

**C FTNG SERIES 40 MM THERMOPLASTIC LIMIT SWITCHES**



**DESCRIPTION**

The **FTNG series** 40 mm thermoplastic limit switches, conform to EN 50047, have been developed to provide a range of options including a various choice of snap acting and slow acting and a wide range of actuator heads. The **FTNG series** offers the option of rotating the head in 90° increments before installation to allow ease of mounting. The dimensions of this line comply with the indications of EN 50041.

Giovenzana limit switches can be used in various applications in automation, lift and handling system fields. The **FTNG series** is particularly suitable for heavy applications, thanks to its solidity and reliability. Operations of these limit switches is achieved by the sliding action of the guard or other moving objects should not pass completely over the switch and allow the plunger or lever to return to its original position.

**TECHNICAL DATA - HOUSING**

Made of glass- reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation	
FTNG Series one threaded conduit entry	Standard: M20
Protection degree	IP67 according to EN60529 with cable gland having equal or higher protection degree

**GENERAL DATA**

Positive opening operation	NC contact
Utilization category	AC15, A600, B600, A300 (for contact block type)
Minimum admissible current	5V, 5mA, DC
Insulation resistance	100MΩ min (DC 500V)
Contact resistance	25mΩ max (Initial)
Max switching speed	250 mm/s
Max switching frequency	6000 operation per hour
Enclosure material	UL approved glass-filled polybutylene terephthalate
Roller Material	Metal, PA, rubber
Operating temperature	Min -25°C (-18°F) / Max 80°C (+176°F)
Mechanical life expectancy	1x10 <sup>7</sup> cycles min
Electrically life expectancy	150.000 cycles min
Vibration resistance	IEC 68-2-6, 10-55Hz ± 1Hz, Excursion: 0.35mm, 1 octave/min
Conduit entry	Various
Fixing	2xM4

**ELECTRICAL DATA**

Rated thermal current (Ith)	10A
Rated insulation voltage (Ui)	600V AC
Rated impulse withstand voltage (Uimp)	2500V AC
Pollution degree	3
Protection against electric shock	Class II (Double insulation)

**STANDARDS & APPROVALS**

Standards	EN60947-5-1, EN50047, EN1088
Approvals	cULus, EAC and CCC for all applicable directives

**QUALITY MARKS**



**MAIN FEATURES**

- Conforms to EN (TUV) standards corresponding to the CE marking.
- Positive opening operation of NC (Normally Closed) contacts conforming to IEC/EN 60947-5-1.
- Double insulation makes ground terminal unnecessary.
- Wide standard operating temperature range: -25°C to 80°C.
- Full range of actuator heads and levers suitable for safety applications.
- Sealing up to IP67.
- Wide switch variations (Snap action and slow action basic switches).

**ACCORDING TO STANDARDS**

**EN81.20** Safety contacts according to EN60947-5-1.  
**EN81.50** Protection degree higher than IP4x. Mechanical endurance higher than 1x10<sup>6</sup> cycles.

**INSTALLATION FOR SAFETY APPLICATIONS**

Use only switches marked with the symbol . Always connect the safety circuit to the **NC contact** (normally closed contacts: 11-12 / 21-22 / 31-32) as required by **EN ISO 14119 paragraph 5.4** and as stated in the standard **EN81.20 paragraph 5.11.2.2.1**.



**TAKE CARE!**

If not expressly indicated in this chapter, for the correct installation and utilization of all articles see the instructions given on pages 92-93.

**DATA TYPE APPROVED BY UL**

Utilization categories:

FTNG SERIES	Q300	A600	1 NC/1 NO Slow Action 2 NC Slow Action
		B600	1 NC/1 NO Snap Action
		A300	2 NC/1 NO Slow Action (3 poles) 3 NC Slow Action (3 poles)

Data of the housing type 1.  
For all contact blocks use 60 or 75°C copper (Cu) conductor and wire size No. 14 - 18 AWG.  
Terminal tightening torque of 7.1 lb in (0.8 Nm).  
In conformity with standard: UL508, CSA 22.2 No. 14 - 10.

Please contact our technical service for the list of approved products.



**PROTECTION CLASS**

**IP67** Designed to be used even in the most severe environmental situations, these devices pass the immersion test IP67 in conformity with EN 60529.

**DOUBLE INSULATION**

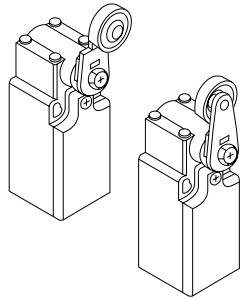
Materials of group II, according to IEC 536, are made with double insulation. This consists of doubling the insulation capability by means of an additional divider in order to eliminate any electrical shock risk and avoid the need for any additional protections.

**POSITIVE OPENING**



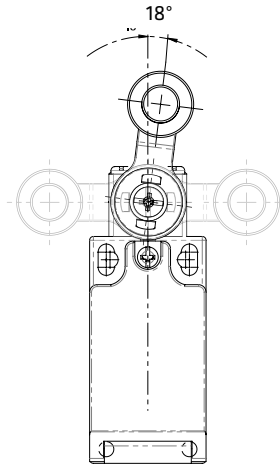
A limit switch complies to the specification when all the normally closed contact elements of the switch can be changed, with certainty, to the open position (no flexible link between the moving contacts and the operator of the switch, to which an actuating force is applied). Positive opening doesn't apply to NO contacts. Control switches with positive opening operation can be equipped with either slow-break or snap action contacts. In order to use different contacts on the same switch, it is necessary to electrically separate them; otherwise only one contact can be used. Every positive opening control switch must be marked on the external housing with the symbol on the left.

## OVERTURNING LEVERS



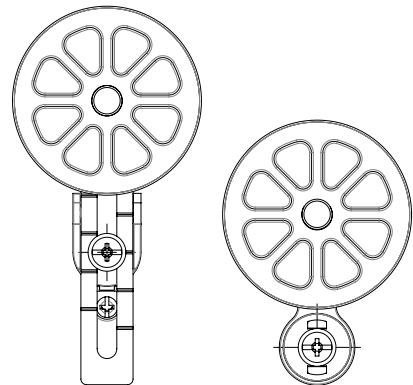
It's possible to fasten the lever on switches on straight or reverse side, maintaining the positive coupling. In this way it is possible to obtain two different work plans of the lever.

## ADJUSTABLE LEVERS



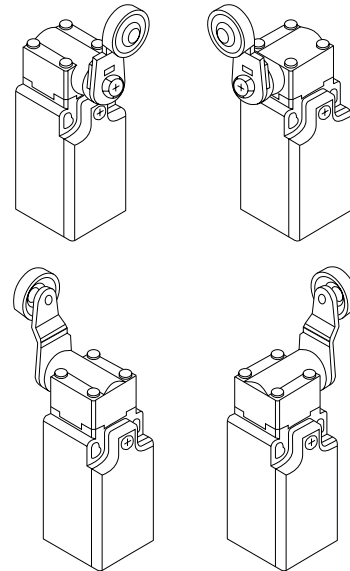
In switches with revolving lever it is possible to adjust the lever with 18° steps for the whole 360° range. The positive movement transmission is always guaranteed thanks to the particular geometrical coupling between the lever and the revolving shaft.

## RUBBER ROLLERS



Different actuators with rubber rollers are available. The customer can choose the most suitable product depending on his needs. For example the lift speed in order to reduce the noise inside the cabin.

## ROTATING HEADS



In all switches, it is possible to rotate the head in 90° steps.

## CONTACT BLOCK FORM

Contact Types	X11	W02	Z11	W12	W03
Contact Form	1NC/1NO Slow Action	2NC Slow Action	1NC/1NO Snap Action	2NC/1NO Slow Action	3NC Slow Action
Electrical Schemes					
Connector pin Arrangement				No Connector type	

M12 Connector pin arrangement - on request

## STRUCTURE DESCRIPTION

### Metal Lever Setting

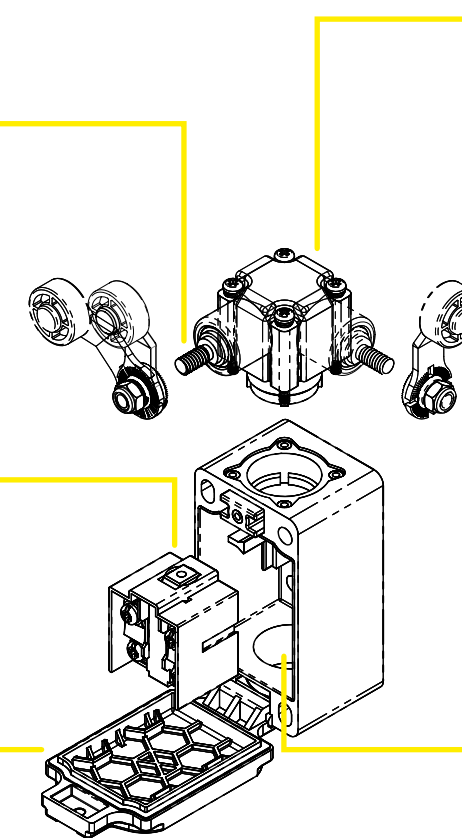
Grooves which engage the lever every 18° are cut in the operation indicator disk to prevent the lever from slipping against the rotary shaft.

### Contact block

Snap Action: 1NC/NO  
Slow Action: 1NC/NO, 2NC, 2NC/1NO, 3NC.

### Cover

The cover, with a hinge on its lower part, can be opened by removing the screw of the cover, which ensures ease of maintenance and wiring.



### Head

With roller lever models, the direction of the switch head can be adjusted to any of the four directions by loosening the roller lever switch screws at the four corners of the head.

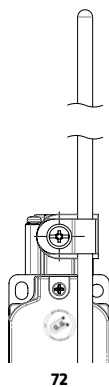
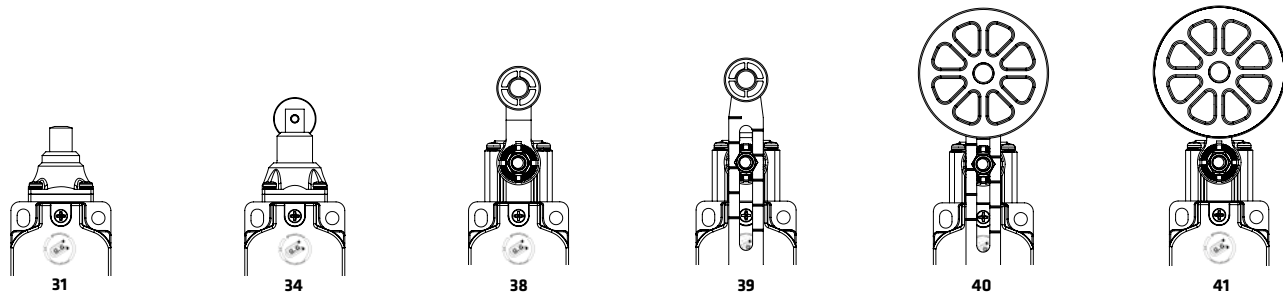
### Conduit Entry

Standard: M20.  
On request: 1/2NPT, PG13.5.

## PRODUCT SELECTION

FTNG	1	31	X11	M
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	31 - Plain steel plunger 34 - Steel roller plunger 38 - ø22 Roller lever 39 - Adjustable ø22 roller lever 40 - Adjustable ø50 roller lever 41 - ø50 Rubber roller lever 72 - Adjustable PA rod lever	X11 - 1NC/1NO Slow Action W02 - 2NC Slow Action Z11 - 1NC/1NO Snap Action W12 - 2NC/1NO Slow Action W03 - 3NC Slow Action	Standard: BLANK - M20 On request: N - 1/2NPT G3 - PG13.5 C - Connector
			Slow Action & Snap Action: Type "Zb"	

SELECTION DIAGRAM



ACTUATORS

FTNG SERIES

CONTACT BLOCKS

CONDUIT ENTRY



**X11** - 1NC/1NO Slow Action  
**W02** - 2NC Slow Action  
**Z11** - 1NC/1NO Snap Action  
**W12** - 2NC/1NO Slow Action  
**W03** - 3NC Slow Action

Threaded conduit entry

Wiring

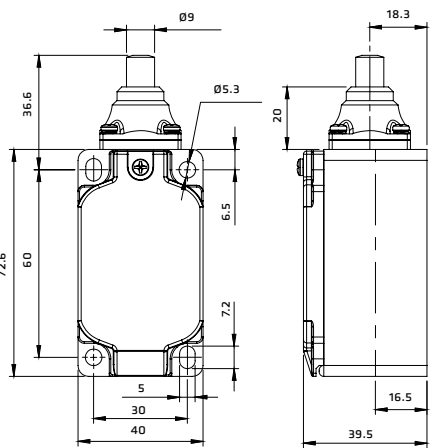
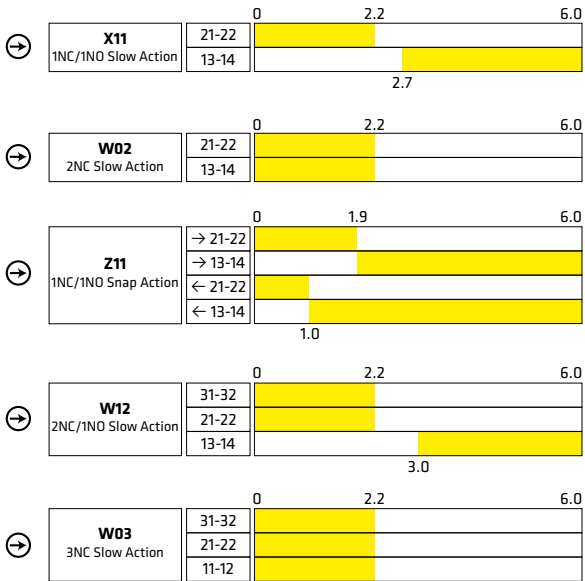
Standard:  
**BLANK** - M20  
  
On request:  
**N** - 1/2NPT  
**G3** - PG13.5  
**C** - Connector

Customized  
wirings are available  
on request, with  
connectors and  
cables in accordance  
with customers'  
specifications.

FTNG131: Plain steel plunger

FTNG	1	31	X11	-
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	31 - Plain steel plunger	<b>X11</b> - 1NC/1NO Slow Action <b>W02</b> - 2NC Slow Action <b>Z11</b> - 1NC/1NO Snap Action <b>W12</b> - 2NC/1NO Slow Action <b>W03</b> - 3NC Slow Action <b>Slow Action &amp; Snap Action: Type "Zb"</b>	Standard: <b>BLANK</b> - M20 On request: <b>N</b> - 1/2NPT <b>G3</b> - PG13.5 <b>C</b> - Connector

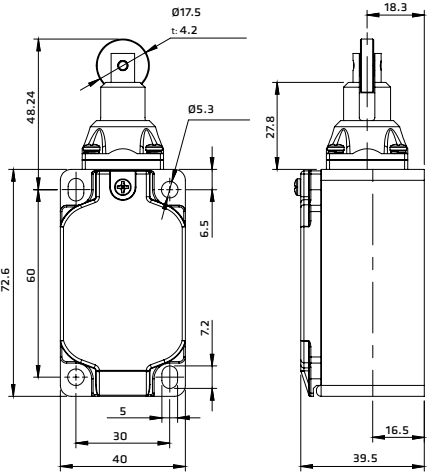
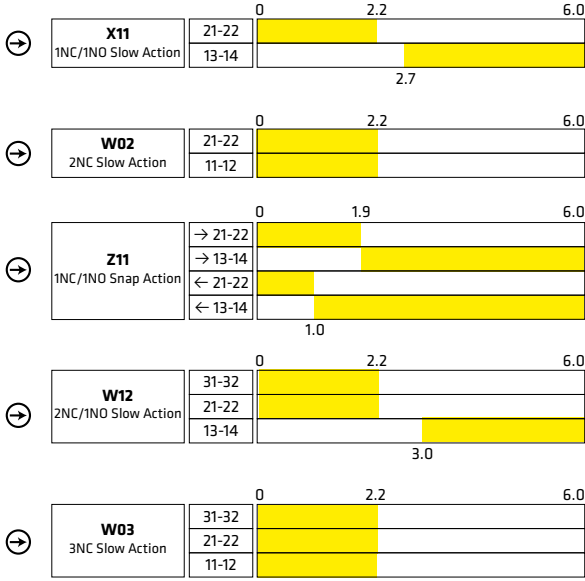
OPERATION DIAGRAMS



FTNG134: Steel roller plunger

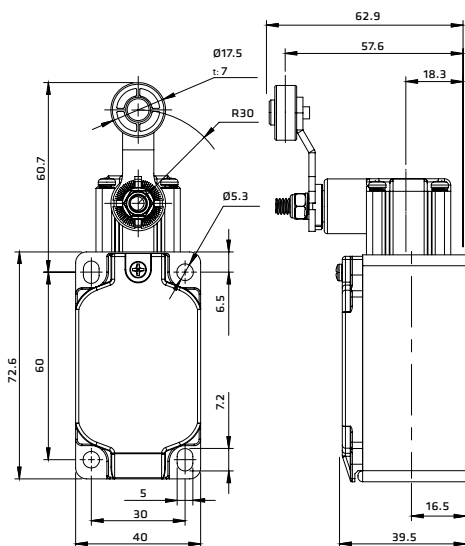
FTNG	1	34	X11	-
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	34 - Steel roller plunger	<b>X11</b> - 1NC/1NO Slow Action <b>W02</b> - 2NC Slow Action <b>Z11</b> - 1NC/1NO Snap Action <b>W12</b> - 2NC/1NO Slow Action <b>W03</b> - 3NC Slow Action <b>Slow Action &amp; Snap Action: Type "Zb"</b>	Standard: <b>BLANK</b> - M20 On request: <b>N</b> - 1/2NPT <b>G3</b> - PG13.5 <b>C</b> - Connector

OPERATION DIAGRAMS



**FTNG138: Ø22 Roller lever**

FTNG	1	38	X11	-
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	38 - Ø22 Roller lever	<b>X11</b> - 1NC/1NO Slow Action <b>W02</b> - 2NC Slow Action <b>Z11</b> - 1NC/1NO Snap Action <b>W12</b> - 2NC/1NO Slow Action <b>W03</b> - 3NC Slow Action	Standard: <b>BLANK</b> - M20 On request: <b>N</b> - 1/2NPT <b>G3</b> - PG13.5 <b>C</b> - Connector
Slow Action & Snap Action: Type "Zb"				

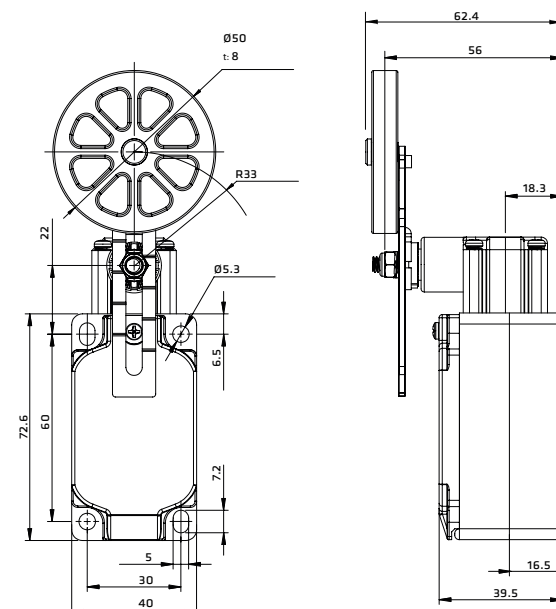


**OPERATION DIAGRAMS**

→	<b>X11</b> 1NC/1NO Slow Action	21-22 13-14	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>W02</b> 2NC Slow Action	21-22 11-12	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>Z11</b> 1NC/1NO Snap Action	→ 21-22 → 13-14 ← 21-22 ← 13-14	80° 40° 40° 40°	28° 40° 40° 40°	0 40° 40° 40°	28° 40° 40° 40°	80° 40° 40° 40°
→	<b>W12</b> 2NC/1NO Slow Action	31-32 21-22 13-14	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°
→	<b>W03</b> 3NC Slow Action	31-32 21-22 11-12	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°

**FTNG140: Adjustable Ø50 rubber roller lever**

FTNG	1	40	X11	-
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	40 - Adjustable Ø50 rubber roller lever	<b>X11</b> - 1NC/1NO Slow Action <b>W02</b> - 2NC Slow Action <b>Z11</b> - 1NC/1NO Snap Action <b>W12</b> - 2NC/1NO Slow Action <b>W03</b> - 3NC Slow Action	Standard: <b>BLANK</b> - M20 On request: <b>N</b> - 1/2NPT <b>G3</b> - PG13.5 <b>C</b> - Connector
Slow Action & Snap Action: Type "Zb"				

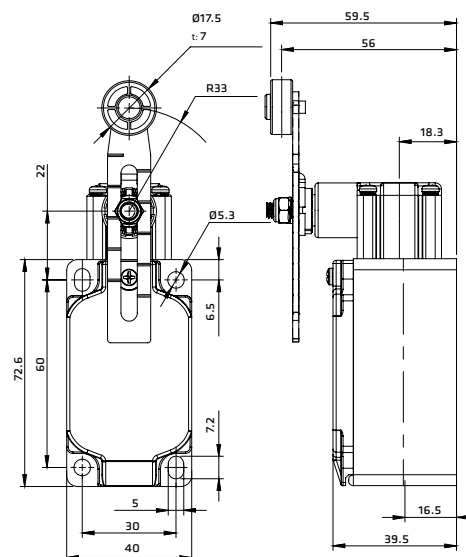


**OPERATION DIAGRAMS**

→	<b>X11</b> 1NC/1NO Slow Action	21-22 13-14	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>W02</b> 2NC Slow Action	21-22 11-12	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>Z11</b> 1NC/1NO Snap Action	→ 21-22 → 13-14 ← 21-22 ← 13-14	80° 40° 40° 40°	28° 40° 40° 40°	0 40° 40° 40°	28° 40° 40° 40°	80° 40° 40° 40°
→	<b>W12</b> 2NC/1NO Slow Action	31-32 21-22 13-14	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°
→	<b>W03</b> 3NC Slow Action	31-32 21-22 11-12	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°

**FTNG139: Adjustable Ø22 roller lever**

FTNG	1	39	X11	-
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	39 - Adjustable Ø22 roller lever	<b>X11</b> - 1NC/1NO Slow Action <b>W02</b> - 2NC Slow Action <b>Z11</b> - 1NC/1NO Snap Action <b>W12</b> - 2NC/1NO Slow Action <b>W03</b> - 3NC Slow Action	Standard: <b>BLANK</b> - M20 On request: <b>N</b> - 1/2NPT <b>G3</b> - PG13.5 <b>C</b> - Connector
Slow Action & Snap Action: Type "Zb"				

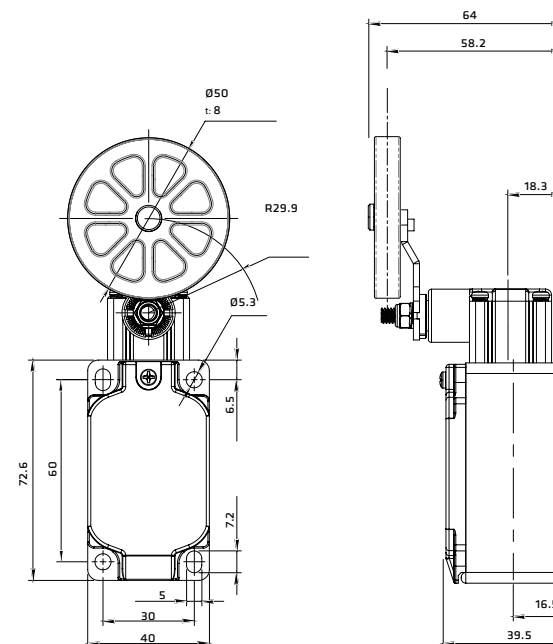


**OPERATION DIAGRAMS**

→	<b>X11</b> 1NC/1NO Slow Action	21-22 13-14	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>W02</b> 2NC Slow Action	21-22 11-12	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>Z11</b> 1NC/1NO Snap Action	→ 21-22 → 13-14 ← 21-22 ← 13-14	80° 40° 40° 40°	28° 40° 40° 40°	0 40° 40° 40°	28° 40° 40° 40°	80° 40° 40° 40°
→	<b>W12</b> 2NC/1NO Slow Action	31-32 21-22 13-14	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°
→	<b>W03</b> 3NC Slow Action	31-32 21-22 11-12	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°

**FTNG141: Ø50 Rubber roller lever**

FTNG	1	41	X11	-
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	41 - Ø50 Rubber roller lever	<b>X11</b> - 1NC/1NO Slow Action <b>W02</b> - 2NC Slow Action <b>Z11</b> - 1NC/1NO Snap Action <b>W12</b> - 2NC/1NO Slow Action <b>W03</b> - 3NC Slow Action	Standard: <b>BLANK</b> - M20 On request: <b>N</b> - 1/2NPT <b>G3</b> - PG13.5 <b>C</b> - Connector
Slow Action & Snap Action: Type "Zb"				

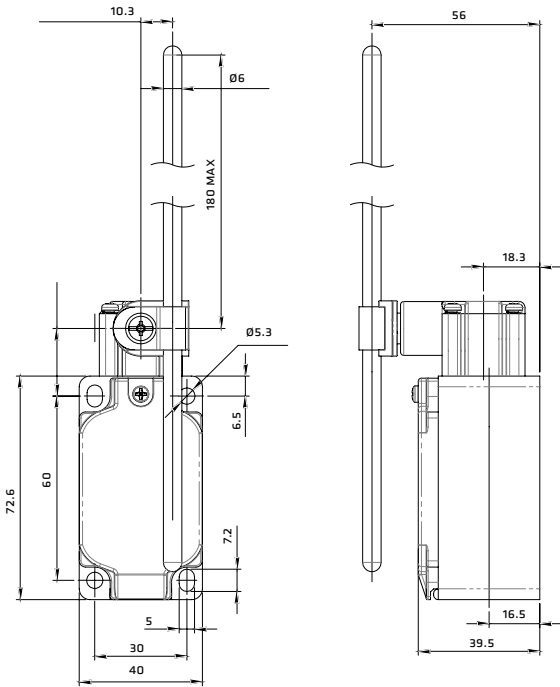


**OPERATION DIAGRAMS**

→	<b>X11</b> 1NC/1NO Slow Action	21-22 13-14	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>W02</b> 2NC Slow Action	21-22 11-12	80° 40°	30° 40°	0 40°	30° 40°	80°
→	<b>Z11</b> 1NC/1NO Snap Action	→ 21-22 → 13-14 ← 21-22 ← 13-14	80° 40° 40° 40°	28° 40° 40° 40°	0 40° 40° 40°	28° 40° 40° 40°	80° 40° 40° 40°
→	<b>W12</b> 2NC/1NO Slow Action	31-32 21-22 13-14	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°
→	<b>W03</b> 3NC Slow Action	31-32 21-22 11-12	80° 40° 40°	30° 40° 40°	0 40° 40°	30° 40° 40°	80° 40° 40°

**FTNG172: Adjustable PA rod lever**

FTNG	1	72	X11	M
Series	Function	Head and actuators	Contact Types	Thread dimension of lead exit
	1 - Without Reset Function	72 - Adjustable PA rod lever	<b>X11</b> - 1NC/1NO Slow Action <b>W02</b> - 2NC Slow Action <b>Z11</b> - 1NC/1NO Snap Action <b>W12</b> - 2NC/1NO Slow Action <b>W03</b> - 3NC Slow Action  Slow Action & Snap Action: Type "Zb"	Standard: <b>BLANK</b> - M20 On request: <b>N</b> - 1/2NPT <b>G3</b> - PG13.5 <b>C</b> - Connector



**OPERATION DIAGRAMS**

⊙	<b>X11</b> 1NC/1NO Slow Action	21-22 13-14	80° 40°	30° 40°	0 40°	30° 40°	80°
⊙	<b>W02</b> 2NC Slow Action	21-22 11-12	80° 40°	30° 40°	0 40°	30° 40°	80°
⊙	<b>Z11</b> 1NC/1NO Snap Action	→ 21-22 → 13-14 ← 21-22 ← 13-14	80° 28° 11°	28° 11°	0 11°	28° 11°	80°
⊙	<b>W12</b> 2NC/1NO Slow Action	31-32 21-22 13-14	80° 40°	30° 40°	0 40°	30° 40°	80°
⊙	<b>W03</b> 3NC Slow Action	31-32 21-22 11-12	80° 40°	30° 40°	0 40°	30° 40°	80°

**OPERATING FORCE FTNG SERIES**

TYPE	CONTACT BLOCK		OPERATING TRAVEL		OPERATING FORCE	POSITIVE OPENING		TOTAL TRAVEL
			PT	PT2nd	OF	Travel	Force	
 <b>FTNG131</b>	<b>X11</b>	1 NC/1 NO Slow Action	2.2 mm	3.0 mm	7.26 N	3.2 mm	19.0 N	6.0 mm
	<b>W02</b>	2 NC Slow Action	2.2 mm	-	7.42 N			
	<b>Z11</b>	1 NC/1 NO Snap Action	1.9 mm	-	6.71 N			
	<b>W12</b>	2 NC/1 NO Slow Action	2.2 mm	3.0 mm	7.26 N			
 <b>FTNG134</b>	<b>W03</b>	3 NC Slow Action	2.2 mm	-	7.42 N	3.2 mm	19.0 N	6.0 mm
	<b>X11</b>	1 NC/1 NO Slow Action	2.2 mm	3.0 mm	7.26 N			
	<b>W02</b>	2 NC Slow Action	2.2 mm	-	7.42 N			
	<b>Z11</b>	1 NC/1 NO Snap Action	1.9 mm	-	6.71 N			
 <b>FTNG138</b>	<b>W12</b>	2 NC/1 NO Slow Action	2.2 mm	3.0 mm	7.26 N	3.2 mm	19.0 N	6.0 mm
	<b>W03</b>	3 NC Slow Action	2.2 mm	-	7.42 N			
	<b>X11</b>	1 NC/1 NO Slow Action	30°	41°	6.5 N			
	<b>W02</b>	2 NC Slow Action	30°	-	6.5 N			
 <b>FTNG139</b>	<b>Z11</b>	1 NC/1 NO Snap Action	28°	-	5.3 N	45°	19.0 N	80°
	<b>W12</b>	2 NC/1 NO Slow Action	30°	41°	6.5 N			
	<b>W03</b>	3 NC Slow Action	30°	-	6.5 N			
	<b>X11</b>	1 NC/1 NO Slow Action	30°	41°	6.5 N			
 <b>FTNG140</b>	<b>W02</b>	2 NC Slow Action	30°	-	6.5 N	45°	19.0 N	80°
	<b>Z11</b>	1 NC/1 NO Snap Action	28°	41°	4.5 N			
	<b>W12</b>	2 NC/1 NO Slow Action	30°	-	5.2 N			
	<b>W03</b>	3 NC Slow Action	30°	-	5.2 N			
 <b>FTNG141</b>	<b>X11</b>	1 NC/1 NO Slow Action	30°	41°	6.5 N	45°	19.0 N	80°
	<b>W02</b>	2 NC Slow Action	30°	-	6.5 N			
	<b>Z11</b>	1 NC/1 NO Snap Action	35°	-	5.3 N			
	<b>W12</b>	2 NC/1 NO Slow Action	30°	41°	6.5 N			
 <b>FTNG172</b>	<b>W03</b>	3 NC Slow Action	30°	-	6.5 N	45°	19.0 N	80°
	<b>X11</b>	1 NC/1 NO Slow Action	30°	41°	1.8 N			
	<b>W02</b>	2 NC Slow Action	30°	-	1.8 N			
	<b>Z11</b>	1 NC/1 NO Snap Action	28°	-	1.9 N			