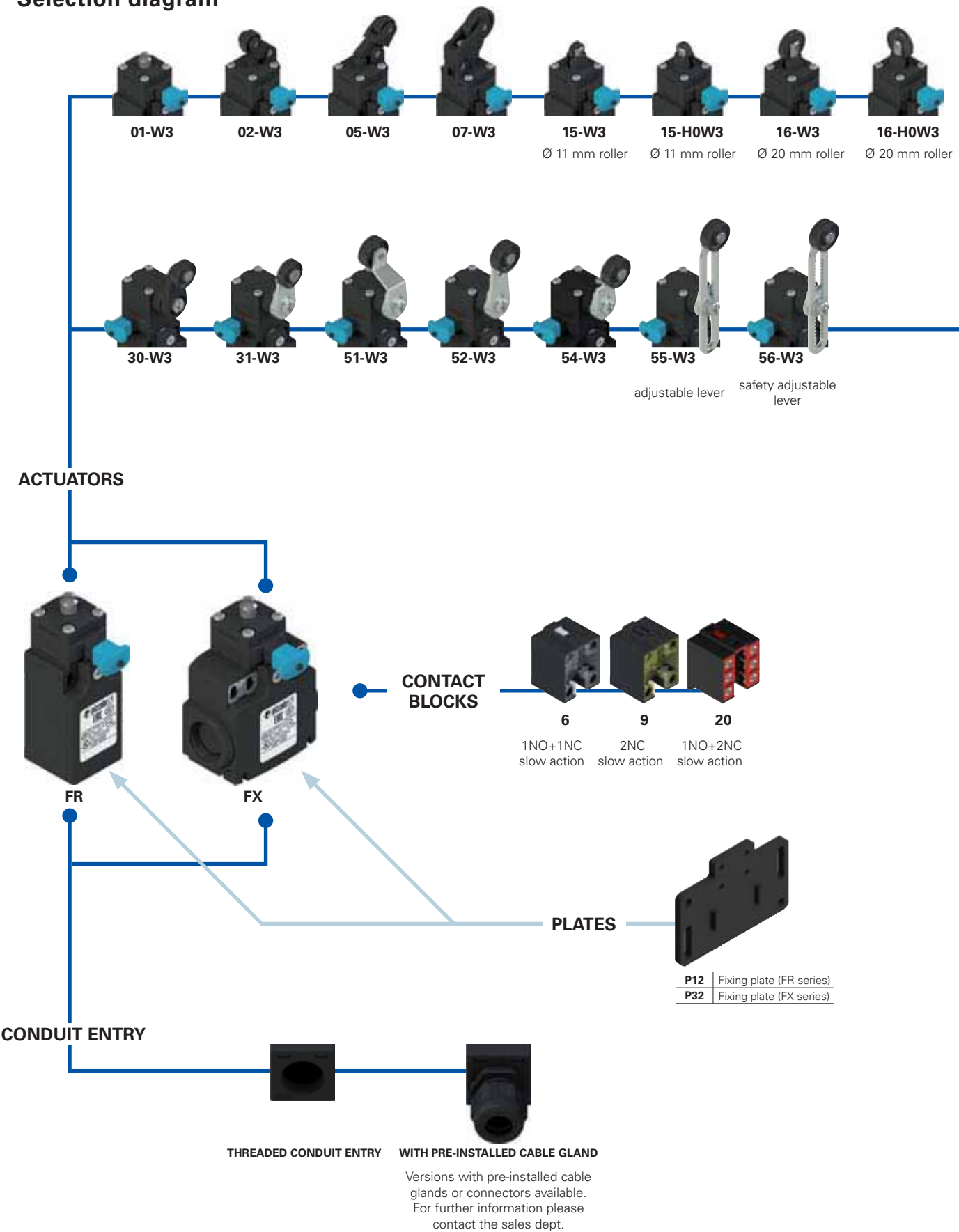
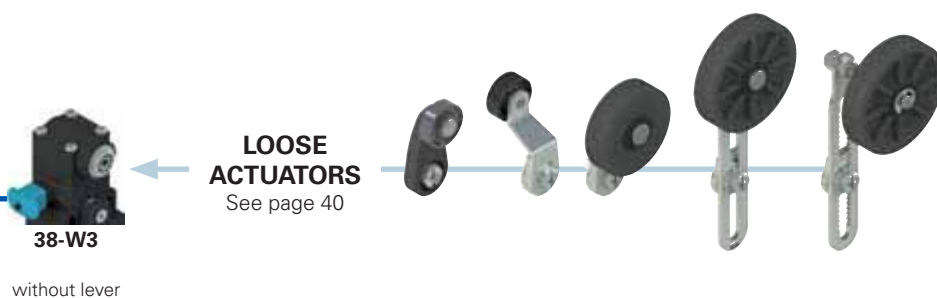


Selection diagram





Code structure

Attention! The feasibility of a code number does not mean the effective availability of a product. Please contact our sales office.

article option options

FR 655-W3GM2P12R26

Housing

FR	polymer housing, one conduit entry
FX	polymer housing, two conduit entries

Contact blocks

6	1NO+1NC, slow action
9	2NC, slow action
20	1NO+2NC, slow action

Actuators

01	short plunger
02	roller lever
05	offset roller lever
...	

Reset hooking

W3	simultaneous reset (standard)
W4	simultaneous reset with increased force

Rollers

	standard roller
R5	with Ø 40 mm rubber roller
R26	with Ø 50 mm rubber roller
R27	with Ø 50 mm overhanging rubber roller

Fixing plate

	without fixing plate (standard)
P12	supplied with fixing plate VF SFP1
P32	supplied with fixing plate VF SFP3

Threaded conduit entry

M2	M20x1.5 (standard)
	PG 13.5
A	PG 11
M1	M16x1.5

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm



Main data

- Polymer housing, with one or two conduit entries
- Protection degree IP67
- External stainless steel parts versions
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:



Approval IMQ: EG610
 Approval IMQ-UNL: in progress
 Approval UL: E131787
 Approval CCC: 2007010305230013
 Approval ECU: 1010151
 Approval EAC: RU C-IT DM94.B.01024

Technical data

Housing

Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation □

FR series one threaded conduit entry: M20x1.5 (standard)
 FX series two threaded conduit entries: M20x1.5 (standard)
 Protection degree: IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

Ambient temperature: -25°C ... +80°C
 Version for operation in ambient temperature from -R270°C to +80° C on request
 Max operating frequency: 3600 operations cycles/hour
 Mechanical endurance: 1 million operations cycles¹
 Assembling position: any
 Driving torque for installation: see page 123
 (1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by EN 60947-5-1 standard.

Cross section of the conductors (flexible copper wire)

Contact blocks 20:	min.	1 x 0.34 mm ²	(1 x AWG 22)
	max.	2 x 1.5 mm ²	(2 x AWG 16)
Contact blocks 6, 9:	min.	1 x 0.5 mm ²	(1 x AWG 20)
	max.	2 x 2.5 mm ²	(2 x AWG 14))

In conformity with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50047, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, EN 60529, EN 60529, EN 81-20, EN 81-50, NFC 63-140, VDE 0660-200, VDE 0113.

Approvals:

IEC 60947-5-1, UL 508, GB14048.5-2001

In conformity with requirements requested by:

Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and EMC Directive 2004/108/EC.

Positive contact opening in conformity with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, VDE 0660-206.

Installation for safety applications:

Use only switches marked with the symbol ⊕. The safety circuit must always be connected with the **NC contacts** (normally closed contacts: 11-12, 21-22 or 31-R262) as stated in the **standard ISO 14119, par. 5.4**. The switch must be actuated with **at least up to the positive opening travel** shown in the travels diagrams on page 123. The switch must be actuated **at least with the positive opening force**, shown in brackets, underneath each article, near the value of the min. force.

Electrical data		Utilization categories			
Thermal current (I _{th}):	10 A	Alternate current: AC15 (50...60 Hz)			
Rated insulation voltage (U _i):	500 Vac 600 Vdc	U _e (V)	250	400	500
	400 Vac 500 Vdc for contacts block 20	I _e (A)	6	4	1
Rated impulse withstand voltage (U _{imp}):	6 kV	Direct current: DC13			
	4 kV for contact blocks 20	U _e (V)	24	125	250
Conditional short circuit current:	1000 A according to EN 60947-5-1	I _e (A)	6	1.1	0.4
Protection against short circuits:	fuse 10 A 500 V type aM				
Pollution degree:	3				

Data type approved by IMQ, CCC and ECU

Rated insulation voltage (U_i): 500 Vac
 400 Vac for contacts block 20
 Thermal current (I_{th}): 10 A
 Protection against short circuits: fuse 10 A 500 V type aM
 Rated impulse withstand voltage (U_{imp}): 6 kV
 4 kV for contacts block 20
 Protection degree: IP67
 MV terminals (screw clamps)
 Pollution degree 3
 Utilization category: AC15
 Operation voltage (U_e): 400 Vac (50 Hz)
 Operation current (I_e): 3 A
 Forms of the contact element: Zb, Y+Y, Y+Y+X
 Positive opening of contacts on contact block 6, 9, 20

In conformity with standards: EN 60947-1, EN 60947-5-1, fundamental requirements of the Low Voltage Directive 2006/95/CE.

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

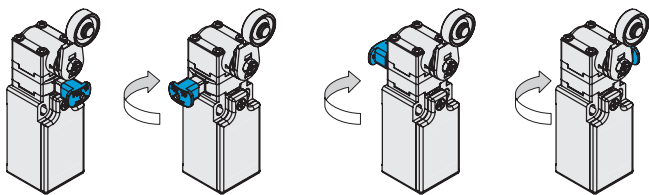
Data type approved by UL

Utilization categories Q300 (69 VA, 125-250 Vdc)
 A600 (720 VA, 120-600 Vac)
 Data of the housing type 1, 4X "indoor use only", 12, 13
 For all contact blocks use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7.1 lb in (0.8 Nm).
 In conformity with standard: UL 508

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

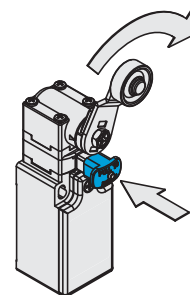
Rotating reset device

The device can be rotated independently from the above actuator, making the product highly flexible in the positioning. The reset is obtained by pulling back the blue button, as prescribed by standards, to avoid that unwanted objects could reset it accidentally.

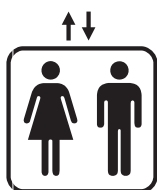


W3 simultaneous reset device

Pizzato Elettrica has developed and patented an innovative reset device. By activating the switch this device forces the simultaneous electrical contacts tripping and the reset system hooking. Therefore contact blocks with snap action are no more necessary and will not occur anymore problems caused by small differences between reset button hooking and contacts opening.



EN 81-20 standard



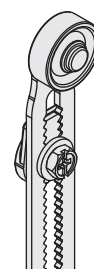
- Safety contacts according to EN 60947-5-1, encl. K.
- Protection degree higher than IP4x.
- Mechanical endurance higher than 10^6 cycles.

Protection degree IP67

IP67

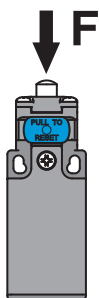
These series switches are all IP 67 rated.

Safety lever LE56



The adjustable lever code 56 (and variants) is supplied with an indentation which blocks the lever slipping in case of fixing screw release.

Increased actuating force

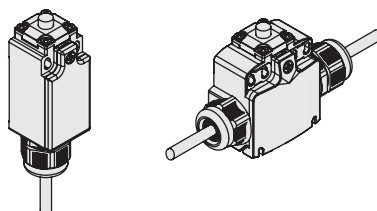


The switch can be supplied with an increased actuating force (option W4); ideal for applications with vibrations.

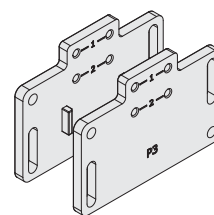
Actuator	Force
01, 14, 15, 16	7 N
02, 05	6 N
07	3.5 N
30 ... 56	0.08 Nm

Conduit entries

Switches with conduit entries in several directions are available, for applications also in restricted spaces.



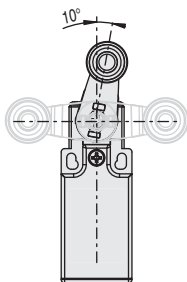
Adaptive plates



Adaptive plates provided with long slots for the adjustment of the actuating point, developed for compatibility with old products. Every plate has a double couple of switch fixing holes, one for standard switches and the other one for switches with reset device. In this way the actuator will always have the same actuating point.

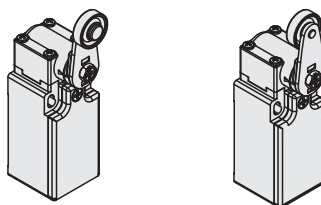
Adjustable levers

In switches with revolving lever it is possible to adjust the lever with 10° 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 as prescribed for safety applications by the German standard BG-GS-ET-15.



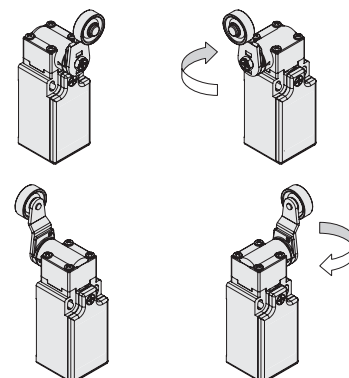
Overturning levers

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.



Rotating heads

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



Extended temperature range

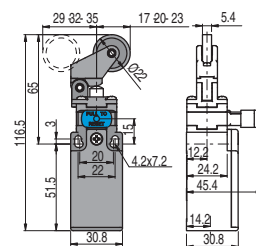
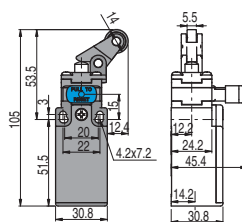
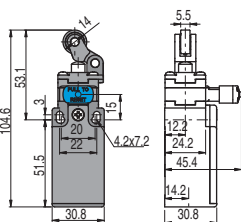
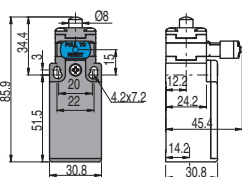
-40°C

This range of switches is also available in a special version with an ambient operating temperature range of -40°C to $+80^\circ\text{C}$. This is particularly useful for applications in cold stores, sterilisers and other low temperature environments. The materials used in the production of these switches maintain the standard operating parameters even over this temperature range, further increasing application possibilities.

2 Switches with manual reset

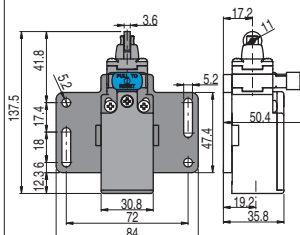
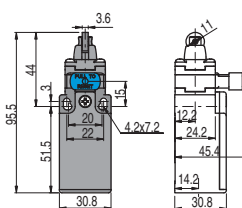
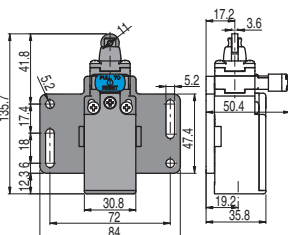
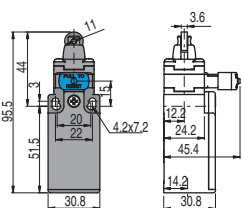
Contacts type:

L = slow action



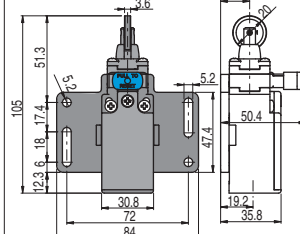
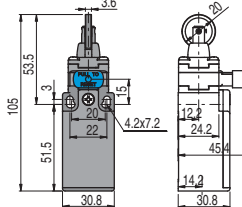
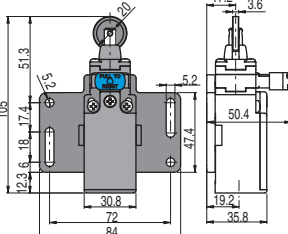
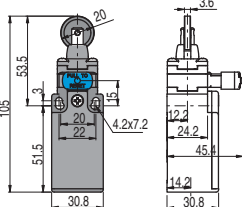
Contact blocks

6	L	FR 601-W3M2	➔ 1NO+1NC	FR 602-W3M2	➔ 1NO+1NC	FR 605-W3M2	➔ 1NO+1NC	FR 607-W3M2	➔ 1NO+1NC
9	L	FR 901-W3M2	➔ 2NC	FR 902-W3M2	➔ 2NC	FR 905-W3M2	➔ 2NC	FR 907-W3M2	➔ 2NC
20	L	FR 2001-W3M2	➔ 1NO+2NC	FR 2002-W3M2	➔ 1NO+2NC	FR 2005-W3M2	➔ 1NO+2NC	FR 2007-W3M2	➔ 1NO+2NC
Max speed		page 123 - type 4		page 123 - type 3		page 123 - type 3		page 123 - type 3	
Min. force		4.5 N (25 N ➔)		4 N (25 N ➔)		4 N (25 N ➔)		2.5 N (25 N ➔)	
Travel diagrams		page 124 - group 1c		page 124 - group 2c		page 124 - group 2c		page 124 - group 3c	



Contact blocks

6	L	FR 615-W3M2	➔ 1NO+1NC	FR 615-W3M2P12	➔ 1NO+1NC	FR 615-W3H0M2	➔ 1NO+1NC	FR 615-W3H0M2P12	➔ 1NO+1NC
9	L	FR 915-W3M2	➔ 2NC	FR 915-W3M2P12	➔ 2NC	FR 915-W3H0M2	➔ 2NC	FR 915-W3H0M2P12	➔ 2NC
20	L	FR 2015-W3M2	➔ 1NO+2NC	FR 2015-W3M2P12	➔ 1NO+2NC	FR 2015-W3H0M2	➔ 1NO+2NC	FR 2015-W3H0M2P12	➔ 1NO+2NC
Max speed		page 123 - type 2		page 123 - type 2		page 123 - type 2		page 123 - type 2	
Min. force		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)	
Travel diagrams		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c	



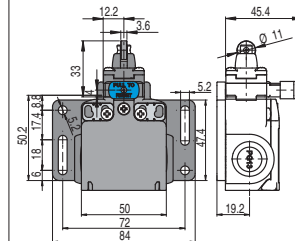
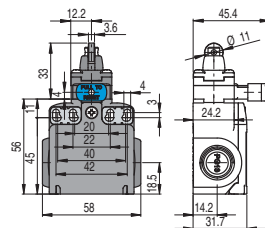
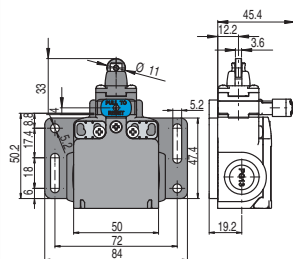
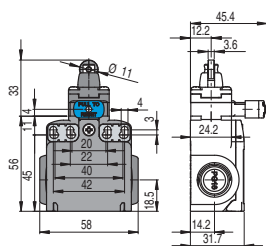
Contact blocks

6	L	FR 616-W3M2	➔ 1NO+1NC	FR 616-W3M2P12	➔ 1NO+1NC	FR 616-W3H0M2	➔ 1NO+1NC	FR 616-W3H0M2P12	➔ 1NO+1NC
9	L	FR 916-W3M2	➔ 2NC	FR 916-W3M2P12	➔ 2NC	FR 916-W3H0M2	➔ 2NC	FR 916-W3H0M2P12	➔ 2NC
20	L	FR 2016-W3M2	➔ 1NO+2NC	FR 2016-W3M2P12	➔ 1NO+2NC	FR 2016-W3H0M2	➔ 1NO+2NC	FR 2016-W3H0M2P12	➔ 1NO+2NC
Max speed		page 123 - type 2		page 123 - type 2		page 123 - type 2		page 123 - type 2	
Min. force		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)	
Travel diagrams		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c	

Accessories See page 119

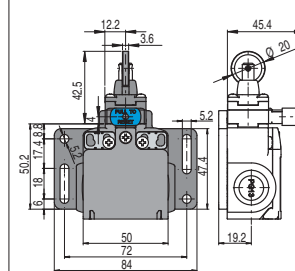
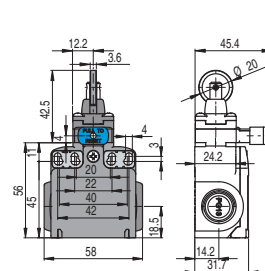
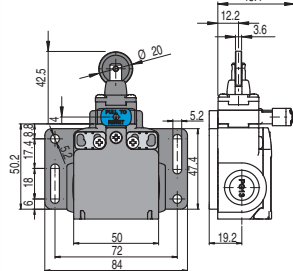
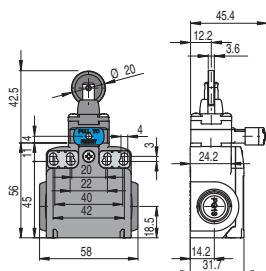
All measures in the drawings are in mm

Contacts type:

L = slow action

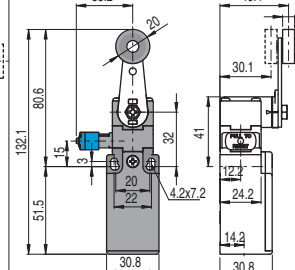
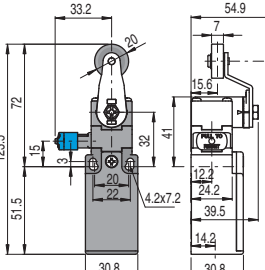
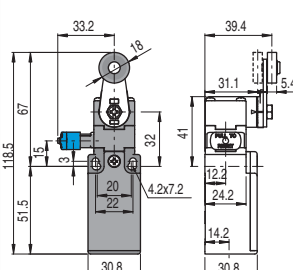
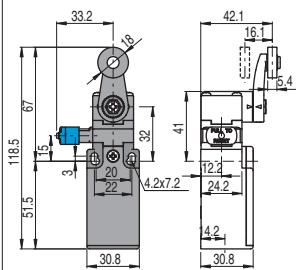
Contact blocks

6	L	FX 615-W3M2	➔ 1NO+1NC	FX 615-W3M2P32	➔ 1NO+1NC	FX 615-W3H0M2	➔ 1NO+1NC	FX 615-W3H0M2P32	➔ 1NO+1NC
9	L	FX 915-W3M2	➔ 2NC	FX 915-W3M2P32	➔ 2NC	FX 915-W3H0M2	➔ 2NC	FX 915-W3H0M2P32	➔ 2NC
20	L	FX 2015-W3M2	➔ 1NO+2NC	FX 2015-W3M2P32	➔ 1NO+2NC	FX 2015-W3H0M2	➔ 1NO+2NC	FX 2015-W3H0M2P32	➔ 1NO+2NC
Max speed		page 123 - type 2		page 123 - type 2		page 123 - type 2		page 123 - type 2	
Min. force		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)	
Travel diagrams		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c	



Contact blocks

6	L	FX 616-W3M2	➔ 1NO+1NC	FX 616-W3M2P32	➔ 1NO+1NC	FX 616-W3H0M2	➔ 1NO+1NC	FX 616-W3H0M2P32	➔ 1NO+1NC
9	L	FX 916-W3M2	➔ 2NC	FX 916-W3M2P32	➔ 2NC	FX 916-W3H0M2	➔ 2NC	FX 916-W3H0M2P32	➔ 2NC
20	L	FX 2016-W3M2	➔ 1NO+2NC	FX 2016-W3M2P32	➔ 1NO+2NC	FX 2016-W3H0M2	➔ 1NO+2NC	FX 2016-W3H0M2P32	➔ 1NO+2NC
Max speed		page 123 - type 2		page 123 - type 2		page 123 - type 2		page 123 - type 2	
Min. force		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)		4.5 N (25 N ➔)	
Travel diagrams		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c		page 124 - group 1c	

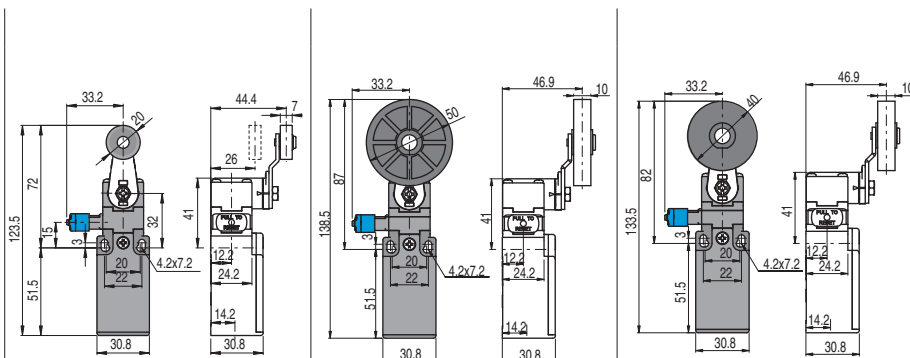


Contact blocks

6	L	FR 630-W3M2	➔ 1NO+1NC	FR 631-W3M2	➔ 1NO+1NC	FR 651-W3M2	➔ 1NO+1NC	FR 652-W3M2	➔ 1NO+1NC
9	L	FR 930-W3M2	➔ 2NC	FR 931-W3M2	➔ 2NC	FR 951-W3M2	➔ 2NC	FR 952-W3M2	➔ 2NC
20	L	FR 2030-W3M2	➔ 1NO+2NC	FR 2031-W3M2	➔ 1NO+2NC	FR 2051-W3M2	➔ 1NO+2NC	FR 2052-W3M2	➔ 1NO+2NC
Max speed		page 123 - type 1		page 123 - type 1		page 123 - type 1		page 123 - type 1	
Min. force		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)	
Travel diagrams		page 124 - group 4c		page 124 - group 4c		page 124 - group 4c		page 124 - group 4c	

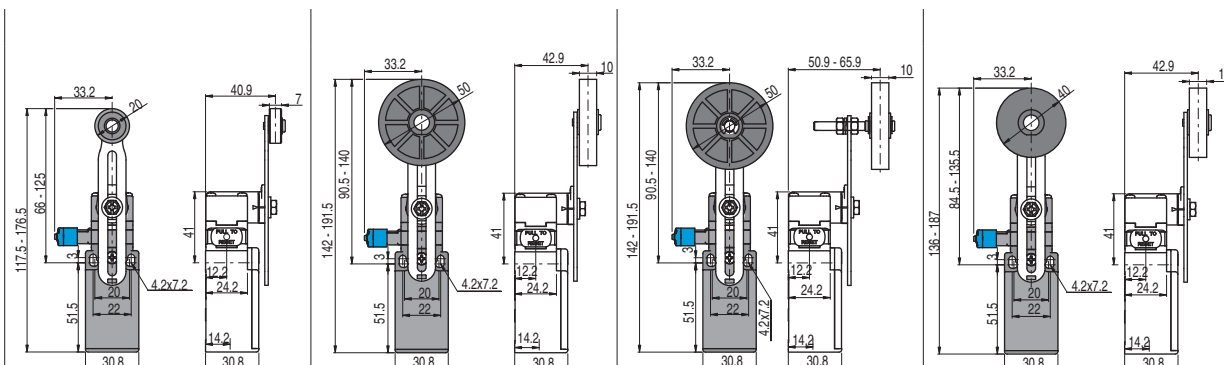
Contacts type:

L = slow action



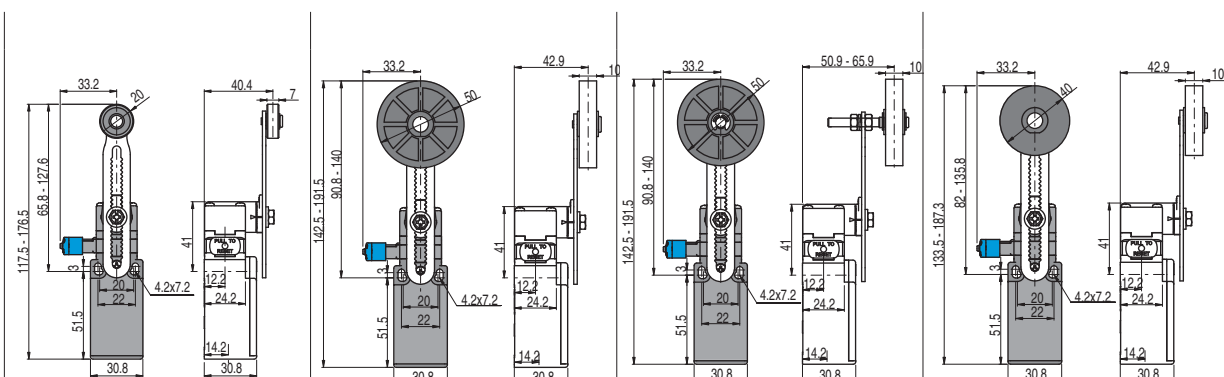
Contact blocks

6	L	FR 654-W3M2	➔ 1NO+1NC	FR 654-W3M2R26	➔ 1NO+1NC	FR 654-W3M2R5	➔ 1NO+1NC
9	L	FR 954-W3M2	➔ 2NC	FR 954-W3M2R26	➔ 2NC	FR 954-W3M2R5	➔ 2NC
20	L	FR 2054-W3M2	➔ 1NO+2NC	FR 2054-W3M2R26	➔ 1NO+2NC	FR 2054-W3M2R5	➔ 1NO+2NC
Max speed		page 123 - type 1		page 123 - type 1		page 123 - type 1	
Min. force		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)	
Travel diagrams		page 124 - group 4c		page 124 - group 4c		page 124 - group 4c	



Contact blocks

6	L	FR 655-W3M2	➔ ⁽¹⁾ 1NO+1NC	FR 655-W3M2R26	➔ ⁽¹⁾ 1NO+1NC	FR 655-W3M2R27	➔ ⁽¹⁾ 1NO+1NC	FR 655-W3M2R5	➔ ⁽¹⁾ 1NO+1NC
9	L	FR 955-W3M2	➔ ⁽¹⁾ 2NC	FR 955-W3M2R26	➔ ⁽¹⁾ 2NC	FR 955-W3M2R27	➔ ⁽¹⁾ 2NC	FR 955-W3M2R5	➔ ⁽¹⁾ 2NC
20	L	FR 2055-W3M2	➔ ⁽¹⁾ 1NO+1NC	FR 2055-W3M2R26	➔ ⁽¹⁾ 1NO+2NC	FR 2055-W3M2R27	➔ ⁽¹⁾ 1NO+2NC	FR 2055-W3M2R5	➔ ⁽¹⁾ 1NO+2NC
Max speed		page 123 - type 1		page 123 - type 1		page 123 - type 1		page 123 - type 1	
Min. force		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)	
Travel diagrams		page 124 - group 4c		page 124 - group 4c		page 124 - group 4c		page 124 - group 4c	



Contact blocks

6	L	FR 656-W3M2	➔ 1NO+1NC	FR 656-W3M2R26	➔ 1NO+1NC	FR 656-W3M2R27	➔ 1NO+1NC	FR 656-W3M2R5	➔ 1NO+1NC
9	L	FR 956-W3M2	➔ 2NC	FR 956-W3M2R26	➔ 2NC	FR 956-W3M2R27	➔ 2NC	FR 956-W3M2R5	➔ 2NC
20	L	FR 2056-W3M2	➔ 1NO+2NC	FR 2056-W3M2R26	➔ 1NO+2NC	FR 2056-W3M2R27	➔ 1NO+2NC	FR 2056-W3M2R5	➔ 1NO+2NC
Max speed		page 123 - type 1		page 123 - type 1		page 123 - type 1		page 123 - type 1	
Min. force		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)		0.07 Nm (0.25 Nm ➔)	
Travel diagrams		page 124 - group 4c		page 124 - group 4c		page 124 - group 4c		page 124 - group 4c	

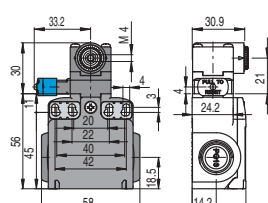
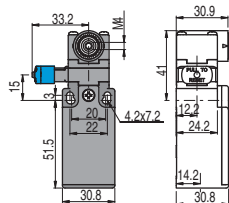
Accessories See page 119

⁽¹⁾ Positive opening only with lever adjusted on the max.

Position switches (reset hooking) with revolving lever without actuator

Contacts type:

L = slow action



IMPORTANT

For safety applications: join only switches and actuators marked with symbol $\ominus$.

Contact blocks

6	L	FR 638-W3M2 $\ominus$	1NO+1NC	FX 638-W3M2 $\ominus$	1NO+1NC		
9	L	FR 938-W3M2 $\ominus$	2NC	FX 938-W3M2 $\ominus$	2NC		
20	L	FR 2038-W3M2 $\ominus$	1NO+2NC	FX 2038-W3M2 $\ominus$	1NO+2NC		
Max speed		page 123 - type 1		page 123 - type 1			
Min. force		0.07 Nm (0.25 Nm $\ominus$)		0.07 Nm (0.25 Nm $\ominus$)			
Travel diagrams		page 124 - group 4c		page 124 - group 4c			

Special loose actuators

IMPORTANT: These loose actuators can be used with items of series FR, FX only.

Ø 40 mm rubber rollers

VF LE31-R5 $\ominus$ (4)	VF LE51-R5 $\ominus$ (4)	VF LE52-R5 $\ominus$	VF LE54-R5 $\ominus$ (4)	VF LE55-R5 $\ominus$ (1)	VF LE56-R5 $\ominus$

Ø 50 mm rubber rollers

VF LE51-R26 $\ominus$ (4)	VF LE52-R26 $\ominus$ (4)	VF LE54-R26 $\ominus$ (4)	VF LE55-R26 $\ominus$ (1)	VF LE56-R26 $\ominus$

Ø 50 mm overhanging rubber rollers

VF LE55-R27 $\ominus$ (1)	VF LE56-R27 $\ominus$

- Only orders for multiple quantities of the packs are accepted.
- (1) Actuator VF LE55 suits to safety applications only if adjusted to its max length, as you can see in figure beside. If you need an adjustable lever for safety applications, use the adjustable safety lever VF LE56.
- (4) The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

