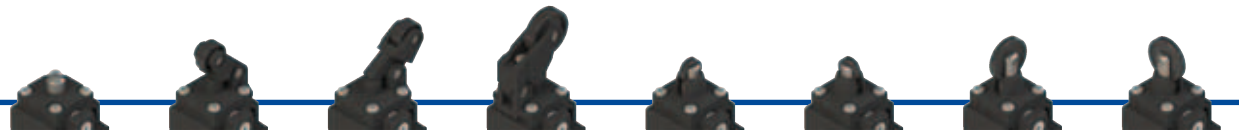
Selection diagram



01 **02** **05** **07** **15** **15-H0** **16** **16-H0**

Ø 11 mm roller — Ø 11 mm roller — Ø 20 mm roller — Ø 20 mm roller

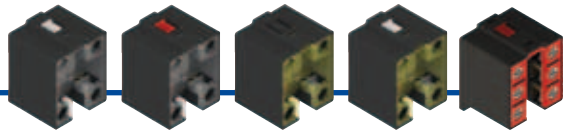
30 **31** **51** **52** **54** **54-R5** **54-R26**

Ø 40 mm rubber roller — Ø 50 mm rubber roller

ACTUATORS

FR **FX**

CONTACT BLOCKS



6 1NO+1NC slow action

7 1NO+1NC slow action overlapped

9 2NC slow action

16 2NC slow action independent

20 1NO+2NC slow action

PLATES

P11	Fixing plate (FR series)
P31	Fixing plate (FX series)

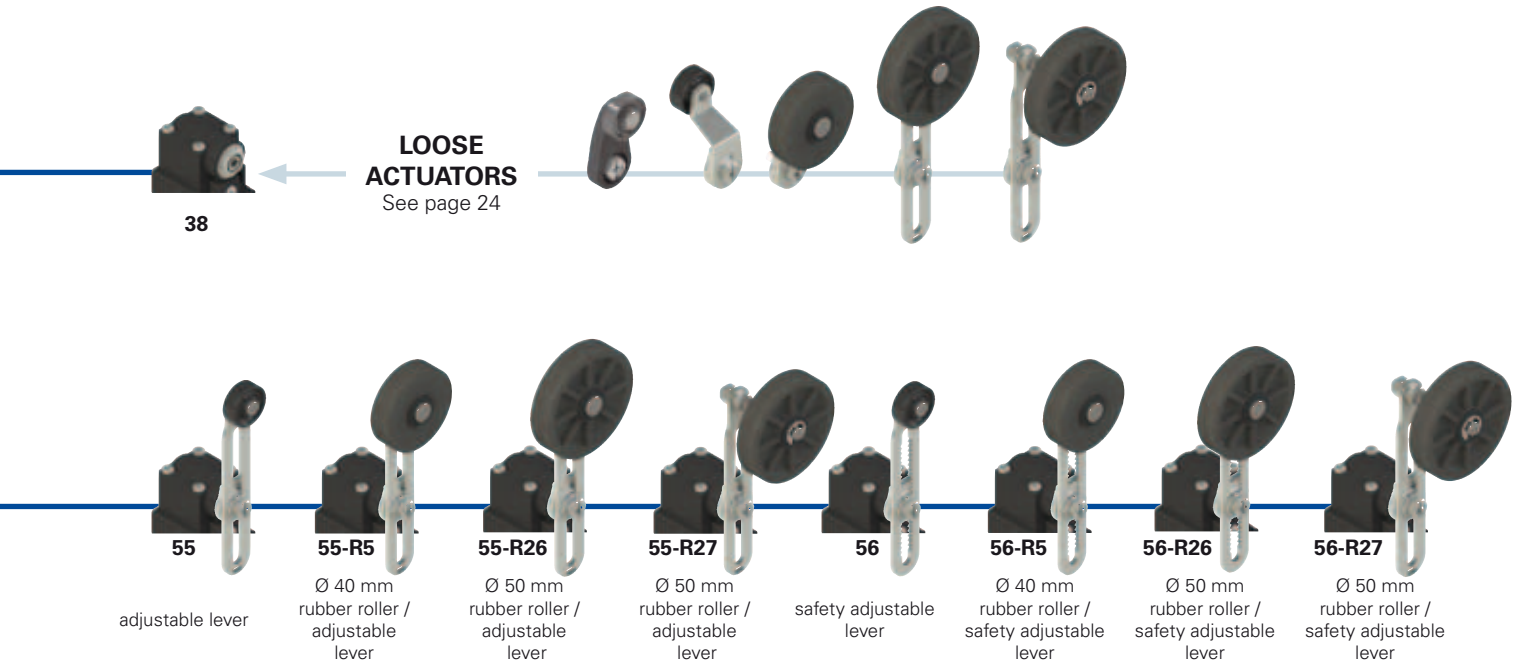
CONDUIT ENTRY

THREADED CONDUIT ENTRY **WITH PRE-INSTALLED CABLE GLAND**

Versions with pre-installed cable glands or connectors available. For further information please contact the technical office

product option

accessory sold separately



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-GM2P11R26

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

Contact blocks	
6	1NO+1NC, slow action
7	1NO+1NC, slow action overlapped
9	2NC, slow action
16	2NC, slow action indipendent
20	1NO+2NC, slow action

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

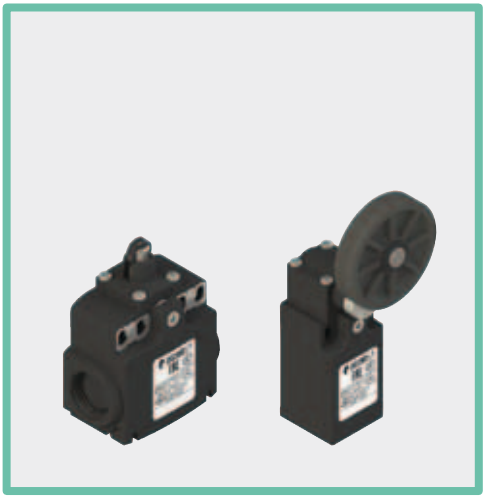
Contacts type	
	silver contacts (standard)
G	silver contacts gold plated 1 µm

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

Fixing plate	
	without fixing plate (standard)
P11	supplied with fixing plate VF SFP1
P31	supplied with fixing plate VF SFP3

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

Position switches **FR, FX** series



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-UNI: CA50.00662
Approval UL: E131787
Approval CCC: 2007010305230013
Approval EAC: RU C-IT ДМ94.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 -40°C to +80° C on request

Max operating frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	20 million operations cycles[1]
Assembling position:	any
Safety parameters:	
B_{10d}:	40,000,000 for NC contacts
Mechanical interlock, not coded:	type 1 according to EN ISO 14119
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 mm²	(1 x AWG 22)
	max.	2 x 1.5 mm²	(2 x AWG 16)
Contact blocks 6, 7, 9, 16:	min.	1 x 0.5 mm²	(1 x AWG 20)
	max.	2 x 2.5 mm²	(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 ISO 14119, EN ISO 12100, IEC 60529, EN 60529, EN 81-20, EN 81-50, UL 508, CSA 22.2 No.14
Approvals:
IEC 60947-5-1, UL 508, CSA 22.2 No.14, GB14048.5-2001.

In conformity with requirements requested by:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and EMC Directive 2014/30/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1.

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 31-32) as stated in the **standard EN 81-20 par. 5.11.2.2.1**. 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

Thermal current (I_{th}):	10 A
Rated insulation voltage (U_i):	500 Vac 600 Vdc 400 Vac 500 Vdc for contacts block 20
Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV for contact blocks 20
Conditional shot circuit current:	1000 A according to EN 60947-5-1
Protection against short circuits:	fuse 10 A 500 V type aM
Pollution degree:	3

Utilization categories

Alternate current: AC15 (50...60 Hz)

Ue (V)	250	400	500
Ie (A)	6	4	1

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	6	1.1	0.4

Data type approved by IMQ

Rated insulation voltage (Ui): 500 Vac
400 Vac for contacts block 20
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (Uimp): 6 kV
4 kV for contacts block 20
Protection degree: IP67
MV terminals (screw clamps)
Pollution degree 3
Utilization category: AC15
Operation voltage (Ue): 400 Vac (50 Hz)
Operation current (Ie): 3 A
Forms of the contact element: Zb, Y+Y, Y+Y+X
Positive opening of contacts on contact block 6, 7, 9, 16, 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.

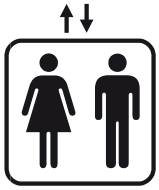
Data type approved by UL

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.

EN 81-20 standard



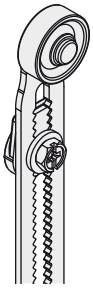
- Safaty contacts according to EN 60947-5-1, encl. K.
- Protection degree higher than IP4x.
- Mechanical endurance higher than 10^6 cycles.

Protection degree IP 67

IP67

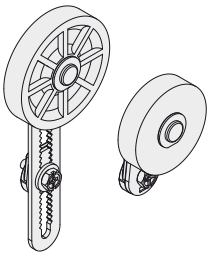
These series switches are all IP 67 rated.

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.

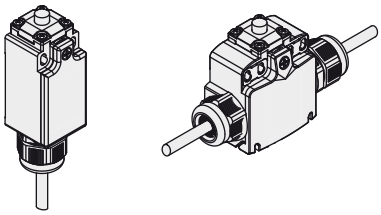
Rubber rollers



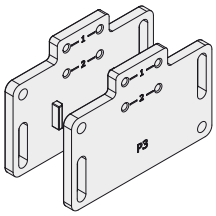
Different actuators with rubber rollers are available. The client can choose the most suitable product depending on lift speed in order to reduce the noise inside the cabin.

Conduit entries

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



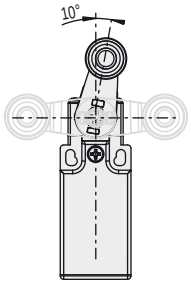
Adaptive plates



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.

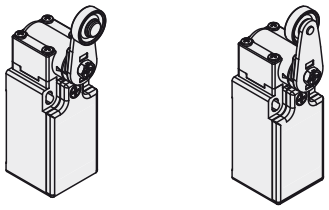
Adjustable levers

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.



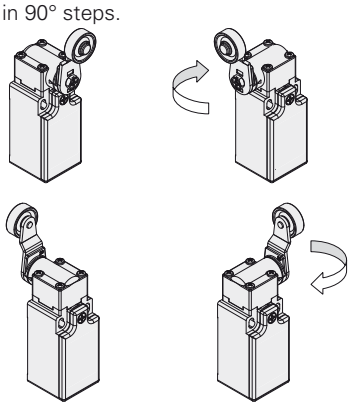
Overturning levers

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.

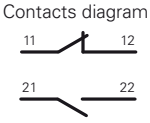


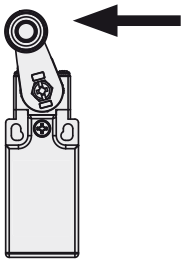
Working operation of contact block 16 with independent contacts

The contact block 16 has two NC contacts**, both with positive opening** activated independently according to the lever turning direction.

Lever turned to left

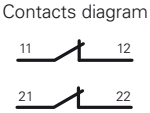
Contacts diagram

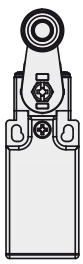




Lever not turned

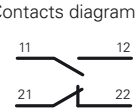
Contacts diagram

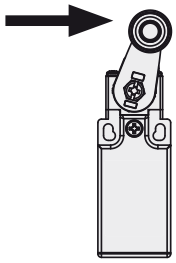




Lever turned to right

Contacts diagram





Extended temperature range

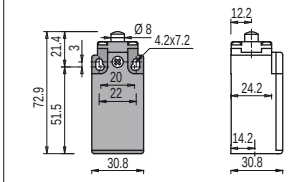
-40°C

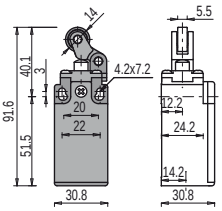
This range of switches is also available in a special version with an ambient operating temperature range of -40°C to +80°C. This is particularly useful for applications in cold stores, sterilisers and other low temperature environments. The materials used in the production of these switches maintain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

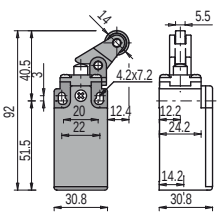
Position switches **FR, FX** series

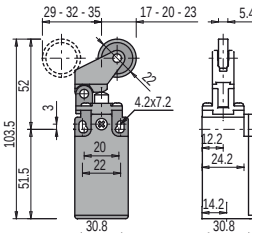
Contacts type:

L = slow action
LO = slow action overlapped
LI = slow action independent

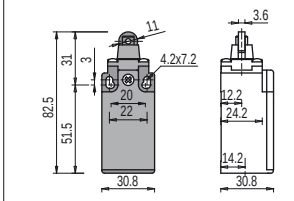


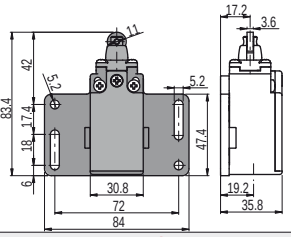


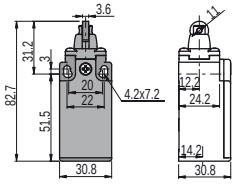


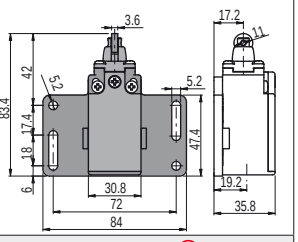


Contact blocks					
6	L	FR 601-M2 → 1NO+1NC	FR 602-M2 → 1NO+1NC	FR 605-M2 → 1NO+1NC	FR 607-M2 → 1NO+1NC
7	LO	FR 701-M2 → 1NO+1NC	FR 702-M2 → 1NO+1NC	FR 705-M2 → 1NO+1NC	FR 707-M2 → 1NO+1NC
9	L	FR 901-M2 → 2NC	FR 902-M2 → 2NC	FR 905-M2 → 2NC	FR 907-M2 → 2NC
16	LI				
20	L	FR 2001-M2 → 1NO+2NC	FR 2002-M2 → 1NO+2NC	FR 2005-M2 → 1NO+2NC	FR 2007-M2 → 1NO+2NC
Max speed		page 123 - type 4	page 123 - type 3	page 123 - type 3	page 123 - type 3
Min. force		8 N (25 N →)	6 N (25 N →)	6 N (25 N →)	4 N (25 N →)
Travel diagrams		page 124 - group 1a	page 124 - group 2a	page 124 - group 2a	page 124 - group 3a

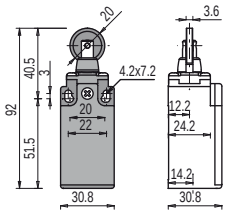


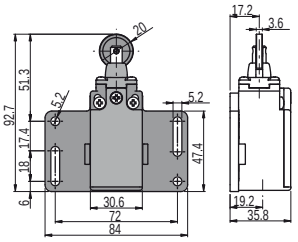


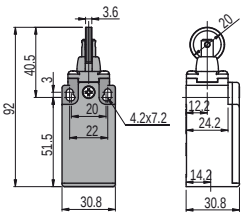


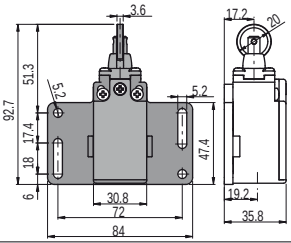


Contact blocks					
6	L	FR 615-M2 → 1NO+1NC	FR 615-M2P11 → 1NO+1NC	FR 615-H0M2 → 1NO+1NC	FR 615-H0M2P11 → 1NO+1NC
7	LO	FR 715-M2 → 1NO+1NC	FR 715-M2P11 → 1NO+1NC	FR 715-H0M2 → 1NO+1NC	FR 715-H0M2P11 → 1NO+1NC
9	L	FR 915-M2 → 2NC	FR 915-M2P11 → 2NC	FR 915-H0M2 → 2NC	FR 915-H0M2P11 → 2NC
16	LI				
20	L	FR 2015-M2 → 1NO+2NC	FR 2015-M2P11 → 1NO+2NC	FR 2015-H0M2 → 1NO+2NC	FR 2015-H0M2P11 → 1NO+2NC
Max speed		page 123 - type 2	page 123 - type 2	page 123 - type 2	page 123 - type 2
Min. force		8 N (25 N →)	8 N (25 N →)	8 N (25 N →)	8 N (25 N →)
Travel diagrams		page 124 - group 1a	page 124 - group 1a	page 124 - group 1a	page 124 - group 1a









Contact blocks					
6	L	FR 616-M2 → 1NO+1NC	FR 616-M2P11 → 1NO+1NC	FR 616-H0M2 → 1NO+1NC	FR 616-H0M2P11 → 1NO+1NC
7	LO	FR 716-M2 → 1NO+1NC	FR 716-M2P11 → 1NO+1NC	FR 716-H0M2 → 1NO+1NC	FR 716-H0M2P11 → 1NO+1NC
9	L	FR 916-M2 → 2NC	FR 916-M2P11 → 2NC	FR 916-H0M2 → 2NC	FR 916-H0M2P11 → 2NC
16	LI				
20	L	FR 2016-M2 → 1NO+2NC	FR 2016-M2P11 → 1NO+2NC	FR 2016-H0M2 → 1NO+2NC	FR 2016-H0M2P11 → 1NO+2NC
Max speed		page 123 - type 2	page 123 - type 2	page 123 - type 2	page 123 - type 2
Min. force		8 N (25 N →)	8 N (25 N →)	8 N (25 N →)	8 N (25 N →)
Travel diagrams		page 124 - group 1a	page 124 - group 1a	page 124 - group 1a	page 124 - group 1a

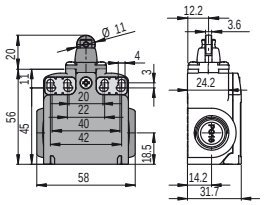
Accessories See page 119

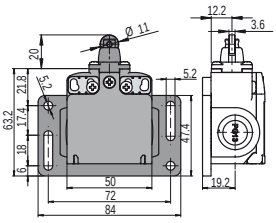
→ The 2D/3D files are available at **www.pizzato.com**

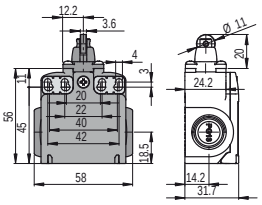
All measures in the drawings are in mm

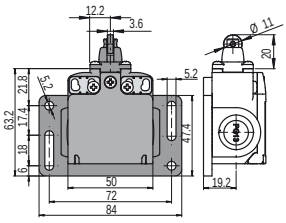
Contacts type:

L = slow action
LO = slow action overlapped
LI = slow action independent

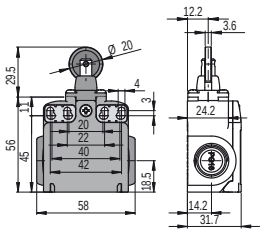


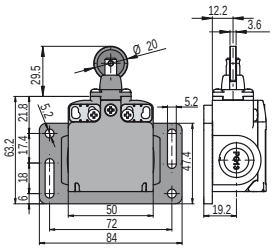


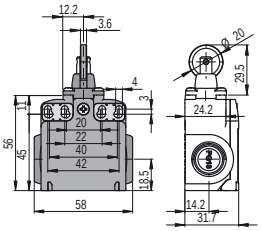


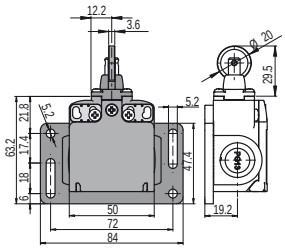


Contact blocks					
6	L	FX 615-M2 → 1NO+1NC	FX 615-M2P31 → 1NO+1NC	FX 615-H0M2 → 1NO+1NC	FX 615-H0M2P31 → 1NO+1NC
7	LO	FX 715-M2 → 1NO+1NC	FX 715-M2P31 → 1NO+1NC	FX 715-H0M2 → 1NO+1NC	FX 715-H0M2P31 → 1NO+1NC
9	L	FX 915-M2 → 2NC	FX 915-M2P31 → 2NC	FX 915-H0M2 → 2NC	FX 915-H0M2P31 → 2NC
16	LI				
20	L	FX 2015-M2 → 1NO+2NC	FX 2015-M2P31 → 1NO+2NC	FX 2015-H0M2 → 1NO+2NC	FX 2015-H0M2P31 → 1NO+2NC
Max speed		page 123 - type 2	page 123 - type 2	page 123 - type 2	page 123 - type 2
Min. force		8 N (25 N →)	8 N (25 N →)	8 N (25 N →)	8 N (25 N →)
Travel diagrams		page 124 - group 1a	page 124 - group 1a	page 124 - group 1a	page 124 - group 1a

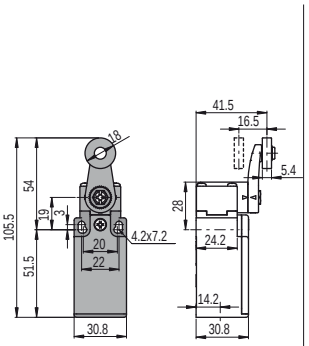


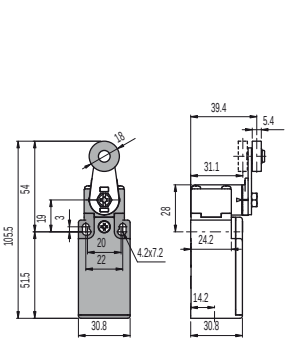


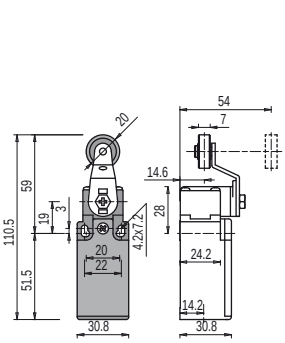


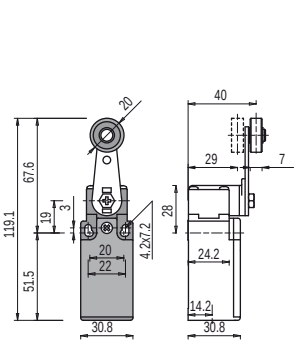


Contact blocks					
6	L	FX 616-M2 → 1NO+1NC	FX 616-M2P31 → 1NO+1NC	FX 616-H0M2 → 1NO+1NC	FX 616-H0M2P31 → 1NO+1NC
7	LO	FX 716-M2 → 1NO+1NC	FX 716-M2P31 → 1NO+1NC	FX 716-H0M2 → 1NO+1NC	FX 716-H0M2P31 → 1NO+1NC
9	L	FX 916-M2 → 2NC	FX 916-M2P31 → 2NC	FX 916-H0M2 → 2NC	FX 916-H0M2P31 → 2NC
16	LI				
20	L	FX 2016-M2 → 1NO+2NC	FX 2016-M2P31 → 1NO+2NC	FX 2016-H0M2 → 1NO+2NC	FX 2016-H0M2P31 → 1NO+2NC
Max speed		page 123 - type 2	page 123 - type 2	page 123 - type 2	page 123 - type 2
Min. force		8 N (25 N →)	8 N (25 N →)	8 N (25 N →)	8 N (25 N →)
Travel diagrams		page 124 - group 1a	page 124 - group 1a	page 124 - group 1a	page 124 - group 1a









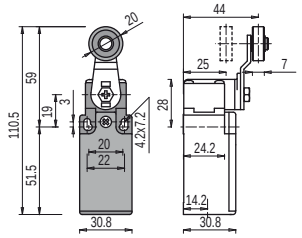
Contact blocks					
6	L	FR 630-M2 → 1NO+1NC	FR 631-M2 → 1NO+1NC	FR 651-M2 → 1NO+1NC	FR 652-M2 → 1NO+1NC
7	LO	FR 730-M2 → 1NO+1NC	FR 731-M2 → 1NO+1NC	FR 751-M2 → 1NO+1NC	FR 752-M2 → 1NO+1NC
9	L	FR 930-M2 → 2NC	FR 931-M2 → 2NC	FR 951-M2 → 2NC	FR 952-M2 → 2NC
16	LI	FR 1630-M2 → 2NC	FR 1631-M2 → 2NC	FR 1651-M2 → 2NC	FR 1652-M2 → 2NC
20	L	FR 2030-M2 → 1NO+2NC	FR 2031-M2 → 1NO+2NC	FR 2051-M2 → 1NO+2NC	FR 2052-M2 → 1NO+2NC
Max speed		page 123 - type 1	page 123 - type 1	page 123 - type 1	page 123 - type 1
Min. force		0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)
Travel diagrams		page 124 - group 4a	page 124 - group 4a	page 124 - group 4a	page 124 - group 4a

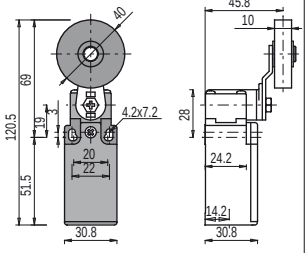
Items with code on the **green** background are available in stock

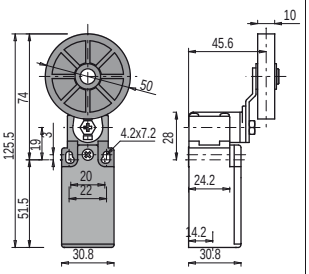
Position switches **FR, FX** series

Contacts type:

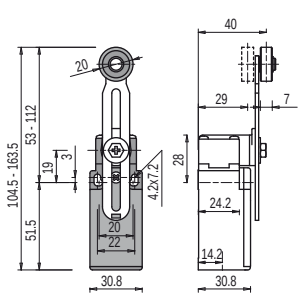
L = slow action
LO = slow action overlapped
LI = slow action independent

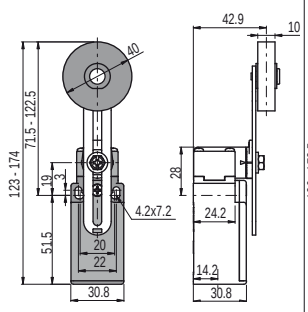


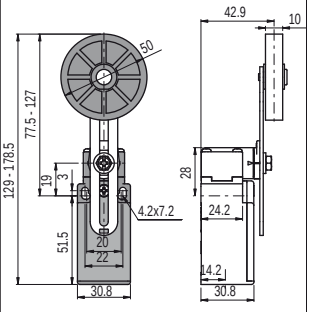


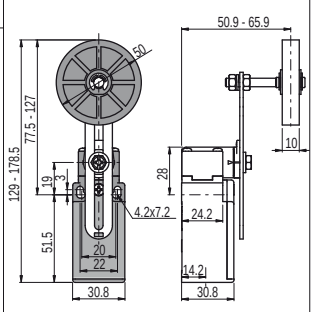


Contact blocks					
6	L	FR 654-M2 → 1NO+1NC	FR 654-M2R5 → 1NO+1NC	FR 654-M2R26 → 1NO+1NC	
7	LO	FR 754-M2 → 1NO+1NC	FR 754-M2R5 → 1NO+1NC	FR 754-M2R26 → 1NO+1NC	
9	L	FR 954-M2 → 2NC	FR 954-M2R5 → 2NC	FR 954-M2R26 → 2NC	
16	LI	FR 1654-M2 → 2NC)	FR 1654-M2R5 → 2NC	FR 1654-M2R26 → 2NC	
20	L	FR 2054-M2 → 1NO+2NC	FR 2054-M2R5 → 1NO+2NC	FR 2054-M2R26 → 1NO+2NC	
Max speed		page 123 - type 1	page 123 - type 1	page 123 - type 1	
Min. force		0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	
Travel diagrams		page 124 - group 4a	page 124 - group 4a	page 124 - group 4a	

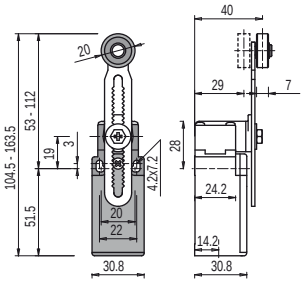


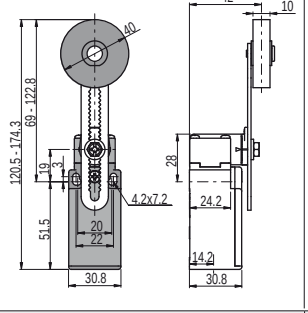


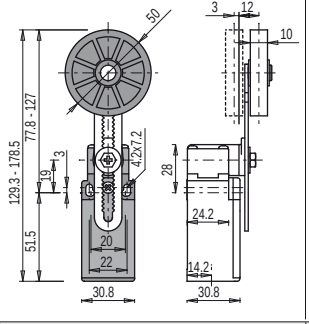


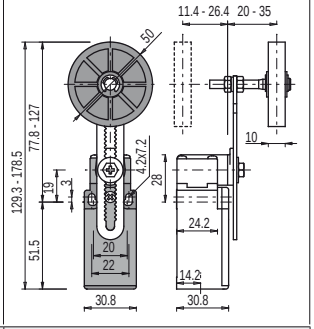


Contact blocks					
6	L	FR 655-M2 → (1) 1NO+1NC	FR 655-M2R5 → (1) 1NO+1NC	FR 655-M2R26 → (1) 1NO+1NC	FR 655-M2R27 → (1) 1NO+1NC
7	LO	FR 755-M2 → (1) 1NO+1NC	FR 755-M2R5 → (1) 1NO+1NC	FR 755-M2R26 → (1) 1NO+1NC	FR 755-M2R27 → (1) 1NO+1NC
9	L	FR 955-M2 → (1) 2NC	FR 955-M2R5 → (1) 2NC	FR 955-M2R26 → (1) 2NC	FR 955-M2R27 → (1) 2NC
16	LI	FR 1655-M2 → (1) 2NC	FR 1655-M2R5 → (1) 2NC	FR 1655-M2R26 → (1) 2NC	FR 1655-M2R27 → (1) 2NC
20	L	FR 2055-M2 → (1) 1NO+2NC	FR 2055-M2R5 → (1) 1NO+2NC	FR 2055-M2R26 → (1) 1NO+2NC	FR 2055-M2R27 → (1) 1NO+2NC
Max speed		page 123 - type 1	page 123 - type 1	page 123 - type 1	page 123 - type 1
Min. force		0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)
Travel diagrams		page 124 - group 4a	page 124 - group 4a	page 124 - group 4a	page 124 - group 4a









Contact blocks					
6	L	FR 656-M2 → 1NO+1NC	FR 656-M2R5 → 1NO+1NC	FR 656-M2R26 → 1NO+1NC	FR 656-M2R27 → 1NO+1NC
7	LO	FR 756-M2 → 1NO+1NC	FR 756-M2R5 → 1NO+1NC	FR 756-M2R26 → 1NO+1NC	FR 756-M2R27 → 1NO+1NC
9	L	FR 956-M2 → 2NC	FR 956-M2R5 → 2NC	FR 956-M2R26 → 2NC	FR 956-M2R27 → 2NC
16	LI	FR 1656-M2 → 2NC	FR 1656-M2R5 → 2NC	FR 1656-M2R26 → 2NC	FR 1656-M2R27 → 2NC
20	L	FR 2056-M2 → 1NO+2NC	FR 2056-M2R5 → 1NO+2NC	FR 2056-M2R26 → 1NO+2NC	FR 2056-M2R27 → 1NO+2NC
Max speed		page 123 - type 1	page 123 - type 1	page 123 - type 1	page 123 - type 1
Min. force		0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)
Travel diagrams		page 124 - group 4a	page 124 - group 4a	page 124 - group 4a	page 124 - group 4a

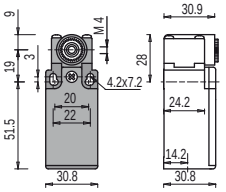
Accessories See page 119

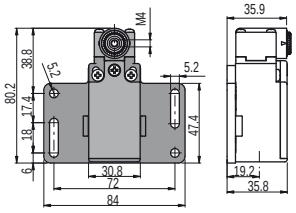
→ The 2D/3D files are available at **www.pizzato.com**

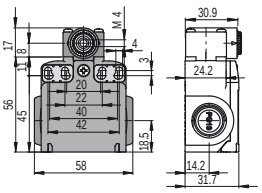
(1) Positive opening only with lever adjusted on the max.

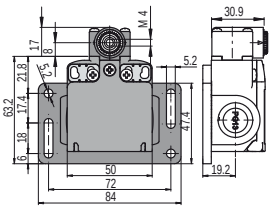
Contacts type:

L = slow action
LO = slow action overlapped
LI = slow action independent









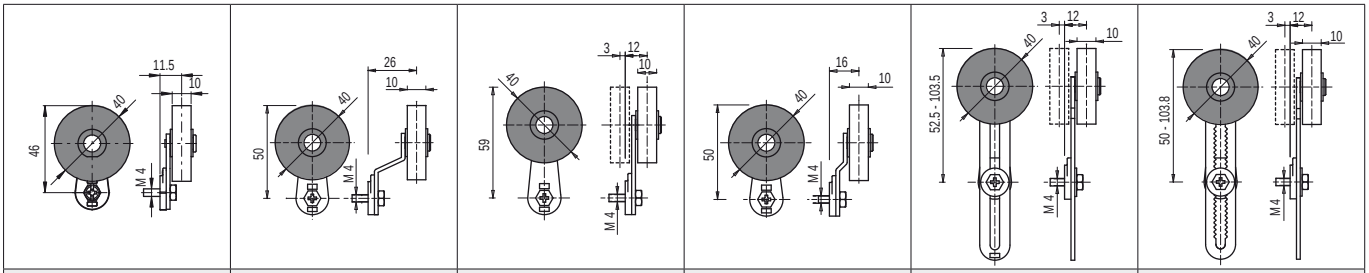
Contact blocks					
6	L	FR 638-M2 → 1NO+1NC	FR 638-M2P11 → 1NO+1NC	FX 638-M2 → 1NO+1NC	FX 638-M2P31 → 1NO+1NC
7	LO	FR 738-M2 → 1NO+1NC	FR 738-M2P11 → 1NO+1NC	FX 738-M2 → 1NO+1NC	FX 738-M2P31 → 1NO+1NC
9	L	FR 938-M2 → 2NC	FR 938-M2P11 → 2NC	FX 938-M2 → 2NC	FX 938-M2P31 → 2NC
16	LI	FR 1638-M2 → 2NC	FR 1638-M2P11 → 2NC	FX 1638-M2 → 2NC	FX 1638-M2P31 → 2NC
20	L	FR 2038-M2 → 1NO+2NC	FR 2038-M2P11 → 1NO+2NC	FX 2038-M2 → 1NO+2NC	FX 2038-M2P31 → 1NO+2NC
Max speed		page 123 - type 1	page 123 - type 1	page 123 - type 1	page 123 - type 1
Min. force		0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)
Travel diagrams		page 124 - group 4a	page 124 - group 4a	page 124 - group 4a	page 124 - group 4a

IMPORTANT
For safety applications: join only switches and actuators marked with symbol →.

Special loose actuators

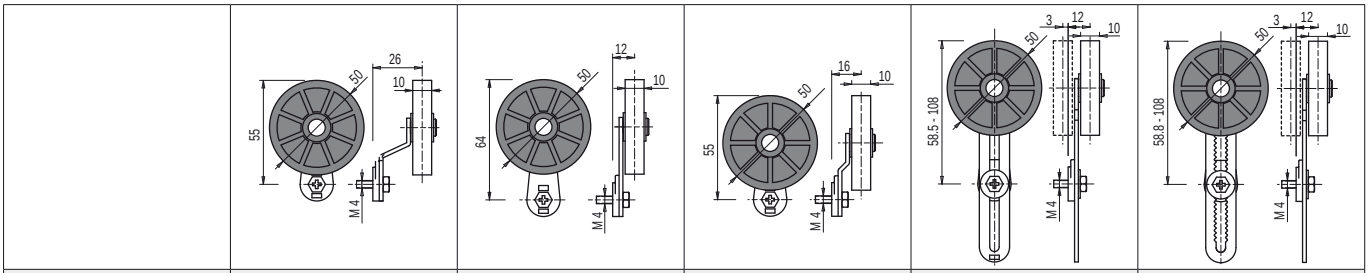
IMPORTANT: These loose actuators can be used with items of series FR, FX only.

Ø 40 mm rubber rollers



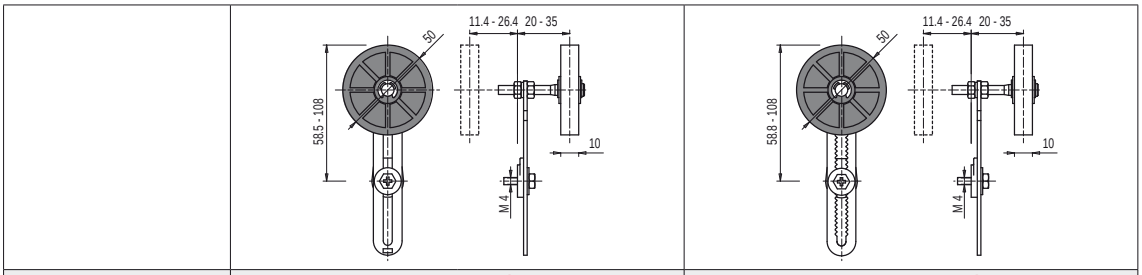
VF LE31-R5 → (4) | VF LE51-R5 → (4) | VF LE52-R5 → | VF LE54-R5 → (4) | VF LE55-R5 → (1) | VF LE56-R5 →

Ø 50 mm rubber rollers



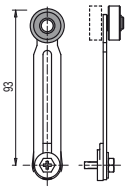
VF LE51-R26 → (4) | VF LE52-R26 → (4) | VF LE54-R26 → (4) | VF LE55-R26 → (1) | VF LE56-R26 →

Ø 50 mm overhanging rubber rollers



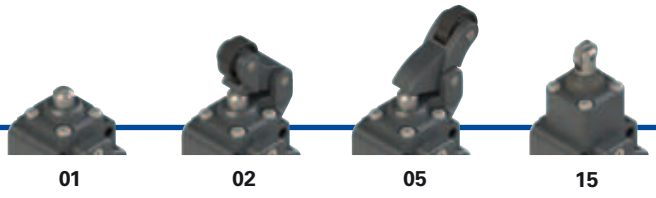
VF LE55-R27 → (1) | VF LE56-R27 →

- 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.



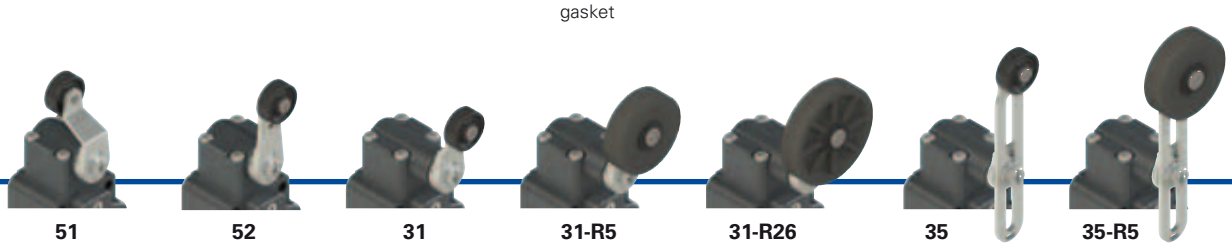
Items with code on the **green** background are available in stock

Selection diagram



01 **02** **05** **15**

stainless steel roller lever
external rubber gasket

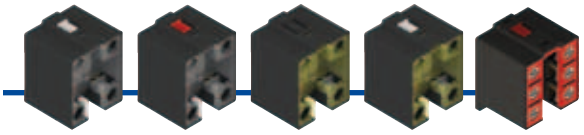


51 **52** **31** **31-R5** **31-R26** **35** **35-R5**

Ø 40 mm rubber roller — Ø 50 mm rubber roller — adjustable lever — Ø 40 mm rubber roller / adjustable lever

ACTUATORS

CONTACT BLOCKS



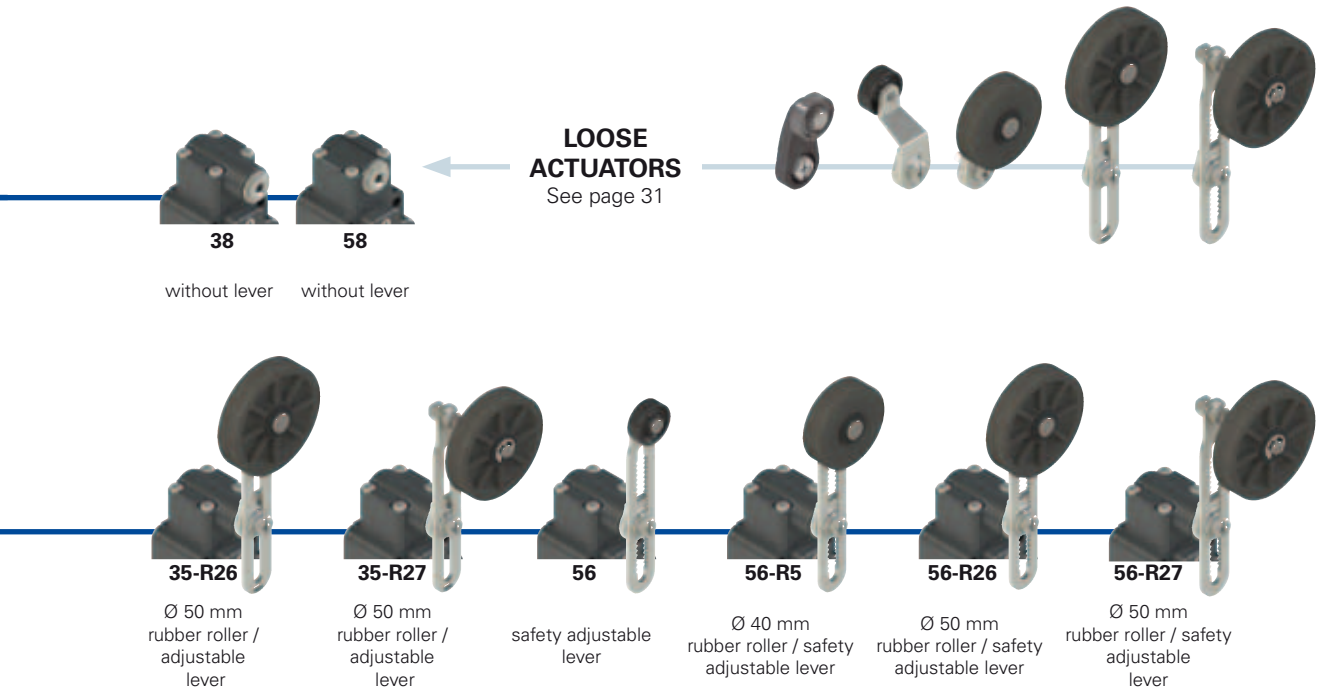
6 1NO+1NC slow action
7 1NO+1NC slow action overlapped
9 2NC slow action
16 2NC slow action independent
20 1NO+2NC slow action

CONDUIT ENTRY

THREADED CONDUIT ENTRY **WITH PRE-INSTALLED CABLE GLAND**

Versions with pre-installed cable glands or connectors available. For further information please contact the sales dept.

product option
accessory sold separately



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

FP 635-GM2R26

Housing	
FP	polymer housing, one conduit entry

Contact blocks	
6	1NO+1NC, slow action
7	1NO+1NC, slow action overlapped
9	2NC, slow action
16	2NC, slow action indipendent
20	1NO+2NC, slow action

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

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

Threaded conduit entry	
M2	M20x1.5 (standard)
	PG 13.5

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

Position switches **FP** series

Main data

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

Markings and quality marks:

Approval IMQ: EG606
Approval IMQ-UNI: CA50.00662
Approval UL: E131787
Approval CCC: 2007010305230014
Approval EAC: RU C-IT ДМ94.B.01024

Technical data

Housing

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

One threaded conduit entry:	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 -40°C to +80° C on request

Max operating frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	20 million operations cycles[1]
Assembling position:	any
Safety parameters:	
B_{10d}:	40,000,00 for NC contacts
Mechanical interlock, not coded:	type 1 according to EN ISO 14119
Driving torque for installation:	see page 125

(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 mm²	(1 x AWG 22)
	max.	2 x 1.5 mm²	(2 x AWG 16)
Contact blocks 6, 7, 9, 16:	min.	1 x 0.5 mm²	(1 x AWG 20)
	max.	2 x 2.5 mm²	(2 x AWG 14))

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50041, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, EN 81-20, EN 81-50, UL 508, CSA 22.2 No.14
Approvals:
IEC 60947-5-1, UL 508, CSA 22.2 No.14, GB14048.5-2001.

In conformity with requirements requested by:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and EMC Directive 2014/30/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1.

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 31-32) as stated in the **standard EN 81-20 par. 5.11.2.2.1**. The switch must be actuated with **at least up to the positive opening travel** shown in the travels diagrams on page 125. 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

Thermal current (Ith):	10 A
Rated insulation voltage (Ui):	500 Vac 600 Vdc 400 Vac 500 Vdc for contacts block 20
Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV for contact blocks 20
Conditional shot circuit current:	1000 A according to EN 60947-5-1
Protection against short circuits:	fuse 10 A 500 V type aM
Pollution degree:	3

Utilization categories

Alternate current: AC15 (50...60 Hz)

Ue (V)	250	400	500
Ie (A)	6	4	1

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	6	1.1	0.4

Data type approved by IMQ

Rated insulation voltage (Ui): 500 Vac
400 Vac for contacts block 20
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (Uimp): 6 kV
4 kV for contacts block 20
Protection degree: IP67
MV terminals (screw clamps)
Pollution degree 3
Utilization category: AC15
Operation voltage (Ue): 400 Vac (50 Hz)
Operation current (Ie): 3 A
Forms of the contact element: Zb, Y+Y, Y+Y+X
Positive opening of contacts on contact block 6, 7, 9, 16, 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.

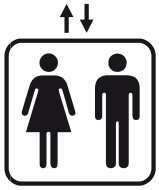
Data type approved by UL

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

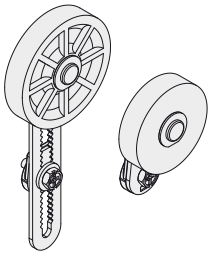
Please contact our technical service for the list of approved products.

EN 81-20 standard



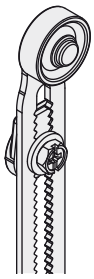
- Safaty contacts according to EN 60947-5-1, encl. K.
- Protection degree higher than IP4x.
- Mechanical endurance higher than 10^6 cycles.

Rubber rollers



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

Safety lever L56



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

Protection degree IP 67

IP67

These series switches are all IP 67 rated.

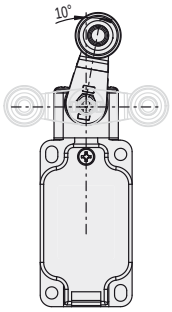
Extended temperature range

-40°C

This range of switches is also available in a special version with an ambient operating temperature range of -40°C to +80°C. This is particularly useful for applications in cold stores, sterilisers and other low temperature environments.

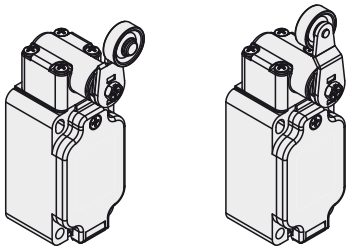
Adjustable levers

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.



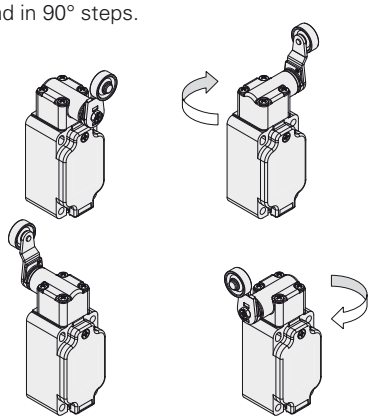
Overturning levers

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.

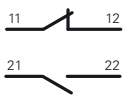


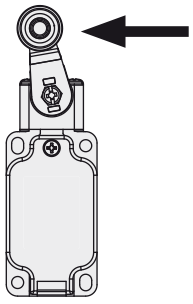
Working operation of contact block 16 with independent contacts

The contact block 16 has two NC contacts**, both with positive opening** activated independently according to the lever turning direction.

Lever turned to left

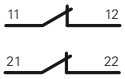
Contacts diagram

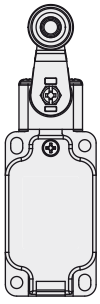




Lever not turned

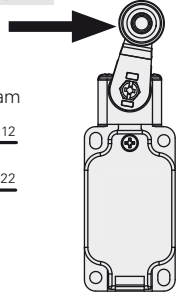
Contacts diagram





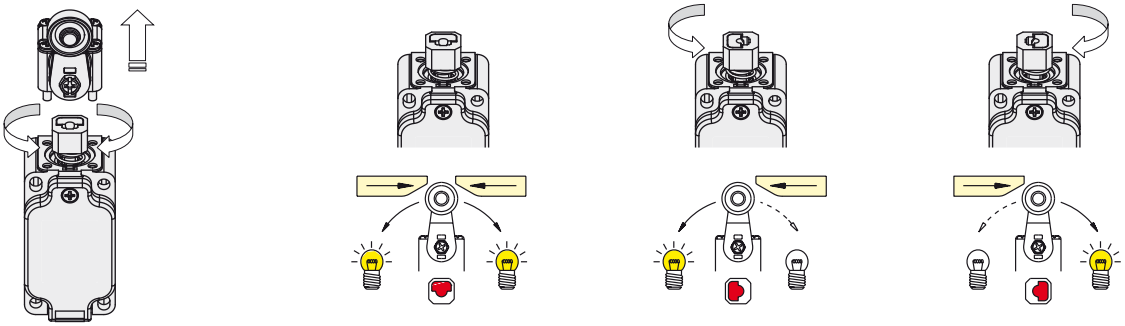
Lever turned to right

Contacts diagram



Unidirectional heads

In the switches with revolving lever, it is possible to select the directional operation by removing the four screws of the head and revolving the internal piston (contact block 16 excluded).

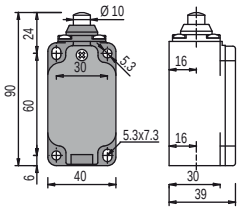


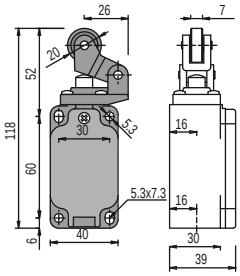
Position switches **FP** series

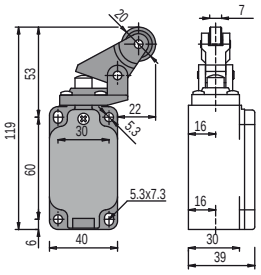
Contacts type:

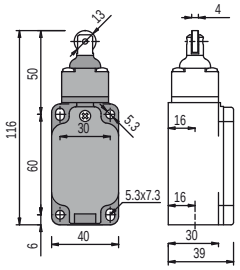
L = slow action
LO = slow action overlapped
LI = slow action independent

With external rubber gasket

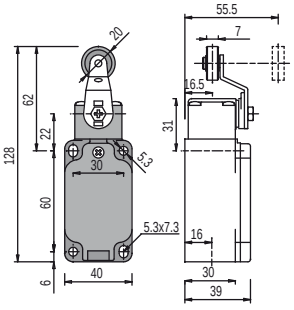


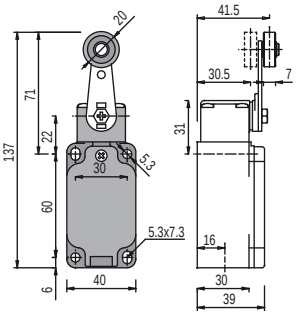




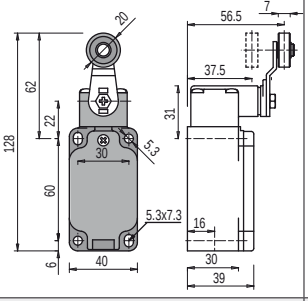


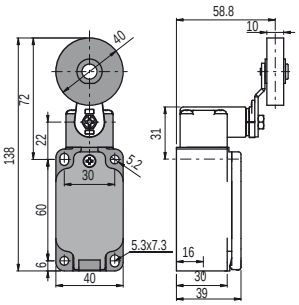
Contact blocks					
6	L	FP 601-M2 → 1NO+1NC	FP 602-M2 → 1NO+1NC	FP 605-M2 → 1NO+1NC	FP 615-M2 → 1NO+1NC
7	LO	FP 701-M2 → 1NO+1NC	FP 702-M2 → 1NO+1NC	FP 705-M2 → 1NO+1NC	FP 715-M2 → 1NO+1NC
9	L	FP 901-M2 → 2NC	FP 902-M2 → 2NC	FP 905-M2 → 2NC	FP 915-M2 → 2NC
16	LI				
20	L	FP 2001-M2 → 1NO+2NC	FP 2002-M2 → 1NO+2NC	FP 2005-M2 → 1NO+2NC	FP 2015-M2 → 1NO+2NC
Max speed		page 125 - type 4	page 125 - type 3	page 125 - type 3	page 125 - type 2
Min. force		8 N (25 N →)	6 N (25 N →)	6 N (25 N →)	11 N (25 N →)
Travel diagrams		page 126 - group 1b	page 126 - group 2b	page 126 - group 2b	page 126 - group 1b

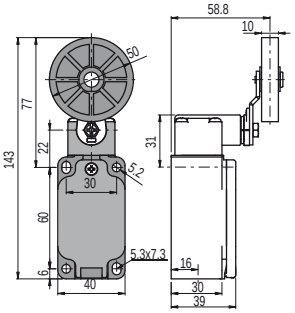




Contact blocks					
6	L	FP 651-M2 → 1NO+1NC	FP 652-M2 → 1NO+1NC		
7	LO	FP 751-M2 → 1NO+1NC	FP 752-M2 → 1NO+1NC		
9	L	FP 951-M2 → 2NC	FP 952-M2 → 2NC		
16	LI				
20	L	FP 2051-M2 → 1NO+2NC	FP 2052-M2 → 1NO+2NC		
Max speed		page 125 - type 1	page 125 - type 1		
Min. force		0.06 Nm (0.25 Nm →)	0.06 Nm (0.25 Nm →)		
Travel diagrams		page 126 - group 3b	page 126 - group 3b		







Contact blocks					
6	L	FP 631-M2 → 1NO+1NC	FP 631-M2R5 → 1NO+1NC	FP 631-M2R26 → 1NO+1NC	
7	LO	FP 731-M2 → 1NO+1NC	FP 731-M2R5 → 1NO+1NC	FP 731-M2R26 → 1NO+1NC	
9	L	FP 931-M2 → 2NC	FP 931-M2R5 2NC	FP 931-M2R26 → 2NC	
16	LI	FP 1631-M2 → 2NC	FP 1631-M2R5 → 2NC	FP 1631-M2R26 → 2NC	
20	L	FP 2031-M2 → 1NO+2NC	FP 2031-M2R5 → 1NO+2NC	FP 2031-M2R26 → 1NO+2NC	
Max speed		page 125 - type 1	page 125 - type 1	page 125 - type 1	
Min. force		0.1 Nm (0.25 Nm →)	0.1 Nm (0.25 Nm →)	0.1 Nm (0.25 Nm →)	
Travel diagrams		page 126 - group 3b	page 126 - group 3b	page 126 - group 3b	

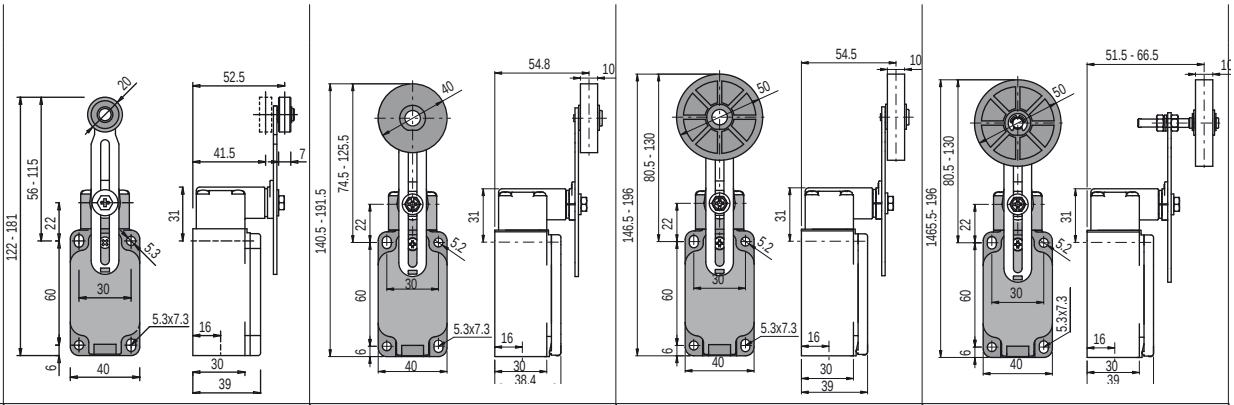
Accessories See page 119

→ The 2D/3D files are available at **www.pizzato.com**

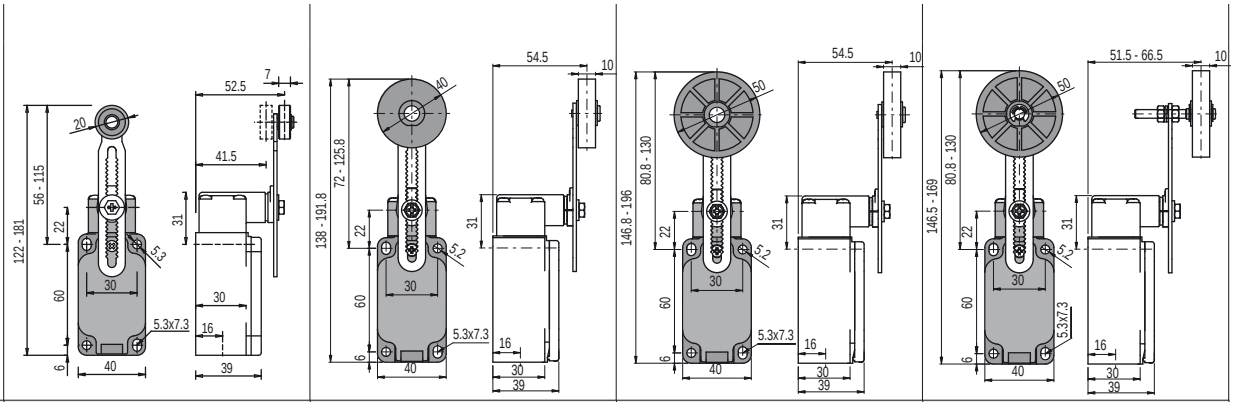
All measures in the drawings are in mm

Contacts type:

L = slow action
LO = slow action overlapped
LI = slow action independent



Contact blocks					
6	L	FP 635-M2 (1) 1NO+1NC	FP 635-M2R5 (1) 1NO+1NC	FP 635-M2R26 (1) 1NO+1NC	FP 635-M2R27 (1) 1NO+1NC
7	LO	FP 735-M2 (1) 1NO+1NC	FP 735-M2R5 (1) 1NO+1NC	FP 735-M2R26 (1) 1NO+1NC	FP 735-M2R27 (1) 1NO+1NC
9	L	FP 935-M2 (1) 2NC	FP 935-M2R5 (1) 2NC	FP 935-M2R26 (1) 2NC	FP 935-M2R27 (1) 2NC
16	LI	FP 1635-M2 (1) 2NC	FP 1635-M2R5 (1) 2NC	FP 1635-M2R26 (1) 2NC	FP 1635-M2R27 (1) 2NC
20	L	FP 2035-M2 (1) 1NO+2NC	FP 2035-M2R5 (1) 1NO+2NC	FP 2035-M2R26 (1) 1NO+2NC	FP 2035-M2R27 (1) 1NO+2NC
Max speed		page 125 - type 1	page 125 - type 1	page 125 - type 1	page 125 - type 1
Min. force		0.1 Nm (0.25 Nm)	0.1 Nm (0.25 Nm)	0.1 Nm (0.25 Nm)	0.1 Nm (0.25 Nm)
Travel diagrams		page 126 - group 3b	page 126 - group 3b	page 126 - group 3b	page 126 - group 3b

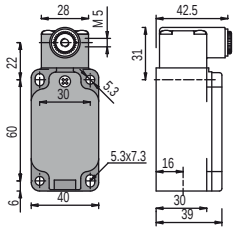


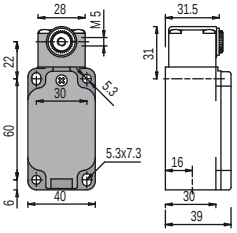
Contact blocks					
6	L	FP 656-M2 1NO+1NC	FP 656-M2R5 1NO+1NC	FP 656-M2R26 1NO+1NC	FP 656-M2R27 1NO+1NC
7	LO	FP 756-M2 1NO+1NC	FP 756-M2R5 1NO+1NC	FP 756-M2R26 1NO+1NC	FP 756-M2R27 1NO+1NC
9	L	FP 956-M2 2NC	FP 956-M2R5 2NC	FP 956-M2R26 2NC	FP 956-M2R27 2NC
16	LI	FP 1656-M2 2NC	FP 1656-M2R5 2NC	FP 1656-M2R26 2NC	FP 1656-M2R27 2NC
20	L	FP 2056-M2 1NO+2NC	FP 2056-M2R5 1NO+2NC	FP 2056-M2R26 1NO+2NC	FP 2056-M2R27 1NO+2NC
Max speed		page 125 - type 1	page 125 - type 1	page 125 - type 1	page 125 - type 1
Min. force		0.1 Nm (0.25 Nm)	0.1 Nm (0.25 Nm)	0.1 Nm (0.25 Nm)	0.1 Nm (0.25 Nm)
Travel diagrams		page 126 - group 3b	page 126 - group 3b	page 126 - group 3b	page 126 - group 3b

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

Contacts type:

L = slow action
LO = slow action overlapped
LI = slow action independent





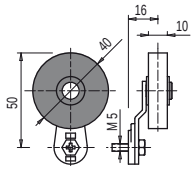
Contact blocks			
6	L	FP 638-M2 ➔ 1NO+1NC	FP 658-M2 ➔ 1NO+1NC
7	LO	FP 738-M2 ➔ 1NO+1NC	FP 758-M2 ➔ 1NO+1NC
9	L	FP 938-M2 ➔ 2NC	FP 958-M2 ➔ 2NC
16	LI	FP 1638-M2 ➔ 2NC	
20	L	FP 2038-M2 ➔ 1NO+2NC	FP 2058-M2 ➔ 1NO+2NC
Max speed		page 125 - type 1	page 125 - type 1
Min. force		0.1 Nm (0.25 Nm ➔)	0.06 Nm (0.25 Nm ➔)
Travel diagrams		page 126 - group 3b	page 126 - group 3b

IMPORTANT
For safety applications: join only switches and actuators marked with symbol ➔.

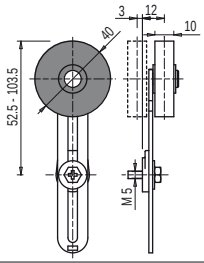
Special loose actuators

IMPORTANT: These loose actuators can be used with items of series FD, FP, FL, FC only.

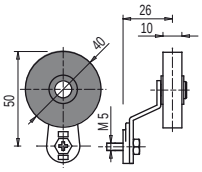
Ø 40 mm rubber rollers



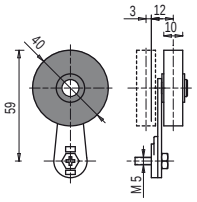
VF L31-R5 ➔ (4)



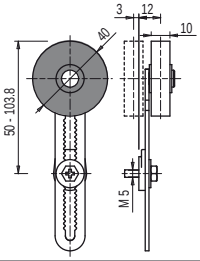
VF L35-R5 ➔ (1) (3)



VF L51-R5 ➔ (4)

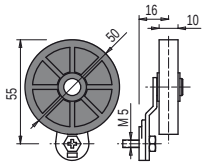


VF L52-R5 ➔

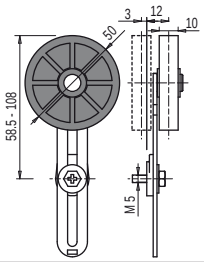


VF L56-R5 ➔ (3)

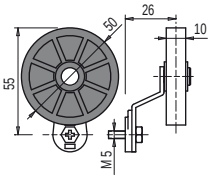
Ø 50 mm rubber rollers



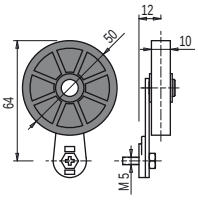
VF L31-R26 ➔ (4)



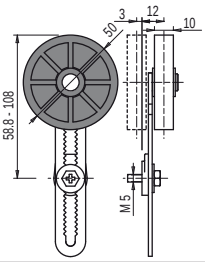
VF L35-R26 ➔ (1) (3)



VF L51-R26 ➔ (4)

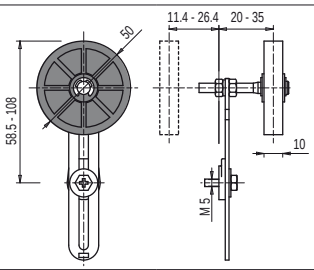


VF L52-R26 ➔ (4)

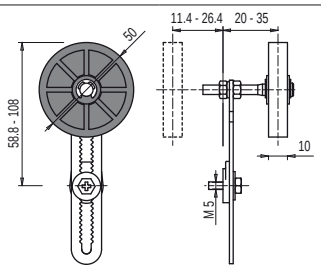


VF L56-R26 ➔ (3)

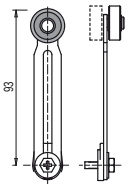
Ø 50 mm overhanging rubber rollers



VF L35-R27 ➔ (1) (3)



VF L56-R27 ➔ (3)



- Only orders for multiple quantities of the packs are accepted.
- (1) Actuator VF L35 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 L56.
- (3) If it is installed with switch FP •58 (e.g. FP 558, FP 658..), the actuator can mechanically interfere with the housing of the switch. The interference could happen or not according to the actuator and the head fixing position.
- (4) The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

Accessories See page 119

➔ The 2D/3D files are available at **www.pizzato.com**

Notes