

# X-FSC X-FRZ

## POSITION LIMIT SWITCHES

Position limit switches are designed to control the movement of overhead travelling cranes, hoists and machine tools. They operate as auxiliary controllers of electrical motors through power interfaces, such as contactors or PLCs.

### FEATURES

The X-FCS series has "T" or "Cross" rods which may move to 3 or 4 maintained positions, while the X-FRZ series features a single rod or a rod with roller with spring return movements. The limit switches are equipped with 1NO+1NC snap action

switches or, upon request, with 1NC slow action switches. All switches are of the positive opening type, thus suitable for safety functions.

### MATERIALS

Both the enclosure and the head of the limit switches are made of thermoplastic material (nylon reinforced with fiberglass). Materials and components ensure high resistance and endurance and protect the equipment against water and dust.



**INDUSTRIAL  
LIFTING**



**INDUSTRIAL  
AUTOMATION**



**STAGE  
TECHNOLOGY**

## STANDARDS - MARKINGS - HOMOLOGATIONS

- Conformity to Community Directives:  
2006/95/CE: Low Voltage Directive  
2006/42/CE: Machinery Directive
- Conformity to Standards:  
EN 60204-1 Safety of machinery - Electrical equipment of machines  
EN 60947-1 Low-voltage switchgear and controlgear

EN 60947-5-1 Low-voltage switchgear and controlgear - Control circuit devices and switching elements - Electromechanical control circuit devices

EN 60529 Degrees of protection provided by enclosures

- Markings and homologations:  $\text{C}\text{E}$

## GENERAL TECHNICAL SPECIFICATIONS

- Storage ambient temperature:  $-40^{\circ}\text{C}/+70^{\circ}\text{C}$
- Operational ambient temperature:  $-25^{\circ}\text{C}/+70^{\circ}\text{C}$
- Protection degree: IP65 max. with dedicated cable clamp M20
- Insulation category: Class II
- Cable entry: cable clamp M20
- Operation frequency: 3600 operations/hour max
- Markings and homologations:  $\text{C}\text{E}$   $\text{EAC}$

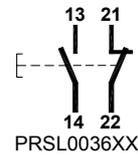
## TECHNICAL SPECIFICATIONS OF THE MICROSWITCHES

- Utilisation category: AC 15
- Rated operational current: 3 A
- Rated operational voltage: 250 V
- Rated thermal current: 10 A
- Rated insulation voltage: 300 V~
- Mechanical life:  $1 \times 10^6$  operations
- Terminal referencing: according to EN 50013
- Connections: screw-type terminals
- Wires:  $1 \times 2.5 \text{ mm}^2$ ,  $2 \times 1.5 \text{ mm}^2$   
(UL - (c)UL: use  $60^{\circ}\text{C}$  or  $75^{\circ}\text{C}$  copper (CU) conductor and wire 16-18 AWG)
- Tightening torque: 0.8 Nm
- Markings and homologations:  $\text{C}\text{E}$   $\text{eULos}$

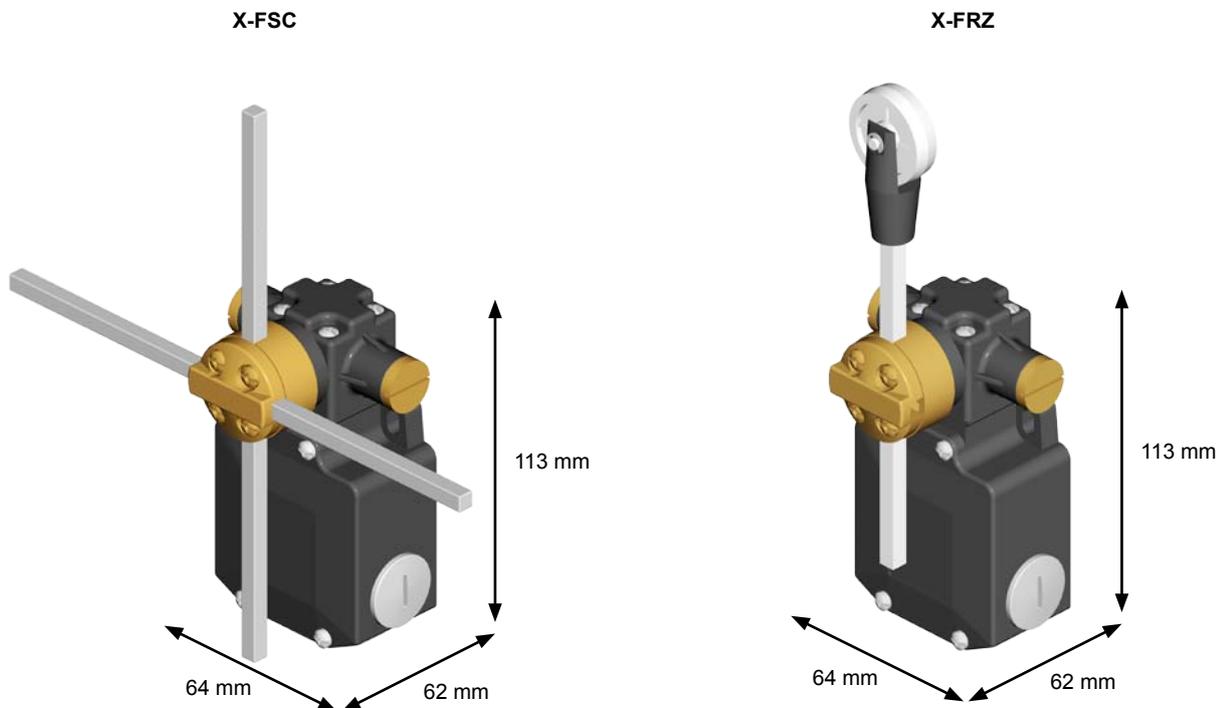
The snap action single switch PRSL0036XX has 1 NO + 1 NC change over contacts with 2 connecting terminals each.

All NC contacts are of the positive opening operation type.

The switches have the following reference for internal wiring.



## OVERALL DIMENSIONS



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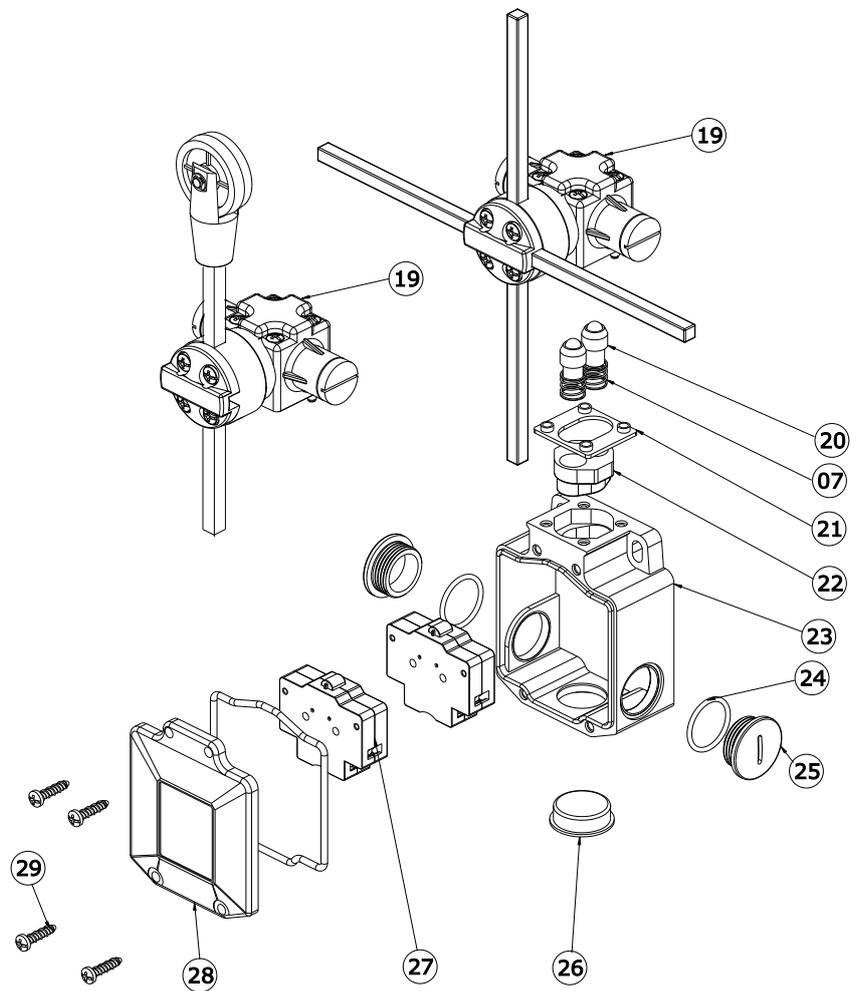
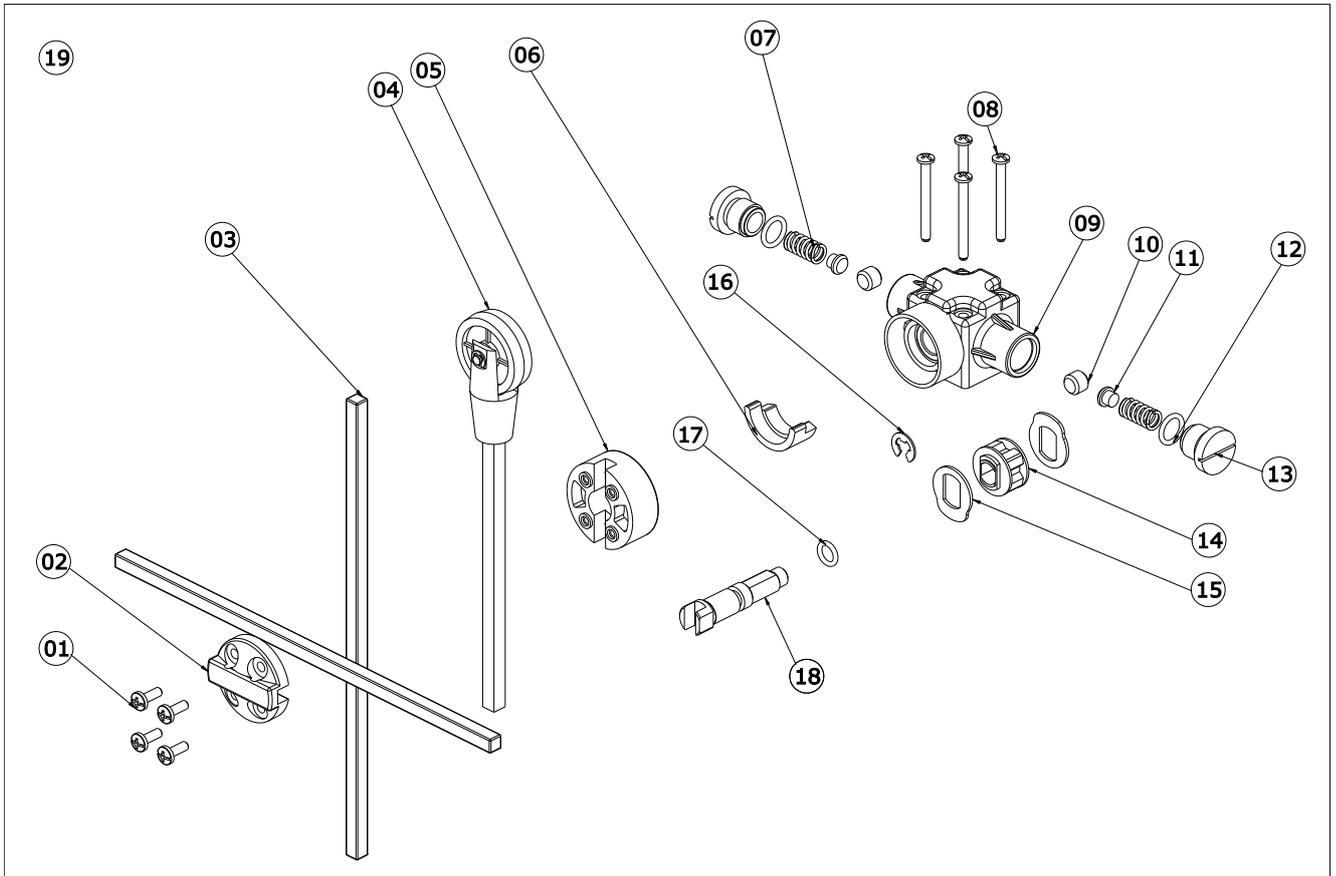
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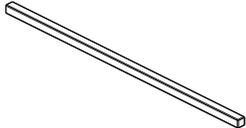
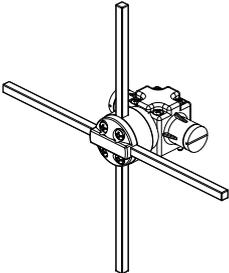
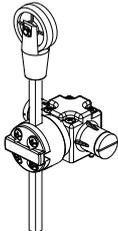


# COMPONENTS

## SWITCHES

REF	DRAWING	DESCRIPTION	SCHEME	CODE
27		Snap action 1NO+1NC switch		PRSL0036XX

## ACCESSORIES

REF	DRAWING	DESCRIPTION	CODE
03		Rod 6x6x200 mm	PRTO3007PE
04		Rod 6x6x130 mm with roller	PRSL0850PI
05		Cross support	PRFU2015PE
19		Head with cross rods	PF33xxxxTE codes on request
		Head with rod and roller	PF33xxxxTE codes on request

## REMARKS

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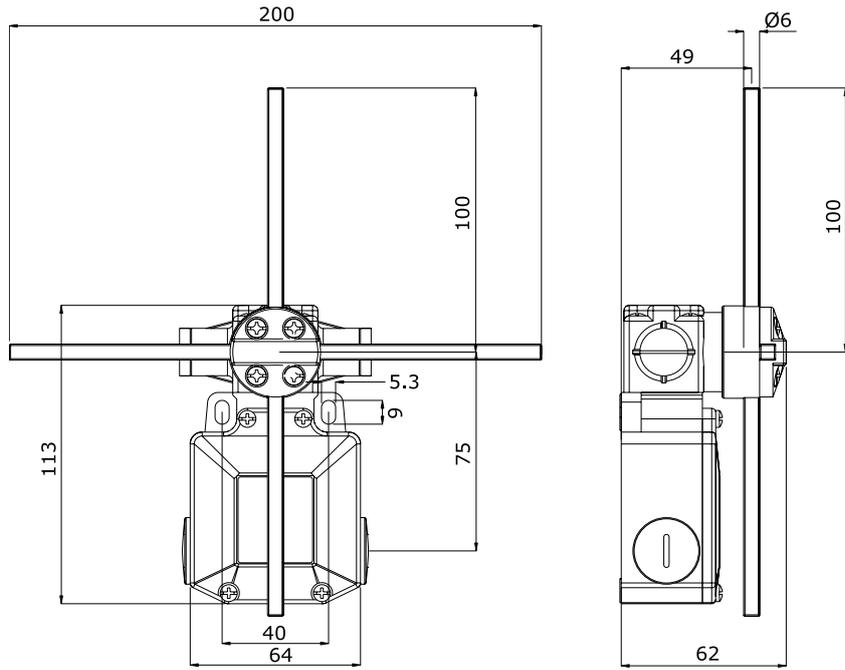
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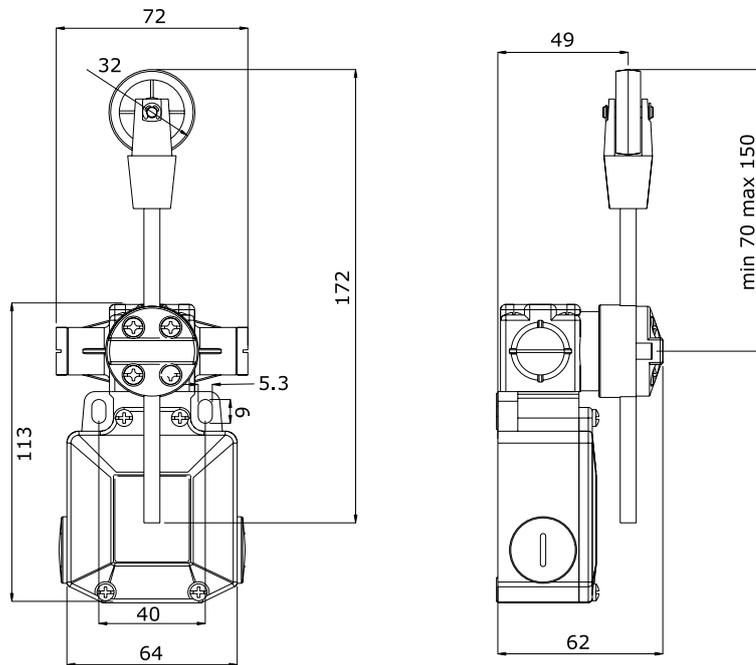
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# OVERALL DIMENSIONS (MM)

## X-FSC



## X-FRZ



# STANDARD LIMIT SWITCHES

Standard limit switches are equipped with 1NO+1NC snap action switches PRSL0036XX



## X-FSC

POSITIONS	ROD	ACTUATING TRAVEL	CODE
3 maintained	T- type		PF33710100
3 maintained	cross		PF33710200
3 maintained	T- type		PF33711100
3 maintained	cross		PF33711200
3 maintained	T- type		PF33712100
3 maintained	cross		PF33712200
3 maintained	T- type		PF33713100
3 maintained	cross		PF33713200
3 maintained	T- type		PF33714100
3 maintained	cross		PF33714200
3 maintained	T- type		PF33715100
3 maintained	cross		PF33715200
4 maintained	cross		PF33750100
4 maintained	cross		PF33751100
4 maintained	cross		PF33752100
4 maintained	cross		PF33752100

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POSITIONS	ROD	ACTUATING TRAVEL	CODE
spring return	rod		PF33700100
spring return	rod and roller		PF33700200
spring return	rod		PF33701100
spring return	rod and roller		PF33701200
spring return	rod		PF33702100
spring return	rod and roller		PF33702200
spring return	rod		PF33703100
spring return	rod and roller		PF33703200
spring return	rod		PF33704100
spring return	rod and roller		PF33704200
spring return	rod		PF33705100
spring return	rod and roller		PF33705200

**MAXIMUM ACTUATING DIMENSIONS**

**T-type rod - Cross rod with 3 maintained positions**

- Pre-travel angle for rotation contact operation: 70°-49°
- Maximum rotation angle for each maintained position: 90°
- Average angle for the mechanical tripping: 48°

**Rod - Rod and Roller**

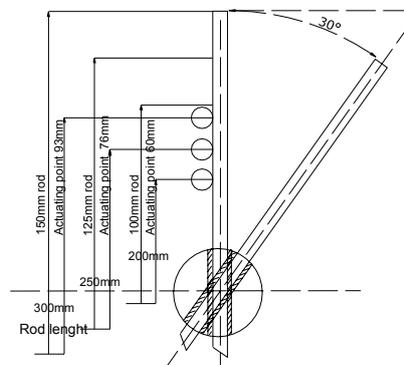
- Pre-travel angle for rotation contact operation: 24°
- Maximum rotation angle: 65°

**Cross rod with 4 maintained positions**

- Pre-travel angle for rotation contact operation: 49°
- Maximum rotation angle for each maintained position: 90°
- Average angle for the mechanical tripping: 48°
- Maintained positions each: 90°

In order to ensure proper operations, the dimensions shall not be increased; anyhow, they can be decreased, taking into account that the closer the impact point is to the center of the head, the higher the impact and the mechanical wear of rod and shaft are.

**IMPORTANT:** the maximum impact speed is 1.35 m/s, referring to the ideal impact points showed in the drawing.



The limit switches X-SFC and X-FRZ are electromechanical devices for low voltage control circuits (EN 60947-1, EN 60947-5-1) for use as electric equipment on machines (EN 60204-1) in compliance with the essential requisites of the Low Voltage Directive 2006/95/CE and the Machine Directive 2006/42/CE.

The limit switch is designed for use in industrial environments with even very severe climatic conditions (working temperatures from -25°C to +70°C and is suitable for use in tropical environments). The equipment is not suitable for use in environments with a potentially explosive atmosphere, in the presence of corrosive agents or high percentage of sodium chloride (saline mist). Contact with oil, acids and solvents may damage the equipment. The limit switches is not suitable for use in environments with a potentially explosive atmosphere.

### Maintenance

Make sure the limit switch is securely fastened in place and the fasteners are tightened properly.

Make sure there are no infiltrations of water through the wire clamp(s) and that the rubber sleeve is intact and flexible.

Open the lid (28)\* and check that the gasket is intact and flat in its housing.

Check that the switches (27) are properly wired and the terminals securely fastened; test the on/off mechanism by hand.

Make sure the head turns without forcing, that it is clean and moves without uncertainty between one position and the next; make sure the screws (01) on the head are properly tightened. If there is any difficulty in switching and positioning the head, replace the limit switch.

Check the conditions of the rods (03) and make sure they are positioned correctly: if the rods are not perfectly straight they should be replaced and repositioned carefully in accordance with the specifications.

NOTE: FOLLOW THE INSTRUCTIONS CAREFULLY WITH REGARD TO THE SPEED AND POSITION OF THE RODS INDICATED IN THE MAXIMUM DRIVE MEASUREMENTS. FAILURE TO FOLLOW THE SPECIFICATIONS INDICATED MAY JEOPARDIZE THE FUNCTION AND SAFETY OF THE SYSTEM.

### Installation

Important: for correct operations, install the device far from sources of heat that could raise its temperature higher than 70°C.

First, position the limit switch so that the machine or one arm of it strikes the rod (03) in the positions indicated in the maximum drive measurements; make sure the wires are not taut, twisted and/or forced into excessive curvatures.

Mark the fastening holes on the supporting wall and drill the holes.

After fastening, make sure the rod is perfectly vertical, that the rods (03) are securely fastened in the head and that the points of impact are as verified previously.

Proceed with electric wiring taking care to tighten the terminals on the switches (27), after manually checking the on/off function.

Tighten the terminal screws with a torque of 0.8 Nm; insertability of wires into the terminals 1x2,5 mm<sup>2</sup> - 2x1,5mm<sup>2</sup> (UL - (c)UL: use 60 or 75°C conductor and wire size No. 16-18 AWG, stranded or solid).

Close the lid (28) taking care to position the gasket in its housing.

Tighten the wire clamp taking care to see that the rubber inside adheres to the sheathing on the wire.

The installation will be complete after checking once or twice that the machine is properly slowed and/or stopped by the limit switch installed.

Any change to parts of the limit switch will invalidate the rating plate data and identification of the device, and render the warranty null and void. In case of replacement of any part, use only original replacements.

TER is not liable for damages caused by improper use of the device and installation which is not made correctly.

\* Please refer to the detailed drawing in the catalogue.



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