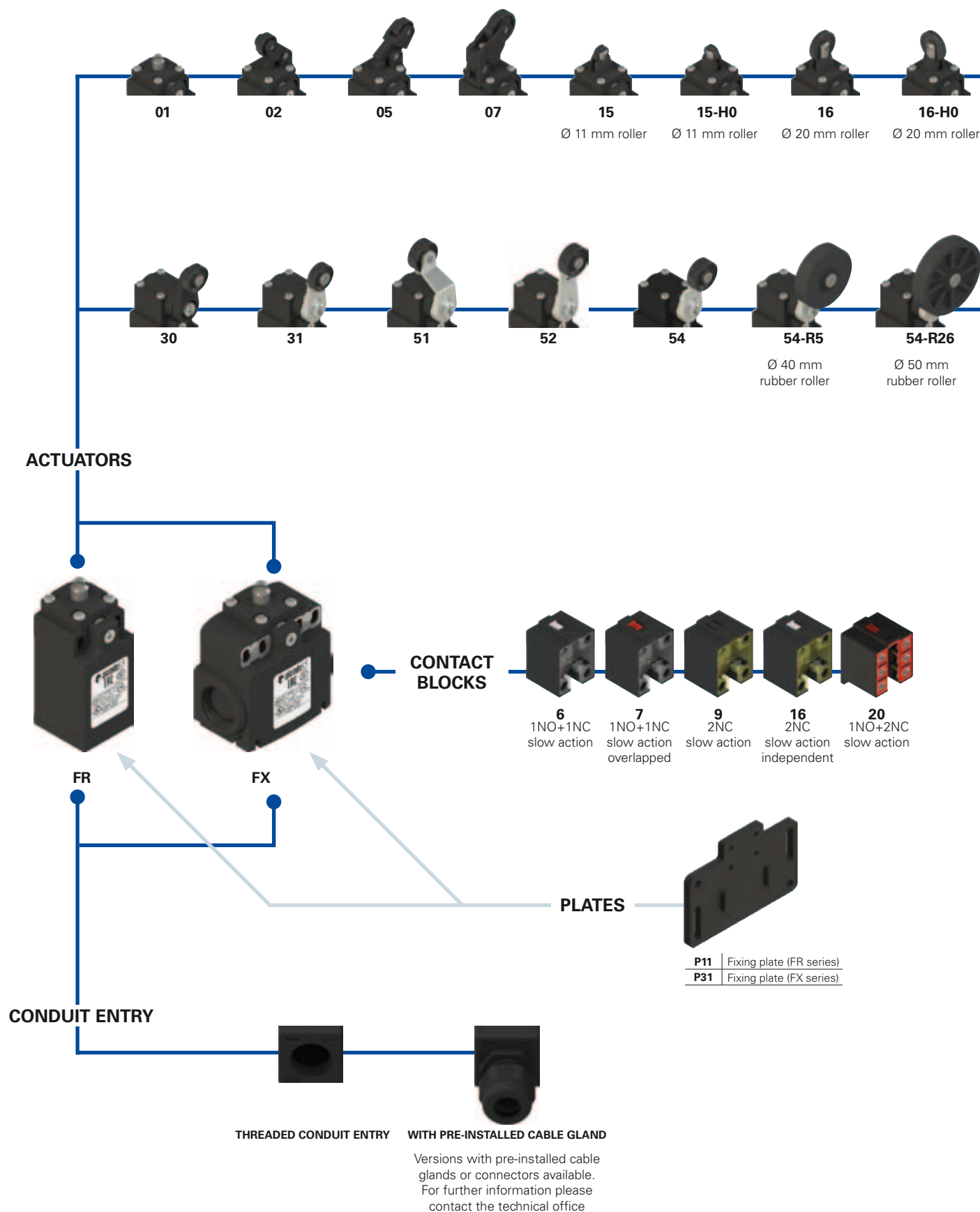


Selection diagram

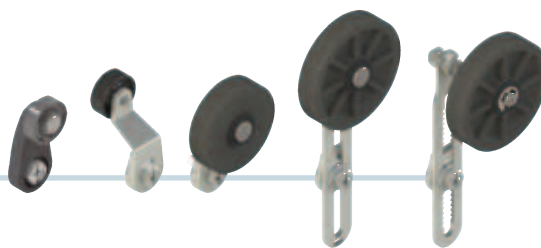




38

LOOSE ACTUATORS

See page 24



55

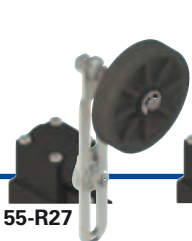
adjustable lever



55-R5

Ø 40 mm
rubber roller /
adjustable
lever

55-R26

Ø 50 mm
rubber roller /
adjustable
lever

55-R27

Ø 50 mm
rubber roller /
adjustable
lever

56

safety adjustable
lever

56-R5

Ø 40 mm
rubber roller /
safety adjustable
lever

56-R26

Ø 50 mm
rubber roller /
safety adjustable
lever

56-R27

Ø 50 mm
rubber roller /
safety adjustable
lever

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 independent
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

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)
P11	supplied with fixing plate VF SFP1
P31	supplied with fixing plate VF SFP3

Threaded conduit entry

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



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: in progress
 Approval UL: E131787
 Approval CCC: 2007010305230013
 Approval ECU: 101015
 Approval EAC: RU C-IT ДМ94.В.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 cycles¹/hour
 Mechanical endurance: 20 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, 7, 9, 16:	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 31-32) 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, 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



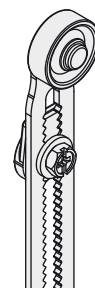
- Safety contacts according to EN 60947-5-1, excl. K.
- Protection degree higher than IP4x.
- Mechanical endurance higher than 10^6 cycles.

Protection degree IP 67

IP67

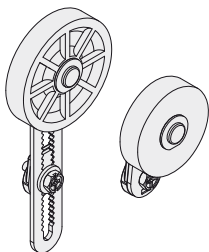
These series switches are all IP 67 rated.

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.

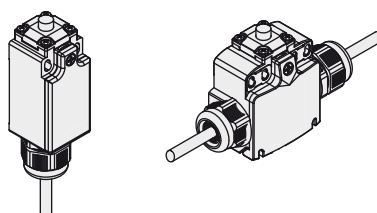
Rubber rollers



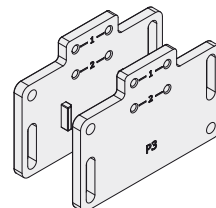
Different actuators with rubber rollers are available. The client can choose the most suitable product depending on lift speed in order to reduce the noise inside the cabin.

Conduit entries

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



Adaptive plates



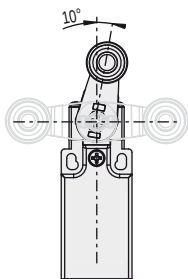
Adaptive plates provided with long slots for the adjustment of the actuating point, developed for compatibility with old products.

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.

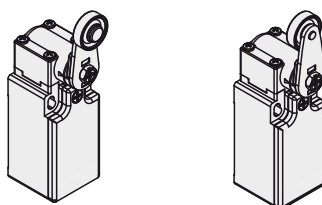
Adjustable levers

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.



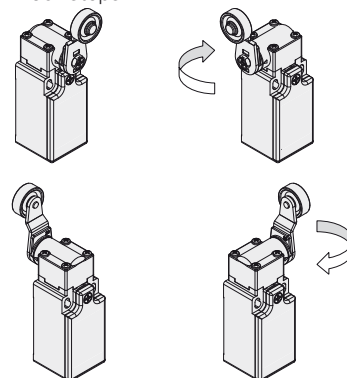
Overturning levers

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

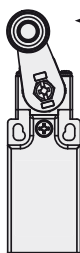
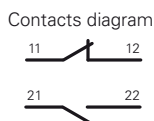
In all switches, it is possible to rotate the head in 90° steps.



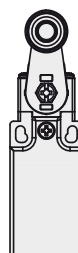
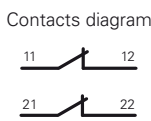
Working operation of contact block 16 with independent contacts

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

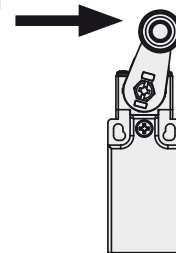
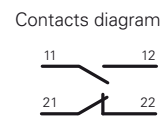
Lever turned to left



Lever not turned



Lever turned to right



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.

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

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

Contacts type:

-  = slow action
 = slow action overlapped
 = slow action independent

Contact blocks

6		FR 654-M2	➔ 1NO+1NC	FR 654-M2R5	➔ 1NO+1NC	FR 654-M2R26	➔ 1NO+1NC
7		FR 754-M2	➔ 1NO+1NC	FR 754-M2R5	➔ 1NO+1NC	FR 754-M2R26	➔ 1NO+1NC
9		FR 954-M2	➔ 2NC	FR 954-M2R5	➔ 2NC	FR 954-M2R26	➔ 2NC
16		FR 1654-M2	➔ 2NC	FR 1654-M2R5	➔ 2NC	FR 1654-M2R26	➔ 2NC
20		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		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		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		FR 955-M2	➔ ⁽¹⁾ 2NC	FR 955-M2R5	➔ ⁽¹⁾ 2NC	FR 955-M2R26	➔ ⁽¹⁾ 2NC	FR 955-M2R27	➔ ⁽¹⁾ 2NC
16		FR 1655-M2	➔ ⁽¹⁾ 2NC	FR 1655-M2R5	➔ ⁽¹⁾ 2NC	FR 1655-M2R26	➔ ⁽¹⁾ 2NC	FR 1655-M2R27	➔ ⁽¹⁾ 2NC
20		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

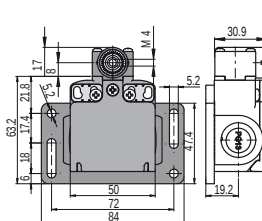
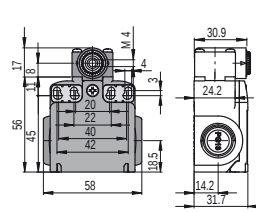
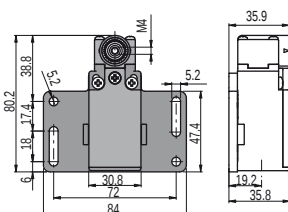
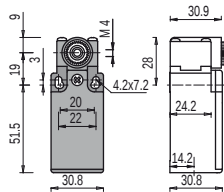
6		FR 656-M2	➔ 1NO+1NC	FR 656-M2R5	➔ 1NO+1NC	FR 656-M2R26	➔ 1NO+1NC	FR 656-M2R27	➔ 1NO+1NC
7		FR 756-M2	➔ 1NO+1NC	FR 756-M2R5	➔ 1NO+1NC	FR 756-M2R26	➔ 1NO+1NC	FR 756-M2R27	➔ 1NO+1NC
9		FR 956-M2	➔ 2NC	FR 956-M2R5	➔ 2NC	FR 956-M2R26	➔ 2NC	FR 956-M2R27	➔ 2NC
16		FR 1656-M2	➔ 2NC	FR 1656-M2R5	➔ 2NC	FR 1656-M2R26	➔ 2NC	FR 1656-M2R27	➔ 2NC
20		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

⁽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

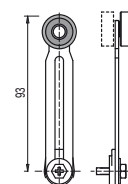
VF LE31-R5 ➔ (4)	VF LE51-R5 ➔ (4)	VF LE52-R5 ➔	VF LE54-R5 ➔ (4)	VF LE55-R5 ➔ (1)	VF LE56-R5 ➔

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 ➔

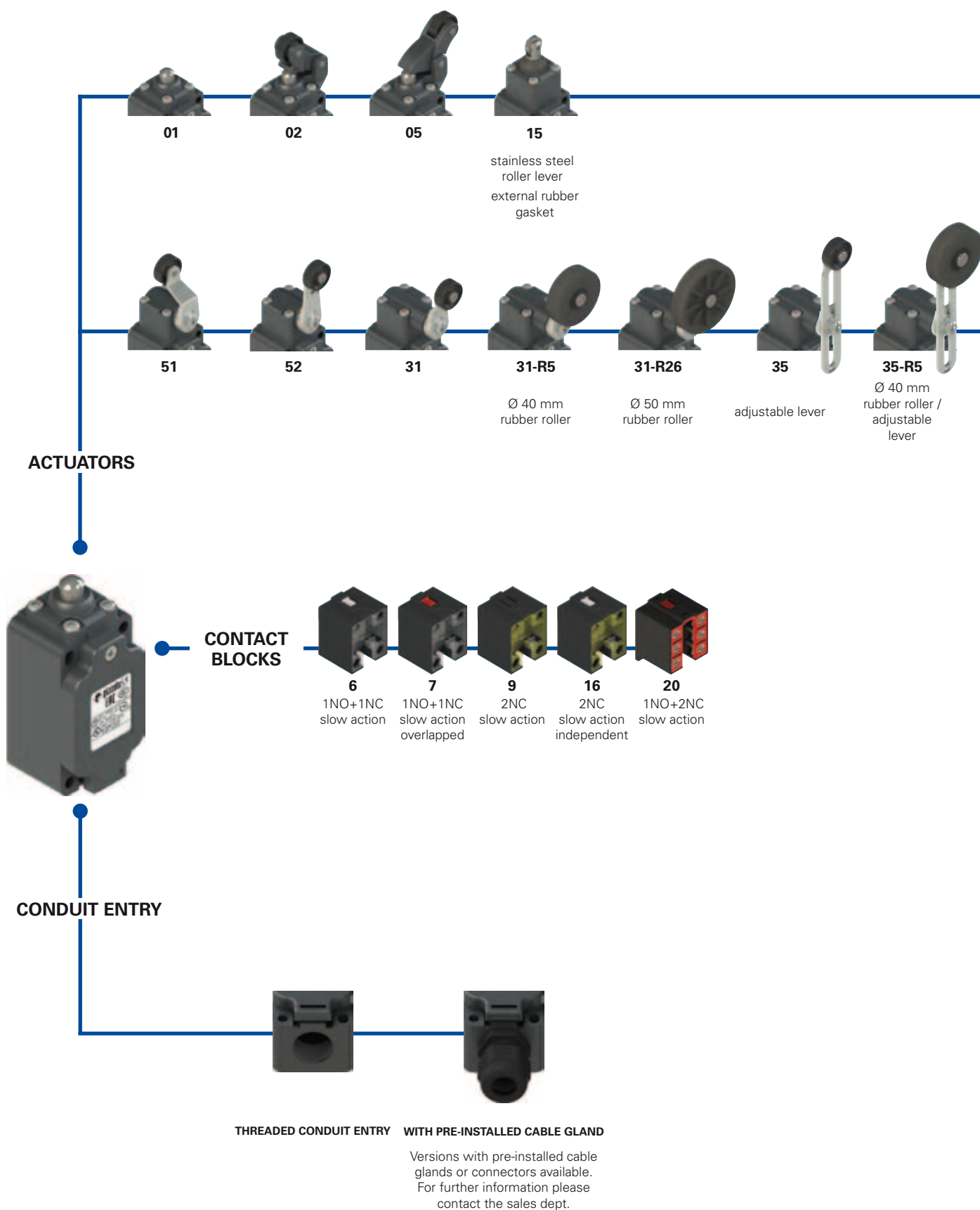


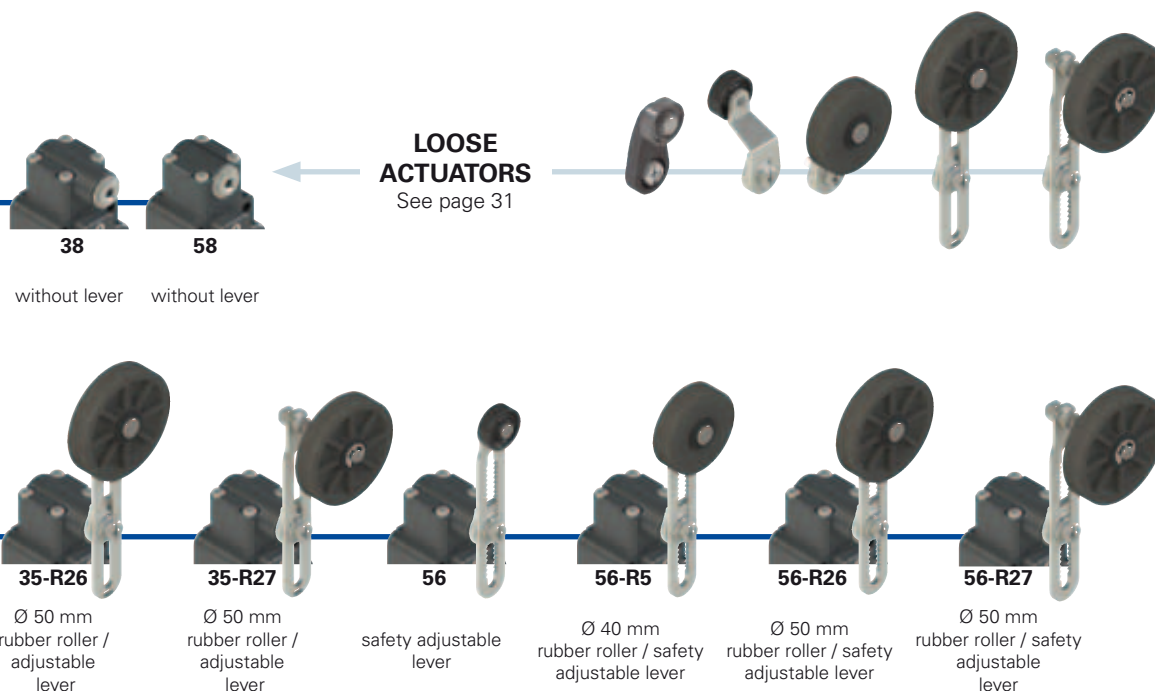
- Only orders for multiple quantities of the packs are accepted.
- (1) Actuator VF LE55 suits to safety applications only if adjusted to its max length, as you can see in figure beside. If you need an adjustable lever for safety applications, use the adjustable safety lever VF LE56.
- (4) The actuator 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

➔ 2D and 3D files available on www.pizzato.com

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	
FP 635		GM2	R26	
Housing				Rollers
FP	polymer housing, one conduit entry			standard roller
Contact blocks				R5 with Ø 40 mm rubber roller
6	1NO+1NC, slow action			R26 with Ø 50 mm rubber roller
7	1NO+1NC, slow action overlapped			R27 with Ø 50 mm overhanging rubber roller
9	2NC, slow action			
16	2NC, slow action independent			
20	1NO+2NC, slow action			
Actuators				Threaded conduit entry
01	short plunger			M2 M20x1.5 (standard)
02	roller lever			PG 13.5
05	offset roller lever			
...				
				Contacts type
				silver contacts (standard)
				G silver contacts gold plated 1 µm



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-UN: in progress
 Approval UL: E131787
 Approval CCC: 2007010305230014
 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 □

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 -R270°C to +80° C on request

Max operating frequency: 3600 operations cycles/hour

Mechanical endurance: 20 million operations cycles¹

Assembling position: any

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 mm ²	(1 x AWG 22)
	max.	2 x 1.5 mm ²	(2 x AWG 16)
Contact blocks 6, 7, 9, 16:	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 50041, 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 31-32) 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 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		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, 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

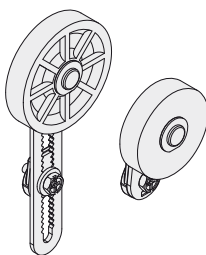
Please contact our technical service for the list of approved products.

EN 81-20 standard



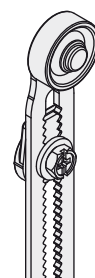
- Safety contacts according to EN 60947-5-1, encl. K.
- Protection degree higher than IP4x.
- Mechanical endurance higher than 10^6 cycles.

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.

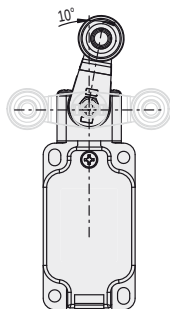
Extended temperature range

-40°C

This range of switches is also available in a special version with an ambient operating temperature range of -40°C to $+80^{\circ}\text{C}$. 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

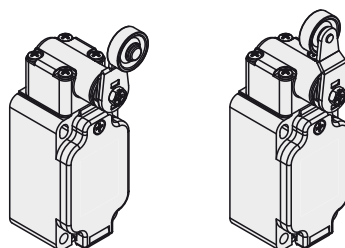


transmission is always guaranteed thanks to the particular geometrical coupling between the lever and the revolving shaft as prescribed for safety applications by the German standard BG-GS-ET-15.

Overturning levers

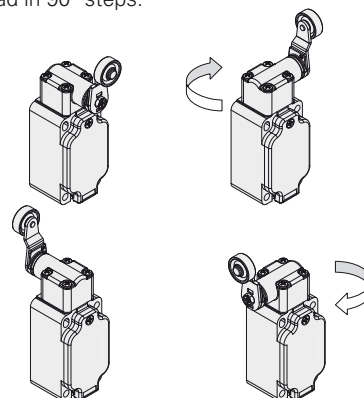
It's possible to fasten the lever on switches on straight or reverse side, maintaining the positive coupling.

In this way it is possible to obtain two different work plans of the lever.



Rotating heads

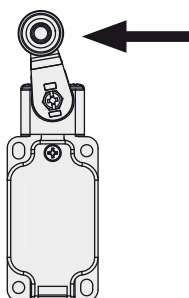
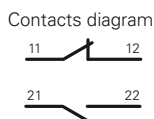
In all switches, it is possible to rotate the head in 90° steps.



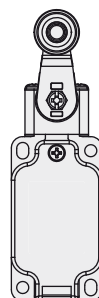
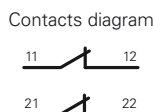
Working operation of contact block 16 with independent contacts

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

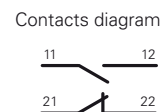
Lever turned to left



Lever not turned

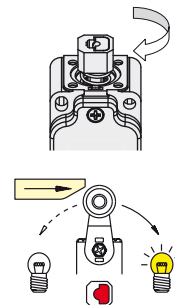
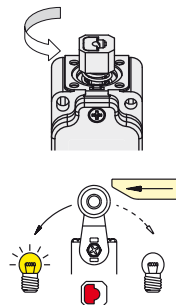
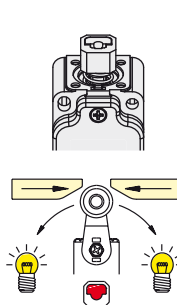
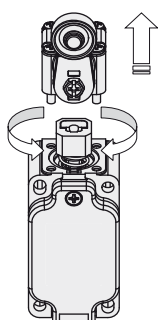


Lever turned to right



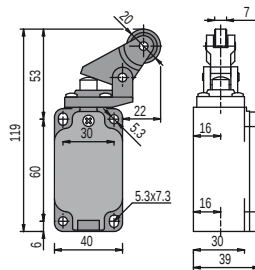
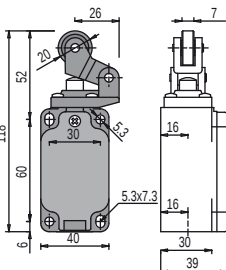
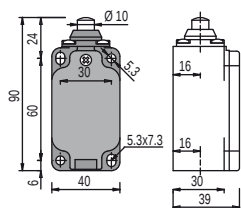
Unidirectional heads

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).

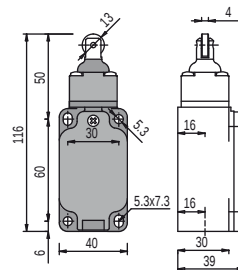


Contacts type:

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

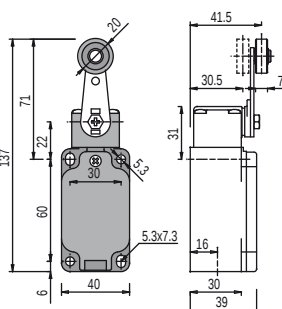
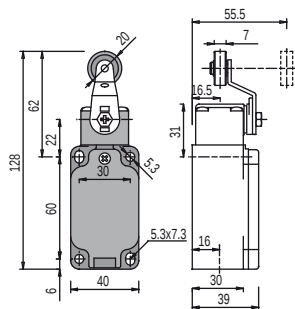


With external rubber gasket



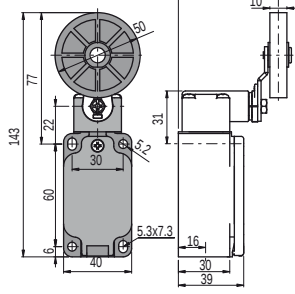
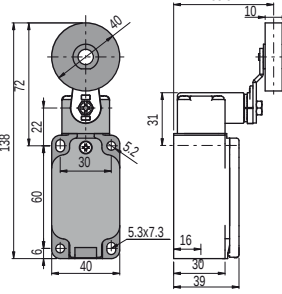
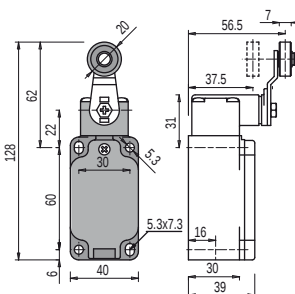
Contact blocks

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

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

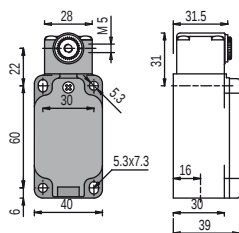
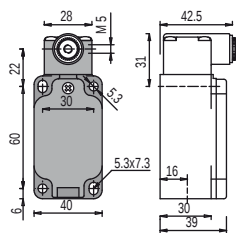
Contact blocks

6	L	FP 656-M2  ⁽¹⁾ 1NO+1NC	FP 656-M2R5  ⁽¹⁾ 1NO+1NC	FP 656-M2R26  ⁽¹⁾ 1NO+1NC	FP 656-M2R27  ⁽¹⁾ 1NO+1NC
7	LO	FP 756-M2  ⁽¹⁾ 1NO+1NC	FP 756-M2R5  ⁽¹⁾ 1NO+1NC	FP 756-M2R26  ⁽¹⁾ 1NO+1NC	FP 756-M2R27  ⁽¹⁾ 1NO+1NC
9	L	FP 956-M2  ⁽¹⁾ 2NC	FP 956-M2R5  ⁽¹⁾ 2NC	FP 956-M2R26  ⁽¹⁾ 2NC	FP 956-M2R27  ⁽¹⁾ 2NC
16	LI	FP 1656-M2  ⁽¹⁾ 2NC	FP 1656-M2R5  ⁽¹⁾ 2NC	FP 1656-M2R26  ⁽¹⁾ 2NC	FP 1656-M2R27  ⁽¹⁾ 2NC
20	L	FP 2056-M2  ⁽¹⁾ 1NO+2NC	FP 2056-M2R5  ⁽¹⁾ 1NO+2NC	FP 2056-M2R26  ⁽¹⁾ 1NO+2NC	FP 2056-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

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

Contacts type:

- = slow action
 = slow action overlapped
 = slow action independent

**IMPORTANT**

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

Contact blocks

6		FP 638-M2		1NO+1NC	FP 658-M2		1NO+1NC
7		FP 738-M2		1NO+1NC	FP 758-M2		1NO+1NC
9		FP 938-M2		2NC	FP 958-M2		2NC
16		FP 1638-M2		2NC			
20		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		

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

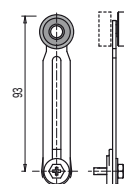
VF L35-R27 (1) (3)	VF L56-R27 (3)

- 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

→ 2D and 3D files available on www.pizzato.com

Notes

A full-page sheet of white graph paper featuring a uniform grid of thin black lines. The grid consists of small squares covering the entire area, typical of standard graph paper used for mathematics or engineering.