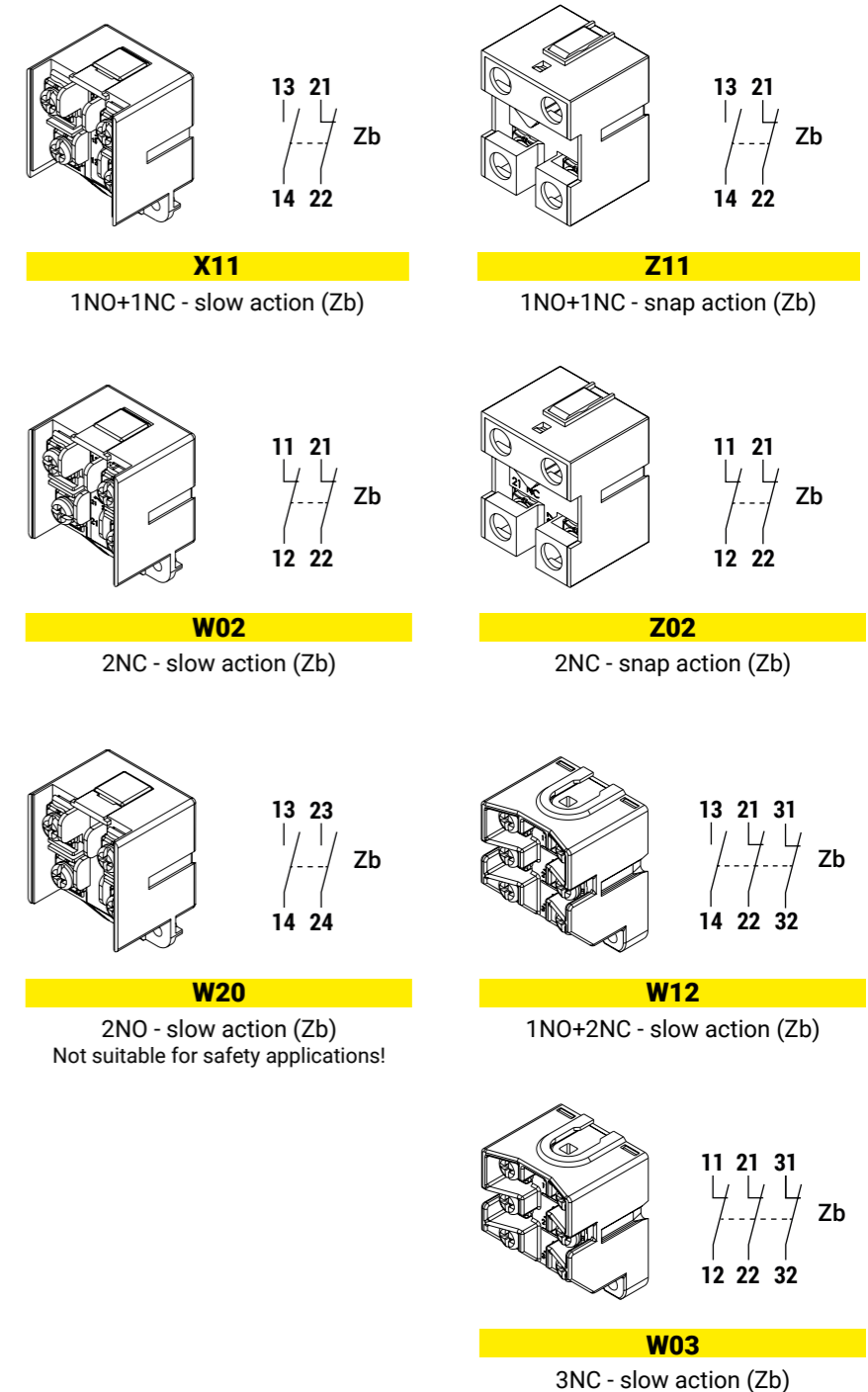


**FTNG - PRODUCT SELECTION OVERVIEW**

**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.

# SIL<sup>3</sup>

### FTNG - CODE SELECTION OVERVIEW

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



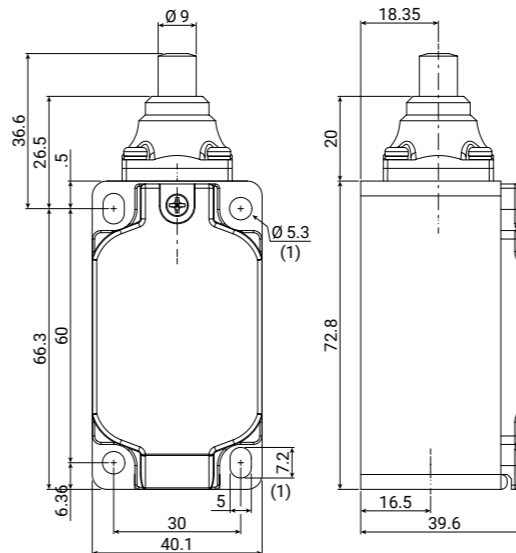
## FTNG131

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	
			<b>X11:</b> 1NO+1NC <b>W02:</b> 2NC <b>W20:</b> 2NO	slow action (Zb)
			<b>Z11:</b> 1NO+1NC <b>Z02:</b> 2NC	snap action (Zb)
			<b>W12:</b> 1NO+2NC <b>W03:</b> 3NC	slow action (Zb)
				<b>blank</b> <b>N</b> <b>G3</b> <b>C</b>
				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
<b>X11</b> 1NO+1NC slow action (Zb)	
<b>W02</b> 2NC slow action (Zb)	
<b>W20</b> 2NO slow action (Zb)	
<b>Z11</b> 1NO+1NC snap action (Zb)	
<b>Z02</b> 2NC snap action (Zb)	
<b>W12</b> 1NO+2NC slow action (Zb)	
<b>W03</b> 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	2.6 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	

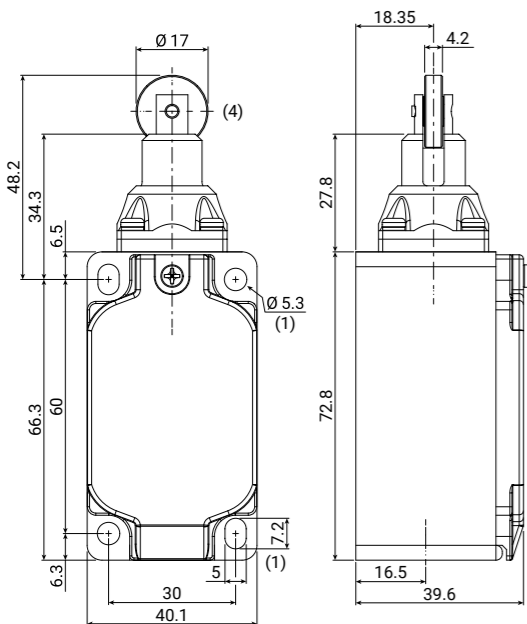
### FTNG134

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 W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	snap 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  
(4) steel roller

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

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		OF	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	

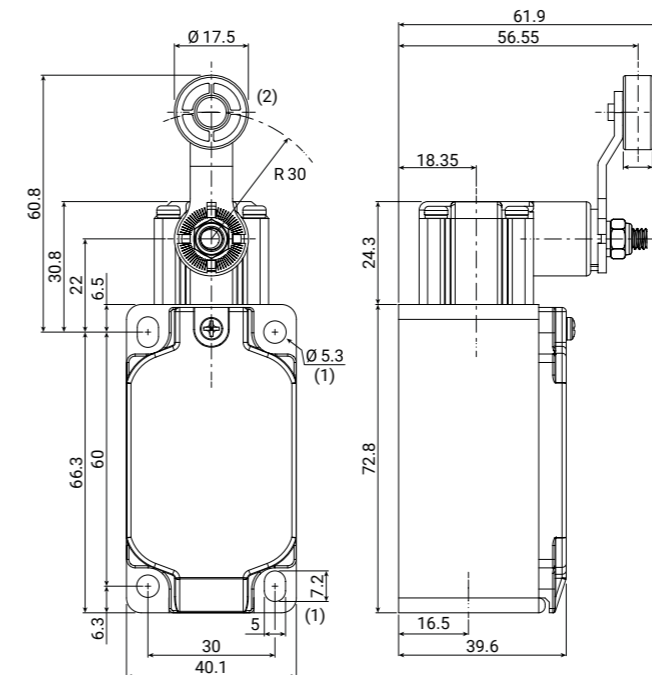
### FTNG138

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 W02: 2NC W20: 2NO	slow action (Zb)
			Z11: 1NO+1NC Z02: 2NC	snap 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  
(2) PA roller

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

contact type	categories	ratings	operational travel		operating force	positive opening		total travel
			PT1	PT2 (slow action) RP (snap action)		OF	POT (travel) POF (force)	
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	



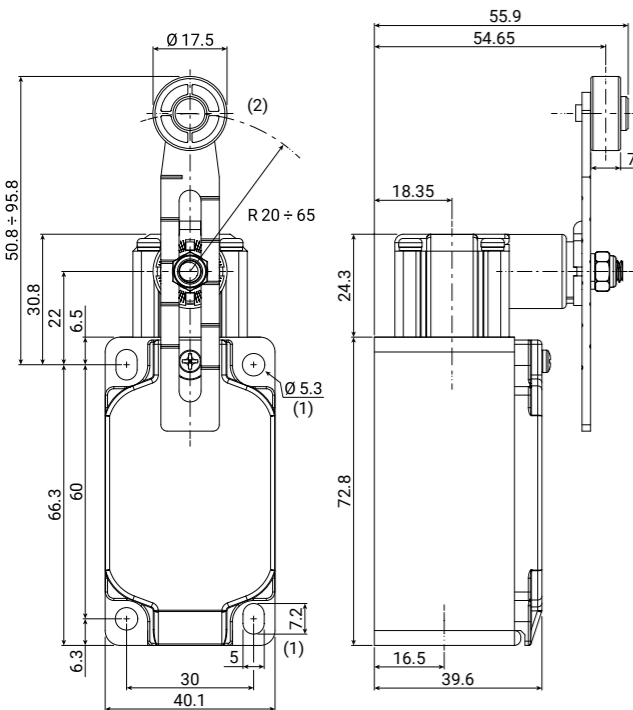
### FTNG139

Limit switch with Ø18 PA roller lever with variable length  
IP67



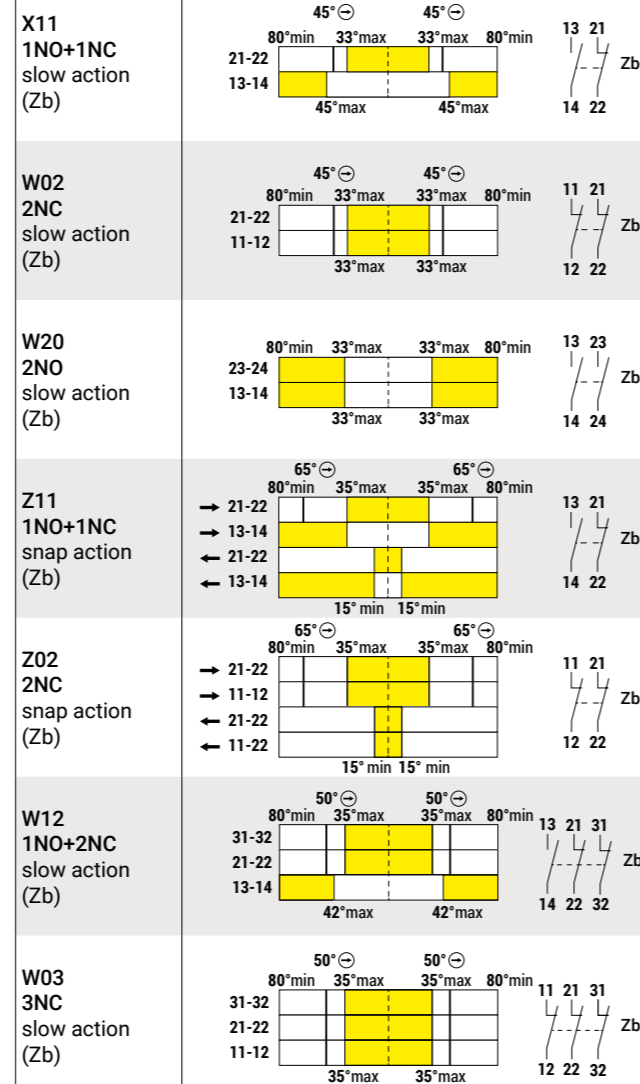
FTNG series	1 function	39 actuator	XXX contact type	XX conduit entry
FTNG 40 mm thermoplastic limit switches for heavy applications	1 without reset function	39 Ø18 PA roller lever with variable length	<b>X11: 1NO+1NC</b> <b>W02: 2NC</b> <b>W20: 2NO</b> <b>Z11: 1NO+1NC</b> <b>Z02: 2NC</b> <b>W12: 1NO+2NC</b> <b>W03: 3NC</b>	<b>blank</b> <b>N</b> <b>G3</b> <b>C</b> M20 × 1.5 (standard) 1/2" NPT PG13.5 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)		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°	42°	6.5 N	50°	8 N	
			35°	-	6.5 N	50°	8 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300	35°	-	6.5 N	50°	8 N		

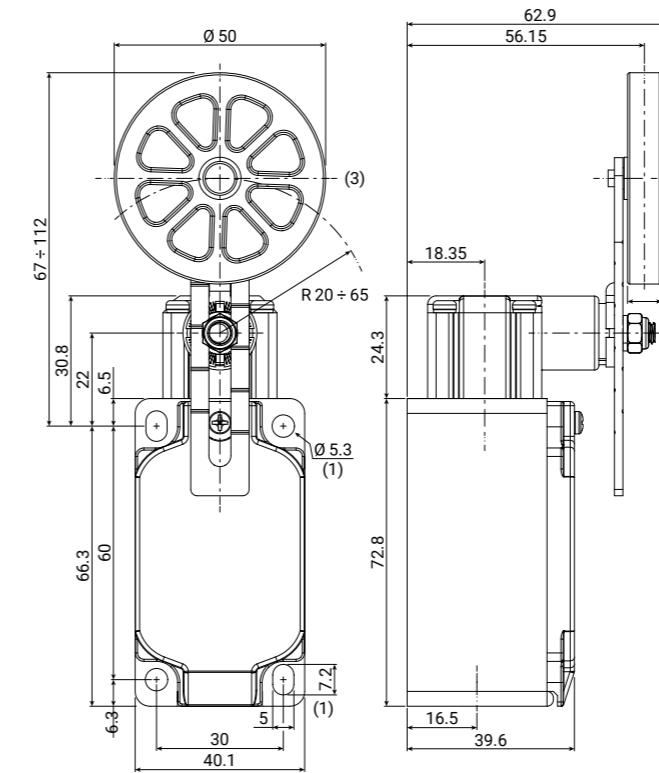
### FTNG140

Limit switch with Ø50 rubber roller lever with variable length  
IP67



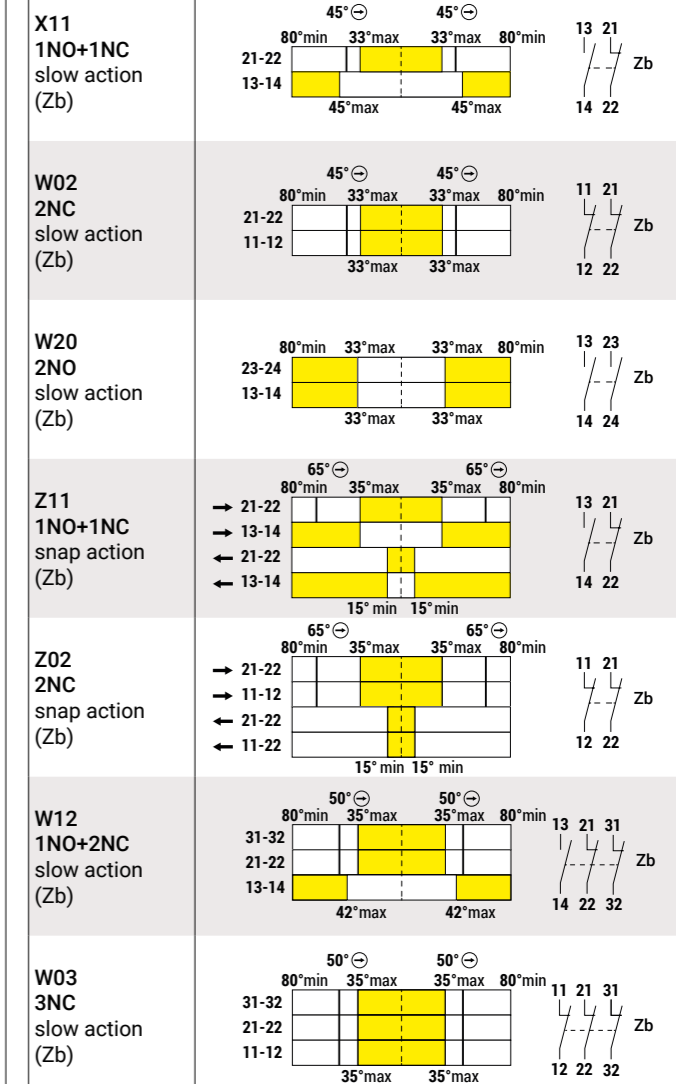
FTNG series	1 function	40 actuator	XXX contact type	XX conduit entry
FTNG 40 mm thermoplastic limit switches for heavy applications	1 without reset function	40 Ø50 rubber roller lever with variable length	<b>X11: 1NO+1NC</b> <b>W02: 2NC</b> <b>W20: 2NO</b> <b>Z11: 1NO+1NC</b> <b>Z02: 2NC</b> <b>W12: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

#### technical drawing - sizes in mm



(1) mounting holes  
(3) rubber roller

#### contact type operation diagrams



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°	42°	6.5 N	50°	8 N	
			35°	-	6.5 N	50°	8 N		
W12: 1NO+2NC W03: 3NC	slow action (Zb)	A300-Q300	35°	-	6.5 N	50°	8 N		



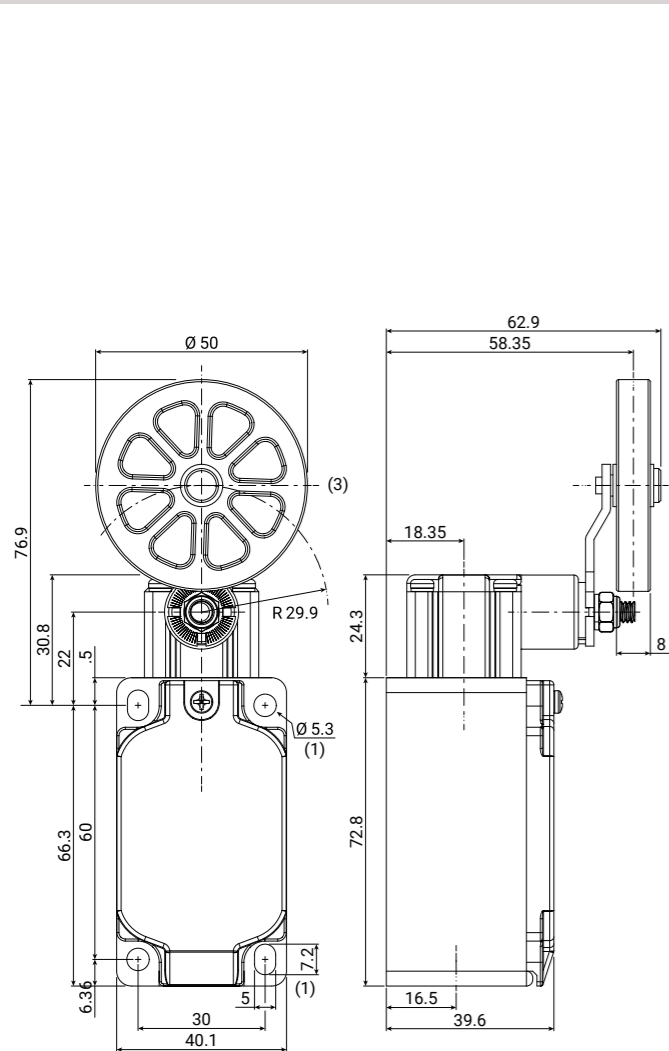
### FTNG141

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

technical drawing - sizes in mm



(1) mounting holes  
(3) rubber roller

contact type	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	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	
			35°	-	6.5 N	50°	8 N	
			33°	-	6.5 N	45°	8.5 N	
			33°	-	6.5 N	-	-	

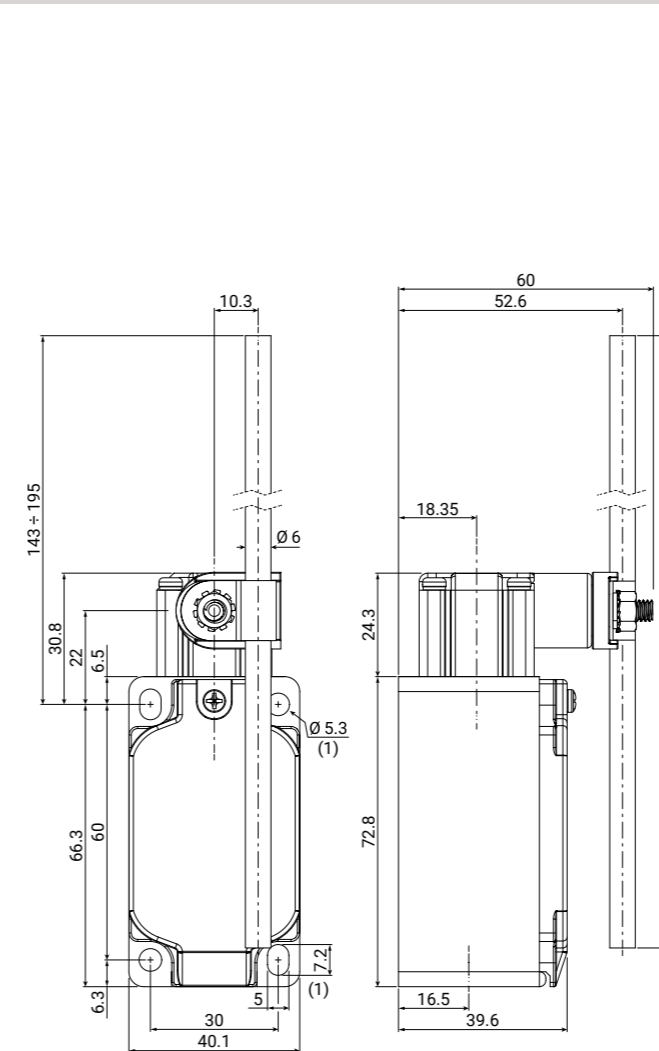
### FTNG172

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 × 1.5 (standard) 1/2" NPT PG13.5 male connector "A" M12 × 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)	
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	
			35°	-	6.5 N	50°	8 N	
			33°	-	6.5 N	45°	8.5 N	
			33°	-	6.5 N	-	-	