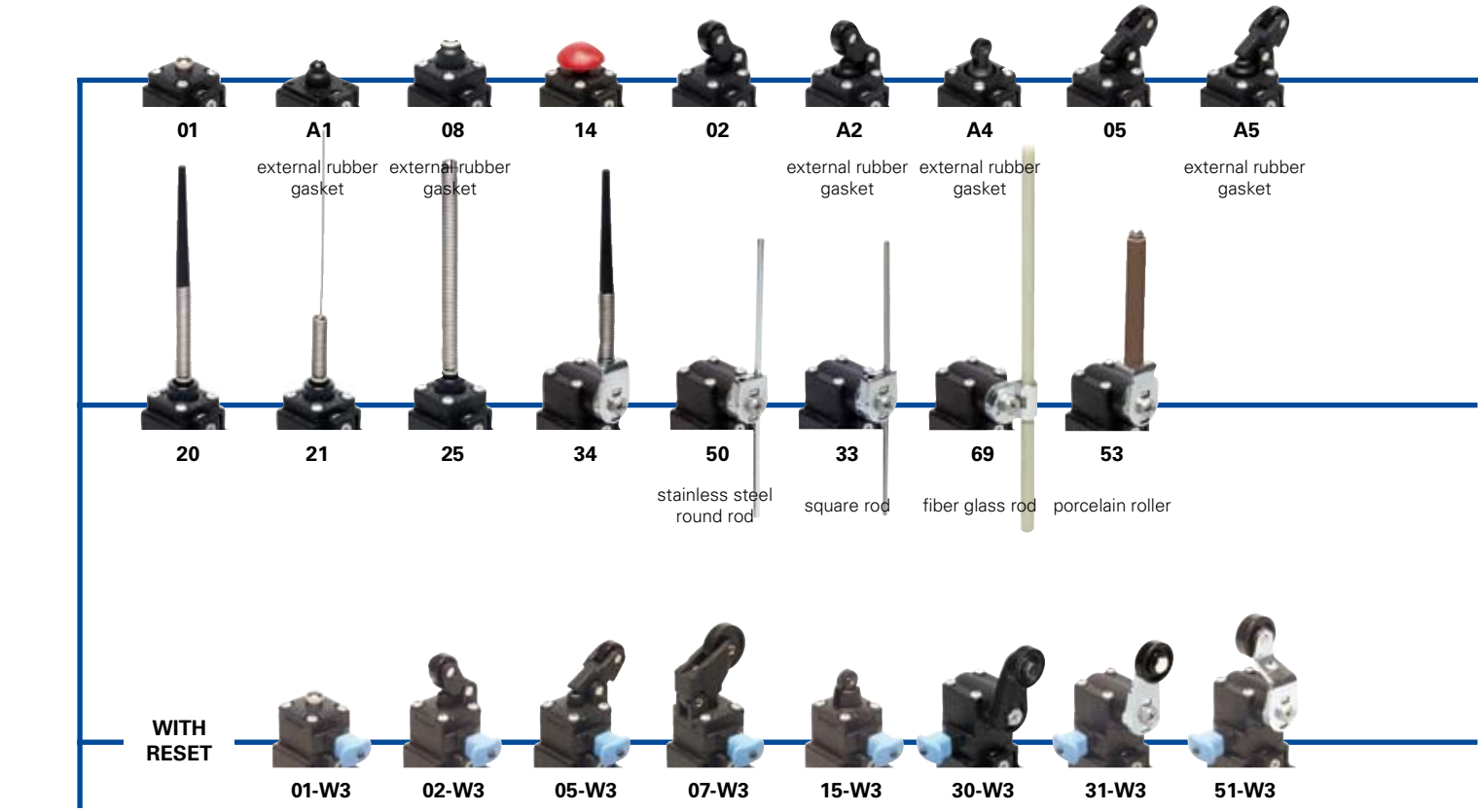
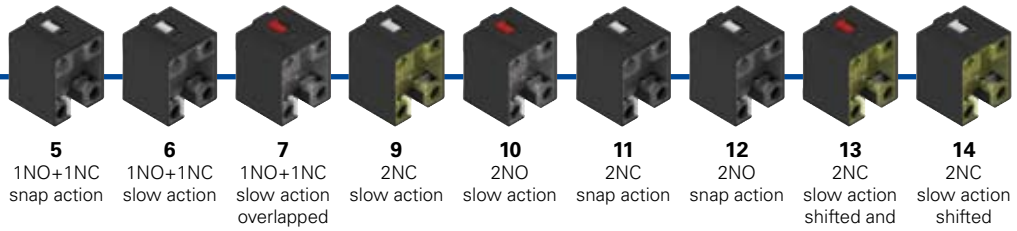
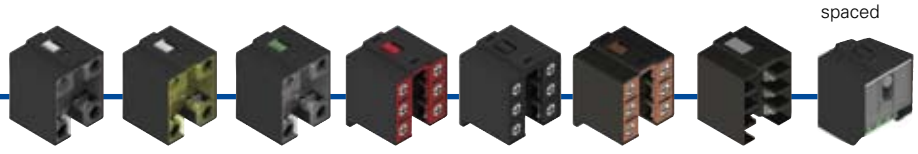
Selection diagram



CONTACT BLOCKS



5 1NO+1NC snap action	**6** 1NO+1NC slow action	**7** 1NO+1NC slow action overlapped	**9** 2NC slow action	**10** 2NO slow action	**11** 2NC snap action	**12** 2NO snap action	**13** 2NC slow action shifted and spaced	**14** 2NC slow action shifted



15 2NO slow action shifted	**16** 2NC slow action independent	**18** 1NO+1NC slow action closer	**20** 1NO+2NC slow action	**21** 3NC slow action	**22** 2NO+1NC slow action	**2** 2x(1NO-1NC) snap action	**E1** 1NO-1NC electronic PNP

CONDUIT ENTRY

Threaded conduit entry

	PG 13,5 (standard)
A	PG 11
M1	M16x1,5
M2	M20x1,5
M3	1/2 NPT

With assembled cable gland

K21	for Ø 6 to Ø 12 mm cables range
K25	for Ø 3 to Ø 7 mm cables range

With M12 plastic connector assembled and wired

K70	4 poles from bottom
K45	8 poles from bottom

With M12 metal connector assembled and wired

K40	8 poles from bottom
K60	4 poles from bottom

product option

accessory sold separately

07

A7
external rubber gasket

15
Ø 11 mm roller

15-1
stainless steel Ø 12 mm roller

16
Ø 20 mm roller

10

17
stainless steel Ø 12 mm roller

12

13
stainless steel Ø 12 mm roller

76
rope switches for signalling

30

31

51

52

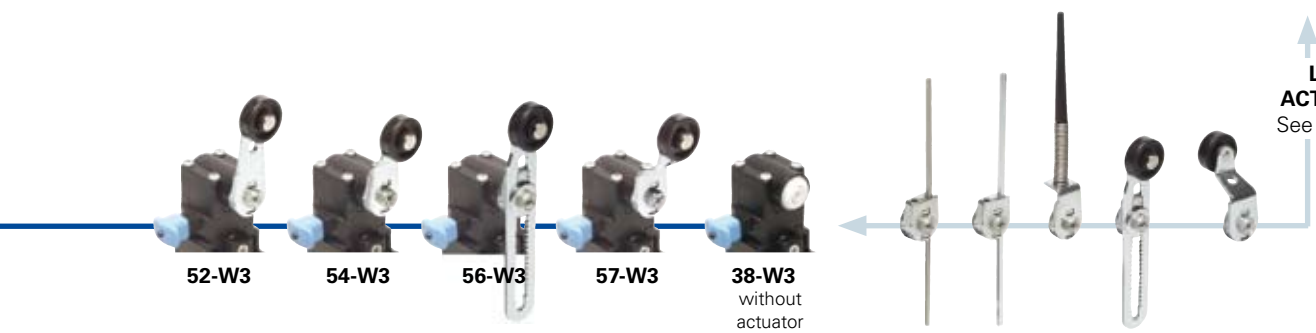
54

55
adjustable lever

56
safety adjustable lever

57

38
without actuator



52-W3

54-W3

56-W3

57-W3

38-W3
without actuator

LOOSE ACTUATORS
See page 2/51

Code structure

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

article: **FR 502** — options: **-1W3XGM2K70**

Housing

FR	polymer housing, one conduit entry

Contact blocks

5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action overlapped
...	.....

Actuators

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

Suffix

	no suffix (standard)
1	with stainless steel roller: - Ø 12 mm for actuator A4, 15 - Ø 14 mm for actuators A2, 02, A5, 05 - Ø 20 mm for actuators 30, 31, 51, 52, 54, 55, 56, 57
2	with Ø 35 mm polymer roller (see special loose actuators on page 2/52)
3	with Ø 50 mm rubber roller (see special loose actuators on page 2/52)
4	with Ø 50 mm overhanging rubber roller (see special loose actuators on page 2/52)

Reset hooking

	without reset (standard)
W3	simultaneous reset
W4	simultaneous reset with increased force

External metallic parts

	zinc plated steel (standard)
X	stainless steel

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm (contact block 2 excluded)

Preinstalled cable gland or connectors

	no cable gland or connector (standard)
K21	assembled cable gland (see conduit entry page 2/41)
...	.....
K70	4 poles M12 assembled plastic connector (see conduit entry page 2/41)
...	.....

For the complete list of all combinations, please contact our technical office.

Threaded conduit entry

	PG 13,5 (standard)
A	PG 11
M1	M16x1,5
M2	M20x1,5
M3	1/2 NPT

Position switches **FR** series

Main data

- Polymer housing, one conduit entry
- Protection degree IP67
- 17 contact blocks available
- 48 actuators available
- External stainless steel parts versions
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:

Approval IMQ: EG610
Approval UL: E131787
Approval CCC: 2007010305230013
Approval EZU: 101015
Approval GOST: POCC IT.AB24.B04512

Technical data

Housing
Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation ⧈
One threaded conduit entry
Protection degree: IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

Ambient temperature:	from -25°C to +80°C
Version for operation in ambient temperature from -40°C to +80° C on request	
Max actuation frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	20 million operations cycles[1]
Assembling position:	any
Driving torque for installation:	see pages 7/1-7/12

(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, 21, 22, 33, 34:	min.	1 x 0,34 mm²	(1 x AWG 22)
	max.	2 x 1,5 mm²	(2 x AWG 16)
Contact blocks 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 2,5 mm²	(2 x AWG 14)
Contact block 2:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 1,5 mm²	(2 x AWG 16)

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, IEC 60529, EN 60529, 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 Electromagnetic Compatibility 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, 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 EN 60947-5-1, encl. K, par. 2**. The switch must be actuated with **at least up to the positive opening travel** shown in the travels diagrams on page 7/6. 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.

⚠ If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 7/1 to page 7/12.

Electrical data

Utilization categories

without connector

Thermal current (Ith): 10 A
Rated insulation voltage (Ui): 500 Vac 600 Vdc
400Vac500Vdc (contact blocks 2, 11, 12, 20, 21, 22, 33, 34)
Rated impulse withstand voltage (U_{imp}): 6 kV
4 kV (contact blocks 20, 21, 22, 33, 34)
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

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

with 4 poles M12 connector

Thermal current (Ith): 4 A
Rated insulation voltage (Ui): 250 Vac 300 Vdc
Protection against short circuits: fuse 4 A 500 V type gG
Pollution degree: 3

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

Ue (V)	24	120	250
Ie (A)	4	4	4

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	4	1,1	0,4

with 8 poles M12 connector

Thermal current (Ith): 2 A
Rated insulation voltage (Ui): 30 Vac 36 Vdc
Protection against short circuits: fuse 2 A 500 V type gG
Pollution degree: 3

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

Ue (V)	24
Ie (A)	2

Direct current: DC13

Ue (V)	24
Ie (A)	2

Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 2, 11, 12, 20, 21, 22, 33, 34)
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (U_{imp}): 6 kV
4 kV (for contact blocks 20, 21, 22, 33, 34)
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: Za, Zb, Za+Za, Y+Y, X+X, Y+Y+X, Y+Y+Y, Y+X+X
Positive opening of contacts on contact block 5, 6, 7, 9, 11, 13, 14, 16, 18, 20, 21, 22, 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2006/95/CE.

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

Data type approved by UL

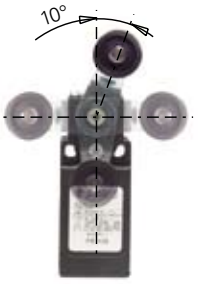
Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks except 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb in (0.8 Nm).
For contact blocks 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 14 AWG. Terminal tightening torque of 12 lb in (1.4 Nm).

In conformity with standard: UL 508

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

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

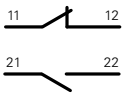
In all switches, it is possible to rotate the head in 90° steps.

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.

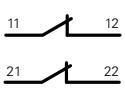
Lever turned to left

Contacts diagram



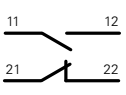
Lever not turned

Contacts diagram



Lever turned to right

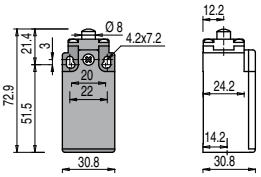
Contacts diagram



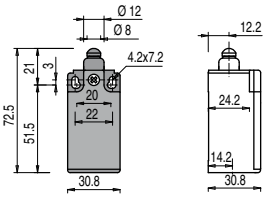
Position switches **FR** series

Contacts type:

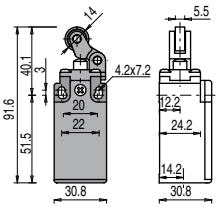
- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



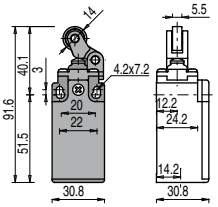
With external rubber gasket



With stainless steel roller on request



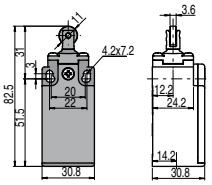
With external rubber gasket
With stainless steel roller on request



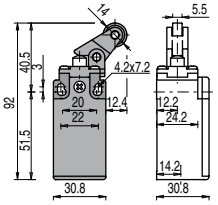
Contact blocks

5	R	FR 501	1NO+1NC		FR 5A1	1NO+1NC		FR 502	1NO+1NC		FR 5A2	1NO+1NC
6	L	FR 601	1NO+1NC		FR 6A1	1NO+1NC		FR 602	1NO+1NC		FR 6A2	1NO+1NC
7	LO	FR 701	1NO+1NC		FR 7A1	1NO+1NC		FR 702	1NO+1NC		FR 7A2	1NO+1NC
9	L	FR 901	2NC		FR 9A1	2NC		FR 902	2NC		FR 9A2	2NC
10	L	FR 1001	2NO		FR 10A1	2NO		FR 1002	2NO		FR 10A2	2NO
11	R	FR 1101	2NC		FR 11A1	2NC		FR 1102	2NC		FR 11A2	2NC
12	R	FR 1201	2NO		FR 12A1	2NO		FR 1202	2NO		FR 12A2	2NO
13	LV	FR 1301	2NC		FR 13A1	2NC		FR 1302	2NC		FR 13A2	2NC
14	LS	FR 1401	2NC		FR 14A1	2NC		FR 1402	2NC		FR 14A2	2NC
15	LS	FR 1501	2NO		FR 15A1	2NO		FR 1502	2NO		FR 15A2	2NO
18	LA	FR 1801	1NO+1NC		FR 18A1	1NO+1NC		FR 1802	1NO+1NC		FR 18A2	1NO+1NC
20	L	FR 2001	1NO+2NC		FR 20A1	1NO+2NC		FR 2002	1NO+2NC		FR 20A2	1NO+2NC
21	L	FR 2101	3NC		FR 21A1	3NC		FR 2102	3NC		FR 21A2	3NC
22	L	FR 2201	2NO+1NC		FR 22A1	2NO+1NC		FR 2202	2NO+1NC		FR 22A2	2NO+1NC
2	R	FR 201	2x(1NO-1NC)					FR 202	2x(1NO-1NC)		FR 2A2	2x(1NO-1NC)
E1		FR E101	1NO-1NC		FR E1A1	1NO-1NC		FR E102	1NO-1NC		FR E1A2	1NO-1NC
Max speed		page 7/5 - type 4			page 7/5 - type 4			page 7/5 - type 3			page 7/5 - type 3	
Min. force		8 N (25 N ⊖)			6 N (25 N ⊖)			6 N (25 N ⊖)			4,3 N (25 N ⊖)	
Travel diagrams		page 7/6 - group 1			page 7/6 - group 1			page 7/6 - group 2			page 7/6 - group 2	

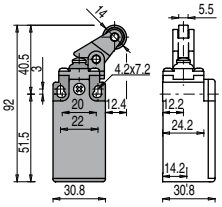
With external rubber gasket
With Ø 12 mm stainless steel roller on request

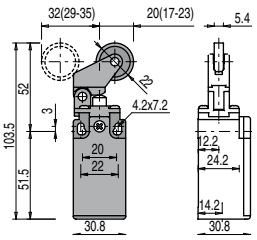


With stainless steel roller on request



With external rubber gasket
With stainless steel roller on request





Contact blocks

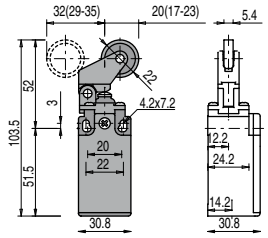
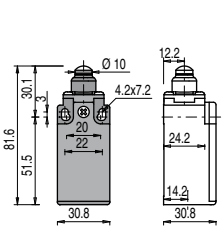
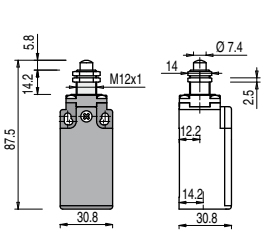
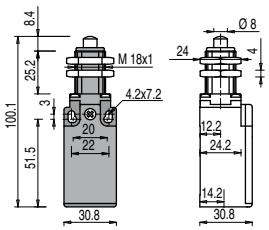
5	R	FR 5A4	1NO+1NC		FR 505	1NO+1NC		FR 5A5	1NO+1NC		FR 507	1NO+1NC
6	L	FR 6A4	1NO+1NC		FR 605	1NO+1NC		FR 6A5	1NO+1NC		FR 607	1NO+1NC
7	LO	FR 7A4	1NO+1NC		FR 705	1NO+1NC		FR 7A5	1NO+1NC		FR 707	1NO+1NC
9	L	FR 9A4	2NC		FR 905	2NC		FR 9A5	2NC		FR 907	2NC
10	L	FR 10A4	2NO		FR 1005	2NO		FR 10A5	2NO		FR 1007	2NO
11	R	FR 11A4	2NC		FR 1105	2NC		FR 11A5	2NC		FR 1107	2NC
12	R	FR 12A4	2NO		FR 1205	2NO		FR 12A5	2NO		FR 1207	2NO
13	LV	FR 13A4	2NC		FR 1305	2NC		FR 13A5	2NC		FR 1307	2NC
14	LS	FR 14A4	2NC		FR 1405	2NC		FR 14A5	2NC		FR 1407	2NC
15	LS	FR 15A4	2NO		FR 1505	2NO		FR 15A5	2NO		FR 1507	2NO
18	LA	FR 18A4	1NO+1NC		FR 1805	1NO+1NC		FR 18A5	1NO+1NC		FR 1807	1NO+1NC
20	L	FR 20A4	1NO+2NC		FR 2005	1NO+2NC		FR 20A5	1NO+2NC		FR 2007	1NO+2NC
21	L	FR 21A4	3NC		FR 2105	3NC		FR 21A5	3NC		FR 2107	3NC
22	L	FR 22A4	2NO+1NC		FR 2205	2NO+1NC		FR 22A5	2NO+1NC		FR 2207	2NO+1NC
2	R				FR 205	2x(1NO-1NC)		FR 2A5	2x(1NO-1NC)		FR 207	2x(1NO-1NC)
E1		FR E1A4	1NO-1NC		FR E105	1NO-1NC		FR E1A5	1NO-1NC		FR E107	1NO-1NC
Max speed		page 7/5 - type 5			page 7/5 - type 3			page 7/5 - type 3			page 7/5 - type 3	
Min. force		6 N (25 N ⊖)			6 N (25 N ⊖)			4,3 N (25 N ⊖)			4 N (25 N ⊖)	
Travel diagrams		page 7/6 - group 1			page 7/6 - group 2			page 7/6 - group 2			page 7/6 - group 3	

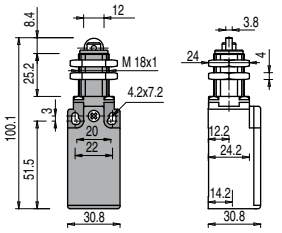
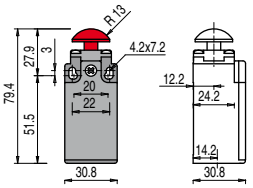
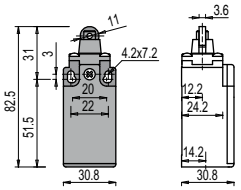
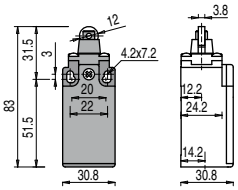
Accessories See page 6/1

All measures in the drawings are in mm

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted
LV = slow action shifted and spaced
LI = slow action independent
LA = slow action closer
= electronic PNP

Contact blocks		With external rubber gasket	With external rubber gasket	Fixed only by threaded head in vertical position	
					
5	R	FR 5A7 1NO+1NC	FR 508 1NO+1NC	FR 510 1NO+1NC	FR 512 1NO+1NC
6	L	FR 6A7 1NO+1NC	FR 608 1NO+1NC	FR 610 1NO+1NC	FR 612 1NO+1NC
7	LO	FR 7A7 1NO+1NC	FR 708 1NO+1NC	FR 710 1NO+1NC	FR 712 1NO+1NC
9	L	FR 9A7 2NC	FR 908 2NC	FR 910 2NC	FR 912 2NC
10	L	FR 10A7 2NO	FR 1008 2NO	FR 1010 2NO	FR 1012 2NO
11	R	FR 11A7 2NC	FR 1108 2NC	FR 1110 2NC	FR 1112 2NC
12	R	FR 12A7 2NO	FR 1208 2NO	FR 1210 2NO	FR 1212 2NO
13	LV	FR 13A7 2NC	FR 1308 2NC	FR 1310 2NC	FR 1312 2NC
14	LS	FR 14A7 2NC	FR 1408 2NC	FR 1410 2NC	FR 1412 2NC
15	LS	FR 15A7 2NO	FR 1508 2NO	FR 1510 2NO	FR 1512 2NO
18	LA	FR 18A7 1NO+1NC	FR 1808 1NO+1NC	FR 1810 1NO+1NC	FR 1812 1NO+1NC
20	L	FR 20A7 1NO+2NC	FR 2008 1NO+2NC	FR 2010 1NO+2NC	FR 2012 1NO+2NC
21	L	FR 21A7 3NC	FR 2108 3NC	FR 2110 3NC	FR 2112 3NC
22	L	FR 22A7 2NO+1NC	FR 2208 2NO+1NC	FR 2210 2NO+1NC	FR 2212 2NO+1NC
2	R	FR 2A7 2x(1NO-1NC)	FR 208 2x(1NO-1NC)	FR 210 2x(1NO-1NC)	FR 212 2x(1NO-1NC)
E1		FR E1A7 1NO-1NC	FR E108 1NO-1NC	FR E110 1NO-1NC	FR E112 1NO-1NC
Max speed		page 7/5 - type 3	page 7/5 - type 4	page 7/5 - type 4	page 7/5 - type 4
Min. force		3 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)
Travel diagrams		page 7/6 - group 3	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1

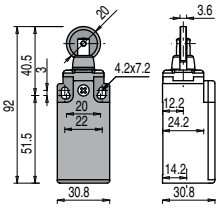
Contact blocks				Ø 11 mm polymer roller	Ø 12 mm stainless steel roller
					
5	R	FR 513 1NO+1NC	FR 514 1NO+1NC	FR 515 1NO+1NC	FR 515-1 1NO+1NC
6	L	FR 613 1NO+1NC	FR 614 1NO+1NC	FR 615 1NO+1NC	FR 615-1 1NO+1NC
7	LO	FR 713 1NO+1NC	FR 714 1NO+1NC	FR 715 1NO+1NC	FR 715-1 1NO+1NC
9	L	FR 913 2NC	FR 914 2NC	FR 915 2NC	FR 915-1 2NC
10	L	FR 1013 2NO	FR 1014 2NO	FR 1015 2NO	FR 1015-1 2NO
11	R	FR 1113 2NC	FR 1114 2NC	FR 1115 2NC	FR 1115-1 2NC
12	R	FR 1213 2NO	FR 1214 2NO	FR 1215 2NO	FR 1215-1 2NO
13	LV	FR 1313 2NC	FR 1314 2NC	FR 1315 2NC	FR 1315-1 2NC
14	LS	FR 1413 2NC	FR 1414 2NC	FR 1415 2NC	FR 1415-1 2NC
15	LS	FR 1513 2NO	FR 1514 2NO	FR 1515 2NO	FR 1515-1 2NO
18	LA	FR 1813 1NO+1NC	FR 1814 1NO+1NC	FR 1815 1NO+1NC	FR 1815-1 1NO+1NC
20	L	FR 2013 1NO+2NC	FR 2014 1NO+2NC	FR 2015 1NO+2NC	FR 2015-1 1NO+2NC
21	L	FR 2113 3NC	FR 2114 3NC	FR 2115 3NC	FR 2115-1 3NC
22	L	FR 2213 2NO+1NC	FR 2214 2NO+1NC	FR 2215 2NO+1NC	FR 2215-1 2NO+1NC
2	R	FR 213 2x(1NO-1NC)	FR 214 2x(1NO-1NC)	FR 215 2x(1NO-1NC)	FR 215-1 2x(1NO-1NC)
E1		FR E113 1NO-1NC	FR E114 1NO-1NC	FR E115 1NO-1NC	FR E115-1 1NO-1NC
Max speed		page 7/5 - type 2	page 7/5 - type 4	page 7/5 - type 2	page 7/5 - type 2
Min. force		8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1

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

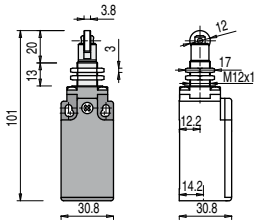
Position switches **FR** series

Contacts type:

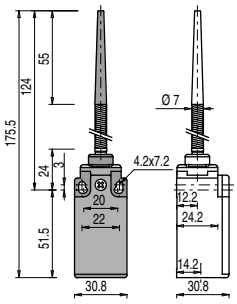
- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



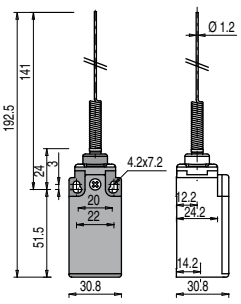
Fixed only by threaded head in vertical position



With external rubber gasket

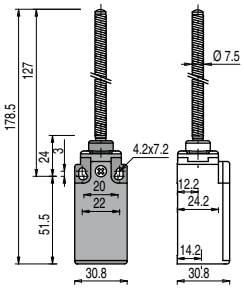


With external rubber gasket

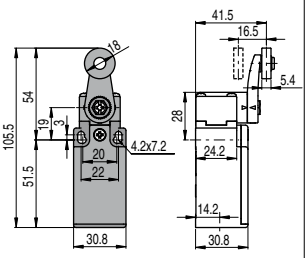


Contact blocks												
5	R	FR 516	1NO+1NC		FR 517	1NO+1NC		FR 520	1NO+1NC		FR 521	1NO+1NC
6	L	FR 616	1NO+1NC		FR 617	1NO+1NC						
7	LO	FR 716	1NO+1NC		FR 717	1NO+1NC						
9	L	FR 916	2NC		FR 917	2NC						
10	L	FR 1016	2NO		FR 1017	2NO		FR 1020	2NO		FR 1021	2NO
11	R	FR 1116	2NC		FR 1117	2NC						
12	R	FR 1216	2NO		FR 1217	2NO		FR 1220	2NO		FR 1221	2NO
13	LV	FR 1316	2NC		FR 1317	2NC						
14	LS	FR 1416	2NC		FR 1417	2NC						
15	LS	FR 1516	2NO		FR 1517	2NO						
18	LA	FR 1816	1NO+1NC		FR 1817	1NO+1NC		FR 1820	1NO+1NC		FR 1821	1NO+1NC
20	L	FR 2016	1NO+2NC		FR 2017	1NO+2NC		FR 2020	1NO+2NC		FR 2021	1NO+2NC
21	L	FR 2116	3NC		FR 2117	3NC		FR 2120	3NC		FR 2121	3NC
22	L	FR 2216	2NO+1NC		FR 2217	2NO+1NC		FR 2220	2NO+1NC		FR 2221	2NO+1NC
2	R	FR 216	2x(1NO-1NC)		FR 217	2x(1NO-1NC)		FR 220	2x(1NO-1NC)		FR 221	2x(1NO-1NC)
E1		FR E116	1NO-1NC		FR E117	1NO-1NC		FR E120	1NO-1NC		FR E121	1NO-1NC
Max speed		page 7/5 - type 2			page 7/5 - type 2			1 m/s			1 m/s	
Min. force		8 N (25 N ⊖)			8 N (25 N ⊖)			0,07 Nm			0,07 Nm	
Travel diagrams		page 7/6 - group 1			page 7/6 - group 1			page 7/6 - group 4			page 7/6 - group 4	

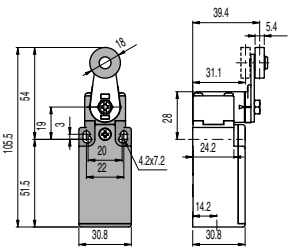
With external rubber gasket



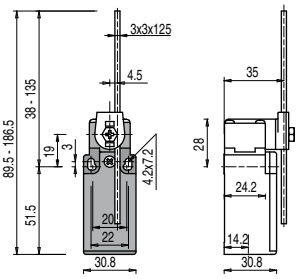
With Ø 20 mm stainless steel roller on request



Other rollers available. See page 2/52



3x3 mm square rod

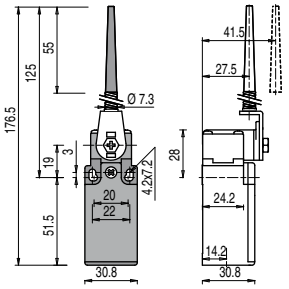
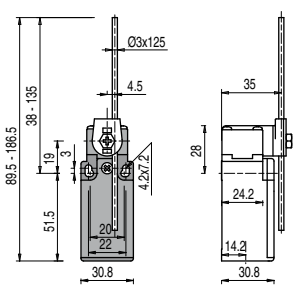
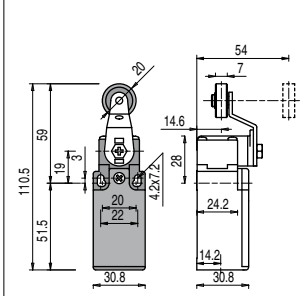
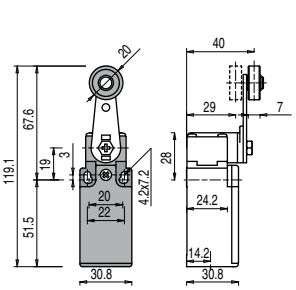


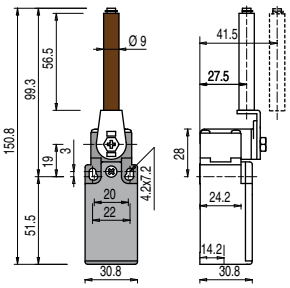
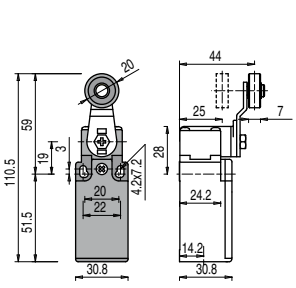
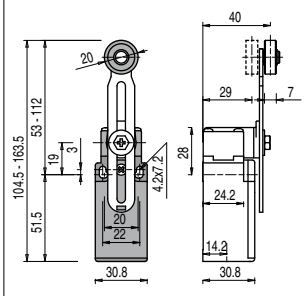
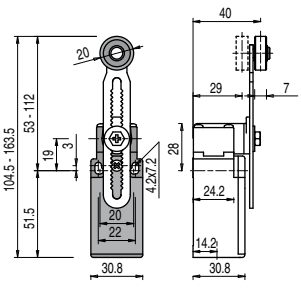
Contact blocks												
5	R	FR 525	1NO+1NC		FR 530	1NO+1NC		FR 531	1NO+1NC		FR 533	1NO+1NC
6	L				FR 630	1NO+1NC		FR 631	1NO+1NC		FR 633	1NO+1NC
7	LO				FR 730	1NO+1NC		FR 731	1NO+1NC		FR 733	1NO+1NC
9	L				FR 930	2NC		FR 931	2NC		FR 933	2NC
10	L	FR 1025	2NO		FR 1030	2NO		FR 1031	2NO		FR 1033	2NO
11	R				FR 1130	2NC		FR 1131	2NC		FR 1133	2NC
12	R	FR 1225	2NO		FR 1230	2NO		FR 1231	2NO		FR 1233	2NO
13	LV				FR 1330	2NC		FR 1331	2NC		FR 1333	2NC
14	LS				FR 1430	2NC		FR 1431	2NC		FR 1433	2NC
15	LS				FR 1530	2NO		FR 1531	2NO		FR 1533	2NO
16	LI				FR 1630	2NC		FR 1631	2NC		FR 1633	2NC
18	LA	FR 1825	1NO+1NC		FR 1830	1NO+1NC		FR 1831	1NO+1NC		FR 1833	1NO+1NC
20	L	FR 2025	1NO+2NC		FR 2030	1NO+2NC		FR 2031	1NO+2NC		FR 2033	1NO+2NC
21	L	FR 2125	3NC		FR 2130	3NC		FR 2131	3NC		FR 2133	3NC
22	L	FR 2225	2NO+1NC		FR 2230	2NO+1NC		FR 2231	2NO+1NC		FR 2233	2NO+1NC
2	R	FR 225	2x(1NO-1NC)		FR 230	2x(1NO-1NC)		FR 231	2x(1NO-1NC)		FR 233	2x(1NO-1NC)
E1		FR E125	1NO-1NC		FR E130	1NO-1NC		FR E131	1NO-1NC		FR E133	1NO-1NC
Max speed		1 m/s			page 7/5 - type 1			page 7/5 - type 1			1,5 m/s	
Min. force		0,12 Nm			0,06 Nm (0,25 Nm ⊖)			0,06 Nm (0,25 Nm ⊖)			0,06 Nm	
Travel diagrams		page 7/6 - group 4			page 7/6 - group 5			page 7/6 - group 5			page 7/6 - group 5	

Accessories See page 6/1

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

Contact blocks												
				Ø 3 mm stainless steel round rod			Other rollers available. See page 2/52			Other rollers available. See page 2/52		
												
5	R	FR 534	1NO+1NC	FR 550	1NO+1NC		FR 551	→	1NO+1NC	FR 552	→	1NO+1NC
6	L	FR 634	1NO+1NC	FR 650	1NO+1NC		FR 651	→	1NO+1NC	FR 652	→	1NO+1NC
7	LO	FR 734	1NO+1NC	FR 750	1NO+1NC		FR 751	→	1NO+1NC	FR 752	→	1NO+1NC
9	L	FR 934	2NC	FR 950	2NC		FR 951	→	2NC	FR 952	→	2NC
10	L	FR 1034	2NO	FR 1050	2NO		FR 1051		2NO	FR 1052		2NO
11	R	FR 1134	2NC	FR 1150	2NC		FR 1151	→	2NC	FR 1152	→	2NC
12	R	FR 1234	2NO	FR 1250	2NO		FR 1251		2NO	FR 1252		2NO
13	LV	FR 1334	2NC	FR 1350	2NC		FR 1351	→	2NC	FR 1352	→	2NC
14	LS	FR 1434	2NC	FR 1450	2NC		FR 1451	→	2NC	FR 1452	→	2NC
15	LS	FR 1534	2NO	FR 1550	2NO		FR 1551		2NO	FR 1552		2NO
16	LI	FR 1634	2NC	FR 1650	2NC		FR 1651	→	2NC	FR 1652	→	2NC
18	LA	FR 1834	1NO+1NC	FR 1850	1NO+1NC		FR 1851	→	1NO+1NC	FR 1852	→	1NO+1NC
20	L	FR 2034	1NO+2NC	FR 2050	1NO+2NC		FR 2051	→	1NO+2NC	FR 2052	→	1NO+2NC
21	L	FR 2134	3NC	FR 2150	3NC		FR 2151	→	3NC	FR 2152	→	3NC
22	L	FR 2234	2NO+1NC	FR 2250	2NO+1NC		FR 2251	→	2NO+1NC	FR 2252	→	2NO+1NC
2	R	FR 234	2x(1NO-1NC)	FR 250	2x(1NO-1NC)		FR 251		2x(1NO-1NC)	FR 252		2x(1NO-1NC)
E1		FR E134	1NO-1NC	FR E150	1NO-1NC		FR E151		1NO-1NC	FR E152		1NO-1NC
Max speed		1,5 m/s		1,5 m/s			page 7/5 - type 1			page 7/5 - type 1		
Min. force		0,06 Nm		0,06 Nm			0,06 Nm (0,25 Nm →)			0,06 Nm (0,25 Nm →)		
Travel diagrams		page 7/6 - group 5		page 7/6 - group 5			page 7/6 - group 5			page 7/6 - group 5		

Contact blocks												
		Porcelain roller			Other rollers available. See page 2/52			Other rollers available. See page 2/52			Other rollers available. See page 2/52		
													
5	R	FR 553-E0V9	→	1NO+1NC	FR 554	→	1NO+1NC	FR 555	→	(1) 1NO+1NC	FR 556	→	1NO+1NC
6	L	FR 653-E0V9	→	1NO+1NC	FR 654	→	1NO+1NC	FR 655	→	(1) 1NO+1NC	FR 656	→	1NO+1NC
7	LO	FR 753-E0V9	→	1NO+1NC	FR 754	→	1NO+1NC	FR 755	→	(1) 1NO+1NC	FR 756	→	1NO+1NC
9	L	FR 953-E0V9	→	2NC	FR 954	→	2NC	FR 955	→	(1) 2NC	FR 956	→	2NC
10	L	FR 1053-E0V9		2NO	FR 1054		2NO	FR 1055		2NO	FR 1056		2NO
11	R				FR 1154	→	2NC	FR 1155	→	(1) 2NC	FR 1156	→	2NC
12	R	FR 1253-E0V9		2NO	FR 1254		2NO	FR 1255		2NO	FR 1256		2NO
13	LV	FR 1353-E0V9	→	2NC	FR 1354	→	2NC	FR 1355	→	(1) 2NC	FR 1356	→	2NC
14	LS	FR 1453-E0V9	→	2NC	FR 1454	→	2NC	FR 1455	→	(1) 2NC	FR 1456	→	2NC
15	LS	FR 1553-E0V9		2NO	FR 1554		2NO	FR 1555		2NO	FR 1556		2NO
16	LI				FR 1654	→	2NC	FR 1655	→	(1) 2NC	FR 1656	→	2NC
18	LA	FR 1853-E0V9	→	1NO+1NC	FR 1854	→	1NO+1NC	FR 1855	→	(1) 1NO+1NC	FR 1856	→	1NO+1NC
20	L	FR 2053-E0V9	→	1NO+2NC	FR 2054	→	1NO+2NC	FR 2055	→	(1) 1NO+2NC	FR 2056	→	1NO+2NC
21	L	FR 2153-E0V9	→	3NC	FR 2154	→	3NC	FR 2155	→	(1) 3NC	FR 2156	→	3NC
22	L	FR 2253-E0V9	→	2NO+1NC	FR 2254	→	2NO+1NC	FR 2255	→	(1) 2NO+1NC	FR 2256	→	2NO+1NC
2	R	FR 253-E0		2x(1NO-1NC)	FR 254		2x(1NO-1NC)	FR 255		2x(1NO-1NC)	FR 256		2x(1NO-1NC)
E1		FR E153-E0V9		1NO-1NC	FR E154		1NO-1NC	FR E155		1NO-1NC	FR E156		1NO-1NC
Max speed		0,5 m/s			page 7/5 - type 1			page 7/5 - type 1			page 7/5 - type 1		
Min. force		0,03 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 7/6 - group 6			page 7/6 - group 5			page 7/6 - group 5			page 7/6 - group 5		

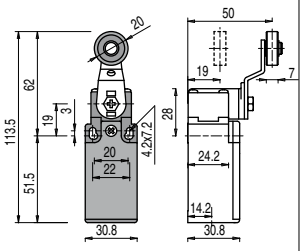
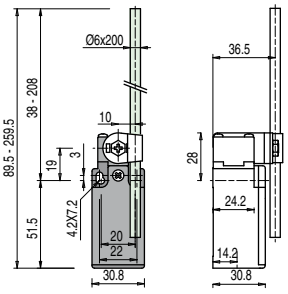
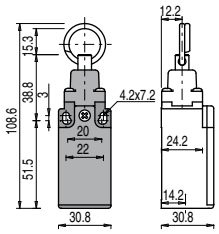
Items with code on the **green** background are available in stock

(1) Positive opening only with lever adjusted on the max. See page 2/51.

Position switches **FR** series

Contacts type:

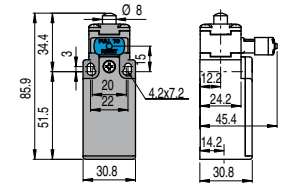
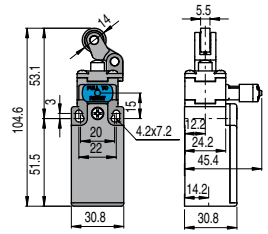
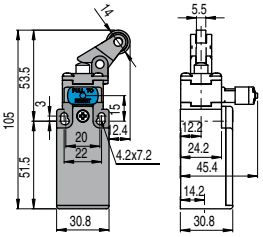
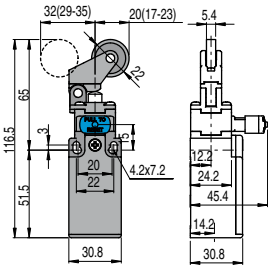
- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

Contact blocks		Other rollers available. See page 2/52	Fiber glass rod	Rope switches for signalling	
					
5	R	FR 557 ⊖ 1NO+1NC	FR 569 1NO+1NC	FR 576 1NO+1NC	
6	L	FR 657 ⊖ 1NO+1NC	FR 669 1NO+1NC	FR 676 1NO+1NC	
7	LO	FR 757 ⊖ 1NO+1NC	FR 769 1NO+1NC	FR 776 1NO+1NC	
9	L	FR 957 ⊖ 2NC	FR 969 2NC	FR 976 2NO	
10	L	FR 1057 2NO	FR 1069 2NO	FR 1076 2NC	
11	R	FR 1157 ⊖ 2NC	FR 1169 2NC	FR 1176 2NO	
12	R	FR 1257 2NO	FR 1269 2NO	FR 1276 2NC	
13	LV	FR 1357 ⊖ 2NC	FR 1369 2NC	FR 1376 2NO	
14	LS	FR 1457 ⊖ 2NC	FR 1469 2NC	FR 1476 2NO	
15	LS	FR 1557 2NO	FR 1569 2NO	FR 1576 2NC	
16	LI	FR 1657 ⊖ 2NC	FR 1669 2NC		
18	LA	FR 1857 ⊖ 1NO+1NC	FR 1869 1NO+1NC	FR 1876 1NO+1NC	
20	L	FR 2057 ⊖ 1NO+2NC	FR 2069 1NO+2NC	FR 2076 2NO+1NC	
21	L	FR 2157 ⊖ 3NC	FR 2169 3NC	FR 2176 3NO	
22	L	FR 2257 ⊖ 2NO+1NC	FR 2269 2NO+1NC	FR 2276 1NO+2NC	
2	R	FR 257 2x(1NO-1NC)	FR 269 2x(1NO-1NC)	FR 276 2x(1NO-1NC)	
E1		FR E157 1NO-1NC	FR E169 1NO-1NC		
Max speed		page 7/5 - type 1	1,5 m/s	0,5 m/s	
Min. force		0,06 Nm (0,25 Nm ⊖)	0,06 Nm	initial 20 N - final 40 N	
Travel diagrams		page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 7	

Position switches **FR** series with reset

Pizzato Elettrica has developed a reset device code W3 to make perfectly simultaneous the actuator and the contact block tripping. The new device is a block inserted between the switch body and the head, and could be rotated independently from this last one. This new device has following advantages:

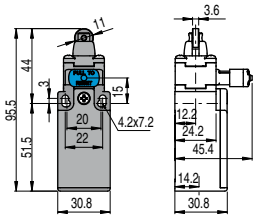
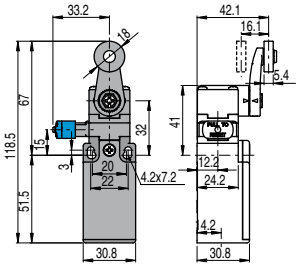
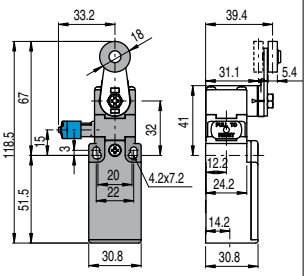
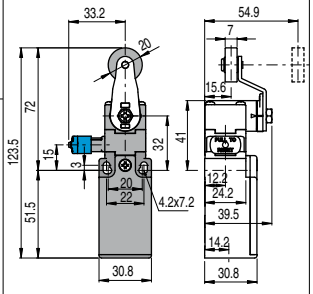
- The reset device integrate in almost all standard actuation head
- Contact blocks with snap action are no more necessary because the tripping movement is made by the reset device itself
- The reset device can be rotated independently from the head for the maximum flexibility during the assembling
- Two driving forces: standard and increased for applications with vibrations
- Mechanical endurance: 1 million operations cycles.

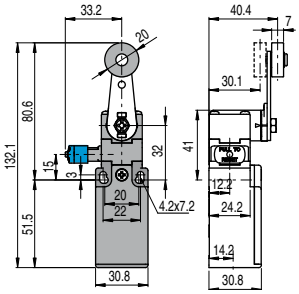
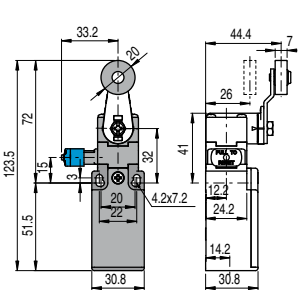
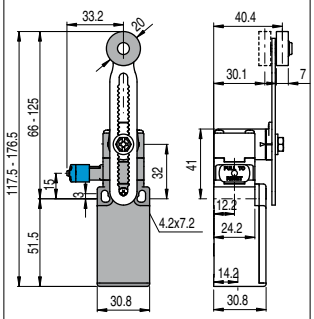
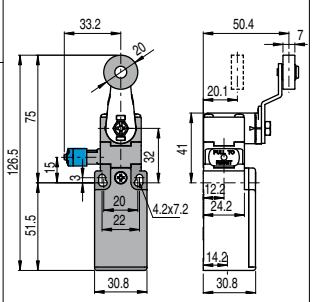
Contact blocks			With stainless steel roller on request	With stainless steel roller on request	
					
6	L	FR 601-W3 ⊖ 1NO+1NC	FR 602-W3 ⊖ 1NO+1NC	FR 605-W3 ⊖ 1NO+1NC	FR 607-W3 ⊖ 1NO+1NC
9	L	FR 901-W3 ⊖ 2NC	FR 902-W3 ⊖ 2NC	FR 905-W3 ⊖ 2NC	FR 907-W3 ⊖ 2NC
10	L	FR 1001-W3 2NO	FR 1002-W3 2NO	FR 1005-W3 2NO	FR 1007-W3 2NO
20	L	FR 2001-W3 ⊖ 1NO+2NC	FR 2002-W3 ⊖ 1NO+2NC	FR 2005-W3 ⊖ 1NO+2NC	FR 2007-W3 ⊖ 1NO+2NC
21	L	FR 2101-W3 ⊖ 3NC	FR 2102-W3 ⊖ 3NC	FR 2105-W3 ⊖ 3NC	FR 2107-W3 ⊖ 3NC
22	L	FR 2201-W3 ⊖ 2NO+1NC	FR 2202-W3 ⊖ 2NO+1NC	FR 2205-W3 ⊖ 2NO+1NC	FR 2207-W3 ⊖ 2NO+1NC
2	R	FR 201-W3 2NO+2NC	FR 202-W3 2NO+2NC	FR 205-W3 2NO+2NC	FR 207-W3 2NO+2NC
Max speed		page 7/5 - type 4	page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 3
Min. force		4,5 N (25 N ⊖)	4 N (25 N ⊖)	4 N (25 N ⊖)	2,5 N (25 N ⊖)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 2	page 7/7 - group 2	page 7/7 - group 3

Accessories See page 6/1

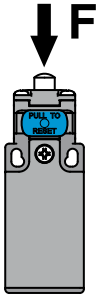
Contacts type:

R = snap action
L = slow action

Contact blocks		With stainless steel roller on request	With Ø 20 mm stainless steel roller on request	Other rollers available. See page 2/52	Other rollers available. See page 2/52
					
6	L	FR 615-W3 ⇒ 1NO+1NC	FR 630-W3 ⇒ 1NO+1NC	FR 631-W3 ⇒ 1NO+1NC	FR 651-W3 ⇒ 1NO+1NC
9	L	FR 915-W3 ⇒ 2NC	FR 930-W3 ⇒ 2NC	FR 931-W3 ⇒ 2NC	FR 951-W3 ⇒ 2NC
10	L	FR 1015-W3 2NO	FR 1030-W3 2NO	FR 1031-W3 2NO	FR 1051-W3 2NO
20	L	FR 2015-W3 ⇒ 1NO+2NC	FR 2030-W3 ⇒ 1NO+2NC	FR 2031-W3 ⇒ 1NO+2NC	FR 2051-W3 ⇒ 1NO+2NC
21	L	FR 2115-W3 ⇒ 3NC	FR 2130-W3 ⇒ 3NC	FR 2131-W3 ⇒ 3NC	FR 2151-W3 ⇒ 3NC
22	L	FR 2215-W3 ⇒ 2NO+1NC	FR 2230-W3 ⇒ 2NO+1NC	FR 2231-W3 ⇒ 2NO+1NC	FR 2251-W3 ⇒ 2NO+1NC
2	R	FR 215-W3 2NO+2NC	FR 230-W3 2NO+2NC	FR 231-W3 2NO+2NC	FR 251-W3 2NO+2NC
Max speed		page 7/5 - type 2	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		4,5 N (25 N ⇒)	0,07 Nm (0,25 Nm ⇒)	0,07 Nm (0,25 Nm ⇒)	0,07 Nm (0,25 Nm ⇒)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

Contact blocks		Other rollers available. See page 2/52	Other rollers available. See page 2/52	Other rollers available. See page 2/52	Other rollers available. See page 2/52
					
6	L	FR 652-W3 ⇒ 1NO+1NC	FR 654-W3 ⇒ 1NO+1NC	FR 656-W3 ⇒ 1NO+1NC	FR 657-W3 ⇒ 1NO+1NC
9	L	FR 952-W3 ⇒ 2NC	FR 954-W3 ⇒ 2NC	FR 956-W3 ⇒ 2NC	FR 957-W3 ⇒ 2NC
10	L	FR 1052-W3 2NO	FR 1054-W3 2NO	FR 1056-W3 2NO	FR 1057-W3 2NO
20	L	FR 2052-W3 ⇒ 1NO+2NC	FR 2054-W3 ⇒ 1NO+2NC	FR 2056-W3 ⇒ 1NO+2NC	FR 2057-W3 ⇒ 1NO+2NC
21	L	FR 2152-W3 ⇒ 3NC	FR 2154-W3 ⇒ 3NC	FR 2156-W3 ⇒ 3NC	FR 2157-W3 ⇒ 3NC
22	L	FR 2252-W3 ⇒ 2NO+1NC	FR 2254-W3 ⇒ 2NO+1NC	FR 2256-W3 ⇒ 2NO+1NC	FR 2257-W3 ⇒ 2NO+1NC
2	R	FR 252-W3 2NO+2NC	FR 254-W3 2NO+2NC	FR 256-W3 2NO+2NC	FR 257-W3 2NO+2NC
Max speed		page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,07 Nm (0,25 Nm ⇒)	0,07 Nm (0,25 Nm ⇒)	0,07 Nm (0,25 Nm ⇒)	0,07 Nm (0,25 Nm ⇒)
Travel diagrams		page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

Increased actuating force



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

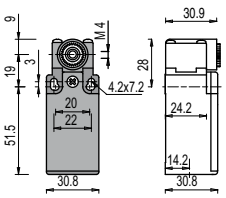
Actuator	Force
01, 14, 15, 16	7 N
02, 05	6 N
07	3,5 N
30 ... 57	0,08 Nm

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

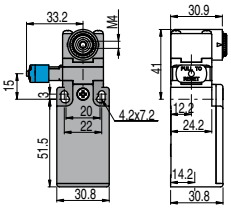
Position switches with revolving lever without actuator

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



With manual reset knob



Contact blocks				With manual reset knob	
5	R	FR 538	1NO+1NC		
6	L	FR 638	1NO+1NC	FR 638-W3	1NO+1NC
7	LO	FR 738	1NO+1NC		
9	L	FR 938	2NC	FR 938-W3	2NC
10	L	FR 1038	2NO	FR 1038-W3	2NO
11	R	FR 1138	2NC		
12	R	FR 1238	2NO		
13	LV	FR 1338	2NC		
14	LS	FR 1438	2NC		
15	LS	FR 1538	2NO		
16	LI	FR 1638	2NC		
18	LA	FR 1838	1NO+1NC		
20	L	FR 2038	1NO+2NC	FR 2038-W3	1NO+2NC
21	L	FR 2138	3NC	FR 2138-W3	3NC
22	L	FR 2238	2NO+1NC	FR 2238-W3	2NO+1NC
2	R	FR 238	2x(1NO-1NC)	FR 238-W3	2NO+2NC
E1		FR E138	1NO-1NC		
Min. force		0,06 Nm (0,25 Nm ⊖)		0,07 Nm (0,25 Nm ⊖)	
Travel diagrams		page 7/6 - group 5		page 7/7 - group 4	

IMPORTANT

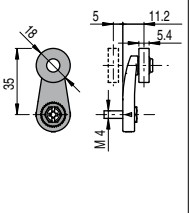
For safety applications: join only switches and actuators marked with symbol ⊖.

For more information about safety applications see page 7/1.

Loose actuators

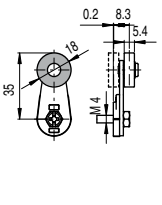
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Polymer roller Ø 18 mm



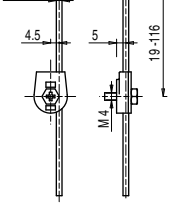
VF LE30 ⊖

Polymer roller Ø 18 mm



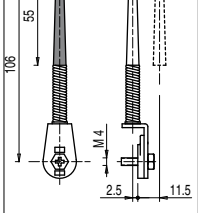
VF LE31 ⊖

Adjustable square rod 3x3x125 mm



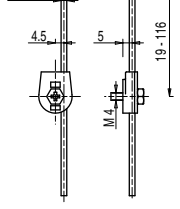
VF LE33

Flexible rod actuator



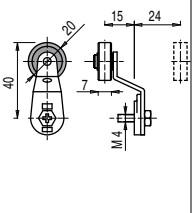
VF LE34

Adjustable round rod Ø 3x125 mm



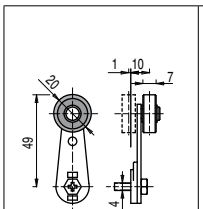
VF LE50

Polymer roller Ø 20 mm



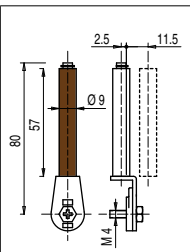
VF LE51 ⊖

Polymer roller Ø 20 mm



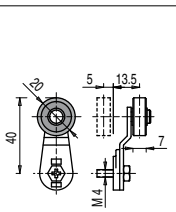
VF LE52 ⊖

Porcelain roller



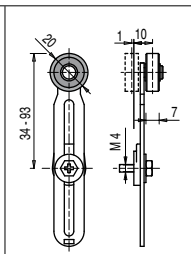
VF LE53 ⊖ (2)

Polymer roller Ø 20 mm



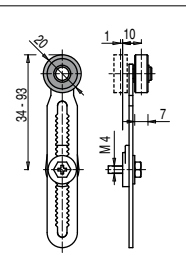
VF LE54 ⊖

Adjustable actuator with polymer roller



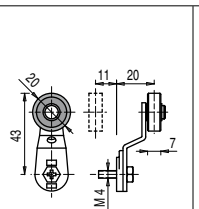
VF LE55 ⊖ (1)

Adjustable safety actuator with polymer roller



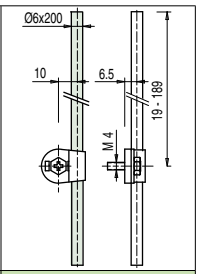
VF LE56 ⊖

Polymer roller Ø 20 mm



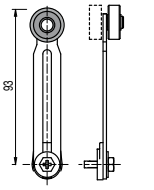
VF LE57 ⊖

Adjustable fiber glass rod



VF LE69

- 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.
- (2) The position switch obtained by assembling the switch FR •38 (e.g. FR 538, FR 638) with the actuator VF LE53 will not present the same travel diagrams and actuating forces as the position switch FR •53-E0V9 (e.g. FR 553-E0V9, FR 653-E0V9...).
- (4) The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

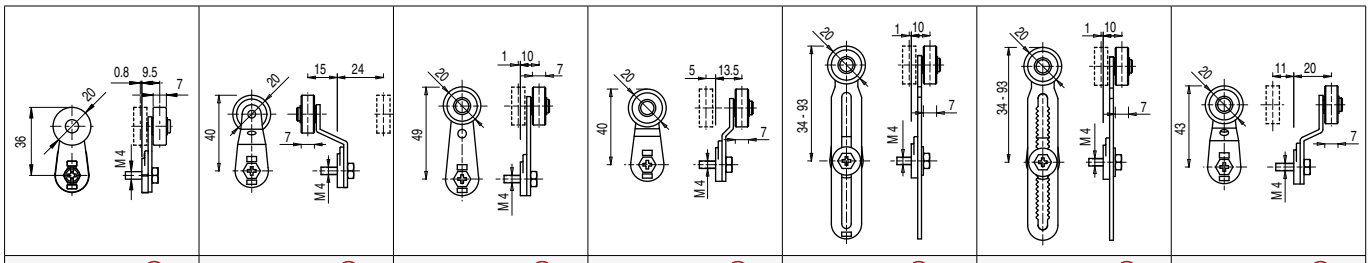


Accessories See page 6/1

Special loose actuators

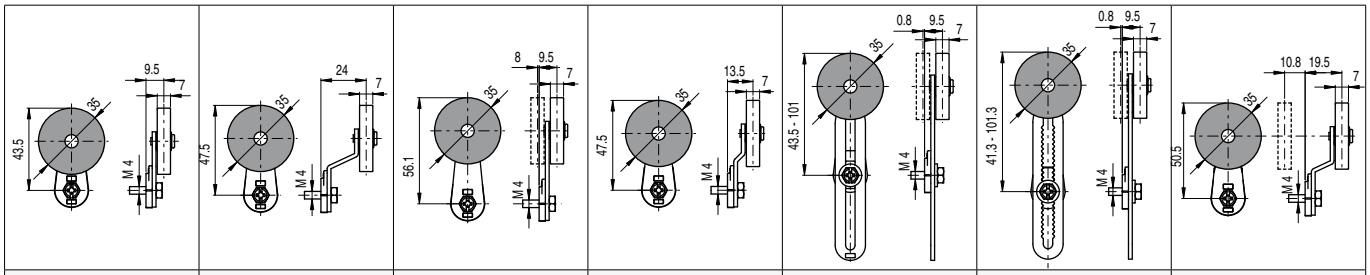
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Ø 20 mm stainless steel rollers



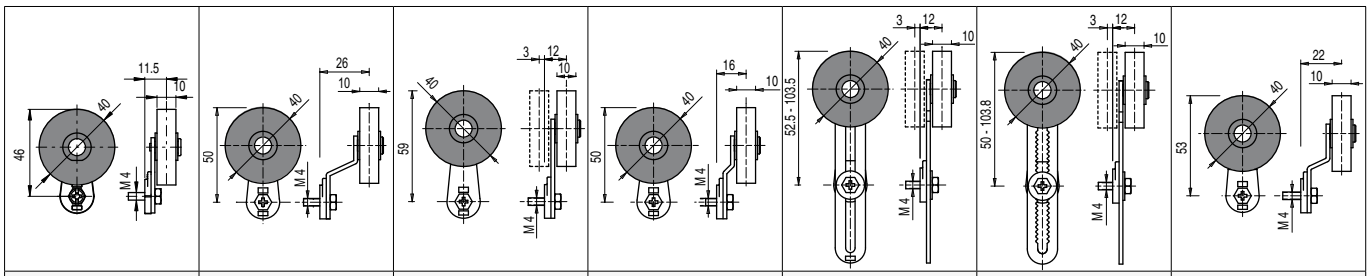
VF LE31-1 | VF LE51-1 | VF LE52-1 | VF LE54-1 | VF LE55-1 (1) | VF LE56-1 | VF LE57-1

Ø 35 mm polymer rollers



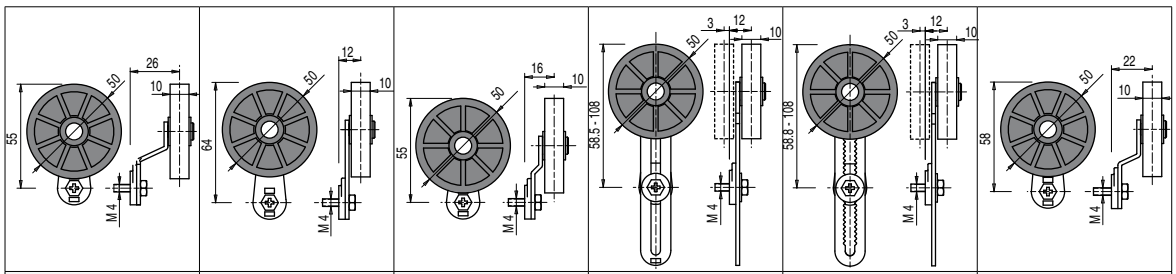
VF LE31-2 (4) | VF LE51-2 (4) | VF LE52-2 | VF LE54-2 (4) | VF LE55-2 (1) | VF LE56-2 | VF LE57-2

Ø 40 mm rubber rollers



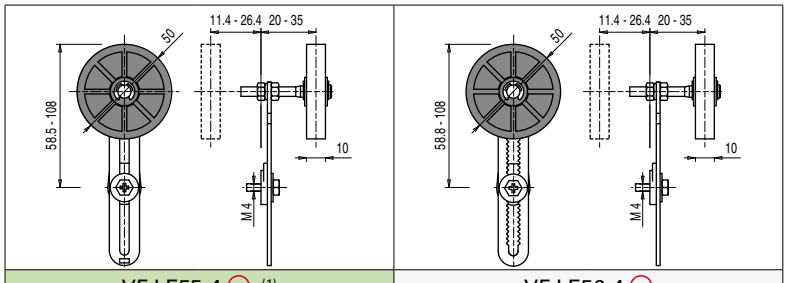
VF LE31-R5 (4) | VF LE51-R5 (4) | VF LE52-R5 | VF LE54-R5 (4) | VF LE55-R5 (1) | VF LE56-R5 | VF LE57-R5 (4)

Ø 50 mm rubber rollers



VF LE51-3 (4) | VF LE52-3 (4) | VF LE54-3 (4) | VF LE55-3 (1) | VF LE56-3 | VF LE57-3 (4)

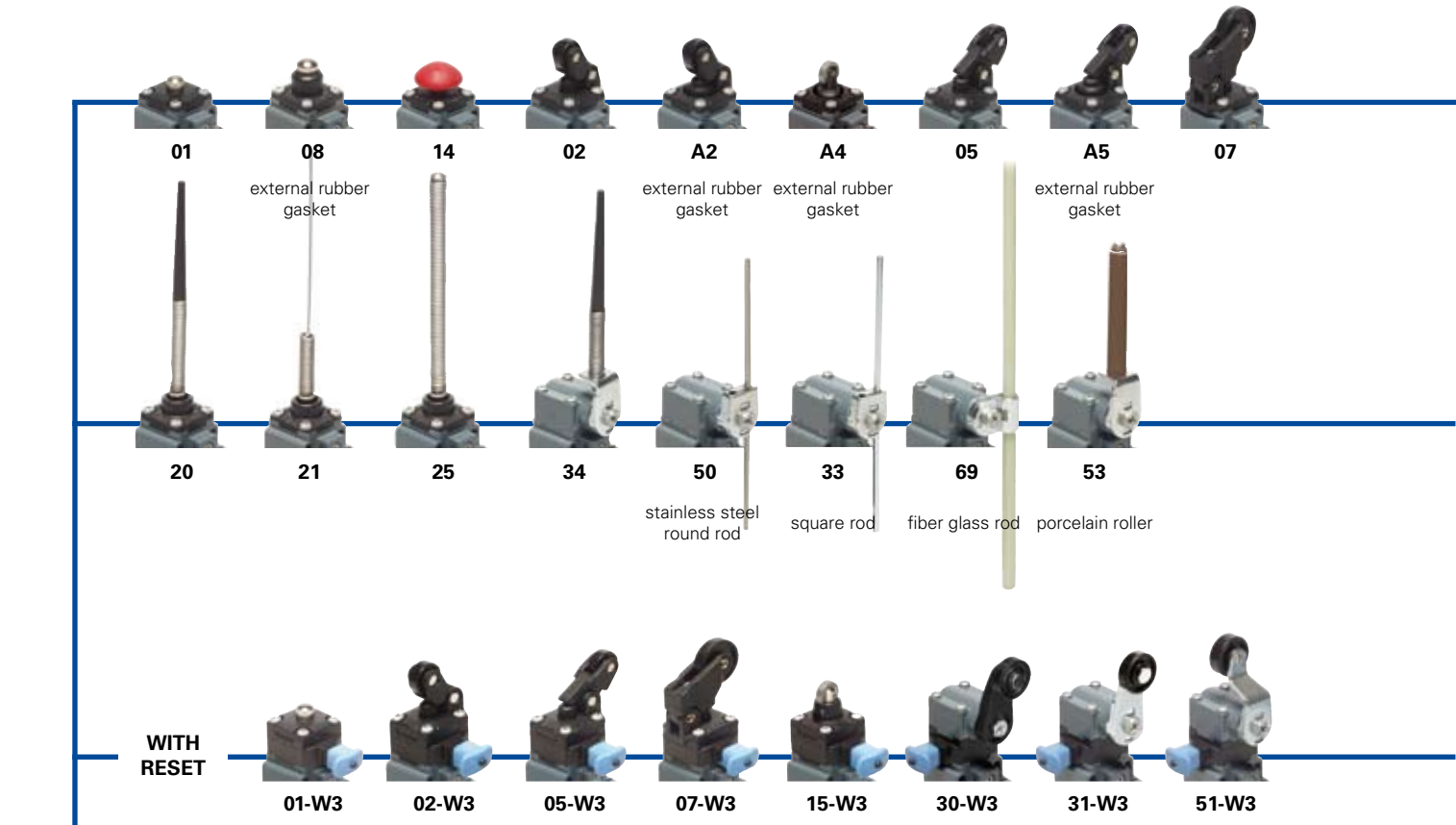
Ø 50 mm overhanging rubber rollers



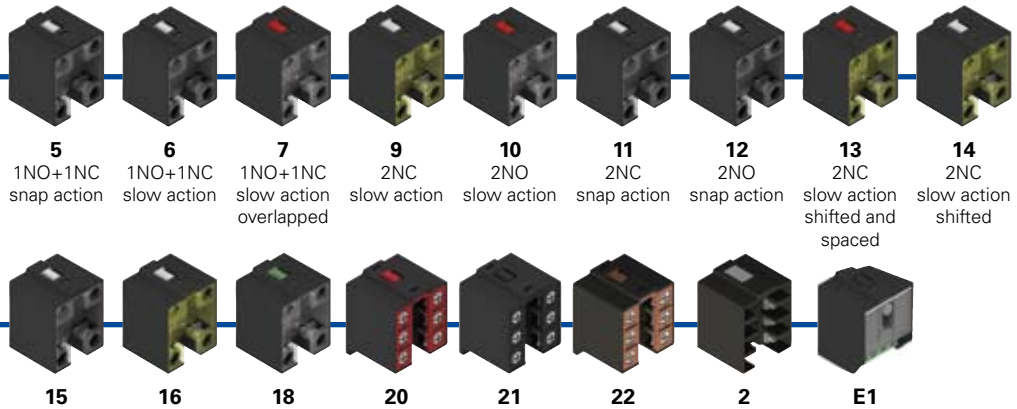
VF LE55-4 (1) | VF LE56-4

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

Selection diagram



CONTACT BLOCKS



5 1NO+1NC snap action	**6** 1NO+1NC slow action	**7** 1NO+1NC slow action overlapped	**9** 2NC slow action	**10** 2NO slow action	**11** 2NC snap action	**12** 2NO snap action	**13** 2NC slow action shifted and spaced	**14** 2NC slow action shifted
15 2NO slow action shifted	**16** 2NC slow action independent	**18** 1NO+1NC slow action closer	**20** 1NO+2NC slow action	**21** 3NC slow action	**22** 2NO+1NC slow action	**2** 2x(1NO-1NC) snap action	**E1** 1NO-1NC electronic PNP	

CONDUIT ENTRY

Threaded conduit entry

	PG 13,5 (standard)
M2	M20x1,5

With assembled cable gland

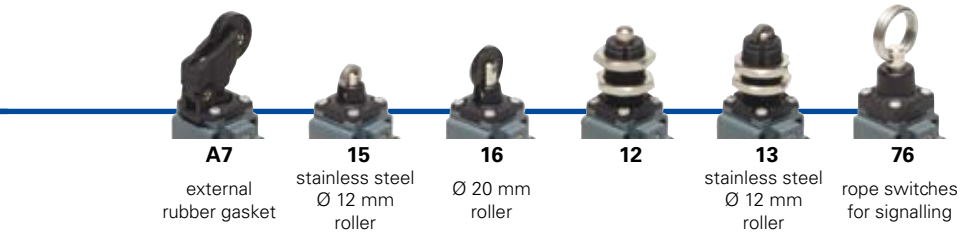
K21	for Ø 6 to Ø 12 mm cables range
K25	for Ø 3 to Ø 7 mm cables range

With M12 metal connector assembled and wired

K40	8 poles from bottom
K50	5 poles from bottom

product option

accessory sold separately



A7 external rubber gasket

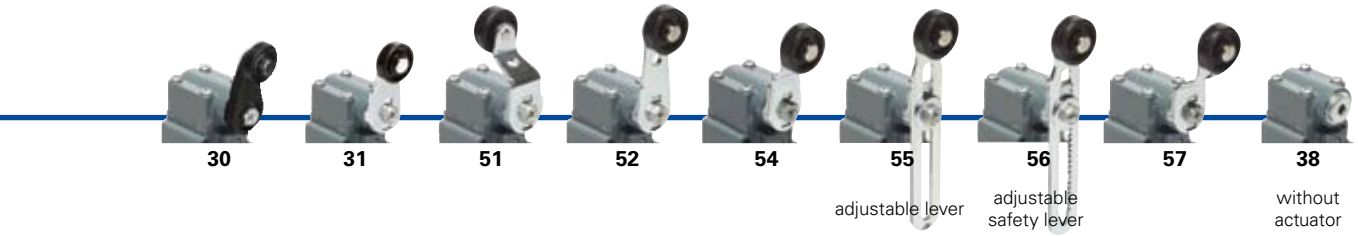
15 stainless steel Ø 12 mm roller

16 Ø 20 mm roller

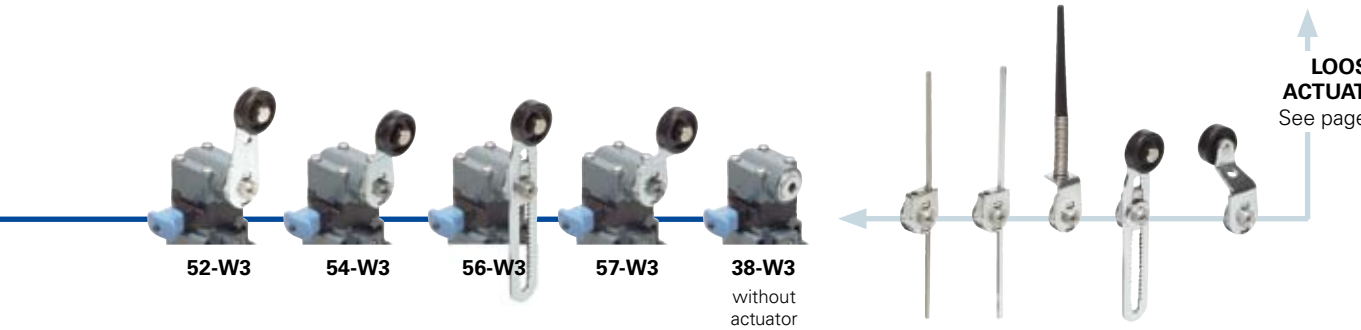
12

13 stainless steel Ø 12 mm roller

76 rope switches for signalling



30 **31** **51** **52** **54** **55** adjustable lever **56** adjustable safety lever **57** **38** without actuator



52-W3 **54-W3** **56-W3** **57-W3** **38-W3** without actuator

LOOSE ACTUATORS
See page 2/63

Code structure

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

article: **FM 502** options: **-1W3GM2K50**

Housing

FM	metal housing, one conduit entry

Contact blocks

5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action overlapped
...	.....

Actuators

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

Suffix

	no suffix (standard)
1	with stainless steel roller: - Ø 14 mm for actuators A2, 02, A5, 05 - Ø 20 mm for actuators 30, 31, 51, 52, 54, 55, 56, 57
2	with Ø 35 mm polymer roller (see special loose actuators on page 2/64)
3	with Ø 50 mm rubber roller (see special loose actuators on page 2/64)
4	with Ø 50 mm overhanging rubber roller (see special loose actuators on page 2/64)

Reset hooking

	without reset (standard)
W3	simultaneous reset
W4	simultaneous reset with increased force

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm (contact block 2 excluded)

Threaded conduit entry

	PG 13,5 (standard)
M2	M20x1,5

Preinstalled cable gland or connectors

	no cable gland or connector (standard)
K21	assembled cable gland (see conduit entry page 2/53)
...	.....
K50	5 poles M12 assembled metal connector (see conduit entry page 2/53)
...	.....

For the complete list of all combinations, please contact our technical office.

Position switches **FM** series

Main data

- Metal housing, one conduit entry
- Protection degree IP67
- 17 contact blocks available
- 43 actuators available
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:

Approval IMQ:	EG609
Approval UL:	E131787
Approval CCC:	2007010305229998
Approval EZU:	1010151
Approval GOST:	POCC IT.AB24.B04512

Technical data

Housing

Metal housing, coated with baked epoxy powder
One threaded conduit entry

Protection degree:	IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

Ambient temperature:	from -25°C to +80°C

Version for operation in ambient temperature from -40°C to +80° C on request

Max actuation frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	20 million operations cycles[1]
Assembling position:	any
Driving torque for installation:	see pages 7/1-7/12

(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, 21, 22, 33, 34:	min.	1 x 0,34 mm²	(1 x AWG 22)
	max.	2 x 1,5 mm²	(2 x AWG 16)
Contact blocks 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 2,5 mm²	(2 x AWG 14)
Contact block 2:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 1,5 mm²	(2 x AWG 16)

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, IEC 60529, EN 60529, 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 Electromagnetic Compatibility 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, 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 EN 60947-5-1, encl. K, par. 2**. The switch must be actuated with **at least up to the positive opening travel** shown in the travels diagrams on page 7/6. 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.

⚠ If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 7/1 to page 7/12.

Electrical data

Utilization categories

without connector

Thermal current (Ith):	10 A
Rated insulation voltage (Ui):	500 Vac 600 Vdc
Rated impulse withstand voltage (U_{imp}):	400Vac500Vdc (contact blocks 2, 11, 12, 20, 21, 22, 33, 34) 6 kV 4 kV (contact blocks 20, 21, 22, 33, 34)
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

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

with 5 poles M12 connector

Thermal current (Ith):	4 A
Rated insulation voltage (Ui):	250 Vac 300 Vdc
Protection against short circuits:	fuse 4 A 500 V type gG
Pollution degree:	3

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

Ue (V)	24	120	250
Ie (A)	4	4	4

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	4	1,1	0,4

with 8 poles M12 connector

Thermal current (Ith):	2 A
Rated insulation voltage (Ui):	30 Vac 36 Vdc
Protection against short circuits:	fuse 2 A 500 V type gG
Pollution degree:	3

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

Ue (V)	24
Ie (A)	2

Direct current: DC13

Ue (V)	24
Ie (A)	2

Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 2, 11, 12, 20, 21, 22, 33, 34)
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (U_{imp}): 6 kV
4 kV (for contact blocks 20, 21, 22, 33, 34)
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: Za, Zb, Za+Za, Y+Y, X+X, Y+Y+X, Y+Y+Y, Y+X+X
Positive opening of contacts on contact block 5, 6, 7, 9, 11, 13, 14, 16, 18, 20, 21, 22, 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2006/95/CE.

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

Data type approved by UL

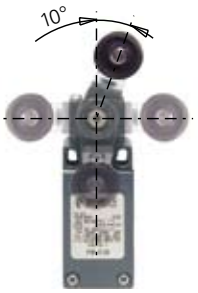
Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks except 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb in (0.8 Nm).
For contact blocks 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 14 AWG. Terminal tightening torque of 12 lb in (1.4 Nm).

In conformity with standard: UL 508

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

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

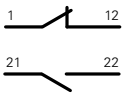
In all switches, it is possible to rotate the head in 90° steps.

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.

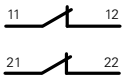
Lever turned to left

Contacts diagram



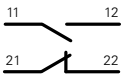
Lever not turned

Contacts diagram



Lever turned to right

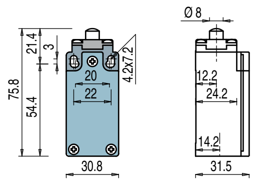
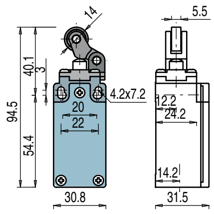
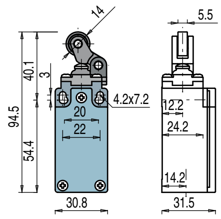
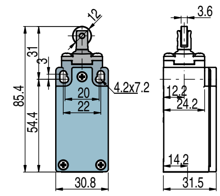
Contacts diagram



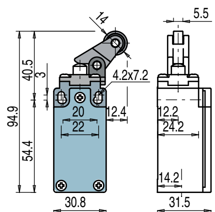
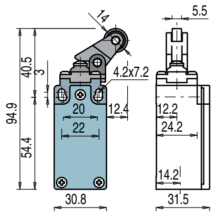
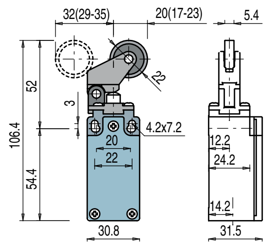
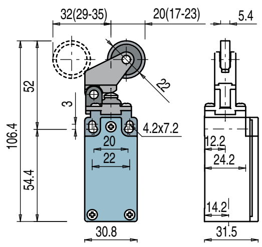
Position switches **FM** series

Contacts type:

- **R** = snap action
- **L** = slow action
- **LO** = slow action overlapped
- **LS** = slow action shifted
- **LV** = slow action shifted and spaced
- **LI** = slow action independent
- **LA** = slow action closer
- (electronic symbol) = electronic PNP

			With stainless steel roller on request	With external rubber gasket With stainless steel roller on request	With external rubber gasket Ø 12 mm stainless steel roller
					

Contact blocks	Type								
5	R	FM 501	→ 1NO+1NC	FM 502	→ 1NO+1NC	FM 5A2	→ 1NO+1NC	FM 5A4	→ 1NO+1NC
6	L	FM 601	→ 1NO+1NC	FM 602	→ 1NO+1NC	FM 6A2	→ 1NO+1NC	FM 6A4	→ 1NO+1NC
7	LO	FM 701	→ 1NO+1NC	FM 702	→ 1NO+1NC	FM 7A2	→ 1NO+1NC	FM 7A4	→ 1NO+1NC
9	L	FM 901	→ 2NC	FM 902	→ 2NC	FM 9A2	→ 2NC	FM 9A4	→ 2NC
10	L	FM 1001	2NO	FM 1002	2NO	FM 10A2	2NO	FM 10A4	2NO
11	R	FM 1101	→ 2NC	FM 1102	→ 2NC	FM 11A2	→ 2NC	FM 11A4	→ 2NC
12	R	FM 1201	2NO	FM 1202	2NO	FM 12A2	2NO	FM 12A4	2NO
13	LV	FM 1301	→ 2NC	FM 1302	→ 2NC	FM 13A2	→ 2NC	FM 13A4	→ 2NC
14	LS	FM 1401	→ 2NC	FM 1402	→ 2NC	FM 14A2	→ 2NC	FM 14A4	→ 2NC
15	LS	FM 1501	2NO	FM 1502	2NO	FM 15A2	2NO	FM 15A4	2NO
18	LA	FM 1801	→ 1NO+1NC	FM 1802	→ 1NO+1NC	FM 18A2	→ 1NO+1NC	FM 18A4	→ 1NO+1NC
20	L	FM 2001	→ 1NO+2NC	FM 2002	→ 1NO+2NC	FM 20A2	→ 1NO+2NC	FM 20A4	→ 1NO+2NC
21	L	FM 2101	→ 3NC	FM 2102	→ 3NC	FM 21A2	→ 3NC	FM 21A4	→ 3NC
22	L	FM 2201	→ 2NO+1NC	FM 2202	→ 2NO+1NC	FM 22A2	→ 2NO+1NC	FM 22A4	→ 2NO+1NC
2	R	FM 201	2x(1NO-1NC)	FM 202	2x(1NO-1NC)	FM 2A2	2x(1NO-1NC)	FM 2A4	2x(1NO-1NC)
E1	(electronic)	FM E101	1NO-1NC	FM E102	1NO-1NC	FM E1A2	1NO-1NC	FM E1A4	1NO-1NC
Max speed		page 7/5 - type 4		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 5	
Min. force		8 N (25 N →)		6 N (25 N →)		4,3 N (25 N →)		4,3 N (25 N →)	
Travel diagrams		page 7/6 - group 1		page 7/6 - group 2		page 7/6 - group 2		page 7/6 - group 1	

		With stainless steel roller on request	With external rubber gasket With stainless steel roller on request		With external rubber gasket
					

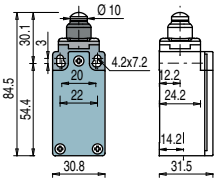
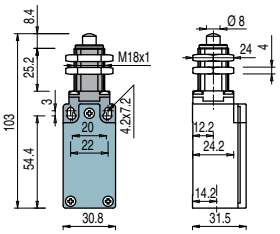
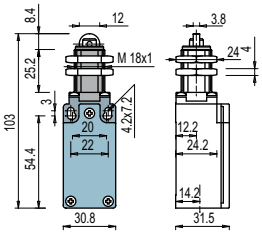
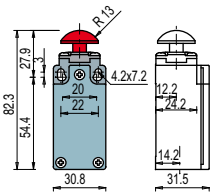
Contact blocks	Type								
5	R	FM 505	→ 1NO+1NC	FM 5A5	→ 1NO+1NC	FM 507	→ 1NO+1NC	FM 5A7	→ 1NO+1NC
6	L	FM 605	→ 1NO+1NC	FM 6A5	→ 1NO+1NC	FM 607	→ 1NO+1NC	FM 6A7	→ 1NO+1NC
7	LO	FM 705	→ 1NO+1NC	FM 7A5	→ 1NO+1NC	FM 707	→ 1NO+1NC	FM 7A7	→ 1NO+1NC
9	L	FM 905	→ 2NC	FM 9A5	→ 2NC	FM 907	→ 2NC	FM 9A7	→ 2NC
10	L	FM 1005	2NO	FM 10A5	2NO	FM 1007	2NO	FM 10A7	2NO
11	R	FM 1105	→ 2NC	FM 11A5	→ 2NC	FM 1107	→ 2NC	FM 11A7	→ 2NC
12	R	FM 1205	2NO	FM 12A5	2NO	FM 1207	2NO	FM 12A7	2NO
13	LV	FM 1305	→ 2NC	FM 13A5	→ 2NC	FM 1307	→ 2NC	FM 13A7	→ 2NC
14	LS	FM 1405	→ 2NC	FM 14A5	→ 2NC	FM 1407	→ 2NC	FM 14A7	→ 2NC
15	LS	FM 1505	2NO	FM 15A5	2NO	FM 1507	2NO	FM 15A7	2NO
18	LA	FM 1805	→ 1NO+1NC	FM 18A5	→ 1NO+1NC	FM 1807	→ 1NO+1NC	FM 18A7	→ 1NO+1NC
20	L	FM 2005	→ 1NO+2NC	FM 20A5	→ 1NO+2NC	FM 2007	→ 1NO+2NC	FM 20A7	→ 1NO+2NC
21	L	FM 2105	→ 3NC	FM 21A5	→ 3NC	FM 2107	→ 3NC	FM 21A7	→ 3NC
22	L	FM 2205	→ 2NO+1NC	FM 22A5	→ 2NO+1NC	FM 2207	→ 2NO+1NC	FM 22A7	→ 2NO+1NC
2	R	FM 205	2x(1NO-1NC)	FM 2A5	2x(1NO-1NC)	FM 207	2x(1NO-1NC)	FM 2A7	2x(1NO-1NC)
E1	(electronic)	FM E105	1NO-1NC	FM E1A5	1NO-1NC	FM E107	1NO-1NC	FM E1A7	1NO-1NC
Max speed		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 3	
Min. force		6 N (25 N →)		4,3 N (25 N →)		4 N (25 N →)		3 N (25 N →)	
Travel diagrams		page 7/6 - group 2		page 7/6 - group 2		page 7/6 - group 3		page 7/6 - group 3	

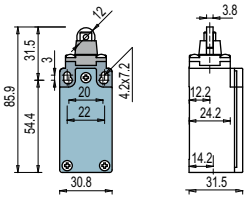
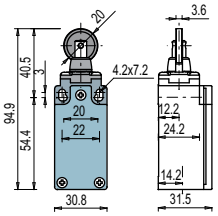
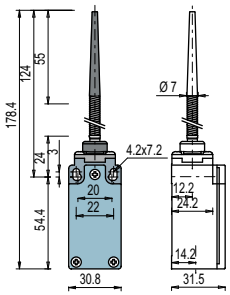
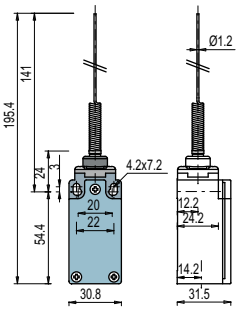
Accessories See page 6/1

All measures in the drawings are in mm

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted
LV = slow action shifted and spaced
LI = slow action independent
LA = slow action closer
= electronic PNP

Contact blocks		With external rubber gasket			
					
5	R	FM 508 1NO+1NC	FM 512 1NO+1NC	FM 513 1NO+1NC	FM 514 1NO+1NC
6	L	FM 608 1NO+1NC	FM 612 1NO+1NC	FM 613 1NO+1NC	FM 614 1NO+1NC
7	LO	FM 708 1NO+1NC	FM 712 1NO+1NC	FM 713 1NO+1NC	FM 714 1NO+1NC
9	L	FM 908 2NC	FM 912 2NC	FM 913 2NC	FM 914 2NC
10	L	FM 1008 2NO	FM 1012 2NO	FM 1013 2NO	FM 1014 2NO
11	R	FM 1108 2NC	FM 1112 2NC	FM 1113 2NC	FM 1114 2NC
12	R	FM 1208 2NO	FM 1212 2NO	FM 1213 2NO	FM 1214 2NO
13	LV	FM 1308 2NC	FM 1312 2NC	FM 1313 2NC	FM 1314 2NC
14	LS	FM 1408 2NC	FM 1412 2NC	FM 1413 2NC	FM 1414 2NC
15	LS	FM 1508 2NO	FM 1512 2NO	FM 1513 2NO	FM 1514 2NO
18	LA	FM 1808 1NO+1NC	FM 1812 1NO+1NC	FM 1813 1NO+1NC	FM 1814 1NO+1NC
20	L	FM 2008 1NO+2NC	FM 2012 1NO+2NC	FM 2013 1NO+2NC	FM 2014 1NO+2NC
21	L	FM 2108 3NC	FM 2112 3NC	FM 2113 3NC	FM 2114 3NC
22	L	FM 2208 2NO+1NC	FM 2212 2NO+1NC	FM 2213 2NO+1NC	FM 2214 2NO+1NC
2	R	FM 208 2x(1NO-1NC)	FM 212 2x(1NO-1NC)	FM 213 2x(1NO-1NC)	FM 214 2x(1NO-1NC)
E1		FM E108 1NO-1NC	FM E112 1NO-1NC	FM E113 1NO-1NC	FM E114 1NO-1NC
Max speed		page 7/5 - type 4	page 7/5 - type 4	page 7/5 - type 2	page 7/5 - type 4
Min. force		8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1

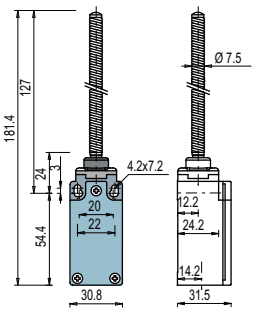
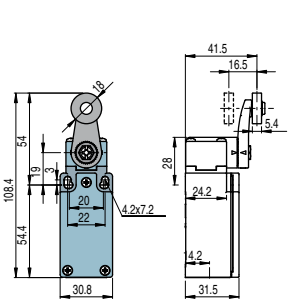
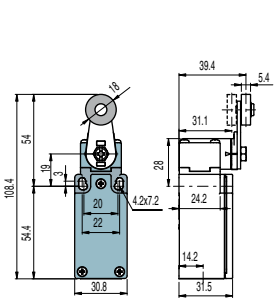
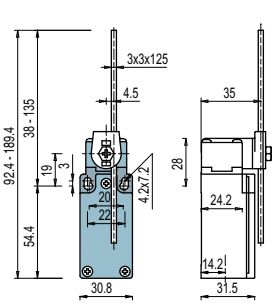
Contact blocks		Ø 12 mm stainless steel roller		With external rubber gasket	With external rubber gasket
					
5	R	FM 515 1NO+1NC	FM 516 1NO+1NC	FM 520 1NO+1NC	FM 521 1NO+1NC
6	L	FM 615 1NO+1NC	FM 616 1NO+1NC		
7	LO	FM 715 1NO+1NC	FM 716 1NO+1NC		
9	L	FM 915 2NC	FM 916 2NC		
10	L	FM 1015 2NO	FM 1016 2NO	FM 1020 2NO	FM 1021 2NO
11	R	FM 1115 2NC	FM 1116 2NC		
12	R	FM 1215 2NO	FM 1216 2NO	FM 1220 2NO	FM 1221 2NO
13	LV	FM 1315 2NC	FM 1316 2NC		
14	LS	FM 1415 2NC	FM 1416 2NC		
15	LS	FM 1515 2NO	FM 1516 2NO		
18	LA	FM 1815 1NO+1NC	FM 1816 1NO+1NC	FM 1820 1NO+1NC	FM 1821 1NO+1NC
20	L	FM 2015 1NO+2NC	FM 2016 1NO+2NC	FM 2020 1NO+2NC	FM 2021 1NO+2NC
21	L	FM 2115 3NC	FM 2116 3NC	FM 2120 3NC	FM 2121 3NC
22	L	FM 2215 2NO+1NC	FM 2216 2NO+1NC	FM 2220 2NO+1NC	FM 2221 2NO+1NC
2	R	FM 215 2x(1NO-1NC)	FM 216 2x(1NO-1NC)	FM 220 2x(1NO-1NC)	FM 221 2x(1NO-1NC)
E1		FM E115 1NO-1NC	FM E116 1NO-1NC	FM E120 1NO-1NC	FM E121 1NO-1NC
Max speed		page 7/5 - type 2	page 7/5 - type 2	1 m/s	1 m/s
Min. force		8 N (25 N ⊖)	8 N (25 N ⊖)	0,07 Nm	0,07 Nm
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 4	page 7/6 - group 4

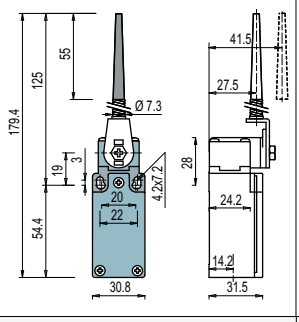
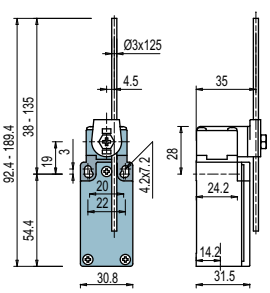
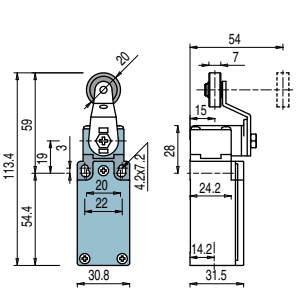
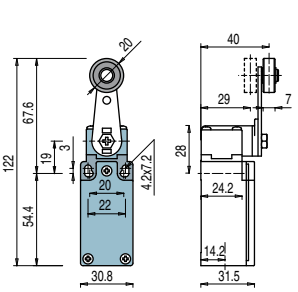
Items with code on the **green** background are available in stock

Position switches **FM** series

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

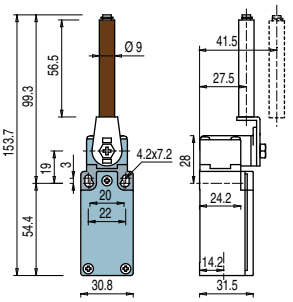
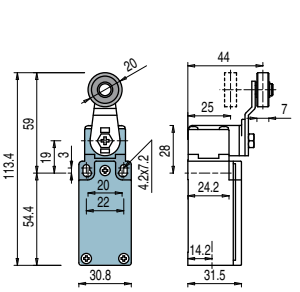
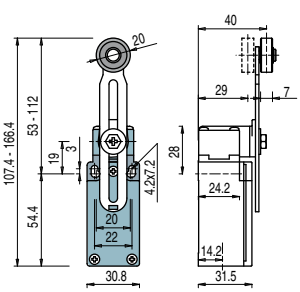
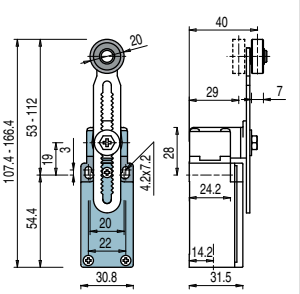
Contact blocks		With external rubber gasket		With Ø 20 mm stainless steel roller on request		Other rollers available. See page 2/64		3x3 mm square rod	
									
5	R	FM 525	1NO+1NC	FM 530	1NO+1NC	FM 531	1NO+1NC	FM 533	1NO+1NC
6	L			FM 630	1NO+1NC	FM 631	1NO+1NC	FM 633	1NO+1NC
7	LO			FM 730	1NO+1NC	FM 731	1NO+1NC	FM 733	1NO+1NC
9	L			FM 930	2NC	FM 931	2NC	FM 933	2NC
10	L	FM 1025	2NO	FM 1030	2NO	FM 1031	2NO	FM 1033	2NO
11	R			FM 1130	2NC	FM 1131	2NC	FM 1133	2NC
12	R	FM 1225	2NO	FM 1230	2NO	FM 1231	2NO	FM 1233	2NO
13	LV			FM 1330	2NC	FM 1331	2NC	FM 1333	2NC
14	LS			FM 1430	2NC	FM 1431	2NC	FM 1433	2NC
15	LS			FM 1530	2NO	FM 1531	2NO	FM 1533	2NO
16	LI			FM 1630	2NC	FM 1631	2NC	FM 1633	2NC
18	LA	FM 1825	1NO+1NC	FM 1830	1NO+1NC	FM 1831	1NO+1NC	FM 1833	1NO+1NC
20	L	FM 2025	1NO+2NC	FM 2030	1NO+2NC	FM 2031	1NO+2NC	FM 2033	1NO+2NC
21	L	FM 2125	3NC	FM 2130	3NC	FM 2131	3NC	FM 2133	3NC
22	L	FM 2225	2NO+1NC	FM 2230	2NO+1NC	FM 2231	2NO+1NC	FM 2233	2NO+1NC
2	R	FM 225	2x(1NO-1NC)	FM 230	2x(1NO-1NC)	FM 231	2x(1NO-1NC)	FM 233	2x(1NO-1NC)
E1		FM E125	1NO-1NC	FM E130	1NO-1NC	FM E131	1NO-1NC	FM E133	1NO-1NC
Max speed		1 m/s		page 7/5 - type 1		page 7/5 - type 1		1,5 m/s	
Min. force		0,12 Nm		0,06 Nm (0,25 Nm)		0,06 Nm (0,25 Nm)		0,06 Nm	
Travel diagrams		page 7/6 - group 4		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5	

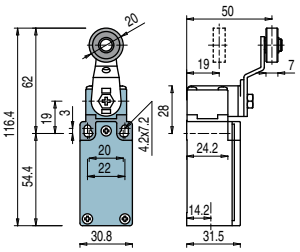
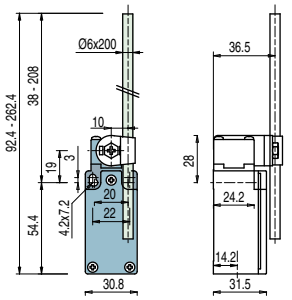
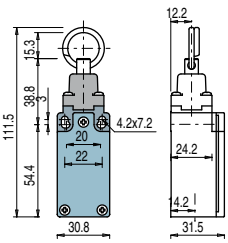
Contact blocks				Ø 3 mm stainless steel round rod		Other rollers available. See page 2/64		Other rollers available. See page 2/64	
									
5	R	FM 534	1NO+1NC	FM 550	1NO+1NC	FM 551	1NO+1NC	FM 552	1NO+1NC
6	L	FM 634	1NO+1NC	FM 650	1NO+1NC	FM 651	1NO+1NC	FM 652	1NO+1NC
7	LO	FM 734	1NO+1NC	FM 750	1NO+1NC	FM 751	1NO+1NC	FM 752	1NO+1NC
9	L	FM 934	2NC	FM 950	2NC	FM 951	2NC	FM 952	2NC
10	L	FM 1034	2NO	FM 1050	2NO	FM 1051	2NO	FM 1052	2NO
11	R	FM 1134	2NC	FM 1150	2NC	FM 1151	2NC	FM 1152	2NC
12	R	FM 1234	2NO	FM 1250	2NO	FM 1251	2NO	FM 1252	2NO
13	LV	FM 1334	2NC	FM 1350	2NC	FM 1351	2NC	FM 1352	2NC
14	LS	FM 1434	2NC	FM 1450	2NC	FM 1451	2NC	FM 1452	2NC
15	LS	FM 1534	2NO	FM 1550	2NO	FM 1551	2NO	FM 1552	2NO
16	LI	FM 1634	2NC	FM 1650	2NC	FM 1651	2NC	FM 1652	2NC
18	LA	FM 1834	1NO+1NC	FM 1850	1NO+1NC	FM 1851	1NO+1NC	FM 1852	1NO+1NC
20	L	FM 2034	1NO+2NC	FM 2050	1NO+2NC	FM 2051	1NO+2NC	FM 2052	1NO+2NC
21	L	FM 2134	3NC	FM 2150	3NC	FM 2151	3NC	FM 2152	3NC
22	L	FM 2234	2NO+1NC	FM 2250	2NO+1NC	FM 2251	2NO+1NC	FM 2252	2NO+1NC
2	R	FM 234	2x(1NO-1NC)	FM 250	2x(1NO-1NC)	FM 251	2x(1NO-1NC)	FM 252	2x(1NO-1NC)
E1		FM E134	1NO-1NC	FM E150	1NO-1NC	FM E151	1NO-1NC	FM E152	1NO-1NC
Max speed		1,5 m/s		1,5 m/s		page 7/5 - type 1		page 7/5 - type 1	
Min. force		0,06 Nm		0,06 Nm		0,06 Nm (0,25 Nm)		0,06 Nm (0,25 Nm)	
Travel diagrams		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5	

Accessories See page 6/1

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted
LV = slow action shifted and spaced
LI = slow action independent
LA = slow action closer
= electronic PNP

Contact blocks		Porcelain roller	Other rollers available. See page 2/64	Other rollers available. See page 2/64	Other rollers available. See page 2/64
					
5	R	FM 553-E0V9 1NO+1NC	FM 554 1NO+1NC	FM 555 (1) 1NO+1NC	FM 556 1NO+1NC
6	L	FM 653-E0V9 1NO+1NC	FM 654 1NO+1NC	FM 655 (1) 1NO+1NC	FM 656 1NO+1NC
7	LO	FM 753-E0V9 1NO+1NC	FM 754 1NO+1NC	FM 755 (1) 1NO+1NC	FM 756 1NO+1NC
9	L	FM 953-E0V9 2NC	FM 954 2NC	FM 955 (1) 2NC	FM 956 2NC
10	L	FM 1053-E0V9 2NO	FM 1054 2NO	FM 1055 2NO	FM 1056 2NO
11	R		FM 1154 2NC	FM 1155 (1) 2NC	FM 1156 2NC
12	R	FM 1253-E0V9 2NO	FM 1254 2NO	FM 1255 2NO	FM 1256 2NO
13	LV	FM 1353-E0V9 2NC	FM 1354 2NC	FM 1355 (1) 2NC	FM 1356 2NC
14	LS	FM 1453-E0V9 2NC	FM 1454 2NC	FM 1455 (1) 2NC	FM 1456 2NC
15	LS	FM 1553-E0V9 2NO	FM 1554 2NO	FM 1555 2NO	FM 1556 2NO
16	LI		FM 1654 2NC	FM 1655 (1) 2NC	FM 1656 2NC
18	LA	FM 1853-E0V9 1NO+1NC	FM 1854 1NO+1NC	FM 1855 (1) 1NO+1NC	FM 1856 1NO+1NC
20	L	FM 2053-E0V9 1NO+2NC	FM 2054 1NO+2NC	FM 2055 (1) 1NO+2NC	FM 2056 1NO+2NC
21	L	FM 2153-E0V9 3NC	FM 2154 3NC	FM 2155 (1) 3NC	FM 2156 3NC
22	L	FM 2253-E0V9 2NO+1NC	FM 2254 2NO+1NC	FM 2255 (1) 2NO+1NC	FM 2256 2NO+1NC
2	R	FM 253-E0 2x(1NO-1NC)	FM 254 2x(1NO-1NC)	FM 255 2x(1NO-1NC)	FM 256 2x(1NO-1NC)
E1		FM E153-E0V9 1NO-1NC	FM E154 1NO-1NC	FM E155 1NO-1NC	FM E156 1NO-1NC
Max speed		0,5 m/s	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,03 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 7/6 - group 6	page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5

Contact blocks		Other rollers available. See page 2/64	Fiber glass rod	Rope switches for signalling	
					
5	R	FM 557 1NO+1NC	FM 569 1NO+1NC	FM 576 1NO+1NC	
6	L	FM 657 1NO+1NC	FM 669 1NO+1NC	FM 676 1NO+1NC	
7	LO	FM 757 1NO+1NC	FM 769 1NO+1NC	FM 776 1NO+1NC	
9	L	FM 957 2NC	FM 969 2NC	FM 976 2NO	
10	L	FM 1057 2NO	FM 1069 2NO	FM 1076 2NC	
11	R	FM 1157 2NC	FM 1169 2NC	FM 1176 2NO	
12	R	FM 1257 2NO	FM 1269 2NO	FM 1276 2NC	
13	LV	FM 1357 2NC	FM 1369 2NC	FM 1376 2NO	
14	LS	FM 1457 2NC	FM 1469 2NC	FM 1476 2NO	
15	LS	FM 1557 2NO	FM 1569 2NO	FM 1576 2NC	
16	LI	FM 1657 2NC	FM 1669 2NC		
18	LA	FM 1857 1NO+1NC	FM 1869 1NO+1NC	FM 1876 1NO+1NC	
20	L	FM 2057 1NO+2NC	FM 2069 1NO+2NC	FM 2076 2NO+1NC	
21	L	FM 2157 3NC	FM 2169 3NC	FM 2176 3NO	
22	L	FM 2257 2NO+1NC	FM 2269 2NO+1NC	FM 2276 1NO+2NC	
2	R	FM 257 2x(1NO-1NC)	FM 269 2x(1NO-1NC)	FM 276 2x(1NO-1NC)	
E1		FM E157 1NO-1NC	FM E169 1NO-1NC		
Max speed		page 7/5 - type 1	1,5 m/s	0,5 m/s	
Min. force		0,06 Nm (0,25 Nm)	0,06 Nm	initial 20 N - final 40 N	
Travel diagrams		page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 7	

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

(1) Positive opening only with lever adjusted on the max. See page 2/63.

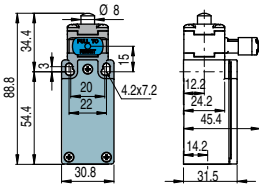
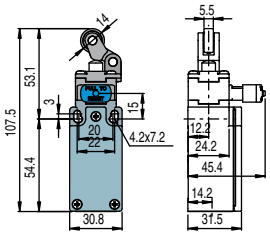
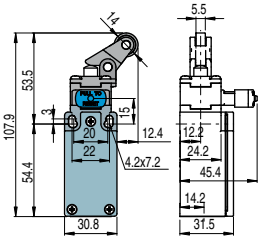
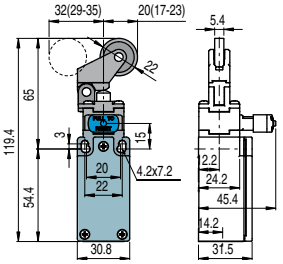
Position switches **FM** series with reset

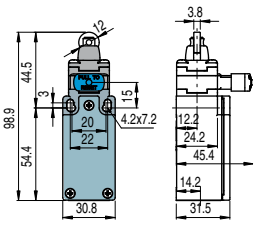
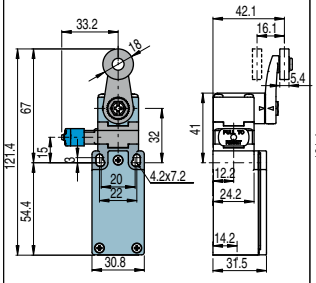
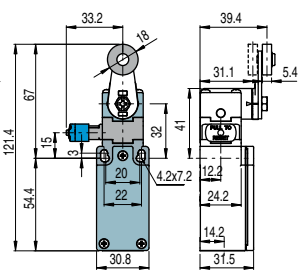
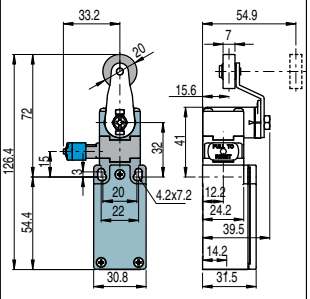
Pizzato Elettrica has developed a reset device code W3 to make perfectly simultaneous the actuator and the contact block tripping. The new device is a block inserted between the switch body and the head, and could be rotated independently from this last one. This new device has following advantages:

- The reset device integrate in almost all standard actuation head
- Contact blocks with snap action are no more necessary because the tripping movement is made by the reset device itself
- The reset device can be rotated independently from the head for the maximum flexibility during the assembling
- Two driving forces: standard and increased for applications with vibrations
- Mechanical endurance: 1 million operations cycles.

Contacts type:

R = snap action
L = slow action

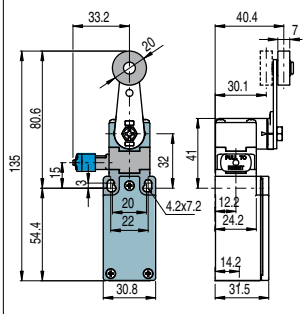
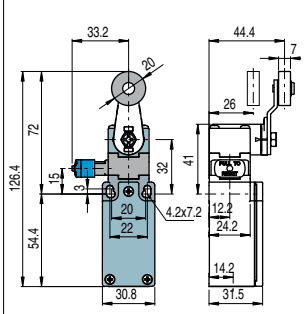
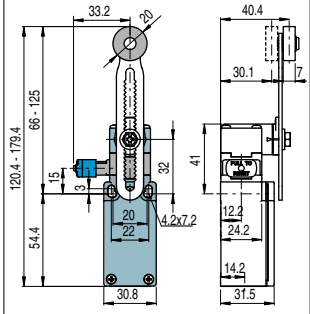
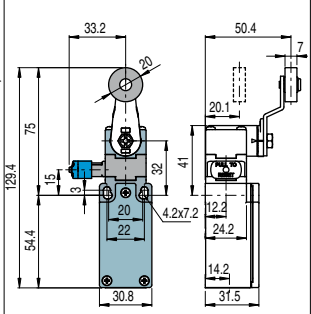
Contact blocks					
			With stainless steel roller on request 	With stainless steel roller on request 	
6	L	FM 601-W3 1NO+1NC	FM 602-W3 1NO+1NC	FM 605-W3 1NO+1NC	FM 607-W3 1NO+1NC
9	L	FM 901-W3 2NC	FM 902-W3 2NC	FM 905-W3 2NC	FM 907-W3 2NC
10	L	FM 1001-W3 2NO	FM 1002-W3 2NO	FM 1005-W3 2NO	FM 1007-W3 2NO
20	L	FM 2001-W3 1NO+2NC	FM 2002-W3 1NO+2NC	FM 2005-W3 1NO+2NC	FM 2007-W3 1NO+2NC
21	L	FM 2101-W3 3NC	FM 2102-W3 3NC	FM 2105-W3 3NC	FM 2107-W3 3NC
22	L	FM 2201-W3 2NO+1NC	FM 2202-W3 2NO+1NC	FM 2205-W3 2NO+1NC	FM 2207-W3 2NO+1NC
2	R	FM 201-W3 2NO+2NC	FM 202-W3 2NO+2NC	FM 205-W3 2NO+2NC	FM 207-W3 2NO+2NC
Max speed		page 7/5 - type 4	page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 3
Min. force		4,5 N (25 N ⊖)	4 N (25 N ⊖)	4 N (25 N ⊖)	2,5 N (25 N ⊖)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 2	page 7/7 - group 2	page 7/7 - group 3

Contact blocks			With Ø 20 mm stainless steel roller on request	Other rollers available. See page 2/64	Other rollers available. See page 2/64
					
6	L	FM 615-W3 1NO+1NC	FM 630-W3 1NO+1NC	FM 631-W3 1NO+1NC	FM 651-W3 1NO+1NC
9	L	FM 915-W3 2NC	FM 930-W3 2NC	FM 931-W3 2NC	FM 951-W3 2NC
10	L	FM 1015-W3 2NO	FM 1030-W3 2NO	FM 1031-W3 2NO	FM 1051-W3 2NO
20	L	FM 2015-W3 1NO+2NC	FM 2030-W3 1NO+2NC	FM 2031-W3 1NO+2NC	FM 2051-W3 1NO+2NC
21	L	FM 2115-W3 3NC	FM 2130-W3 3NC	FM 2131-W3 3NC	FM 2151-W3 3NC
22	L	FM 2215-W3 2NO+1NC	FM 2230-W3 2NO+1NC	FM 2231-W3 2NO+1NC	FM 2251-W3 2NO+1NC
2	R	FM 215-W3 2NO+2NC	FM 230-W3 2NO+2NC	FM 231-W3 2NO+2NC	FM 251-W3 2NO+2NC
Max speed		page 7/5 - type 2	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		4,5 N (25 N ⊖)	0,07 Nm (0,25 Nm ⊖)	0,07 Nm (0,25 Nm ⊖)	0,07 Nm (0,25 Nm ⊖)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

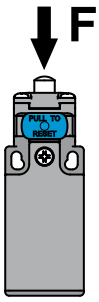
Accessories See page 6/1

Contacts type:

R = snap action
L = slow action

Contact blocks		Other rollers available. See page 2/64	Other rollers available. See page 2/64	Other rollers available. See page 2/64	Other rollers available. See page 2/64
					
6	L	FM 652-W3 → 1NO+1NC	FM 654-W3 → 1NO+1NC	FM 656-W3 → 1NO+1NC	FM 657-W3 → 1NO+1NC
9	L	FM 952-W3 → 2NC	FM 954-W3 → 2NC	FM 956-W3 → 2NC	FM 957-W3 → 2NC
10	L	FM 1052-W3 2NO	FM 1054-W3 2NO	FM 1056-W3 2NO	FM 1057-W3 2NO
20	L	FM 2052-W3 → 1NO+2NC	FM 2054-W3 → 1NO+2NC	FM 2056-W3 → 1NO+2NC	FM 2057-W3 → 1NO+2NC
21	L	FM 2152-W3 → 3NC	FM 2154-W3 → 3NC	FM 2156-W3 → 3NC	FM 2157-W3 → 3NC
22	L	FM 2252-W3 → 2NO+1NC	FM 2254-W3 → 2NO+1NC	FM 2256-W3 → 2NO+1NC	FM 2257-W3 → 2NO+1NC
2	R	FM 252-W3 2NO+2NC	FM 254-W3 2NO+2NC	FM 256-W3 2NO+2NC	FM 257-W3 2NO+2NC
Max speed		page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)
Travel diagrams		page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

Increased actuating force



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

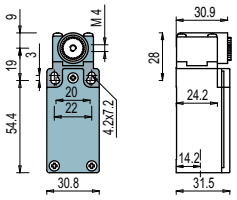
Actuator	Force
01, 14, 15, 16	7 N
02, 05	6 N
07	3,5 N
30 ... 57	0,08 Nm

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

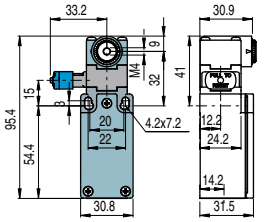
Position switches with revolving lever without actuator

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



With manual reset knob



Contact blocks				With manual reset knob	
5	R	FM 538	1NO+1NC		
6	L	FM 638	1NO+1NC	FM 638-W3	1NO+1NC
7	LO	FM 738	1NO+1NC		
9	L	FM 938	2NC	FM 938-W3	2NC
10	L	FM 1038	2NO	FM 1038-W3	2NO
11	R	FM 1138	2NC		
12	R	FM 1238	2NO		
13	LV	FM 1338	2NC		
14	LS	FM 1438	2NC		
15	LS	FM 1538	2NO		
16	LI	FM 1638	2NC		
18	LA	FM 1838	1NO+1NC		
20	L	FM 2038	1NO+2NC	FM 2038-W3	1NO+2NC
21	L	FM 2138	3NC	FM 2138-W3	3NC
22	L	FM 2238	2NO+1NC	FM 2238-W3	2NO+1NC
2	R	FM 238	2x(1NO-1NC)	FM 238-W3	2NO+2NC
E1		FM E138	1NO-1NC		
Min. force		0,06 Nm (0,25 Nm ⊖)		0,07 Nm (0,25 Nm ⊖)	
Travel diagrams		page 7/6 - group 5		page 7/7 - group 4	

IMPORTANT

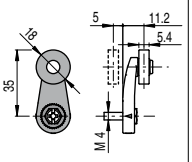
For safety applications: join only switches and actuators marked with symbol ⊖.

For more information about safety applications see page 7/1.

Loose actuators

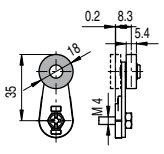
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Polymer roller Ø 18 mm



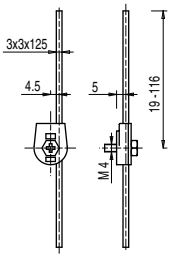
VF LE30 ⊖

Polymer roller Ø 18 mm



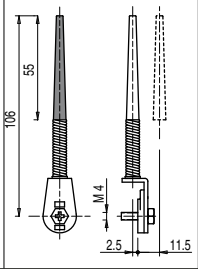
VF LE31 ⊖

Adjustable square rod 3x3x125 mm



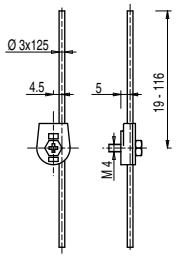
VF LE33

Flexible rod actuator



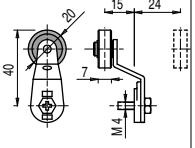
VF LE34

Adjustable round rod Ø 3x125 mm



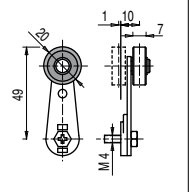
VF LE50

Polymer roller Ø 20 mm



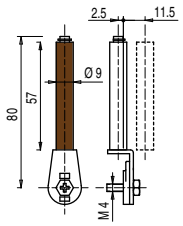
VF LE51 ⊖

Polymer roller Ø 20 mm



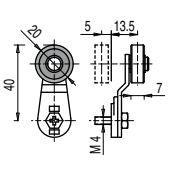
VF LE52 ⊖

Porcelain roller



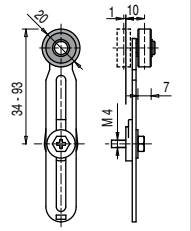
VF LE53 ⊖ (2)

Polymer roller Ø 20 mm



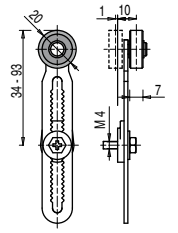
VF LE54 ⊖

Adjustable actuator with polymer roller



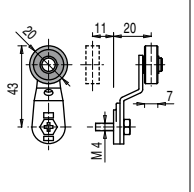
VF LE55 ⊖ (1)

Adjustable safety actuator with polymer roller



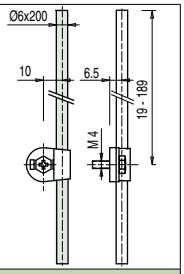
VF LE56 ⊖

Polymer roller Ø 20 mm



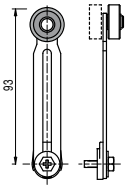
VF LE57 ⊖

Adjustable fiber glass rod



VF LE69

- 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.
- (2) The position switch obtained by assembling the switch FM •38 (e.g. FM 538, FM 638) with the actuator VF LE53 will not present the same travel diagrams and actuating forces as the position switch FM •53-E0V9 (e.g. FM 553-E0V9, FM 653-E0V9...).
- (4) The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

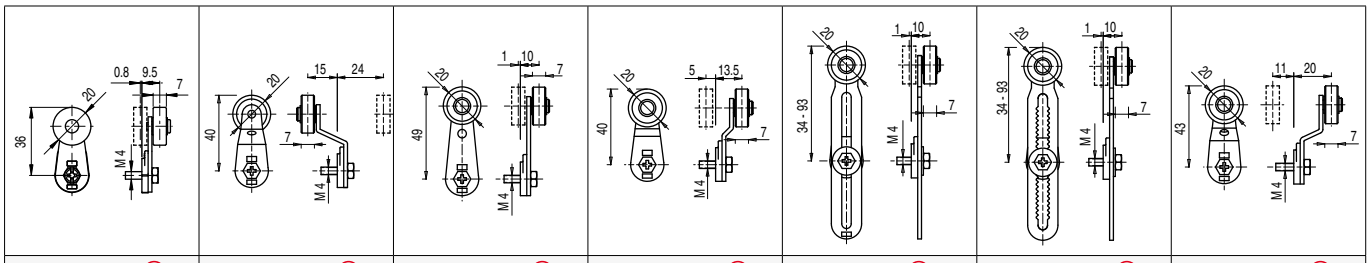


Accessories See page 6/1

Special loose actuators

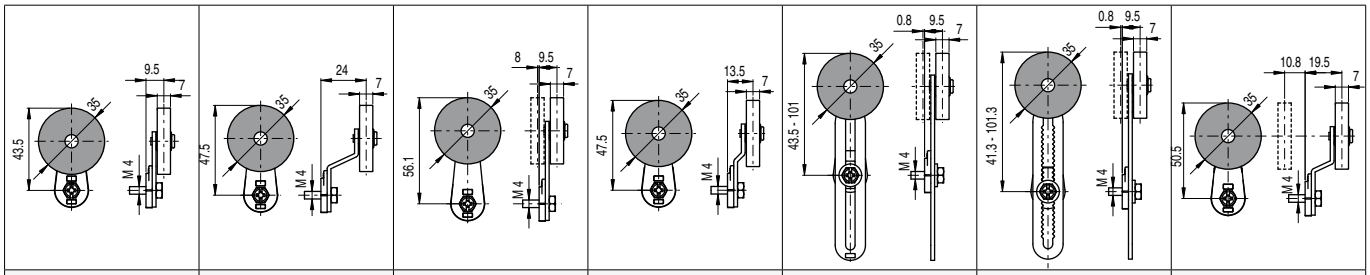
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Ø 20 mm stainless steel rollers



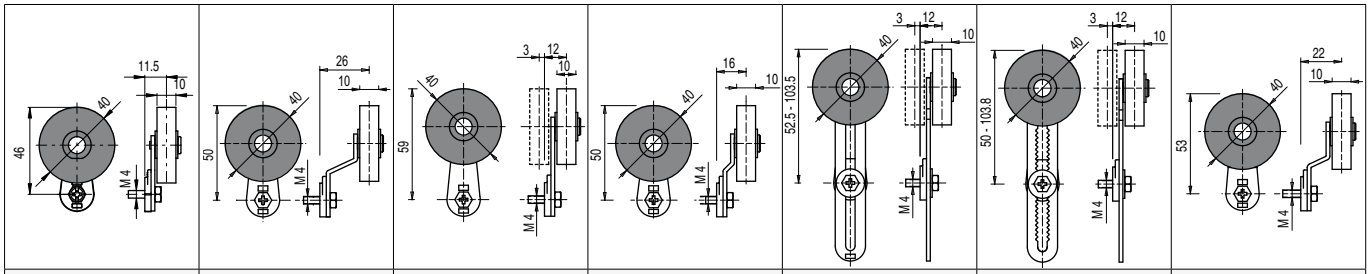
VF LE31-1 | VF LE51-1 | VF LE52-1 | VF LE54-1 | VF LE55-1 (1) | VF LE56-1 | VF LE57-1

Ø 35 mm polymer rollers



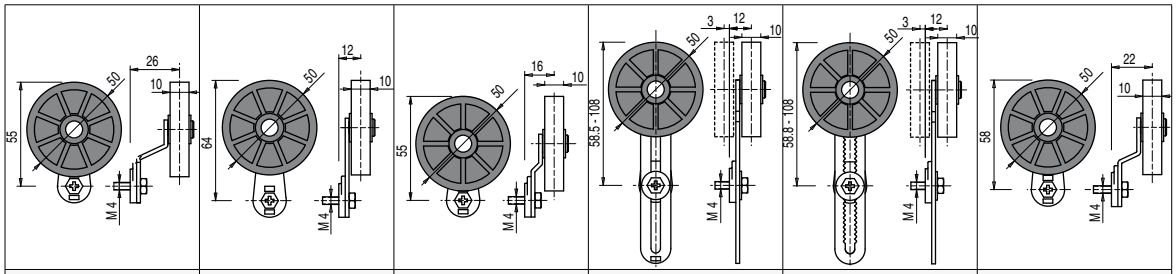
VF LE31-2 (4) | VF LE51-2 (4) | VF LE52-2 | VF LE54-2 (4) | VF LE55-2 (1) | VF LE56-2 | VF LE57-2

Ø 40 mm rubber rollers



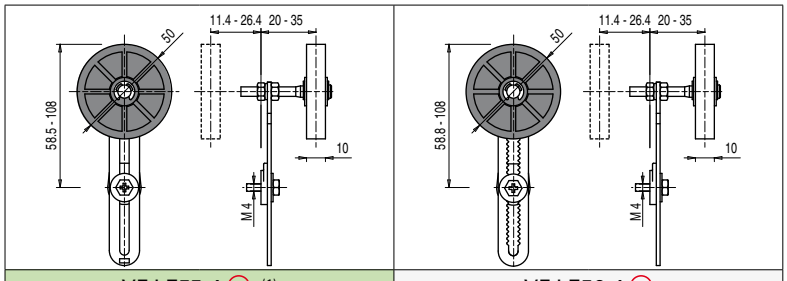
VF LE31-R5 (4) | VF LE51-R5 (4) | VF LE52-R5 | VF LE54-R5 (4) | VF LE55-R5 (1) | VF LE56-R5 | VF LE57-R5 (4)

Ø 50 mm rubber rollers



VF LE51-3 (4) | VF LE52-3 (4) | VF LE54-3 (4) | VF LE55-3 (1) | VF LE56-3 | VF LE57-3 (4)

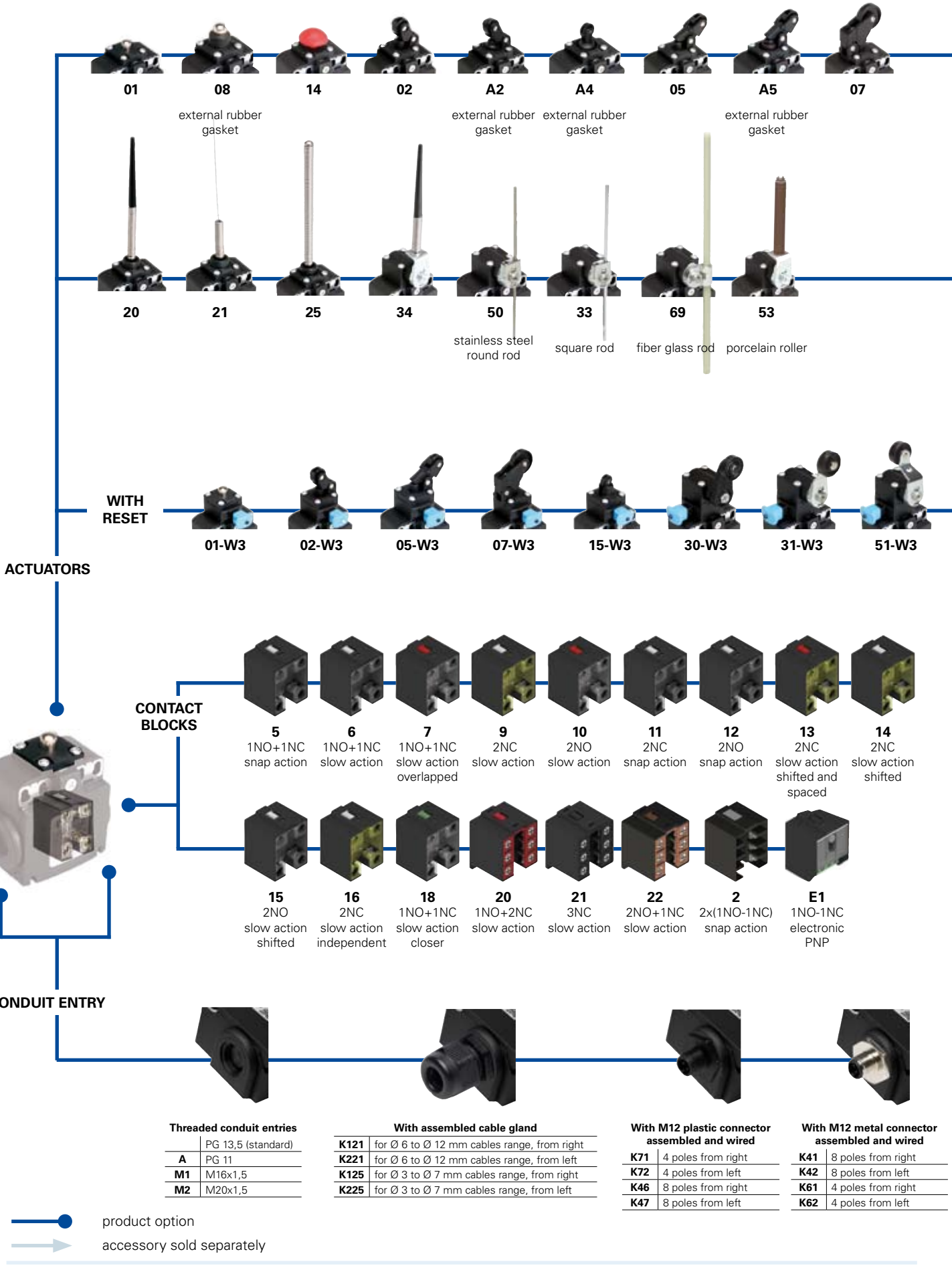
Ø 50 mm overhanging rubber rollers



VF LE55-4 (1) | VF LE56-4

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

Selection diagram



Threaded conduit entries	
	PG 13,5 (standard)
A	PG 11
M1	M16x1,5
M2	M20x1,5

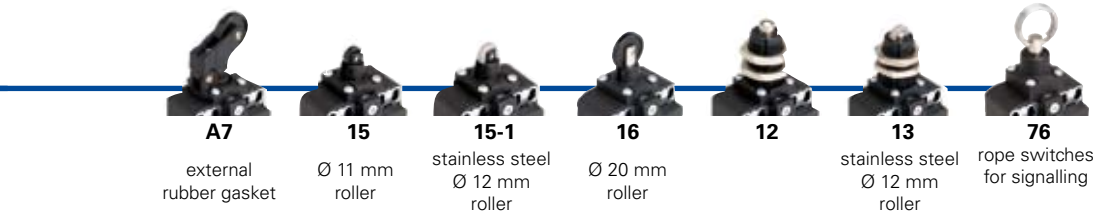
With assembled cable gland	
K121	for Ø 6 to Ø 12 mm cables range, from right
K221	for Ø 6 to Ø 12 mm cables range, from left
K125	for Ø 3 to Ø 7 mm cables range, from right
K225	for Ø 3 to Ø 7 mm cables range, from left

With M12 plastic connector assembled and wired	
K71	4 poles from right
K72	4 poles from left
K46	8 poles from right
K47	8 poles from left

With M12 metal connector assembled and wired	
K41	8 poles from right
K42	8 poles from left
K61	4 poles from right
K62	4 poles from left

product option

accessory sold separately



A7 external rubber gasket

15 Ø 11 mm roller

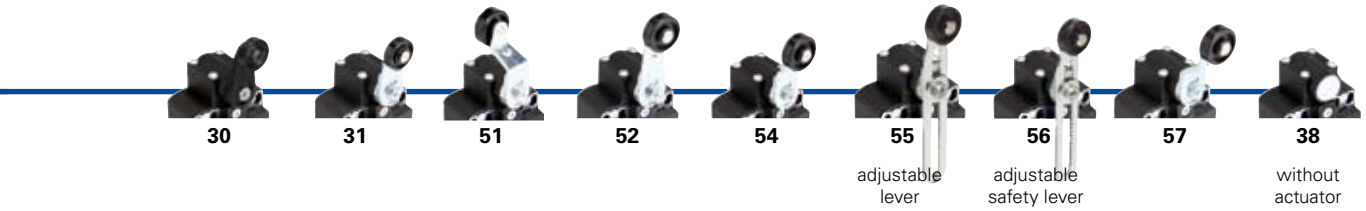
15-1 stainless steel Ø 12 mm roller

16 Ø 20 mm roller

12

13 stainless steel Ø 12 mm roller

76 rope switches for signalling

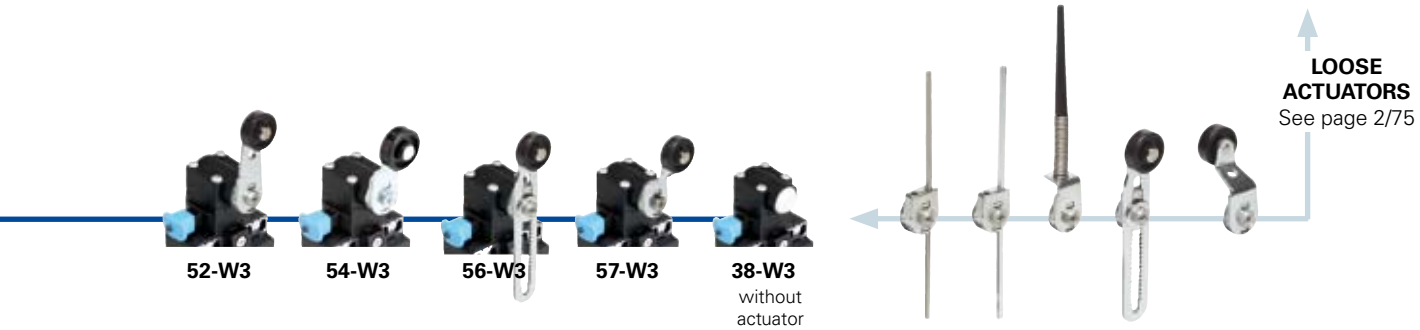


30 **31** **51** **52** **54**

55 adjustable lever

56 adjustable safety lever

57 **38** without actuator



52-W3 **54-W3** **56-W3** **57-W3**

38-W3 without actuator

LOOSE ACTUATORS
See page 2/75

Code structure

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

article: **FX 502** — options: **-1W3XGM2K71**

Housing

FX	polymer housing, two conduit entries

Contact blocks

5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action overlapped
...	.....

Actuators

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

Suffix

	no suffix (standard)
1	with stainless steel roller: - Ø 12 mm for actuator A4, 15 - Ø 14 mm for actuators A2, 02, A5, 05 - Ø 20 mm for actuators 30, 31, 51, 52, 54, 55, 56, 57
2	with Ø 35 mm polymer roller (see special loose actuators on page 2/76)
3	with Ø 50 mm rubber roller (see special loose actuators on page 2/76)
4	with Ø 50 mm overhanging rubber roller (see special loose actuators on page 2/76)

Reset hooking

	without reset (standard)
W3	simultaneous reset
W4	simultaneous reset with increased force

External metallic parts

	zinc plated steel (standard)
X	stainless steel

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm (contact block 2 excluded)

Threaded conduit entry

	PG 13,5 (standard)
A	PG 11
M1	M16x1,5
M2	M20x1,5

Preinstalled cable gland or connectors

	no cable gland or connector (standard)
K121	assembled cable gland from right (see conduit entry page 2/65)
...	.....
K71	assembled 4 poles M12 plastic connector from right (see conduit entry page 2/65)
...	.....

For the complete list of all combinations, please contact our technical office.

Main data

- Polymer housing, two conduit entries
- Protection degree IP67
- 17 contact blocks available
- 43 actuators available
- External stainless steel parts versions
- M12 assembled connector versions
- Silver contacts gold plated versions

Technical data

Housing

Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation ⧈
Two knock out threaded conduit entries

Protection degree:	IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

Ambient temperature:	from -25°C to +80°C

Version for operation in ambient temperature from -40°C to +80° C on request

Max actuation frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	20 million operations cycles[1]
Assembling position:	any
Driving torque for installation:	see pages 7/1-7/12

(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, 21, 22, 33, 34:	min.	1 x 0,34 mm²	(1 x AWG 22)
	max.	2 x 1,5 mm²	(2 x AWG 16)
Contact blocks 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 2,5 mm²	(2 x AWG 14)
Contact block 2:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 1,5 mm²	(2 x AWG 16)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 60529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113.
Approvals:
IEC 60947-5-1, UL 508, GB14048.5-2001.

Markings and quality marks:

Approval IMQ:	EG610
Approval UL:	E131787
Approval CCC:	2007010305230013
Approval EZU:	1010151
Approval GOST:	POCC IT.AB24.B04512

In conformity with requirements requested by:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and Electromagnetic Compatibility 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, 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 EN 60947-5-1, encl. K, par. 2**. The switch must be actuated with **at least up to the positive opening travel** shown in the travels diagrams on page 7/6. 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.

⚠ **If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 7/1 to page 7/12.**

	Electrical data		Utilization categories
without connector	Thermal current (Ith):	10 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	500 Vac 600 Vdc	Ue (V) 250 400 500
		400Vac500Vdc (contact blocks 2, 11, 12, 20, 21, 22, 33, 34)	Ie (A) 6 4 1
	Rated impulse withstand voltage (U_{imp}):	6 kV	Direct current: DC13
		4 kV (contact blocks 20, 21, 22, 33, 34)	Ue (V) 24 125 250
	Conditional shot circuit current:	1000 A according to EN 60947-5-1	Ie (A) 6 1,1 0,4
	Protection against short circuits:	fuse 10 A 500 V type aM	
	Pollution degree:	3	
with 4 poles M12 connector	Thermal current (Ith):	4 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	250 Vac 300 Vdc	Ue (V) 24 120 250
	Protection against short circuits:	fuse 4 A 500 V type gG	Ie (A) 4 4 4
	Pollution degree:	3	Direct current: DC13
			Ue (V) 24 125 250
			Ie (A) 4 1,1 0,4
with 8 poles M12 connector	Thermal current (Ith):	2 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	30 Vac 36 Vdc	Ue (V) 24
	Protection against short circuits:	fuse 2 A 500 V type gG	Ie (A) 2
	Pollution degree:	3	Direct current: DC13
			Ue (V) 24
			Ie (A) 2

Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 2, 11, 12, 20, 21, 22, 33, 34)
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (U_{imp}): 6 kV
4 kV (for contact blocks 20, 21, 22, 33, 34)
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: Za, Zb, Za+Za, Y+Y, X+X, Y+Y+X, Y+Y+Y, Y+X+X
Positive opening of contacts on contact block 5, 6, 7, 9, 11, 13, 14, 16, 18, 20, 21, 22, 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2006/95/CE.

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

Data type approved by UL

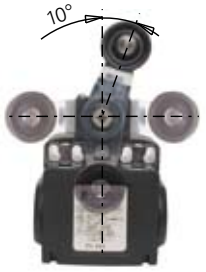
Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks except 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb in (0.8 Nm).
For contact blocks 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 14 AWG. Terminal tightening torque of 12 lb in (1.4 Nm).

In conformity with standard: UL 508

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

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

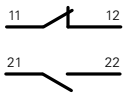
In all switches, it is possible to rotate the head in 90° steps.

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.

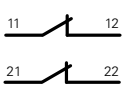
Lever turned to left

Contacts diagram



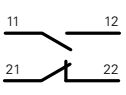
Lever not turned

Contacts diagram



Lever turned to right

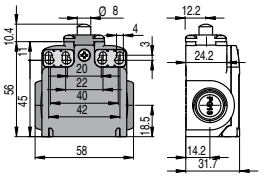
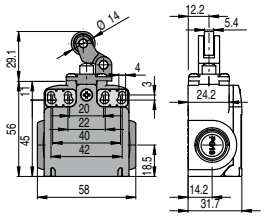
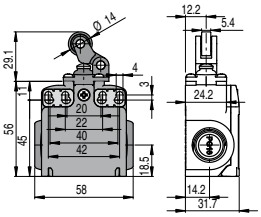
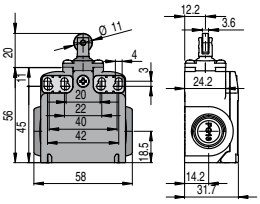
Contacts diagram

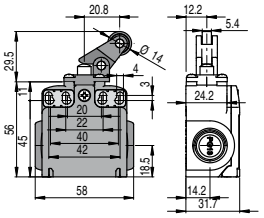
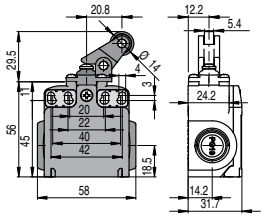
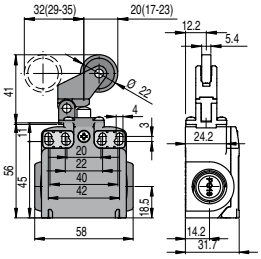
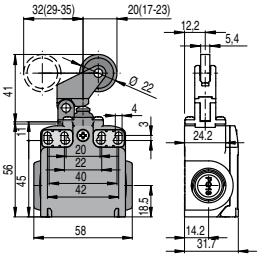


Position switches **FX** series

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

Contact blocks								
				With stainless steel roller on request 		With external rubber gasket With stainless steel roller on request 		With external rubber gasket With Ø 12 mm stainless steel roller on request 
5	R	FX 501	1NO+1NC	FX 502	1NO+1NC	FX 5A2	1NO+1NC	FX 5A4	1NO+1NC
6	L	FX 601	1NO+1NC	FX 602	1NO+1NC	FX 6A2	1NO+1NC	FX 6A4	1NO+1NC
7	LO	FX 701	1NO+1NC	FX 702	1NO+1NC	FX 7A2	1NO+1NC	FX 7A4	1NO+1NC
9	L	FX 901	2NC	FX 902	2NC	FX 9A2	2NC	FX 9A4	2NC
10	L	FX 1001	2NO	FX 1002	2NO	FX 10A2	2NO	FX 10A4	2NO
11	R	FX 1101	2NC	FX 1102	2NC	FX 11A2	2NC	FX 11A4	2NC
12	R	FX 1201	2NO	FX 1202	2NO	FX 12A2	2NO	FX 12A4	2NO
13	LV	FX 1301	2NC	FX 1302	2NC	FX 13A2	2NC	FX 13A4	2NC
14	LS	FX 1401	2NC	FX 1402	2NC	FX 14A2	2NC	FX 14A4	2NC
15	LS	FX 1501	2NO	FX 1502	2NO	FX 15A2	2NO	FX 15A4	2NO
18	LA	FX 1801	1NO+1NC	FX 1802	1NO+1NC	FX 18A2	1NO+1NC	FX 18A4	1NO+1NC
20	L	FX 2001	1NO+2NC	FX 2002	1NO+2NC	FX 20A2	1NO+2NC	FX 20A4	1NO+2NC
21	L	FX 2101	3NC	FX 2102	3NC	FX 21A2	3NC	FX 21A4	3NC
22	L	FX 2201	2NO+1NC	FX 2202	2NO+1NC	FX 22A2	2NO+1NC	FX 22A4	2NO+1NC
2	R	FX 201	2x(1NO-1NC)	FX 202	2x(1NO-1NC)	FX 2A2	2x(1NO-1NC)	FX 2A4	2x(1NO-1NC)
E1		FX E101	1NO-1NC	FX E102	1NO-1NC	FX E1A2	1NO-1NC	FX E1A4	1NO-1NC
Max speed		page 7/5 - type 4		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 5	
Min. force		8 N (25 N ⊖)		6 N (25 N ⊖)		4,3 N (25 N ⊖)		4,3 N (25 N ⊖)	
Travel diagrams		page 7/6 - group 1		page 7/6 - group 2		page 7/6 - group 2		page 7/6 - group 1	

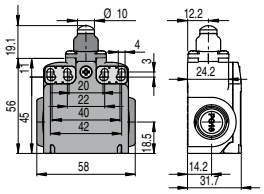
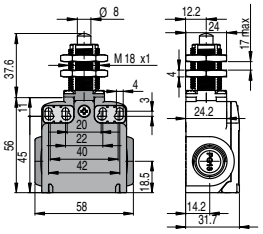
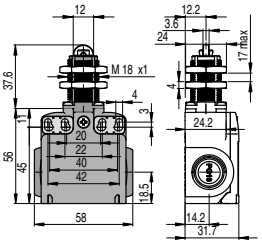
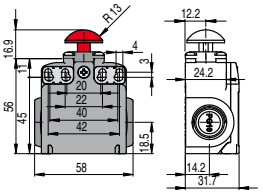
Contact blocks								
		With stainless steel roller on request 		With external rubber gasket With stainless steel roller on request 				With external rubber gasket 
5	R	FX 505	1NO+1NC	FX 5A5	1NO+1NC	FX 507	1NO+1NC	FX 5A7	1NO+1NC
6	L	FX 605	1NO+1NC	FX 6A5	1NO+1NC	FX 607	1NO+1NC	FX 6A7	1NO+1NC
7	LO	FX 705	1NO+1NC	FX 7A5	1NO+1NC	FX 707	1NO+1NC	FX 7A7	1NO+1NC
9	L	FX 905	2NC	FX 9A5	2NC	FX 907	2NC	FX 9A7	2NC
10	L	FX 1005	2NO	FX 10A5	2NO	FX 1007	2NO	FX 10A7	2NO
11	R	FX 1105	2NC	FX 11A5	2NC	FX 1107	2NC	FX 11A7	2NC
12	R	FX 1205	2NO	FX 12A5	2NO	FX 1207	2NO	FX 12A7	2NO
13	LV	FX 1305	2NC	FX 13A5	2NC	FX 1307	2NC	FX 13A7	2NC
14	LS	FX 1405	2NC	FX 14A5	2NC	FX 1407	2NC	FX 14A7	2NC
15	LS	FX 1505	2NO	FX 15A5	2NO	FX 1507	2NO	FX 15A7	2NO
18	LA	FX 1805	1NO+1NC	FX 18A5	1NO+1NC	FX 1807	1NO+1NC	FX 18A7	1NO+1NC
20	L	FX 2005	1NO+2NC	FX 20A5	1NO+2NC	FX 2007	1NO+2NC	FX 20A7	1NO+2NC
21	L	FX 2105	3NC	FX 21A5	3NC	FX 2107	3NC	FX 21A7	3NC
22	L	FX 2205	2NO+1NC	FX 22A5	2NO+1NC	FX 2207	2NO+1NC	FX 22A7	2NO+1NC
2	R	FX 205	2x(1NO-1NC)	FX 2A5	2x(1NO-1NC)	FX 207	2x(1NO-1NC)	FX 2A7	2x(1NO-1NC)
E1		FX E105	1NO-1NC	FX E1A5	1NO-1NC	FX E107	1NO-1NC	FX E1A7	1NO-1NC
Max speed		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 3	
Min. force		6 N (25 N ⊖)		4,3 N (25 N ⊖)		4 N (25 N ⊖)		3 N (25 N ⊖)	
Travel diagrams		page 7/6 - group 2		page 7/6 - group 2		page 7/6 - group 3		page 7/6 - group 3	

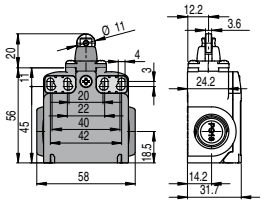
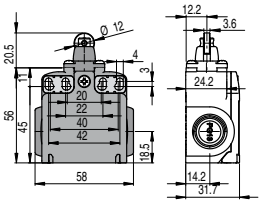
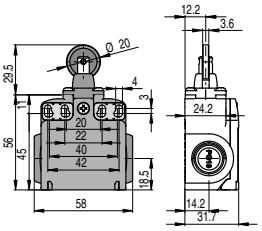
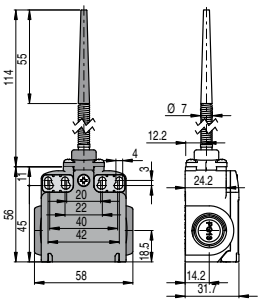
Accessories See page 6/1

All measures in the drawings are in mm

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted
LV = slow action shifted and spaced
LI = slow action independent
LA = slow action closer
= electronic PNP

Contact blocks		With external rubber gasket			
					
5	R	FX 508 1NO+1NC	FX 512 1NO+1NC	FX 513 1NO+1NC	FX 514 1NO+1NC
6	L	FX 608 1NO+1NC	FX 612 1NO+1NC	FX 613 1NO+1NC	FX 614 1NO+1NC
7	LO	FX 708 1NO+1NC	FX 712 1NO+1NC	FX 713 1NO+1NC	FX 714 1NO+1NC
9	L	FX 908 2NC	FX 912 2NC	FX 913 2NC	FX 914 2NC
10	L	FX 1008 2NO	FX 1012 2NO	FX 1013 2NO	FX 1014 2NO
11	R	FX 1108 2NC	FX 1112 2NC	FX 1113 2NC	FX 1114 2NC
12	R	FX 1208 2NO	FX 1212 2NO	FX 1213 2NO	FX 1214 2NO
13	LV	FX 1308 2NC	FX 1312 2NC	FX 1313 2NC	FX 1314 2NC
14	LS	FX 1408 2NC	FX 1412 2NC	FX 1413 2NC	FX 1414 2NC
15	LS	FX 1508 2NO	FX 1512 2NO	FX 1513 2NO	FX 1514 2NO
18	LA	FX 1808 1NO+1NC	FX 1812 1NO+1NC	FX 1813 1NO+1NC	FX 1814 1NO+1NC
20	L	FX 2008 1NO+2NC	FX 2012 1NO+2NC	FX 2013 1NO+2NC	FX 2014 1NO+2NC
21	L	FX 2108 3NC	FX 2112 3NC	FX 2113 3NC	FX 2114 3NC
22	L	FX 2208 2NO+1NC	FX 2212 2NO+1NC	FX 2213 2NO+1NC	FX 2214 2NO+1NC
2	R	FX 208 2x(1NO-1NC)	FX 212 2x(1NO-1NC)	FX 213 2x(1NO-1NC)	FX 214 2x(1NO-1NC)
E1		FX E108 1NO-1NC	FX E112 1NO-1NC	FX E113 1NO-1NC	FX E114 1NO-1NC
Max speed		page 7/5 - type 4	page 7/5 - type 4	page 7/5 - type 2	page 7/5 - type 4
Min. force		8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1

Contact blocks		Ø 11 mm polymer roller	Ø 12 mm stainless steel roller		With external rubber gasket
					
5	R	FX 515 1NO+1NC	FX 515-1 1NO+1NC	FX 516 1NO+1NC	FX 520 1NO+1NC
6	L	FX 615 1NO+1NC	FX 615-1 1NO+1NC	FX 616 1NO+1NC	
7	LO	FX 715 1NO+1NC	FX 715-1 1NO+1NC	FX 716 1NO+1NC	
9	L	FX 915 2NC	FX 915-1 2NC	FX 916 2NC	
10	L	FX 1015 2NO	FX 1015-1 2NO	FX 1016 2NO	FX 1020 2NO
11	R	FX 1115 2NC	FX 1115-1 2NC	FX 1116 2NC	
12	R	FX 1215 2NO	FX 1215-1 2NO	FX 1216 2NO	FX 1220 2NO
13	LV	FX 1315 2NC	FX 1315-1 2NC	FX 1316 2NC	
14	LS	FX 1415 2NC	FX 1415-1 2NC	FX 1416 2NC	
15	LS	FX 1515 2NO	FX 1515-1 2NO	FX 1516 2NO	
18	LA	FX 1815 1NO+1NC	FX 1815-1 1NO+1NC	FX 1816 1NO+1NC	FX 1820 1NO+1NC
20	L	FX 2015 1NO+2NC	FX 2015-1 1NO+2NC	FX 2016 1NO+2NC	FX 2020 1NO+2NC
21	L	FX 2115 3NC	FX 2115-1 3NC	FX 2116 3NC	FX 2120 3NC
22	L	FX 2215 2NO+1NC	FX 2215-1 2NO+1NC	FX 2216 2NO+1NC	FX 2220 2NO+1NC
2	R	FX 215 2x(1NO-1NC)	FX 215-1 2x(1NO-1NC)	FX 216 2x(1NO-1NC)	FX 220 2x(1NO-1NC)
E1		FX E115 1NO-1NC	FX E115-1 1NO-1NC	FX E116 1NO-1NC	FX E120 1NO-1NC
Max speed		page 7/5 - type 2	page 7/5 - type 2	page 7/5 - type 2	1 m/s
Min. force		8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)	0,07 Nm
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 4

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

Position switches **FX** series

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

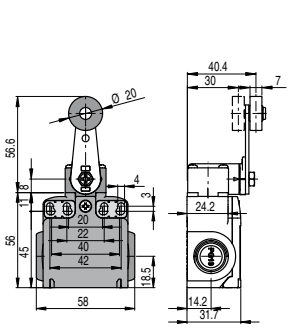
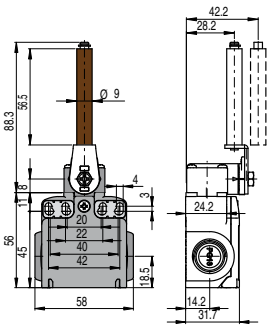
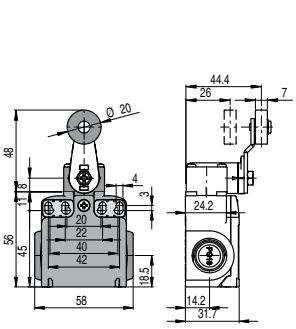
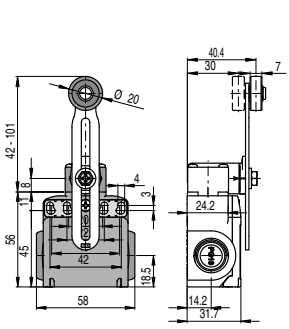
Contact blocks		With external rubber gasket		With external rubber gasket		With Ø 20 mm stainless steel roller on request		Other rollers available. See page 2/76	
5	R	FX 521	1NO+1NC	FX 525	1NO+1NC	FX 530 ⊖	1NO+1NC	FX 531 ⊖	1NO+1NC
6	L					FX 630 ⊖	1NO+1NC	FX 631 ⊖	1NO+1NC
7	LO					FX 730 ⊖	1NO+1NC	FX 731 ⊖	1NO+1NC
9	L					FX 930 ⊖	2NC	FX 931 ⊖	2NC
10	L	FX 1021	2NO	FX 1025	2NO	FX 1030	2NO	FX 1031	2NO
11	R					FX 1130 ⊖	2NC	FX 1131 ⊖	2NC
12	R	FX 1221	2NO	FX 1225	2NO	FX 1230	2NO	FX 1231	2NO
13	LV					FX 1330 ⊖	2NC	FX 1331 ⊖	2NC
14	LS					FX 1430 ⊖	2NC	FX 1431 ⊖	2NC
15	LS					FX 1530	2NO	FX 1531	2NO
16	LI					FX 1630 ⊖	2NC	FX 1631 ⊖	2NC
18	LA	FX 1821	1NO+1NC	FX 1825	1NO+1NC	FX 1830 ⊖	1NO+1NC	FX 1831 ⊖	1NO+1NC
20	L	FX 2021	1NO+2NC	FX 2025	1NO+2NC	FX 2030 ⊖	1NO+2NC	FX 2031 ⊖	1NO+2NC
21	L	FX 2121	3NC	FX 2125	3NC	FX 2130 ⊖	3NC	FX 2131 ⊖	3NC
22	L	FX 2221	2NO+1NC	FX 2225	2NO+1NC	FX 2230 ⊖	2NO+1NC	FX 2231 ⊖	2NO+1NC
2	R	FX 221	2x(1NO-1NC)	FX 225	2x(1NO-1NC)	FX 230	2x(1NO-1NC)	FX 231	2x(1NO-1NC)
E1		FX E121	1NO-1NC	FX E125	1NO-1NC	FX E130	1NO-1NC	FX E131	1NO-1NC
Max speed		1 m/s		1 m/s		page 7/5 - type 1		page 7/5 - type 1	
Min. force		0,07 Nm		0,12 Nm		0,06 Nm (0,25 Nm ⊖)		0,06 Nm (0,25 Nm ⊖)	
Travel diagrams		page 7/6 - group 4		page 7/6 - group 4		page 7/6 - group 5		page 7/6 - group 5	

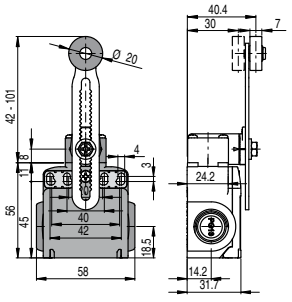
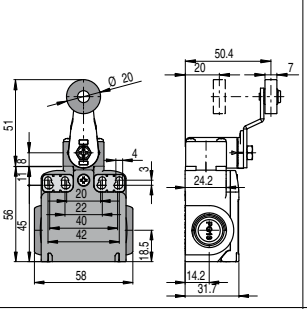
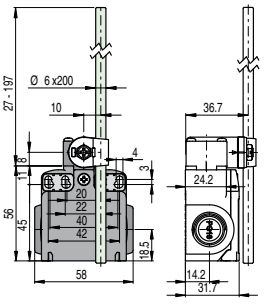
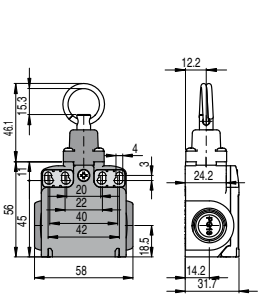
Contact blocks		3x3 mm square rod				Ø 3 mm stainless steel round rod		Other rollers available. See page 2/76	
5	R	FX 533	1NO+1NC	FX 534	1NO+1NC	FX 550	1NO+1NC	FX 551 ⊖	1NO+1NC
6	L	FX 633	1NO+1NC	FX 634	1NO+1NC	FX 650	1NO+1NC	FX 651 ⊖	1NO+1NC
7	LO	FX 733	1NO+1NC	FX 734	1NO+1NC	FX 750	1NO+1NC	FX 751 ⊖	1NO+1NC
9	L	FX 933	2NC	FX 934	2NC	FX 950	2NC	FX 951 ⊖	2NC
10	L	FX 1033	2NO	FX 1034	2NO	FX 1050	2NO	FX 1051	2NO
11	R	FX 1133	2NC	FX 1134	2NC	FX 1150	2NC	FX 1151 ⊖	2NC
12	R	FX 1233	2NO	FX 1234	2NO	FX 1250	2NO	FX 1251	2NO
13	LV	FX 1333	2NC	FX 1334	2NC	FX 1350	2NC	FX 1351 ⊖	2NC
14	LS	FX 1433	2NC	FX 1434	2NC	FX 1450	2NC	FX 1451 ⊖	2NC
15	LS	FX 1533	2NO	FX 1534	2NO	FX 1550	2NO	FX 1551	2NO
16	LI	FX 1633	2NC	FX 1634	2NC	FX 1650	2NC	FX 1651 ⊖	2NC
18	LA	FX 1833	1NO+1NC	FX 1834	1NO+1NC	FX 1850	1NO+1NC	FX 1851 ⊖	1NO+1NC
20	L	FX 2033	1NO+2NC	FX 2034	1NO+2NC	FX 2050	1NO+2NC	FX 2051 ⊖	1NO+2NC
21	L	FX 2133	3NC	FX 2134	3NC	FX 2150	3NC	FX 2151 ⊖	3NC
22	L	FX 2233	2NO+1NC	FX 2234	2NO+1NC	FX 2250	2NO+1NC	FX 2251 ⊖	2NO+1NC
2	R	FX 233	2x(1NO-1NC)	FX 234	2x(1NO-1NC)	FX 250	2x(1NO-1NC)	FX 251	2x(1NO-1NC)
E1		FX E133	1NO-1NC	FX E134	1NO-1NC	FX E150	1NO-1NC	FX E151	1NO-1NC
Max speed		1,5 m/s		1,5 m/s		1,5 m/s		page 7/5 - type 1	
Min. force		0,06 Nm		0,06 Nm		0,06 Nm		0,06 Nm (0,25 Nm ⊖)	
Travel diagrams		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5	

Accessories See page 6/1

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted
LV = slow action shifted and spaced
LI = slow action independent
LA = slow action closer
= electronic PNP

Contact blocks		Other rollers available. See page 2/76	Porcelain roller	Other rollers available. See page 2/76	Other rollers available. See page 2/76
					
5	R	FX 552 → 1NO+1NC	FX 553-E0V9 → 1NO+1NC	FX 554 → 1NO+1NC	FX 555 → (1) 1NO+1NC
6	L	FX 652 → 1NO+1NC	FX 653-E0V9 → 1NO+1NC	FX 654 → 1NO+1NC	FX 655 → (1) 1NO+1NC
7	LO	FX 752 → 1NO+1NC	FX 753-E0V9 → 1NO+1NC	FX 754 → 1NO+1NC	FX 755 → (1) 1NO+1NC
9	L	FX 952 → 2NC	FX 953-E0V9 → 2NC	FX 954 → 2NC	FX 955 → (1) 2NC
10	L	FX 1052 2NO	FX 1053-E0V9 2NO	FX 1054 2NO	FX 1055 2NO
11	R	FX 1152 → 2NC		FX 1154 → 2NC	FX 1155 → (1) 2NC
12	R	FX 1252 2NO	FX 1253-E0V9 2NO	FX 1254 2NO	FX 1255 2NO
13	LV	FX 1352 → 2NC	FX 1353-E0V9 → 2NC	FX 1354 → 2NC	FX 1355 → (1) 2NC
14	LS	FX 1452 → 2NC	FX 1453-E0V9 → 2NC	FX 1454 → 2NC	FX 1455 → (1) 2NC
15	LS	FX 1552 2NO	FX 1553-E0V9 2NO	FX 1554 2NO	FX 1555 2NO
16	LI	FX 1652 → 2NC		FX 1654 → 2NC	FX 1655 → (1) 2NC
18	LA	FX 1852 → 1NO+1NC	FX 1853-E0V9 → 1NO+1NC	FX 1854 → 1NO+1NC	FX 1855 → (1) 1NO+1NC
20	L	FX 2052 → 1NO+2NC	FX 2053-E0V9 → 1NO+2NC	FX 2054 → 1NO+2NC	FX 2055 → (1) 1NO+2NC
21	L	FX 2152 → 3NC	FX 2153-E0V9 → 3NC	FX 2154 → 3NC	FX 2155 → (1) 3NC
22	L	FX 2252 → 2NO+1NC	FX 2253-E0V9 → 2NO+1NC	FX 2254 → 2NO+1NC	FX 2255 → (1) 2NO+1NC
2	R	FX 252 2x(1NO-1NC)	FX 253-E0 2x(1NO-1NC)	FX 254 2x(1NO-1NC)	FX 255 2x(1NO-1NC)
E1		FX E152 1NO-1NC	FX E153-E0V9 1NO-1NC	FX E154 1NO-1NC	FX E155 1NO-1NC
Max speed		page 7/5 - type 1	0,5 m/s	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,06 Nm (0,25 Nm →)	0,03 Nm (0,25 Nm →)	0,06 Nm (0,25 Nm →)	0,06 Nm (0,25 Nm →)
Travel diagrams		page 7/6 - group 5	page 7/6 - group 6	page 7/6 - group 5	page 7/6 - group 5

Contact blocks		Other rollers available. See page 2/76	Other rollers available. See page 2/76	Fiber glass rod	Rope switches for signalling
					
5	R	FX 556 → 1NO+1NC	FX 557 → 1NO+1NC	FX 569 1NO+1NC	FX 576 1NO+1NC
6	L	FX 656 → 1NO+1NC	FX 657 → 1NO+1NC	FX 669 1NO+1NC	FX 676 1NO+1NC
7	LO	FX 756 → 1NO+1NC	FX 757 → 1NO+1NC	FX 769 1NO+1NC	FX 776 1NO+1NC
9	L	FX 956 → 2NC	FX 957 → 2NC	FX 969 2NC	FX 976 2NO
10	L	FX 1056 2NO	FX 1057 2NO	FX 1069 2NO	FX 1076 2NC
11	R	FX 1156 → 2NC	FX 1157 → 2NC	FX 1169 2NC	FX 1176 2NO
12	R	FX 1256 2NO	FX 1257 2NO	FX 1269 2NO	FX 1276 2NC
13	LV	FX 1356 → 2NC	FX 1357 → 2NC	FX 1369 2NC	FX 1376 2NO
14	LS	FX 1456 → 2NC	FX 1457 → 2NC	FX 1469 2NC	FX 1476 2NO
15	LS	FX 1556 2NO	FX 1557 2NO	FX 1569 2NO	FX 1576 2NC
16	LI	FX 1656 → 2NC	FX 1657 → 2NC	FX 1669 2NC	
18	LA	FX 1856 → 1NO+1NC	FX 1857 → 1NC+1NO	FX 1869 1NC+1NO	FX 1876 1NO+1NC
20	L	FX 2056 → 1NO+2NC	FX 2057 → 1NO+2NC	FX 2069 1NO+2NC	FX 2076 2NO+1NC
21	L	FX 2156 → 3NC	FX 2157 → 3NC	FX 2169 3NC	FX 2176 3NO
22	L	FX 2256 → 2NO+1NC	FX 2257 → 2NO+1NC	FX 2269 2NO+1NC	FX 2276 1NO+2NC
2	R	FX 256 2x(1NO-1NC)	FX 257 2x(1NO-1NC)	FX 269 2x(1NO-1NC)	FX 276 2x(1NO-1NC)
E1		FX E156 1NO-1NC	FX E157 1NO-1NC	FX E169 1NO-1NC	
Max speed		page 7/5 - type 1	page 7/5 - type 1	1,5 m/s	0,5 m/s
Min. force		0,06 Nm (0,25 Nm →)	0,06 Nm (0,25 Nm →)	0,06 Nm	initial 20 N - final 40 N
Travel diagrams		page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 7

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

(1) Positive opening only with lever adjusted on the max. See page 2/75.

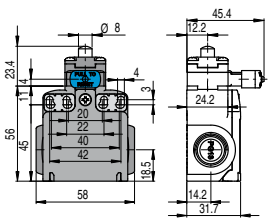
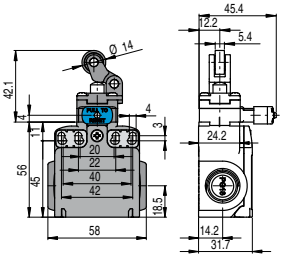
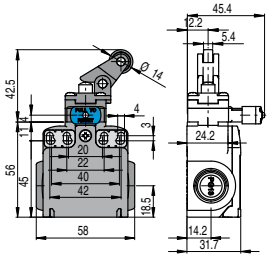
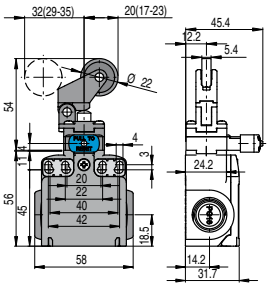
Position switches **FX** series with reset

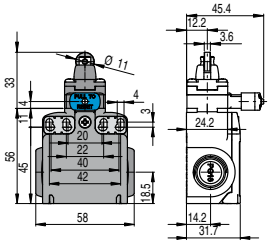
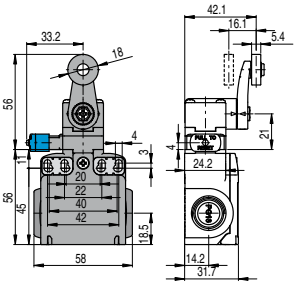
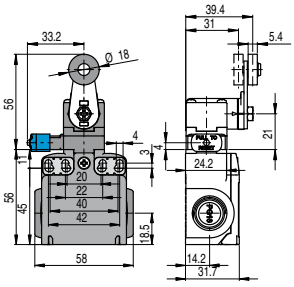
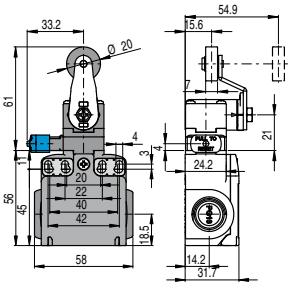
Pizzato Elettrica has developed a reset device code W3 to make perfectly simultaneous the actuator and the contact block tripping. The new device is a block inserted between the switch body and the head, and could be rotated independently from this last one. This new device has following advantages:

- The reset device integrate in almost all standard actuation head
- Contact blocks with snap action are no more necessary because the tripping movement is made by the reset device itself
- The reset device can be rotated independently from the head for the maximum flexibility during the assembling
- Two driving forces: standard and increased for applications with vibrations
- Mechanical endurance: 1 million operations cycles.

Contacts type:

R = snap action
L = slow action

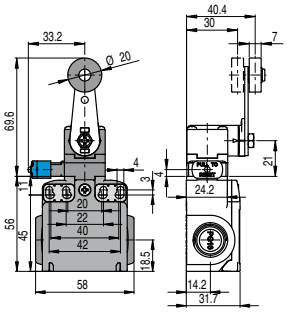
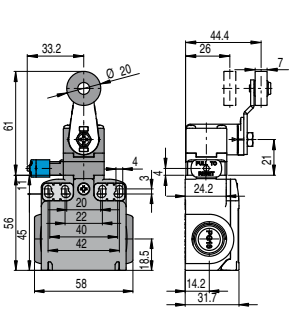
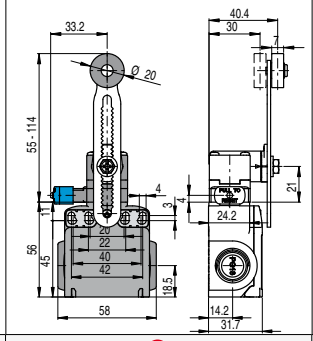
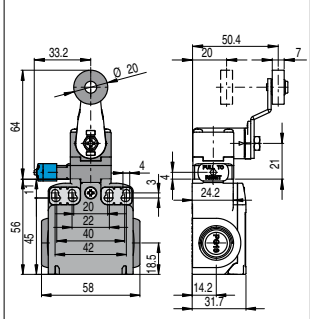
Contact blocks					
			With stainless steel roller on request 	With stainless steel roller on request 	
6	L	FX 601-W3 → 1NO+1NC	FX 602-W3 → 1NO+1NC	FX 605-W3 → 1NO+1NC	FX 607-W3 → 1NO+1NC
9	L	FX 901-W3 → 2NC	FX 902-W3 → 2NC	FX 905-W3 → 2NC	FX 907-W3 → 2NC
10	L	FX 1001-W3 2NO	FX 1002-W3 2NO	FX 1005-W3 2NO	FX 1007-W3 2NO
20	L	FX 2001-W3 → 1NO+2NC	FX 2002-W3 → 1NO+2NC	FX 2005-W3 → 1NO+2NC	FX 2007-W3 → 1NO+2NC
21	L	FX 2101-W3 → 3NC	FX 2102-W3 → 3NC	FX 2105-W3 → 3NC	FX 2107-W3 → 3NC
22	L	FX 2201-W3 → 2NO+1NC	FX 2202-W3 → 2NO+1NC	FX 2205-W3 → 2NO+1NC	FX 2207-W3 → 2NO+1NC
2	R	FX 201-W3 2NO+2NC	FX 202-W3 2NO+2NC	FX 205-W3 2NO+2NC	FX 207-W3 2NO+2NC
Max speed		page 7/5 - type 4	page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 3
Min. force		4,5 N (25 N →)	4 N (25 N →)	4 N (25 N →)	2,5 N (25 N →)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 2	page 7/7 - group 2	page 7/7 - group 3

		With stainless steel roller on request 	With Ø 20 mm stainless steel roller on request 	Other rollers available. See page 2/76 	Other rollers available. See page 2/76 
6	L	FX 615-W3 → 1NO+1NC	FX 630-W3 → 1NO+1NC	FX 631-W3 → 1NO+1NC	FX 651-W3 → 1NO+1NC
9	L	FX 915-W3 → 2NC	FX 930-W3 → 2NC	FX 931-W3 → 2NC	FX 951-W3 → 2NC
10	L	FX 1015-W3 2NO	FX 1030-W3 2NO	FX 1031-W3 2NO	FX 1051-W3 2NO
20	L	FX 2015-W3 → 1NO+2NC	FX 2030-W3 → 1NO+2NC	FX 2031-W3 → 1NO+2NC	FX 2051-W3 → 1NO+2NC
21	L	FX 2115-W3 → 3NC	FX 2130-W3 → 3NC	FX 2131-W3 → 3NC	FX 2151-W3 → 3NC
22	L	FX 2215-W3 → 2NO+1NC	FX 2230-W3 → 2NO+1NC	FX 2231-W3 → 2NO+1NC	FX 2251-W3 → 2NO+1NC
2	R	FX 215-W3 2NO+2NC	FX 230-W3 2NO+2NC	FX 231-W3 2NO+2NC	FX 251-W3 2NO+2NC
Max speed		page 7/5 - type 2	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		4,5 N (25 N →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

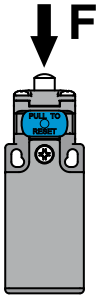
Accessories See page 6/1

Contacts type:

R = snap action
L = slow action

Contact blocks		Other rollers available. See page 2/76	Other rollers available. See page 2/76	Other rollers available. See page 2/76	Other rollers available. See page 2/76
					
6	L	FX 652-W3 → 1NO+1NC	FX 654-W3 → 1NO+1NC	FX 656-W3 → 1NO+1NC	FX 657-W3 → 1NO+1NC
9	L	FX 952-W3 → 2NC	FX 954-W3 → 2NC	FX 956-W3 → 2NC	FX 957-W3 → 2NC
10	L	FX 1052-W3 2NO	FX 1054-W3 2NO	FX 1056-W3 2NO	FX 1057-W3 2NO
20	L	FX 2052-W3 → 1NO+2NC	FX 2054-W3 → 1NO+2NC	FX 2056-W3 → 1NO+2NC	FX 2057-W3 → 1NO+2NC
21	L	FX 2152-W3 → 3NC	FX 2154-W3 → 3NC	FX 2156-W3 → 3NC	FX 2157-W3 → 3NC
22	L	FX 2252-W3 → 2NO+1NC	FX 2254-W3 → 2NO+1NC	FX 2256-W3 → 2NO+1NC	FX 2257-W3 → 2NO+1NC
2	R	FX 252-W3 2NO+2NC	FX 254-W3 2NO+2NC	FX 256-W3 2NO+2NC	FX 257-W3 2NO+2NC
Max speed		page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)
Travel diagrams		page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

Increased actuating force



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

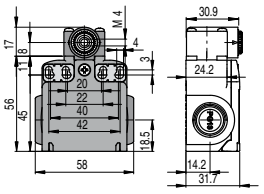
Actuator	Force
01, 14, 15, 16	7 N
02, 05	6 N
07	3,5 N
30 ... 57	0,08 Nm

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

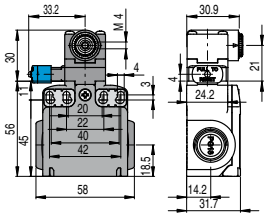
Position switches with revolving lever without actuator

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



With manual reset knob



Contact blocks			With manual reset knob
5	R	FX 538 ⊕ 1NO+1NC	
6	L	FX 638 ⊕ 1NO+1NC	FX 638-W3 ⊕ 1NO+1NC
7	LO	FX 738 ⊕ 1NO+1NC	
9	L	FX 938 ⊕ 2NC	FX 938-W3 ⊕ 2NC
10	L	FX 1038 2NO	FX 1038-W3 2NO
11	R	FX 1138 ⊕ 2NC	
12	R	FX 1238 2NO	
13	LV	FX 1338 ⊕ 2NC	
14	LS	FX 1438 ⊕ 2NC	
15	LS	FX 1538 2NO	
16	LI	FX 1638 ⊕ 2NC	
18	LA	FX 1838 ⊕ 1NO+1NC	
20	L	FX 2038 ⊕ 1NO+2NC	FX 2038-W3 ⊕ 1NO+2NC
21	L	FX 2138 ⊕ 3NC	FX 2138-W3 ⊕ 3NC
22	L	FX 2238 ⊕ 2NO+1NC	FX 2238-W3 ⊕ 2NO+1NC
2	R	FX 238 2x(1NO-1NC)	FX 238-W3 2NO+2NC
E1		FX E138 1NO-1NC	
Min. force		0,06 Nm (0,25 Nm ⊕)	0,07 Nm (0,25 Nm ⊕)
Travel diagrams		page 7/6 - group 5	page 7/7 - group 4

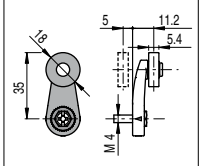
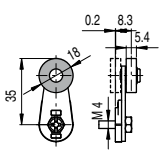
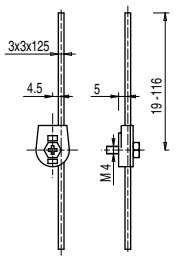
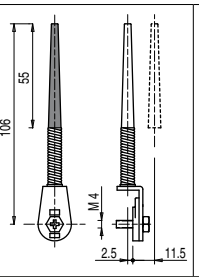
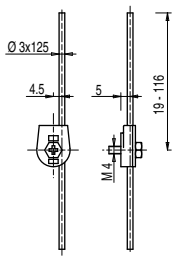
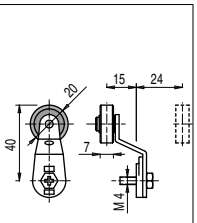
IMPORTANT

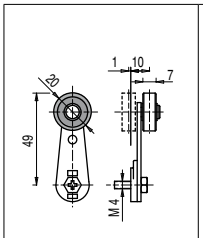
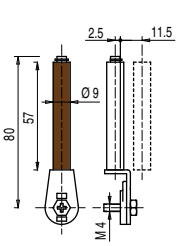
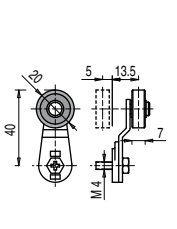
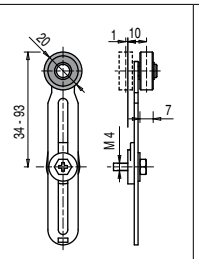
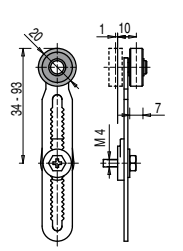
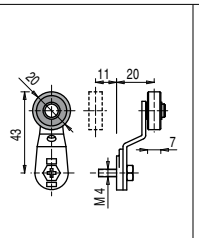
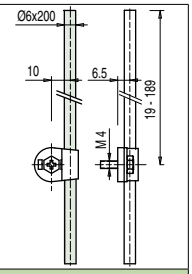
For safety applications: join only switches and actuators marked with symbol ⊕.

For more information about safety applications see page 7/1.

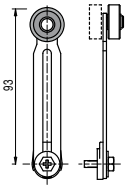
Loose actuators

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

Polymer roller Ø 18 mm	Polymer roller Ø 18 mm	Adjustable square rod 3x3x125 mm	Flexible rod actuator	Adjustable round rod Ø 3x125 mm	Polymer roller Ø 20 mm
					
VF LE30 ⊕	VF LE31 ⊕	VF LE33	VF LE34	VF LE50	VF LE51 ⊕

Polymer roller Ø 20 mm	Porcelain roller	Polymer roller Ø 20 mm	Adjustable actuator with polymer roller	Adjustable safety actuator with polymer roller	Polymer roller Ø 20 mm	Adjustable fiber glass rod
						
VF LE52 ⊕	VF LE53 ⊕ (2)	VF LE54 ⊕	VF LE55 ⊕ (1)	VF LE56 ⊕	VF LE57 ⊕	VF LE69

- 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.
- (2) The position switch obtained by assembling the switch FX •38 (e.g. FX 538, FX 638) with the actuator VF LE53 will not present the same travel diagrams and actuating forces as the position switch FX •53-E0V9 (e.g. FX 553-E0V9, FX 653-E0V9...).
- (4) The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

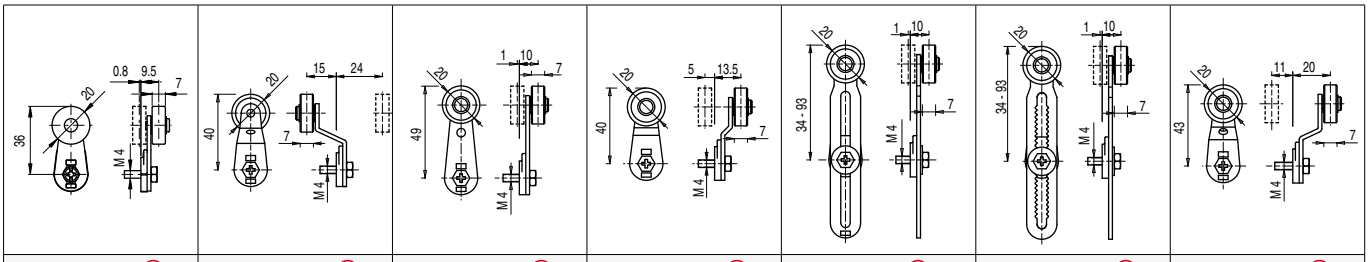


Accessories See page 6/1

Special loose actuators

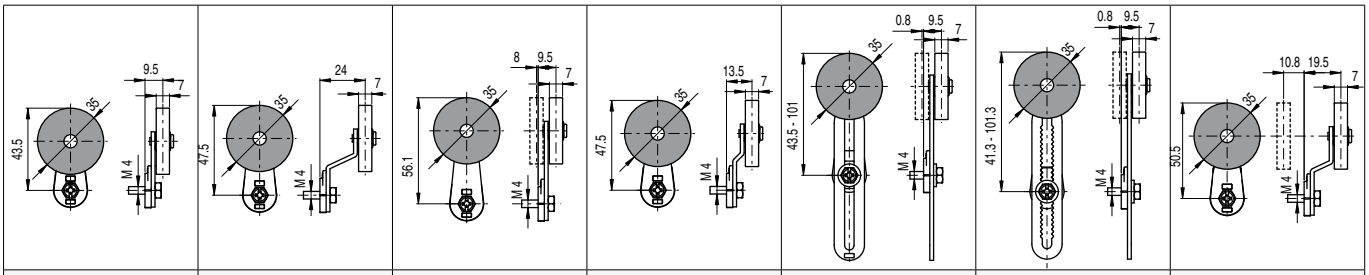
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Ø 20 mm stainless steel rollers



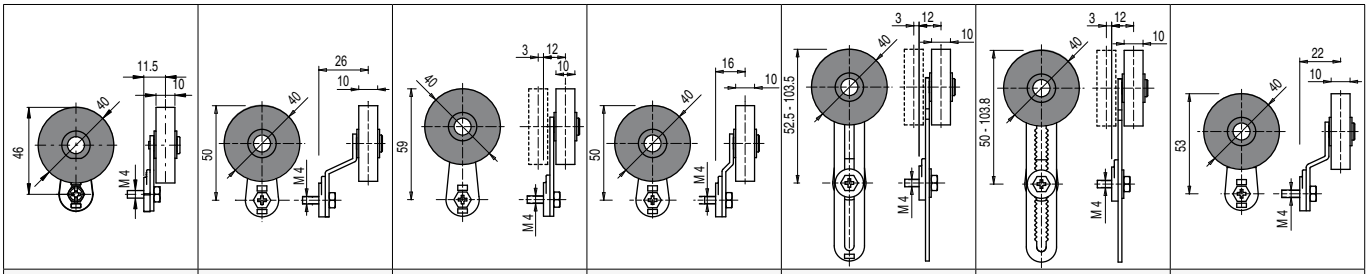
VF LE31-1 | VF LE51-1 | VF LE52-1 | VF LE54-1 | VF LE55-1 (1) | VF LE56-1 | VF LE57-1

Ø 35 mm polymer rollers



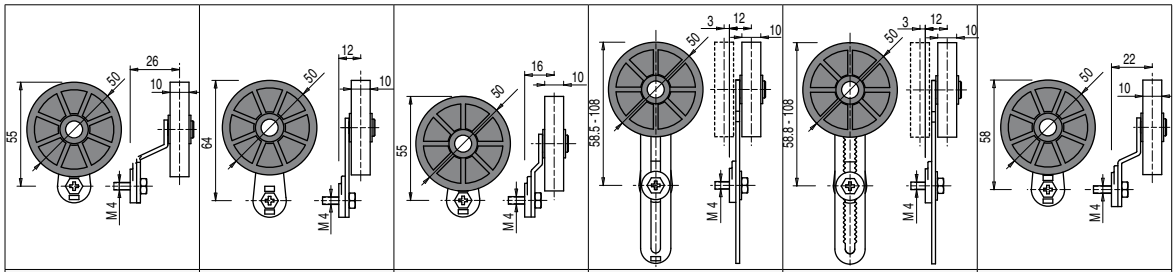
VF LE31-2 (4) | VF LE51-2 (4) | VF LE52-2 | VF LE54-2 (4) | VF LE55-2 (1) | VF LE56-2 | VF LE57-2

Ø 40 mm rubber rollers



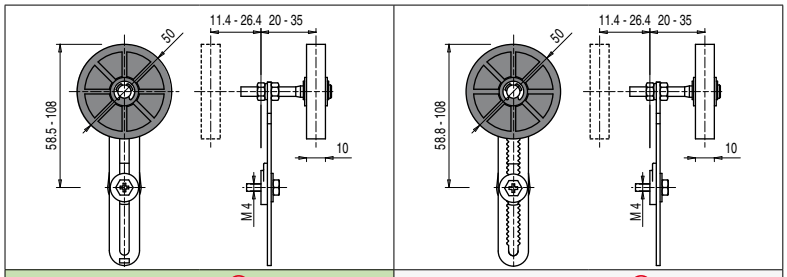
VF LE31-R5 (4) | VF LE51-R5 (4) | VF LE52-R5 | VF LE54-R5 (4) | VF LE55-R5 (1) | VF LE56-R5 | VF LE57-R5 (4)

Ø 50 mm rubber rollers



VF LE51-3 (4) | VF LE52-3 (4) | VF LE54-3 (4) | VF LE55-3 (1) | VF LE56-3 | VF LE57-3 (4)

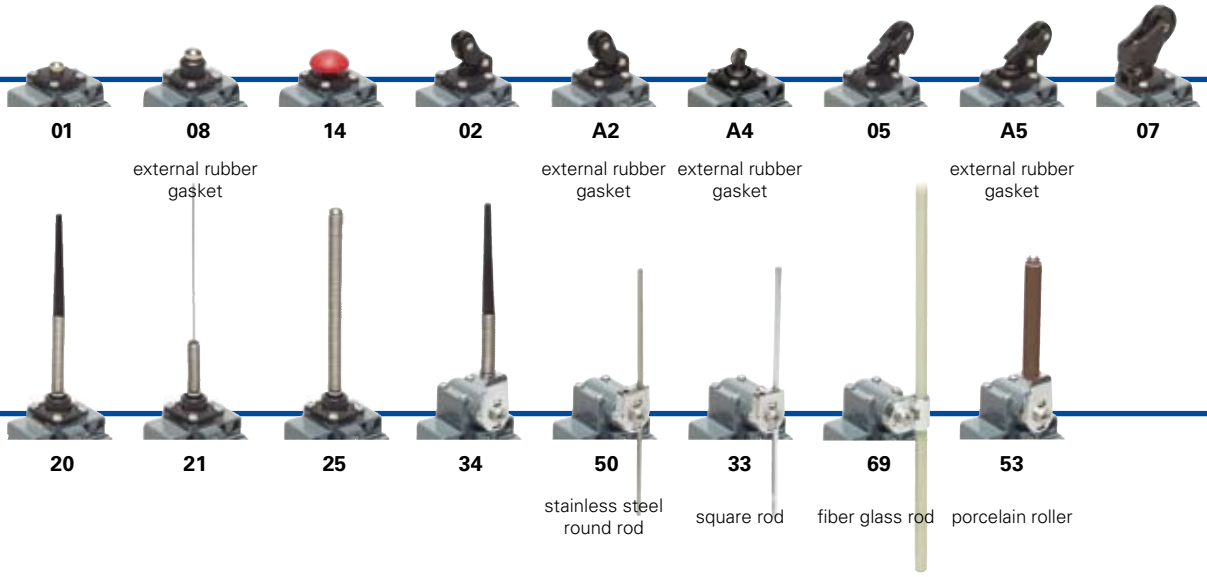
Ø 50 mm overhanging rubber rollers



VF LE55-4 (1) | VF LE56-4

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

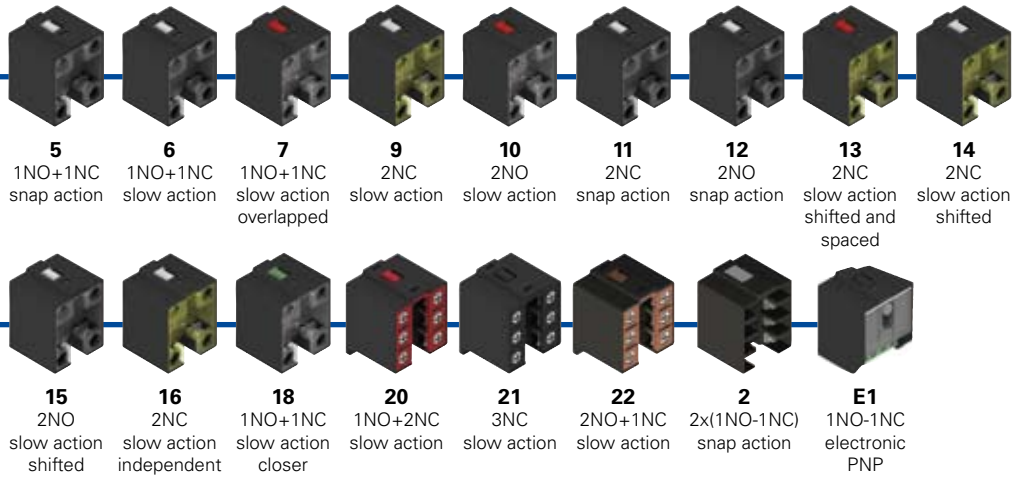
Selection diagram



WITH RESET

ACTUATORS

CONTACT BLOCKS



CONDUIT ENTRY

Threaded conduit entries

	PG 13,5 (standard)
M2	M20x1,5

With assembled cable gland

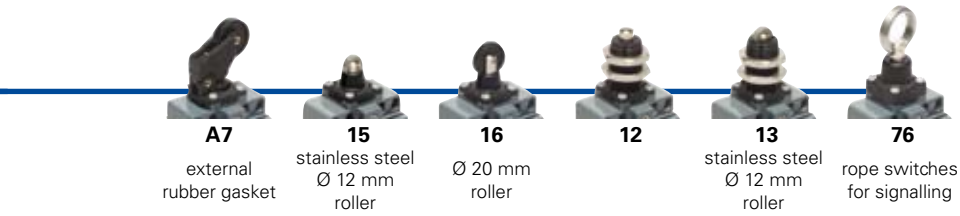
K121	for Ø 6 to Ø 12 mm cables range, from right
K221	for Ø 6 to Ø 12 mm cables range, from left
K125	for Ø 3 to Ø 7 mm cables range, from right
K225	for Ø 3 to Ø 7 mm cables range, from left

With M12 metal connector assembled and wired

K41	8 poles from right
K42	8 poles from left
K51	5 poles from right
K52	5 poles from left

product option

accessory sold separately



A7 external rubber gasket

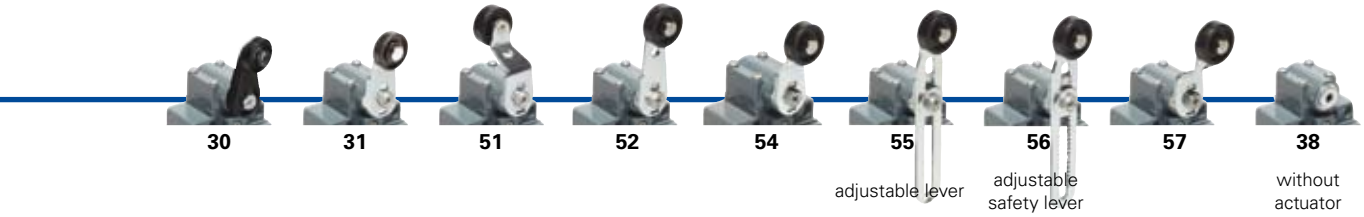
15 stainless steel Ø 12 mm roller

16 Ø 20 mm roller

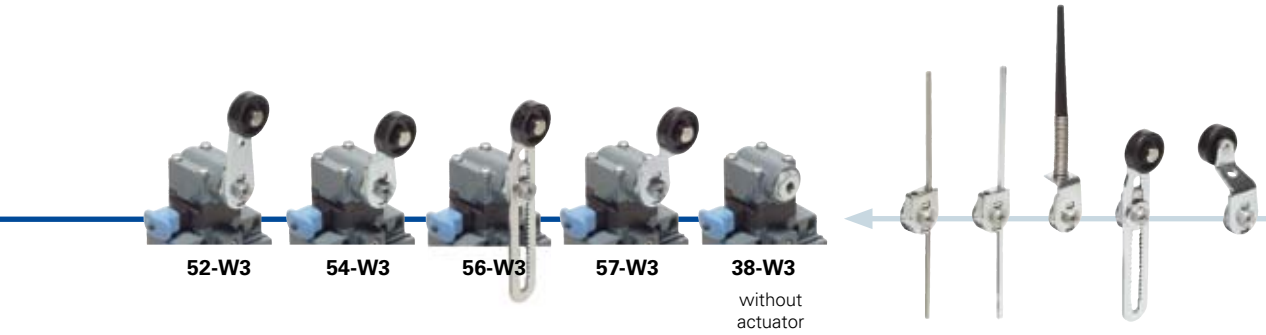
12

13 stainless steel Ø 12 mm roller

76 rope switches for signalling



30 **31** **51** **52** **54** **55** adjustable lever **56** adjustable safety lever **57** **38** without actuator



52-W3 **54-W3** **56-W3** **57-W3** **38-W3** without actuator

LOOSE ACTUATORS
See page 2/87

Code structure

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

article: **FZ 502** — options: **-1W3GM2K51**

Housing

FZ	Metal housing, two conduit entries

Contact blocks

5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action overlapped
...	.....

Actuators

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

Suffix

	no suffix (standard)
1	with stainless steel roller: - Ø 14 mm for actuators A2, 02, A5, 05 - Ø 20 mm for actuators 30, 31, 51, 52, 54, 55, 56, 57
2	with Ø 35 mm polymer roller (see special loose actuators on page 2/88)
3	with Ø 50 mm rubber roller (see special loose actuators on page 2/88)
4	with Ø 50 mm overhanging rubber roller (see special loose actuators on page 2/88)

Reset hooking

	without reset (standard)
W3	simultaneous reset
W4	simultaneous reset with increased force

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm (contact block 2 excluded)

Threaded conduit entry

	PG 13,5 (standard)
M2	M20x1,5

Preinstalled cable gland or connectors

	no cable gland or connector (standard)
K121	assembled cable gland from right (see conduit entry page 2/77)
...	.....
K51	assembled 5 poles M12 metal connector from right (see conduit entry page 2/77)
...	.....

For the complete list of all combinations, please contact our technical office.

Position switches **FZ** series

Main data

- Metal housing, two conduit entries
- Protection degree IP67
- 17 contact blocks available
- 42 actuators available
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:

Approval IMQ: EG609
Approval UL: E131787
Approval CCC: 2007010305229998
Approval EZU: 1010151
Approval GOST: POCC IT.AB24.B04512

Technical data

Housing
Metal housing, coated with baked epoxy powder
Two threaded conduit entries
Protection degree: IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data
Ambient temperature: from -25°C to +80°C
Version for operation in ambient temperature from -40°C to +80° C on request
Max actuation frequency: 3600 operations cycles[1]/hour
Mechanical endurance: 20 million operations cycles[1]
Assembling position: any
Driving torque for installation: see pages 7/1-7/12
(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, 21, 22, 33, 34:	min.	1 x 0,34 mm²	(1 x AWG 22)
	max.	2 x 1,5 mm²	(2 x AWG 16)
Contact blocks 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 2,5 mm²	(2 x AWG 14)
Contact block 2:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 1,5 mm²	(2 x AWG 16)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 60529, EN 60529, 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 Electromagnetic Compatibility 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, 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 EN 60947-5-1, encl. K, par. 2**. The switch must be actuated with **at least up to the positive opening travel** shown in the travels diagrams on page 7/6. 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.

⚠ **If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 7/1 to page 7/12.**

	Electrical data		Utilization categories
without connector	Thermal current (Ith):	10 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	500 Vac 600 Vdc	Ue (V) 250 400 500
		400Vac500Vdc (contact blocks 2, 11, 12, 20, 21, 22, 33, 34)	Ie (A) 6 4 1
	Rated impulse withstand voltage (U_{imp}):	6 kV	Direct current: DC13
		4 kV (contact blocks 20, 21, 22, 33, 34)	Ue (V) 24 125 250
	Conditional shot circuit current:	1000 A according to EN 60947-5-1	Ie (A) 6 1,1 0,4
	Protection against short circuits:	fuse 10 A 500 V type aM	
	Pollution degree:	3	
with 5 poles M12 connector	Thermal current (Ith):	4 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	250 Vac 300 Vdc	Ue (V) 24 120 250
	Protection against short circuits:	fuse 4 A 500 V type gG	Ie (A) 4 4 4
	Pollution degree:	3	Direct current: DC13
			Ue (V) 24 125 250
			Ie (A) 4 1,1 0,4
with 8 poles M12 connector	Thermal current (Ith):	2 A	Alternate current: AC15 (50...60 Hz)
	Rated insulation voltage (Ui):	30 Vac 36 Vdc	Ue (V) 24
	Protection against short circuits:	fuse 2 A 500 V type gG	Ie (A) 2
	Pollution degree:	3	Direct current: DC13
			Ue (V) 24
			Ie (A) 2

Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 2, 11, 12, 20, 21, 22, 33, 34)
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (U_{imp}): 6 kV
4 kV (for contact blocks 20, 21, 22, 33, 34)
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: Za, Zb, Za+Za, Y+Y, X+X, Y+Y+X, Y+Y+Y, Y+X+X
Positive opening of contacts on contact block 5, 6, 7, 9, 11, 13, 14, 16, 18, 20, 21, 22, 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2006/95/CE.

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

Data type approved by UL

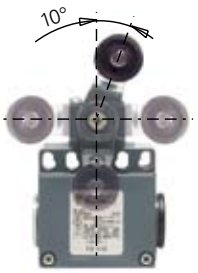
Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks except 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb in (0.8 Nm).
For contact blocks 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 14 AWG. Terminal tightening torque of 12 lb in (1.4 Nm).

In conformity with standard: UL 508

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

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

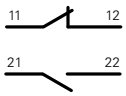
In all switches, it is possible to rotate the head in 90° steps.

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.

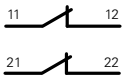
Lever turned to left

Contacts diagram



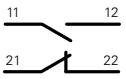
Lever not turned

Contacts diagram



Lever turned to right

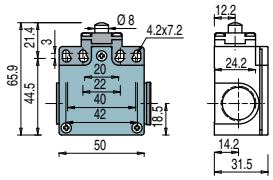
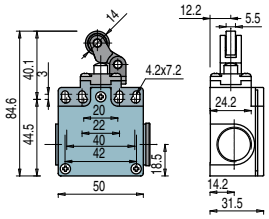
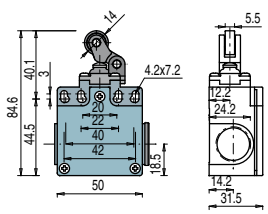
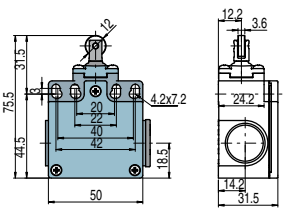
Contacts diagram

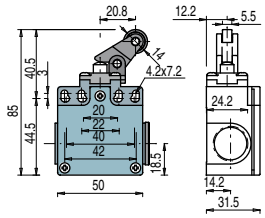
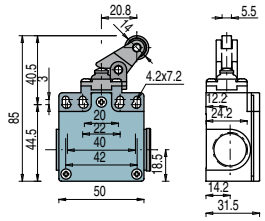
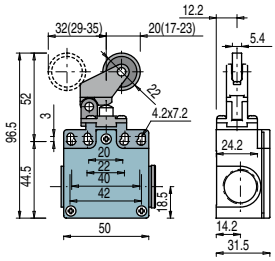
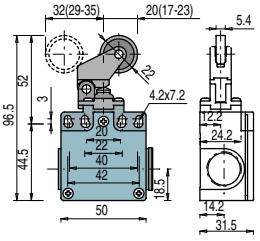


Position switches **FZ** series

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

Contact blocks				With stainless steel roller on request		With external rubber gasket With stainless steel roller on request		With external rubber gasket Ø 12 mm stainless steel roller	
									
5	R	FZ 501	1NO+1NC	FZ 502	1NO+1NC	FZ 5A2	1NO+1NC	FZ 5A4	1NO+1NC
6	L	FZ 601	1NO+1NC	FZ 602	1NO+1NC	FZ 6A2	1NO+1NC	FZ 6A4	1NO+1NC
7	LO	FZ 701	1NO+1NC	FZ 702	1NO+1NC	FZ 7A2	1NO+1NC	FZ 7A4	1NO+1NC
9	L	FZ 901	2NC	FZ 902	2NC	FZ 9A2	2NC	FZ 9A4	2NC
10	L	FZ 1001	2NO	FZ 1002	2NO	FZ 10A2	2NO	FZ 10A4	2NO
11	R	FZ 1101	2NC	FZ 1102	2NC	FZ 11A2	2NC	FZ 11A4	2NC
12	R	FZ 1201	2NO	FZ 1202	2NO	FZ 12A2	2NO	FZ 12A4	2NO
13	LV	FZ 1301	2NC	FZ 1302	2NC	FZ 13A2	2NC	FZ 13A4	2NC
14	LS	FZ 1401	2NC	FZ 1402	2NC	FZ 14A2	2NC	FZ 14A4	2NC
15	LS	FZ 1501	2NO	FZ 1502	2NO	FZ 15A2	2NO	FZ 15A4	2NO
18	LA	FZ 1801	1NO+1NC	FZ 1802	1NO+1NC	FZ 18A2	1NO+1NC	FZ 18A4	1NO+1NC
20	L	FZ 2001	1NO+2NC	FZ 2002	1NO+2NC	FZ 20A2	1NO+2NC	FZ 20A4	1NO+2NC
21	L	FZ 2101	3NC	FZ 2102	3NC	FZ 21A2	3NC	FZ 21A4	3NC
22	L	FZ 2201	2NO+1NC	FZ 2202	2NO+1NC	FZ 22A2	2NO+1NC	FZ 22A4	2NO+1NC
2	R	FZ 201	2x(1NO-1NC)	FZ 202	2x(1NO-1NC)	FZ 2A2	2x(1NO-1NC)	FZ 2A4	2x(1NO-1NC)
E1		FZ E101	1NO-1NC	FZ E102	1NO-1NC	FZ E1A2	1NO-1NC	FZ E1A4	1NO-1NC
Max speed		page 7/5 - type 4		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 5	
Min. force		8 N (25 N ⊖)		6 N (25 N ⊖)		4,3 N (25 N ⊖)		4,3 N (25 N ⊖)	
Travel diagrams		page 7/6 - group 1		page 7/6 - group 2		page 7/6 - group 2		page 7/6 - group 1	

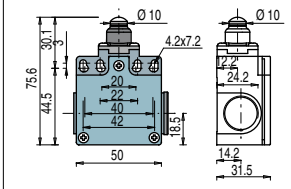
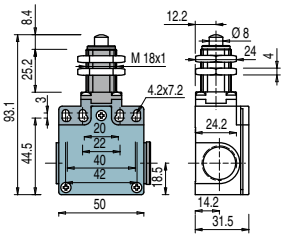
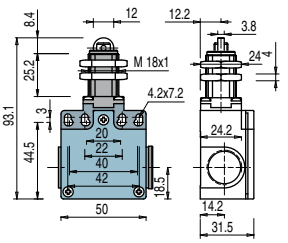
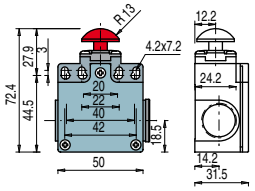
Contact blocks		With stainless steel roller on request		With external rubber gasket With stainless steel roller on request				With external rubber gasket	
									
5	R	FZ 505	1NO+1NC	FZ 5A5	1NO+1NC	FZ 507	1NO+1NC	FZ 5A7	1NO+1NC
6	L	FZ 605	1NO+1NC	FZ 6A5	1NO+1NC	FZ 607	1NO+1NC	FZ 6A7	1NO+1NC
7	LO	FZ 705	1NO+1NC	FZ 7A5	1NO+1NC	FZ 707	1NO+1NC	FZ 7A7	1NO+1NC
9	L	FZ 905	2NC	FZ 9A5	2NC	FZ 907	2NC	FZ 9A7	2NC
10	L	FZ 1005	2NO	FZ 10A5	2NO	FZ 1007	2NO	FZ 10A7	2NO
11	R	FZ 1105	2NC	FZ 11A5	2NC	FZ 1107	2NC	FZ 11A7	2NC
12	R	FZ 1205	2NO	FZ 12A5	2NO	FZ 1207	2NO	FZ 12A7	2NO
13	LV	FZ 1305	2NC	FZ 13A5	2NC	FZ 1307	2NC	FZ 13A7	2NC
14	LS	FZ 1405	2NC	FZ 14A5	2NC	FZ 1407	2NC	FZ 14A7	2NC
15	LS	FZ 1505	2NO	FZ 15A5	2NO	FZ 1507	2NO	FZ 15A7	2NO
18	LA	FZ 1805	1NO+1NC	FZ 18A5	1NO+1NC	FZ 1807	1NO+1NC	FZ 18A7	1NO+1NC
20	L	FZ 2005	1NO+2NC	FZ 20A5	1NO+2NC	FZ 2007	1NO+2NC	FZ 20A7	1NO+2NC
21	L	FZ 2105	3NC	FZ 21A5	3NC	FZ 2107	3NC	FZ 21A7	3NC
22	L	FZ 2205	2NO+1NC	FZ 22A5	2NO+1NC	FZ 2207	2NO+1NC	FZ 22A7	2NO+1NC
2	R	FZ 205	2x(1NO-1NC)	FZ 2A5	2x(1NO-1NC)	FZ 207	2x(1NO-1NC)	FZ 2A7	2x(1NO-1NC)
E1		FZ E105	1NO-1NC	FZ E1A5	1NO-1NC	FZ E107	1NO-1NC	FZ E1A7	1NO-1NC
Max speed		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 3		page 7/5 - type 3	
Min. force		6 N (25 N ⊖)		4,3 N (25 N ⊖)		4 N (25 N ⊖)		3 N (25 N ⊖)	
Travel diagrams		page 7/6 - group 2		page 7/6 - group 2		page 7/6 - group 3		page 7/6 - group 3	

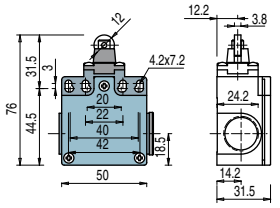
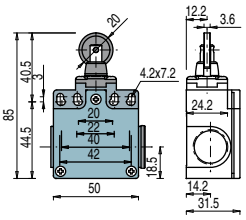
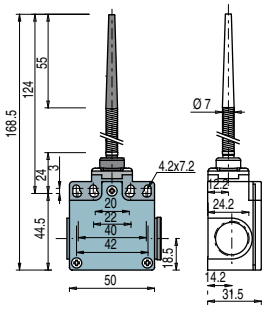
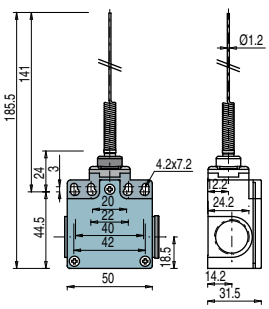
Accessories See page 6/1

All measures in the drawings are in mm

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted
LV = slow action shifted and spaced
LI = slow action independent
LA = slow action closer
= electronic PNP

Contact blocks		With external rubber gasket			
					
5	R	FZ 508 1NO+1NC	FZ 512 1NO+1NC	FZ 513 1NO+1NC	FZ 514 1NO+1NC
6	L	FZ 608 1NO+1NC	FZ 612 1NO+1NC	FZ 613 1NO+1NC	FZ 614 1NO+1NC
7	LO	FZ 708 1NO+1NC	FZ 712 1NO+1NC	FZ 713 1NO+1NC	FZ 714 1NO+1NC
9	L	FZ 908 2NC	FZ 912 2NC	FZ 913 2NC	FZ 914 2NC
10	L	FZ 1008 2NO	FZ 1012 2NO	FZ 1013 2NO	FZ 1014 2NO
11	R	FZ 1108 2NC	FZ 1112 2NC	FZ 1113 2NC	FZ 1114 2NC
12	R	FZ 1208 2NO	FZ 1212 2NO	FZ 1213 2NO	FZ 1214 2NO
13	LV	FZ 1308 2NC	FZ 1312 2NC	FZ 1313 2NC	FZ 1314 2NC
14	LS	FZ 1408 2NC	FZ 1412 2NC	FZ 1413 2NC	FZ 1414 2NC
15	LS	FZ 1508 2NO	FZ 1512 2NO	FZ 1513 2NO	FZ 1514 2NO
18	LA	FZ 1808 1NO+1NC	FZ 1812 1NO+1NC	FZ 1813 1NO+1NC	FZ 1814 1NO+1NC
20	L	FZ 2008 1NO+2NC	FZ 2012 1NO+2NC	FZ 2013 1NO+2NC	FZ 2014 1NO+2NC
21	L	FZ 2108 3NC	FZ 2112 3NC	FZ 2113 3NC	FZ 2114 3NC
22	L	FZ 2208 2NO+1NC	FZ 2212 2NO+1NC	FZ 2213 2NO+1NC	FZ 2214 2NO+1NC
2	R	FZ 208 2x(1NO-1NC)	FZ 212 2x(1NO-1NC)	FZ 213 2x(1NO-1NC)	FZ 214 2x(1NO-1NC)
E1		FZ E108 1NO-1NC	FZ E112 1NO-1NC	FZ E113 1NO-1NC	FZ E114 1NO-1NC
Max speed		page 7/5 - type 4	page 7/5 - type 4	page 7/5 - type 2	page 7/5 - type 4
Min. force		8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)	8 N (25 N ⊖)
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1

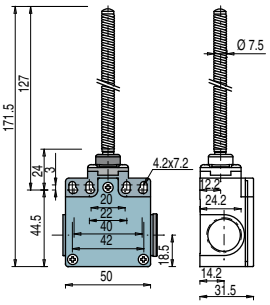
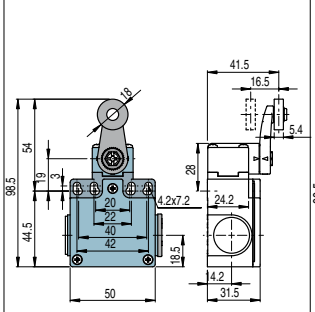
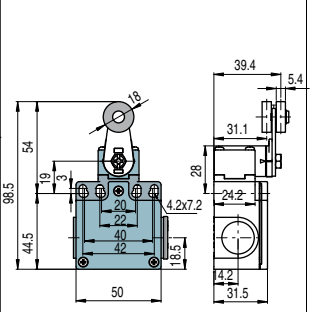
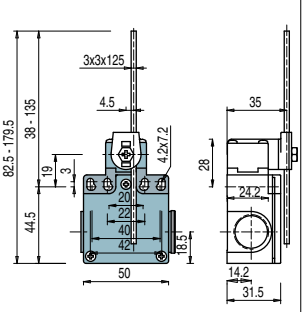
Contact blocks		Ø 12 mm stainless steel roller		With external rubber gasket	With external rubber gasket
					
5	R	FZ 515 1NO+1NC	FZ 516 1NO+1NC	FZ 520 1NO+1NC	FZ 521 1NO+1NC
6	L	FZ 615 1NO+1NC	FZ 616 1NO+1NC		
7	LO	FZ 715 1NO+1NC	FZ 716 1NO+1NC		
9	L	FZ 915 2NC	FZ 916 2NC		
10	L	FZ 1015 2NO	FZ 1016 2NO	FZ 1020 2NO	FZ 1021 2NO
11	R	FZ 1115 2NC	FZ 1116 2NC		
12	R	FZ 1215 2NO	FZ 1216 2NO	FZ 1220 2NO	FZ 1221 2NO
13	LV	FZ 1315 2NC	FZ 1316 2NC		
14	LS	FZ 1415 2NC	FZ 1416 2NC		
15	LS	FZ 1515 2NO	FZ 1516 2NO		
18	LA	FZ 1815 1NO+1NC	FZ 1816 1NO+1NC	FZ 1820 1NO+1NC	FZ 1821 1NO+1NC
20	L	FZ 2015 1NO+2NC	FZ 2016 1NO+2NC	FZ 2020 1NO+2NC	FZ 2021 1NO+2NC
21	L	FZ 2115 3NC	FZ 2116 3NC	FZ 2120 3NC	FZ 2121 3NC
22	L	FZ 2215 2NO+1NC	FZ 2216 2NO+1NC	FZ 2220 2NO+1NC	FZ 2221 2NO+1NC
2	R	FZ 215 2x(1NO-1NC)	FZ 216 2x(1NO-1NC)	FZ 220 2x(1NO-1NC)	FZ 221 2x(1NO-1NC)
E1		FZ E115 1NO-1NC	FZ E116 1NO-1NC	FZ E120 1NO-1NC	FZ E121 1NO-1NC
Max speed		page 7/5 - type 2	page 7/5 - type 2	1 m/s	1 m/s
Min. force		8 N (25 N ⊖)	8 N (25 N ⊖)	0,07 Nm	0,07 Nm
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 4	page 7/6 - group 4

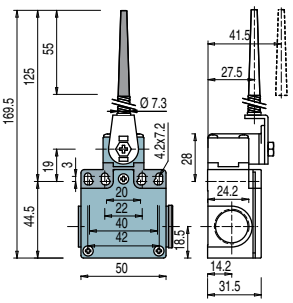
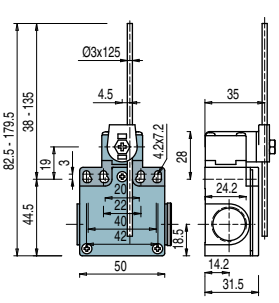
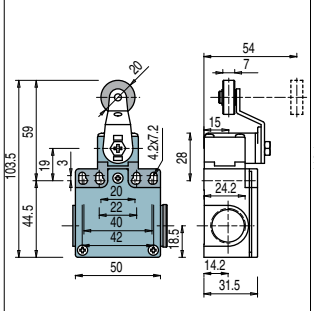
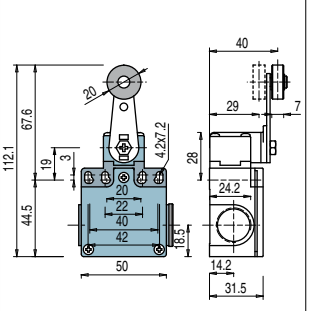
Items with code on the **green** background are available in stock

Position switches **FZ** series

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

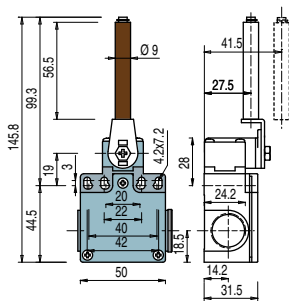
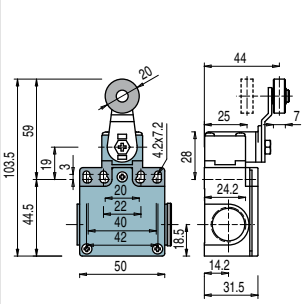
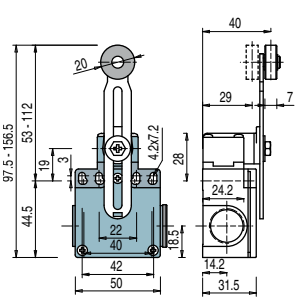
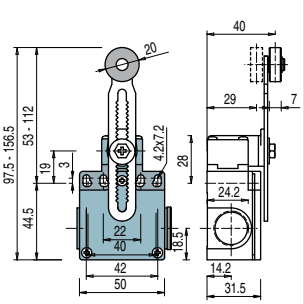
Contact blocks		With external rubber gasket		With Ø 20 mm stainless steel roller on request		Other rollers available. See page 2/88		3x3 mm square rod	
									
5	R	FZ 525	1NO+1NC	FZ 530	1NO+1NC	FZ 531	1NO+1NC	FZ 533	1NO+1NC
6	L			FZ 630	1NO+1NC	FZ 631	1NO+1NC	FZ 633	1NO+1NC
7	LO			FZ 730	1NO+1NC	FZ 731	1NO+1NC	FZ 733	1NO+1NC
9	L			FZ 930	2NC	FZ 931	2NC	FZ 933	2NC
10	L	FZ 1025	2NO	FZ 1030	2NO	FZ 1031	2NO	FZ 1033	2NO
11	R			FZ 1130	2NC	FZ 1131	2NC	FZ 1133	2NC
12	R	FZ 1225	2NO	FZ 1230	2NO	FZ 1231	2NO	FZ 1233	2NO
13	LV			FZ 1330	2NC	FZ 1331	2NC	FZ 1333	2NC
14	LS			FZ 1430	2NC	FZ 1431	2NC	FZ 1433	2NC
15	LS			FZ 1530	2NO	FZ 1531	2NO	FZ 1533	2NO
16	LI			FZ 1630	2NC	FZ 1631	2NC	FZ 1633	2NC
18	LA	FZ 1825	1NO+1NC	FZ 1830	1NO+1NC	FZ 1831	1NO+1NC	FZ 1833	1NO+1NC
20	L	FZ 2025	1NO+2NC	FZ 2030	1NO+2NC	FZ 2031	1NO+2NC	FZ 2033	1NO+2NC
21	L	FZ 2125	3NC	FZ 2130	3NC	FZ 2131	3NC	FZ 2133	3NC
22	L	FZ 2225	2NO+1NC	FZ 2230	2NO+1NC	FZ 2231	2NO+1NC	FZ 2233	2NO+1NC
2	R	FZ 225	2x(1NO-1NC)	FZ 230	2x(1NO-1NC)	FZ 231	2x(1NO-1NC)	FZ 233	2x(1NO-1NC)
E1		FZ E125	1NO-1NC	FZ E130	1NO-1NC	FZ E131	1NO-1NC	FZ E133	1NO-1NC
Max speed		1 m/s		page 7/5 - type 1		page 7/5 - type 1		1,5 m/s	
Min. force		0,12 Nm		0,06 Nm (0,25 Nm)		0,06 Nm (0,25 Nm)		0,06 Nm	
Travel diagrams		page 7/6 - group 4		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5	

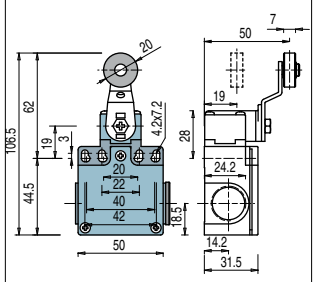
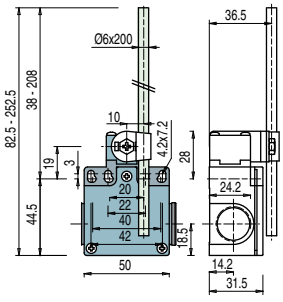
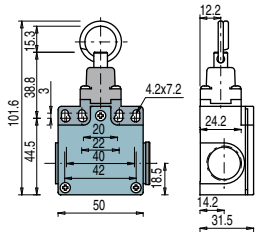
Contact blocks				Ø 3 mm stainless steel round rod 		Other rollers available. See page 2/88 		Other rollers available. See page 2/88 	
5	R	FZ 534	1NO+1NC	FZ 550	1NO+1NC	FZ 551	1NO+1NC	FZ 552	1NO+1NC
6	L	FZ 634	1NO+1NC	FZ 650	1NO+1NC	FZ 651	1NO+1NC	FZ 652	1NO+1NC
7	LO	FZ 734	1NO+1NC	FZ 750	1NO+1NC	FZ 751	1NO+1NC	FZ 752	1NO+1NC
9	L	FZ 934	2NC	FZ 950	2NC	FZ 951	2NC	FZ 952	2NC
10	L	FZ 1034	2NO	FZ 1050	2NO	FZ 1051	2NO	FZ 1052	2NO
11	R	FZ 1134	2NC	FZ 1150	2NC	FZ 1151	2NC	FZ 1152	2NC
12	R	FZ 1234	2NO	FZ 1250	2NO	FZ 1251	2NO	FZ 1252	2NO
13	LV	FZ 1334	2NC	FZ 1350	2NC	FZ 1351	2NC	FZ 1352	2NC
14	LS	FZ 1434	2NC	FZ 1450	2NC	FZ 1451	2NC	FZ 1452	2NC
15	LS	FZ 1534	2NO	FZ 1550	2NO	FZ 1551	2NO	FZ 1552	2NO
16	LI	FZ 1634	2NC	FZ 1650	2NC	FZ 1651	2NC	FZ 1652	2NC
18	LA	FZ 1834	1NO+1NC	FZ 1850	1NO+1NC	FZ 1851	1NO+1NC	FZ 1852	1NO+1NC
20	L	FZ 2034	1NO+2NC	FZ 2050	1NO+2NC	FZ 2051	1NO+2NC	FZ 2052	1NO+2NC
21	L	FZ 2134	3NC	FZ 2150	3NC	FZ 2151	3NC	FZ 2152	3NC
22	L	FZ 2234	2NO+1NC	FZ 2250	2NO+1NC	FZ 2251	2NO+1NC	FZ 2252	2NO+1NC
2	R	FZ 234	2x(1NO-1NC)	FZ 250	2x(1NO-1NC)	FZ 251	2x(1NO-1NC)	FZ 252	2x(1NO-1NC)
E1		FZ E134	1NO-1NC	FZ E150	1NO-1NC	FZ E151	1NO-1NC	FZ E152	1NO-1NC
Max speed		1,5 m/s		1,5 m/s		page 7/5 - type 1		page 7/5 - type 1	
Min. force		0,06 Nm		0,06 Nm		0,06 Nm (0,25 Nm)		0,06 Nm (0,25 Nm)	
Travel diagrams		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5		page 7/6 - group 5	

Accessories See page 6/1

Contacts type:

R = snap action
L = slow action
LO = slow action overlapped
LS = slow action shifted
LV = slow action shifted and spaced
LI = slow action independent
LA = slow action closer
= electronic PNP

Contact blocks		Porcelain roller	Other rollers available. See page 2/88	Other rollers available. See page 2/88	Other rollers available. See page 2/88
					
5	R	FZ 553-E0V9 → 1NO+1NC	FZ 554 → 1NO+1NC	FZ 555 → (1) 1NO+1NC	FZ 556 → 1NO+1NC
6	L	FZ 653-E0V9 → 1NO+1NC	FZ 654 → 1NO+1NC	FZ 655 → (1) 1NO+1NC	FZ 656 → 1NO+1NC
7	LO	FZ 753-E0V9 → 1NO+1NC	FZ 754 → 1NO+1NC	FZ 755 → (1) 1NO+1NC	FZ 756 → 1NO+1NC
9	L	FZ 953-E0V9 → 2NC	FZ 954 → 2NC	FZ 955 → (1) 2NC	FZ 956 → 2NC
10	L	FZ 1053-E0V9 2NO	FZ 1054 2NO	FZ 1055 2NO	FZ 1056 2NO
11	R		FZ 1154 → 2NC	FZ 1155 → (1) 2NC	FZ 1156 → 2NC
12	R	FZ 1253-E0V9 2NO	FZ 1254 2NO	FZ 1255 2NO	FZ 1256 2NO
13	LV	FZ 1353-E0V9 → 2NC	FZ 1354 → 2NC	FZ 1355 → (1) 2NC	FZ 1356 → 2NC
14	LS	FZ 1453-E0V9 → 2NC	FZ 1454 → 2NC	FZ 1455 → (1) 2NC	FZ 1456 → 2NC
15	LS	FZ 1553-E0V9 2NO	FZ 1554 2NO	FZ 1555 2NO	FZ 1556 2NO
16	LI		FZ 1654 → 2NC	FZ 1655 → (1) 2NC	FZ 1656 → 2NC
18	LA	FZ 1853-E0V9 → 1NO+1NC	FZ 1854 → 1NO+1NC	FZ 1855 → (1) 1NO+1NC	FZ 1856 → 1NO+1NC
20	L	FZ 2053-E0V9 → 1NO+2NC	FZ 2054 → 1NO+2NC	FZ 2055 → (1) 1NO+2NC	FZ 2056 → 1NO+2NC
21	L	FZ 2153-E0V9 → 3NC	FZ 2154 → 3NC	FZ 2155 → (1) 3NC	FZ 2156 → 3NC
22	L	FZ 2253-E0V9 → 2NO+1NC	FZ 2254 → 2NO+1NC	FZ 2255 → (1) 2NO+1NC	FZ 2256 → 2NO+1NC
2	R	FZ 253-E0 2x(1NO-1NC)	FZ 254 2x(1NO-1NC)	FZ 255 2x(1NO-1NC)	FZ 256 2x(1NO-1NC)
E1		FZ E153-E0V9 1NO-1NC	FZ E154 1NO-1NC	FZ E155 1NO-1NC	FZ E156 1NO-1NC
Max speed		0,5 m/s	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,03 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 7/6 - group 6	page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5

Contact blocks		Other rollers available. See page 2/88	Fiber glass rod	Rope switches for signalling	
					
5	R	FZ 557 → 1NO+1NC	FZ 569 1NO+1NC	FZ 576 1NO+1NC	
6	L	FZ 657 → 1NO+1NC	FZ 669 1NO+1NC	FZ 676 1NO+1NC	
7	LO	FZ 757 → 1NO+1NC	FZ 769 1NO+1NC	FZ 776 1NO+1NC	
9	L	FZ 957 → 2NC	FZ 969 2NC	FZ 976 2NO	
10	L	FZ 1057 2NO	FZ 1069 2NO	FZ 1076 2NC	
11	R	FZ 1157 → 2NC	FZ 1169 2NC	FZ 1176 2NO	
12	R	FZ 1257 2NO	FZ 1269 2NO	FZ 1276 2NC	
13	LV	FZ 1357 → 2NC	FZ 1369 2NC	FZ 1376 2NO	
14	LS	FZ 1457 → 2NC	FZ 1469 2NC	FZ 1476 2NO	
15	LS	FZ 1557 2NO	FZ 1569 2NO	FZ 1576 2NC	
16	LI	FZ 1657 → 2NC	FZ 1669 2NC		
18	LA	FZ 1857 → 1NO+1NC	FZ 1869 1NO+1NC	FZ 1876 1NO+1NC	
20	L	FZ 2057 → 1NO+2NC	FZ 2069 1NO+2NC	FZ 2076 2NO+1NC	
21	L	FZ 2157 → 3NC	FZ 2169 3NC	FZ 2176 3NO	
22	L	FZ 2257 → 2NO+1NC	FZ 2269 2NO+1NC	FZ 2276 1NO+2NC	
2	R	FZ 257 2x(1NO-1NC)	FZ 269 2x(1NO-1NC)	FZ 276 2x(1NO-1NC)	
E1		FZ E157 1NO-1NC	FZ E169 1NO-1NC		
Max speed		page 7/5 - type 1	1,5 m/s	0,5 m/s	
Min. force		0,06 Nm (0,25 Nm →)	0,06 Nm	initial 20 N - final 40 N	
Travel diagrams		page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 7	

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

(1) Positive opening only with lever adjusted on the max. See page 2/87.

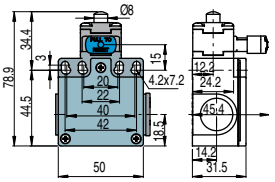
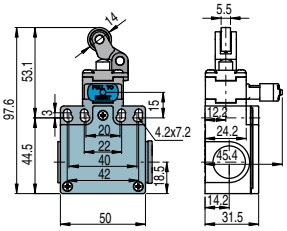
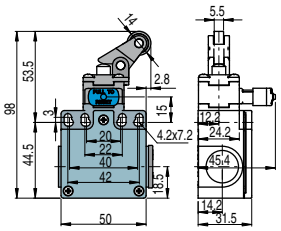
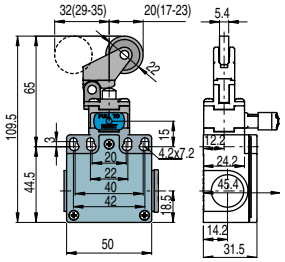
Position switches **FZ** series with reset

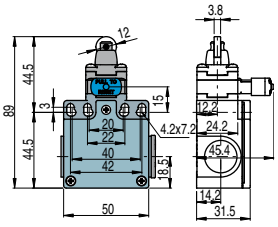
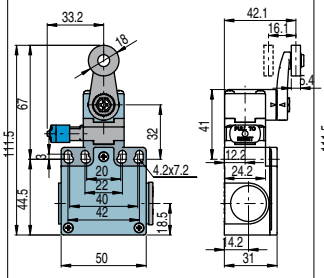
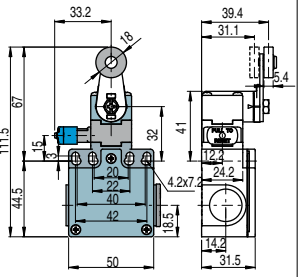
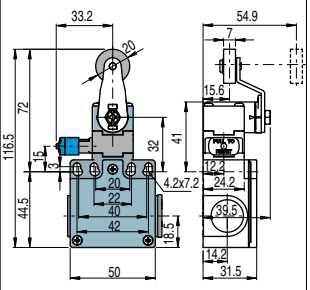
Pizzato Elettrica has developed a reset device code W3 to make perfectly simultaneous the actuator and the contact block tripping. The new device is a block inserted between the switch body and the head, and could be rotated independently from this last one. This new device has following advantages:

- The reset device integrate in almost all standard actuation head
- Contact blocks with snap action are no more necessary because the tripping movement is made by the reset device itself
- The reset device can be rotated independently from the head for the maximum flexibility during the assembling
- Two driving forces: standard and increased for applications with vibrations
- Mechanical endurance: 1 million operations cycles.

Contacts type:

R = snap action
L = slow action

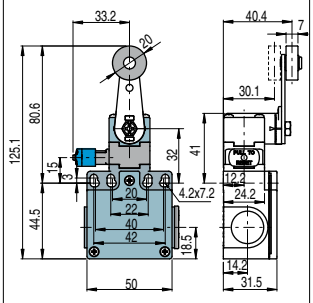
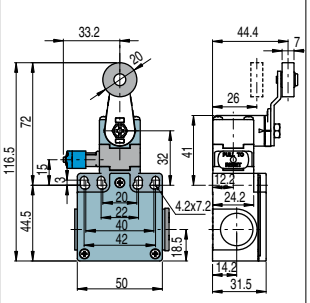
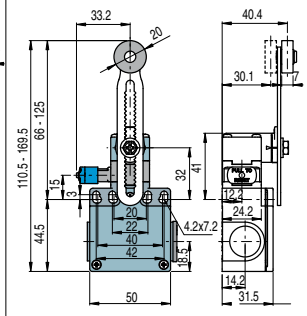
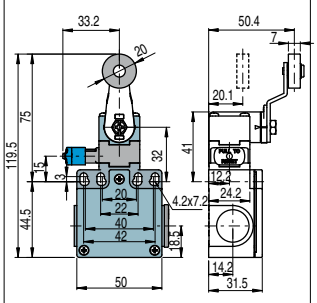
Contact blocks					
			With stainless steel roller on request 	With stainless steel roller on request 	
6	L	FZ 601-W3 1NO+1NC	FZ 602-W3 1NO+1NC	FZ 605-W3 1NO+1NC	FZ 607-W3 1NO+1NC
9	L	FZ 901-W3 2NC	FZ 902-W3 2NC	FZ 905-W3 2NC	FZ 907-W3 2NC
10	L	FZ 1001-W3 2NO	FZ 1002-W3 2NO	FZ 1005-W3 2NO	FZ 1007-W3 2NO
20	L	FZ 2001-W3 1NO+2NC	FZ 2002-W3 1NO+2NC	FZ 2005-W3 1NO+2NC	FZ 2007-W3 1NO+2NC
21	L	FZ 2101-W3 3NC	FZ 2102-W3 3NC	FZ 2105-W3 3NC	FZ 2107-W3 3NC
22	L	FZ 2201-W3 2NO+1NC	FZ 2202-W3 2NO+1NC	FZ 2205-W3 2NO+1NC	FZ 2207-W3 2NO+1NC
2	R	FZ 201-W3 2NO+2NC	FZ 202-W3 2NO+2NC	FZ 205-W3 2NO+2NC	FZ 207-W3 2NO+2NC
Max speed		page 7/5 - type 4	page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 3
Min. force		4,5 N (25 N →)	4 N (25 N →)	4 N (25 N →)	2,5 N (25 N →)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 2	page 7/7 - group 2	page 7/7 - group 3

Contact blocks			With Ø 20 mm stainless steel roller on request	Other rollers available. See page 2/88	Other rollers available. See page 2/88
					
6	L	FZ 615-W3 1NO+1NC	FZ 630-W3 1NO+1NC	FZ 631-W3 1NO+1NC	FZ 651-W3 1NO+1NC
9	L	FZ 915-W3 2NC	FZ 930-W3 2NC	FZ 931-W3 2NC	FZ 951-W3 2NC
10	L	FZ 1015-W3 2NO	FZ 1030-W3 2NO	FZ 1031-W3 2NO	FZ 1051-W3 2NO
20	L	FZ 2015-W3 1NO+2NC	FZ 2030-W3 1NO+2NC	FZ 2031-W3 1NO+2NC	FZ 2051-W3 1NO+2NC
21	L	FZ 2115-W3 3NC	FZ 2130-W3 3NC	FZ 2131-W3 3NC	FZ 2151-W3 3NC
22	L	FZ 2215-W3 2NO+1NC	FZ 2230-W3 2NO+1NC	FZ 2231-W3 2NO+1NC	FZ 2251-W3 2NO+1NC
2	R	FZ 215-W3 2NO+2NC	FZ 230-W3 2NO+2NC	FZ 231-W3 2NO+2NC	FZ 251-W3 2NO+2NC
Max speed		page 7/5 - type 2	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		4,5 N (25 N →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

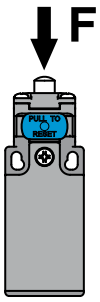
Accessories See page 6/1

Contacts type:

R = snap action
L = slow action

Contact blocks		Other rollers available. See page 2/88	Other rollers available. See page 2/88	Other rollers available. See page 2/88	Other rollers available. See page 2/88
					
6	L	FZ 652-W3 → 1NO+1NC	FZ 654-W3 → 1NO+1NC	FZ 656-W3 → 1NO+1NC	FZ 657-W3 → 1NO+1NC
9	L	FZ 952-W3 → 2NC	FZ 954-W3 → 2NC	FZ 956-W3 → 2NC	FZ 957-W3 → 2NC
10	L	FZ 1052-W3 2NO	FZ 1054-W3 2NO	FZ 1056-W3 2NO	FZ 1057-W3 2NO
20	L	FZ 2052-W3 → 1NO+2NC	FZ 2054-W3 → 1NO+2NC	FZ 2056-W3 → 1NO+2NC	FZ 2057-W3 → 1NO+2NC
21	L	FZ 2152-W3 → 3NC	FZ 2154-W3 → 3NC	FZ 2156-W3 → 3NC	FZ 2157-W3 → 3NC
22	L	FZ 2252-W3 → 2NO+1NC	FZ 2254-W3 → 2NO+1NC	FZ 2256-W3 → 2NO+1NC	FZ 2257-W3 → 2NO+1NC
2	R	FZ 252-W3 2NO+2NC	FZ 254-W3 2NO+2NC	FZ 256-W3 2NO+2NC	FZ 257-W3 2NO+2NC
Max speed		page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)
Travel diagrams		page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

Increased actuating force



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

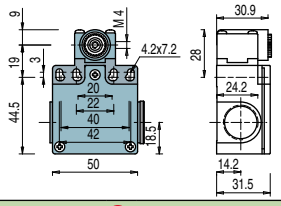
Actuator	Force
01, 14, 15, 16	7 N
02, 05	6 N
07	3,5 N
30 ... 57	0,08 Nm

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

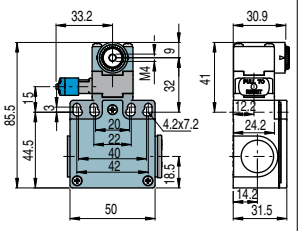
Position switches with revolving lever without actuator

Contacts type:

- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



With manual reset knob



Contact blocks					
5	R	FZ 538	1NO+1NC		
6	L	FZ 638	1NO+1NC	FZ 638-W3	1NO+1NC
7	LO	FZ 738	1NO+1NC		
9	L	FZ 938	2NC	FZ 938-W3	2NC
10	L	FZ 1038	2NO	FZ 1038-W3	2NO
11	R	FZ 1138	2NC		
12	R	FZ 1238	2NO		
13	LV	FZ 1338	2NC		
14	LS	FZ 1438	2NC		
15	LS	FZ 1538	2NO		
16	LI	FZ 1638	2NC		
18	LA	FZ 1838	1NO+1NC		
20	L	FZ 2038	1NO+2NC	FZ 2038-W3	1NO+2NC
21	L	FZ 2138	3NC	FZ 2138-W3	3NC
22	L	FZ 2238	2NO+1NC	FZ 2238-W3	2NO+1NC
2	R	FZ 238	2x(1NO-1NC)	FZ 238-W3	2NO+2NC
E1		FZ E138	1NO-1NC		
Min. force		0,06 Nm (0,25 Nm ⊖)		0,07 Nm (0,25 Nm ⊖)	
Travel diagrams		page 7/6 - group 5		page 7/7 - group 4	

IMPORTANT

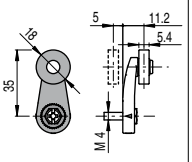
For safety applications: join only switches and actuators marked with symbol ⊖.

For more information about safety applications see page 7/1.

Loose actuators

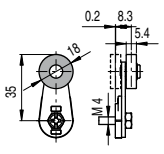
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Polymer roller Ø 18 mm



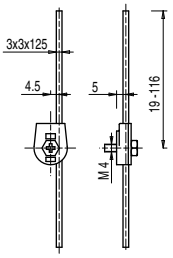
VF LE30 ⊖

Polymer roller Ø 18 mm



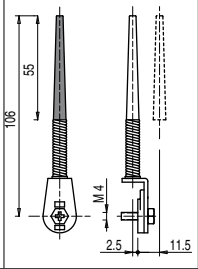
VF LE31 ⊖

Adjustable square rod 3x3x125 mm



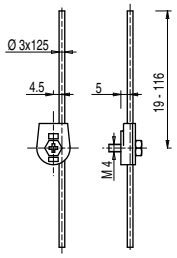
VF LE33

Flexible rod actuator



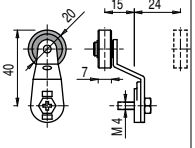
VF LE34

Adjustable round rod Ø 3x125 mm



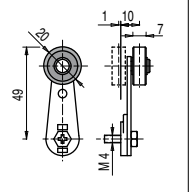
VF LE50

Polymer roller Ø 20 mm



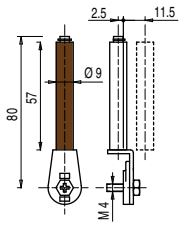
VF LE51 ⊖

Polymer roller Ø 20 mm



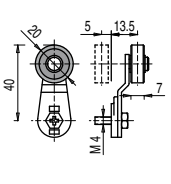
VF LE52 ⊖

Porcelain roller



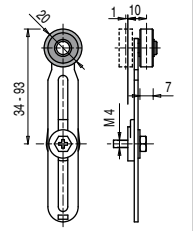
VF LE53 ⊖ [2]

Polymer roller Ø 20 mm



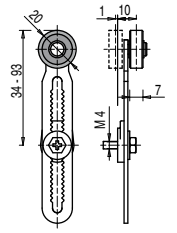
VF LE54 ⊖

Adjustable actuator with polymer roller



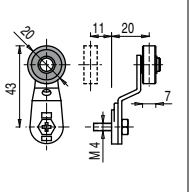
VF LE55 ⊖ [1]

Adjustable safety actuator with polymer roller



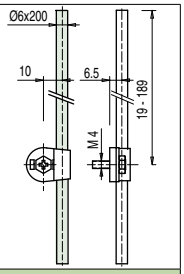
VF LE56 ⊖

Polymer roller Ø 20 mm



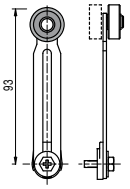
VF LE57 ⊖

Adjustable fiber glass rod



VF LE69

- 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.
- [2] The position switch obtained by assembling the switch FZ •38 (e.g. FZ 538, FZ 638) with the actuator VF LE53 will not present the same travel diagrams and actuating forces as the position switch FZ •53-E0V9 (e.g. FZ 553-E0V9, FZ 653-E0V9...).
- [4] The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

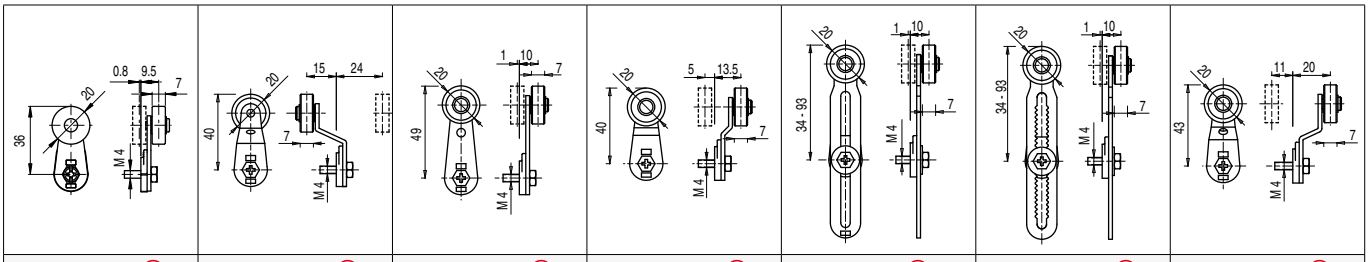


Accessories See page 6/1

Special loose actuators

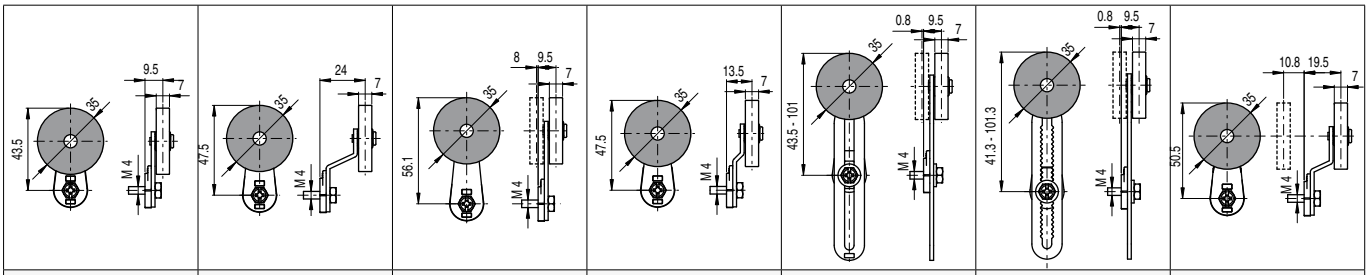
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Ø 20 mm stainless steel rollers



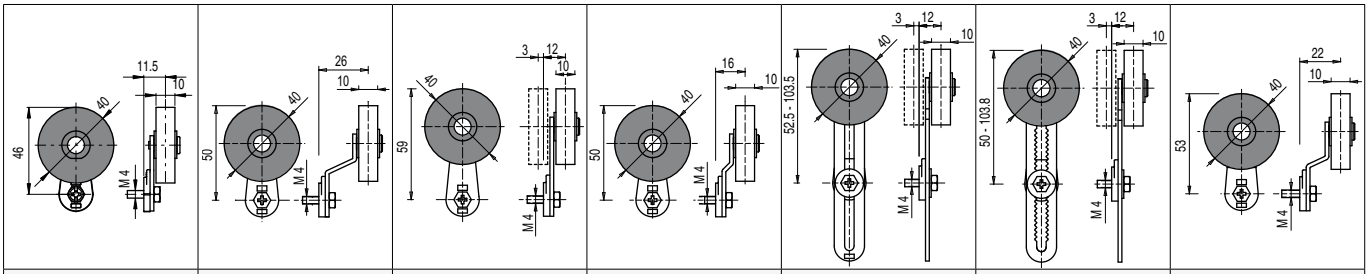
VF LE31-1 | VF LE51-1 | VF LE52-1 | VF LE54-1 | VF LE55-1 (1) | VF LE56-1 | VF LE57-1

Ø 35 mm polymer rollers



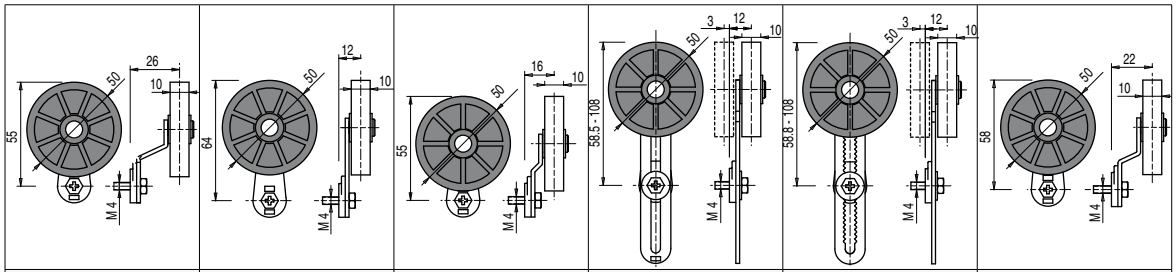
VF LE31-2 (4) | VF LE51-2 (4) | VF LE52-2 | VF LE54-2 (4) | VF LE55-2 (1) | VF LE56-2 | VF LE57-2

Ø 40 mm rubber rollers



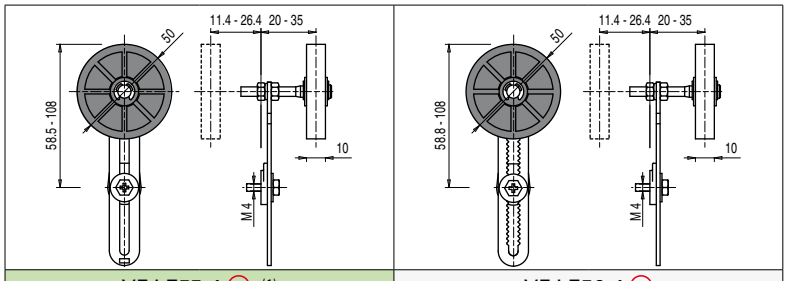
VF LE31-R5 (4) | VF LE51-R5 (4) | VF LE52-R5 | VF LE54-R5 (4) | VF LE55-R5 (1) | VF LE56-R5 | VF LE57-R5 (4)

Ø 50 mm rubber rollers



VF LE51-3 (4) | VF LE52-3 (4) | VF LE54-3 (4) | VF LE55-3 (1) | VF LE56-3 | VF LE57-3 (4)

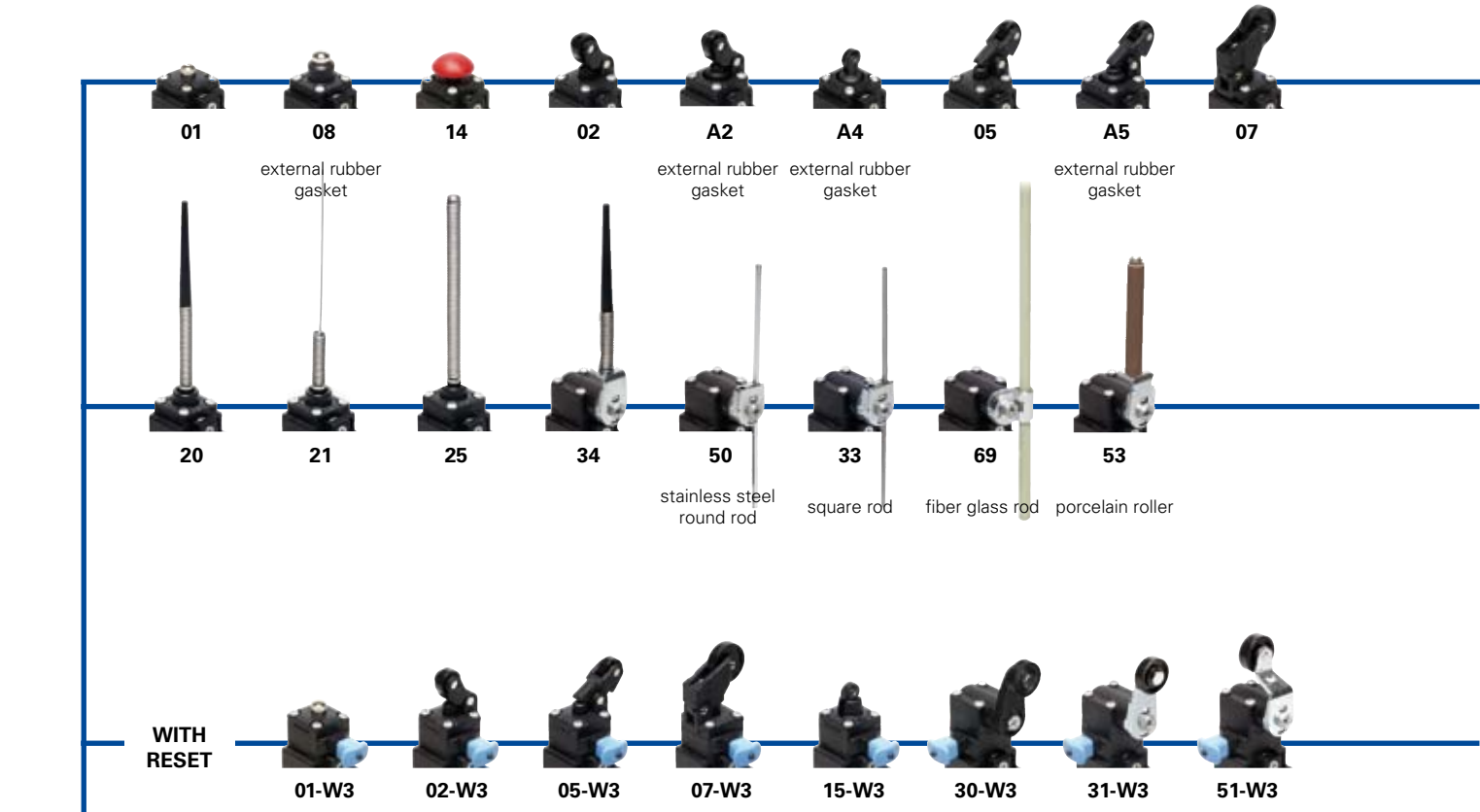
Ø 50 mm overhanging rubber rollers



VF LE55-4 (1) | VF LE56-4

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

Selection diagram



Threaded conduit entry	
	PG 11 (standard)
M1	M16x1,5

With assembled cable gland	
K22	for Ø 5 to Ø 10 mm cables range
K26	for Ø 3 to Ø 7 mm cables range

product option

accessory sold separately

A7 external rubber gasket

15 Ø 11 mm roller

15-1 stainless steel Ø 12 mm roller

16 Ø 20 mm roller

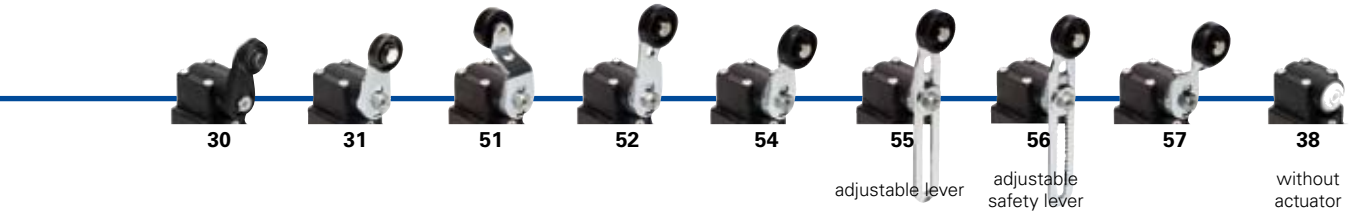
10

17 stainless steel Ø 12 mm roller

12

13 stainless steel Ø 12 mm roller

76 rope switches for signalling



30

31

51

52

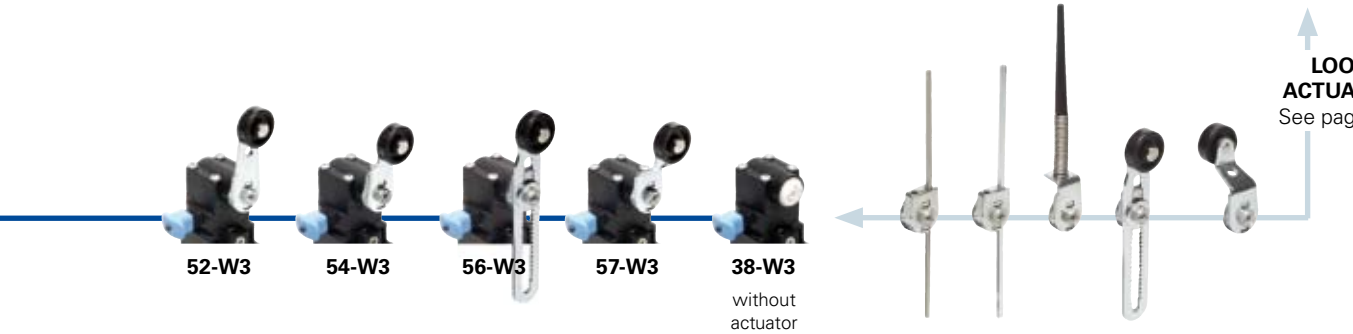
54

55 adjustable lever

56 adjustable safety lever

57

38 without actuator



52-W3

54-W3

56-W3

57-W3

38-W3 without actuator

LOOSE ACTUATORS
See page 2/97

Code structure

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

article | options

FK 302-1W3XGM1K22

Housing

FK	polymer housing, one conduit entry

Contact blocks

3	1NO-1NC, snap action
33	1NO+1NC, slow action
34	2NC, slow action

Actuators

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

Suffix

	no suffix (standard)
1	with stainless steel roller: - Ø 12 mm for actuator A4, 15 - Ø 14 mm for actuators A2, 02, A5, 05 - Ø 20 mm for actuators 30, 31, 51, 52, 54, 55, 56, 57
2	with Ø 35 mm polymer roller (see special loose actuators on page 2/98)
3	with Ø 50 mm rubber roller (see special loose actuators on page 2/98)
4	with Ø 50 mm overhanging rubber roller (see special loose actuators on page 2/98)

Preinstalled cable gland

	no cable gland (standard)
K22	assembled cable gland (see conduit entry page 2/89)
K26	assembled cable gland (see conduit entry page 2/89)

Threaded conduit entry

	PG 11 (standard)
M1	M16x1,5

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm (contact block 3 excluded)

External metallic parts

	zinc plated steel (standard)
X	stainless steel

Reset hooking

	without reset (standard)
W3	simultaneous reset
W4	simultaneous reset with increased force

Main data

- Polymer housing, one conduit entry
- Protection degree IP67
- 3 contact blocks available
- 46 actuators available
- External stainless steel parts versions
- Silver contacts gold plated versions

Markings and quality marks:

Approval IMQ:	EG610
Approval UL:	E131787
Approval CCC:	2007010305230013
Approval EZU:	1010151
Approval GOST:	POCC IT.AB24.B04512

Technical data

Housing

Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation ⧈
One threaded conduit entry
Protection degree: IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

Ambient temperature:	from -25°C to +80°C
Version for operation in ambient temperature from -40°C to +80° C on request	
Max actuation frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	20 million operations cycles[1]
Assembling position:	any
Driving torque for installation:	see pages 7/1-7/12

(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 33, 34:	min.	1 x 0,34 mm²	(1 x AWG 22)
	max.	2 x 1,5 mm²	(2 x AWG 16)
Contact blocks 3:	min.	1 x 0,5 mm²	(1 x AWG 20)
	max.	2 x 1,5 mm²	(2 x AWG 16)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 60529, EN 60529, 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 Electromagnetic Compatibility 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, 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 EN 60947-5-1, encl. K, par. 2**. The switch must be actuated with **at least up to the positive opening travel** shown in the travels diagrams on page 7/6. 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.

⚠ **If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 7/1 to page 7/12.**

Electrical data

without connector

Thermal current (Ith):	10 A
Rated insulation voltage (Ui):	500 Vac 600 Vdc 400 Vac 500 Vdc (contact blocks 33, 34)
Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV (contact blocks 33, 34)
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, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 33, 34)
Thermal current (Ith): 10 A
Protection against short circuits: fuse 10 A 500 V type aM
Rated impulse withstand voltage (U_{imp}): 6 kV
4 kV (for contact blocks 33, 34)
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,
Positive opening of contacts on contact block 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2006/95/CE.

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

Data type approved by UL

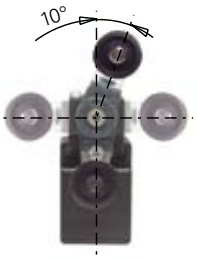
Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks except 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb in (0.8 Nm).
For contact blocks 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 14 AWG. Terminal tightening torque of 12 lb in (1.4 Nm).

In conformity with standard: UL 508

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

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.

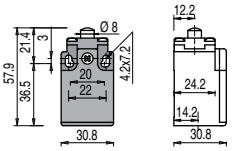
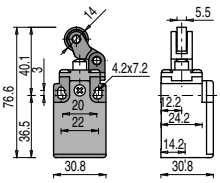
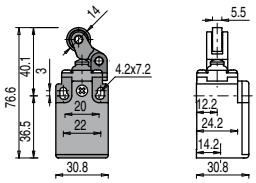
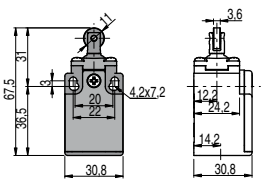
Rotating heads

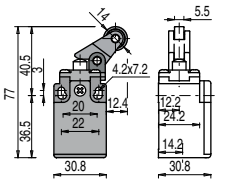
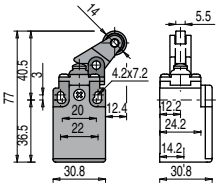
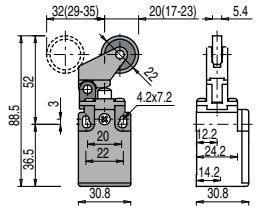
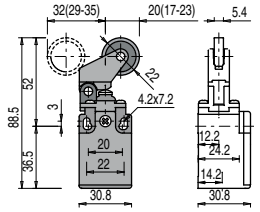
In all switches, it is possible to rotate the head in 90° steps.

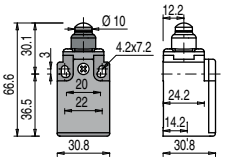
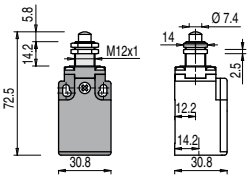
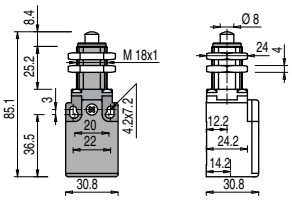
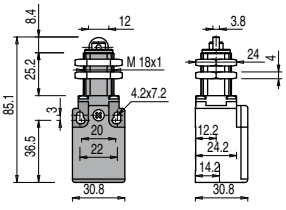
Position switches **FK** series

Contacts type:

R = snap action
L = slow action

Contact blocks					
			With stainless steel roller on request 	With external rubber gasket With stainless steel roller on request 	With external rubber gasket With Ø 12 mm stainless steel roller on request 
3	R	FK 301 1NO-1NC	FK 302 1NO-1NC	FK 3A2 1NO-1NC	FK 3A4 1NO-1NC
33	L	FK 3301 ⊕ 1NO+1NC	FK 3302 ⊕ 1NO+1NC	FK 33A2 ⊕ 1NO+1NC	FK 33A4 ⊕ 1NO+1NC
34	L	FK 3401 ⊕ 2NC	FK 3402 ⊕ 2NC	FK 34A2 ⊕ 2NC	FK 34A4 ⊕ 2NC
Max speed		page 7/5 - type 4	page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 5
Min. force		5 N (25 N ⊕)	4 N (25 N ⊕)	4,3 N (25 N ⊕)	4,3 N (25 N ⊕)
Travel diagrams		page 7/6 - group 1	page 7/6 - group 2	page 7/6 - group 2	page 7/6 - group 1

Contact blocks					
		With stainless steel roller on request 	With external rubber gasket With stainless steel roller on request 		With external rubber gasket 
3	R	FK 305 1NO-1NC	FK 3A5 1NO-1NC	FK 307 1NO-1NC	FK 3A7 1NO-1NC
33	L	FK 3305 ⊕ 1NO+1NC	FK 33A5 ⊕ 1NO+1NC	FK 3307 ⊕ 1NO+1NC	FK 33A7 ⊕ 1NO+1NC
34	L	FK 3405 ⊕ 2NC	FK 34A5 ⊕ 2NC	FK 3407 ⊕ 2NC	FK 34A7 ⊕ 2NC
Max speed		page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 3
Min. force		4 N (25 N ⊕)	4,3 N (25 N ⊕)	4 N (25 N ⊕)	3 N (25 N ⊕)
Travel diagrams		page 7/6 - group 2	page 7/6 - group 2	page 7/6 - group 3	page 7/6 - group 3

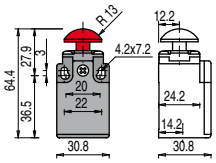
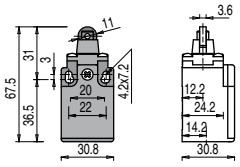
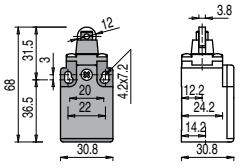
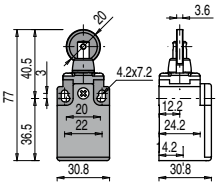
Contact blocks					
		With external rubber gasket 	Fixed only by threaded head in vertical position 		
3	R	FK 308 1NO-1NC	FK 310 1NO-1NC	FK 312 1NO-1NC	FK 313 1NO-1NC
33	L	FK 3308 ⊕ 1NO+1NC	FK 3310 ⊕ 1NO+1NC	FK 3312 ⊕ 1NO+1NC	FK 3313 ⊕ 1NO+1NC
34	L	FK 3408 ⊕ 2NC	FK 3410 ⊕ 2NC	FK 3412 ⊕ 2NC	FK 3413 ⊕ 2NC
Max speed		page 7/5 - type 4	page 7/5 - type 4	page 7/5 - type 4	page 7/5 - type 2
Min. force		5 N (25 N ⊕)	5 N (25 N ⊕)	5 N (25 N ⊕)	5 N (25 N ⊕)
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1

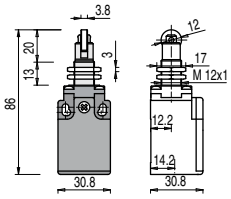
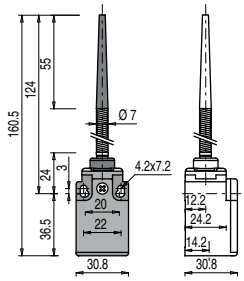
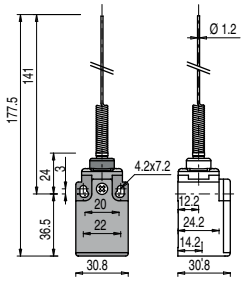
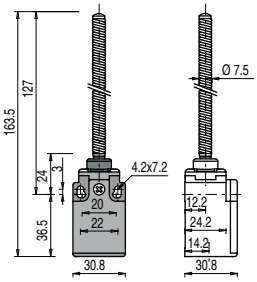
Accessories See page 6/1

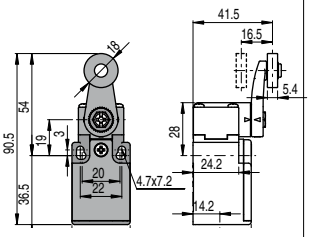
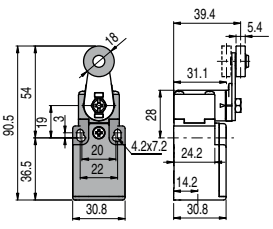
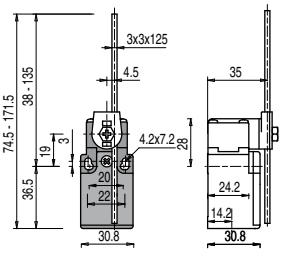
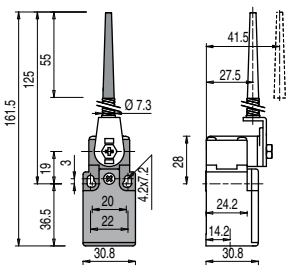
All measures in the drawings are in mm

Contacts type:

R = snap action
L = slow action

Contact blocks					
			 Ø 11 mm polymer roller	 Ø 12 mm stainless steel roller	
3	R	FK 314 1NO-1NC	FK 315 1NO-1NC	FK 315-1 1NO-1NC	FK 316 1NO-1NC
33	L	FK 3314 ⊕ 1NO+1NC	FK 3315 ⊕ 1NO+1NC	FK 3315-1 ⊕ 1NO+1NC	FK 3316 ⊕ 1NO+1NC
34	L	FK 3414 ⊕ 2NC	FK 3415 ⊕ 2NC	FK 3415-1 ⊕ 2NC	FK 3416 ⊕ 2NC
Max speed		page 7/5 - type 4	page 7/5 - type 2	page 7/5 - type 2	page 7/5 - type 2
Min. force		6 N (25 N ⊕)	5 N (25 N ⊕)	5 N (25 N ⊕)	5 N (25 N ⊕)
Travel diagrams		page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1	page 7/6 - group 1

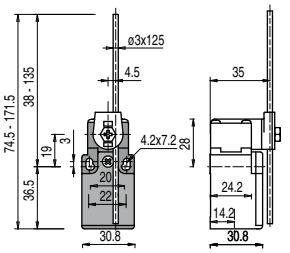
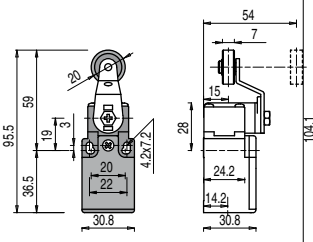
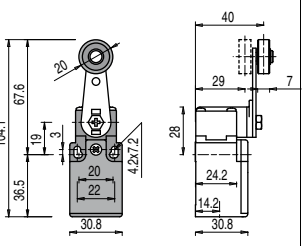
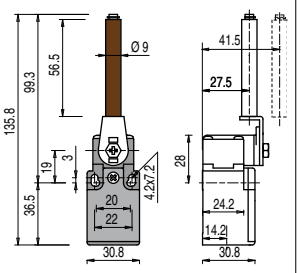
Contact blocks					
		Fixed only by threaded head in vertical position 	With external rubber gasket 	With external rubber gasket 	With external rubber gasket 
3	R	FK 317 1NO-1NC	FK 320 1NO-1NC	FK 321 1NO-1NC	FK 325 1NO-1NC
33	L	FK 3317 ⊕ 1NO+1NC	FK 3320 1NO+1NC	FK 3321 1NO+1NC	FK 3325 1NO+1NC
34	L	FK 3417 ⊕ 2NC	FK 3420 2NC	FK 3421 2NC	FK 3425 2NC
Max speed		page 7/5 - type 2	1 m/s	1 m/s	1 m/s
Min. force		5 N (25 N ⊕)	0,05 Nm	0,05 Nm	0,1 Nm
Travel diagrams		page 7/6 - group 1	page 7/6 - group 4	page 7/6 - group 4	page 7/6 - group 4

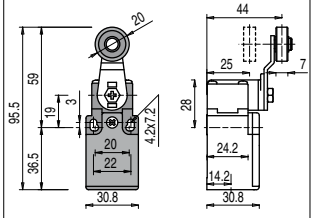
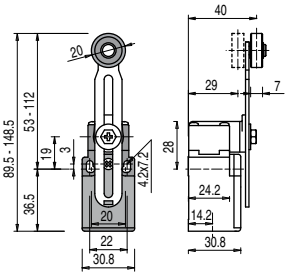
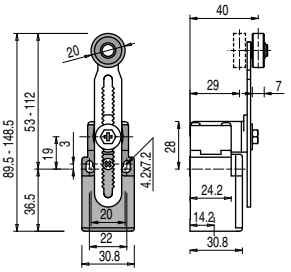
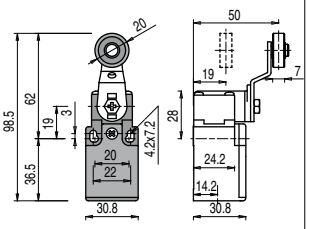
Contact blocks					
		With Ø 20 mm stainless steel roller on request 	Other rollers available. See page 2/98 	3x3 mm square rod 	
3	R	FK 330 1NO-1NC	FK 331 1NO-1NC	FK 333 1NO-1NC	FK 334 1NO-1NC
33	L	FK 3330 ⊕ 1NO+1NC	FK 3331 ⊕ 1NO+1NC	FK 3333 1NO+1NC	FK 3334 1NO+1NC
34	L	FK 3430 ⊕ 2NC	FK 3431 ⊕ 2NC	FK 3433 2NC	FK 3434 2NC
Max speed		page 7/5 - type 1	page 7/5 - type 1	1,5 m/s	1,5 m/s
Min. force		0,05 Nm (0,25 Nm ⊕)	0,05 Nm (0,25 Nm ⊕)	0,05 Nm	0,05 Nm
Travel diagrams		page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5

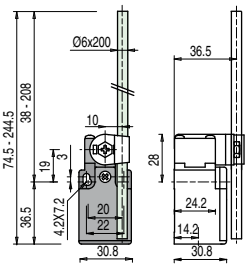
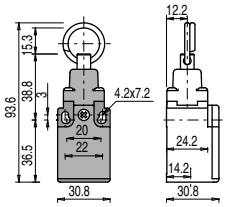
Items with code on the **green** background are available in stock

Position switches **FK** series

Contacts type:
R = snap action
L = slow action

Contact blocks		Ø 3 mm stainless steel round rod	Other rollers available. See page 2/98	Other rollers available. See page 2/98	Porcelain roller
					
3	R	FK 350 1NO-1NC	FK 351 1NO-1NC	FK 352 1NO-1NC	FK 353-E0 1NO-1NC
33	L	FK 3350 1NO+1NC	FK 3351 ⊖ 1NO+1NC	FK 3352 ⊖ 1NO+1NC	FK 3353-E0V9 ⊖ 1NO+1NC
34	L	FK 3450 2NC	FK 3451 ⊖ 2NC	FK 3452 ⊖ 2NC	FK 3453-E0V9 ⊖ 2NC
Max speed		1,5 m/s	page 7/5 - type 1	page 7/5 - type 1	0,5 m/s
Min. force		0,05 Nm	0,05 Nm (0,25 Nm ⊖)	0,05 Nm (0,25 Nm ⊖)	0,02 Nm (0,25 Nm ⊖)
Travel diagrams		page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 6

Contact blocks		Other rollers available. See page 2/98	Other rollers available. See page 2/98	Other rollers available. See page 2/98	Other rollers available. See page 2/98
					
3	R	FK 354 1NO-1NC	FK 355 1NO-1NC	FK 356 1NO-1NC	FK 357 1NO-1NC
33	L	FK 3354 ⊖ 1NO+1NC	FK 3355 ⊖ (1) 1NO+1NC	FK 3356 ⊖ 1NO+1NC	FK 3357 ⊖ 1NO+1NC
34	L	FK 3454 ⊖ 2NC	FK 3455 ⊖ (1) 2NC	FK 3456 ⊖ 2NC	FK 3457 ⊖ 2NC
Max speed		page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,05 Nm (0,25 Nm ⊖)	0,05 Nm (0,25 Nm ⊖)	0,05 Nm (0,25 Nm ⊖)	0,05 Nm (0,25 Nm ⊖)
Travel diagrams		page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5	page 7/6 - group 5

Contact blocks		Fiber glass rod	Rope switches for signalling		
					
3	R	FK 369 1NO-1NC	FK 376 1NO-1NC		
33	L	FK 3369 1NO+1NC	FK 3376 1NO+1NC		
34	L	FK 3469 2NC	FK 3476 2NO		
Max speed		1,5 m/s	0,5 m/s		
Min. force		0,05 Nm	initial 20 N - final 40 N		
Travel diagrams		page 7/6 - group 5	page 7/6 - group 7		

Accessories See page 6/1

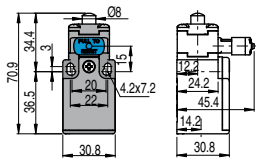
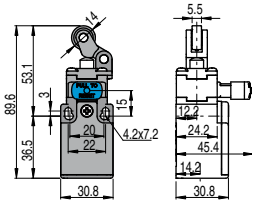
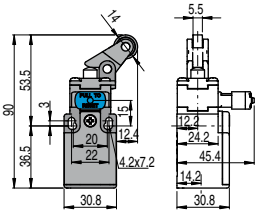
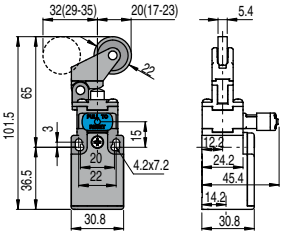
(1) Positive opening only with lever adjusted on the max. See page 2/97.

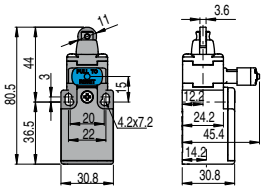
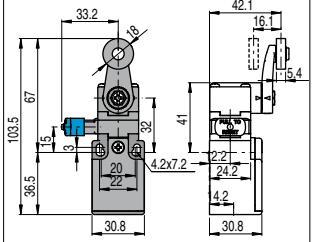
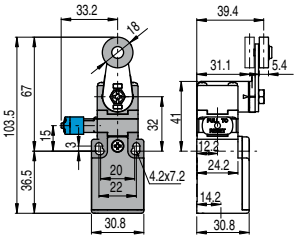
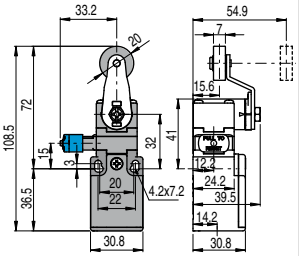
Pizzato Elettrica has developed a reset device code W3 to make perfectly simultaneous the actuator and the contact block tripping. The new device is a block inserted between the switch body and the head, and could be rotated independently from this last one. This new device has following advantages:

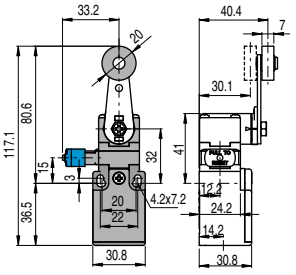
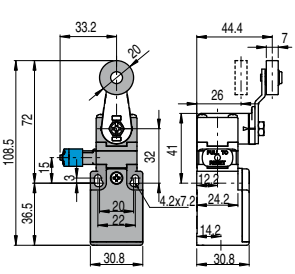
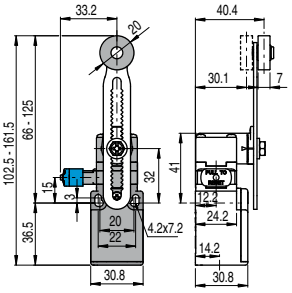
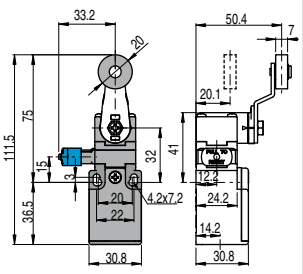
- The reset device integrate in almost all standard actuation head
- Contact blocks with snap action are no more necessary because the tripping movement is made by the reset device itself
- The reset device can be rotated independently from the head for the maximum flexibility during the assembling
- Two driving forces: standard and increased for applications with vibrations
- Mechanical endurance: 1 million operations cycles.

Contacts type:

L = slow action

Contact blocks					
			With stainless steel roller on request 	With stainless steel roller on request 	
33	L	FK 3301-W3 → 1NO+1NC	FK 3302-W3 → 1NO+1NC	FK 3305-W3 → 1NO+1NC	FK 3307-W3 → 1NO+1NC
34	L	FK 3401-W3 → 2NC	FK 3402-W3 → 2NC	FK 3405-W3 → 2NC	FK 3407-W3 → 2NC
Max speed		page 7/5 - type 4	page 7/5 - type 3	page 7/5 - type 3	page 7/5 - type 3
Min. force		4,5 N (25 N →)	4 N (25 N →)	4 N (25 N →)	2,5 N (25 N →)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 2	page 7/7 - group 2	page 7/7 - group 3

Contact blocks					
		With stainless steel roller on request 	With Ø 20 mm stainless steel roller on request 	Other rollers available. See page 2/98 	Other rollers available. See page 2/98 
33	L	FK 3315-W3 → 1NO+1NC	FK 3330-W3 → 1NO+1NC	FK 3331-W3 → 1NO+1NC	FK 3351-W3 → 1NO+1NC
34	L	FK 3415-W3 → 2NC	FK 3430-W3 → 2NC	FK 3431-W3 → 2NC	FK 3451-W3 → 2NC
Max speed		page 7/5 - type 2	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		4,5 N (25 N →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)
Travel diagrams		page 7/7 - group 1	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

Contact blocks					
		Other rollers available. See page 2/98 	Other rollers available. See page 2/98 	Other rollers available. See page 2/98 	Other rollers available. See page 2/98 
33	L	FK 3352-W3 → 1NO+1NC	FK 3354-W3 → 1NO+1NC	FK 3356-W3 → 1NO+1NC	FK 3357-W3 → 1NO+1NC
34	L	FK 3452-W3 → 2NC	FK 3454-W3 → 2NC	FK 3456-W3 → 2NC	FK 3457-W3 → 2NC
Max speed		page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1	page 7/5 - type 1
Min. force		0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)	0,07 Nm (0,25 Nm →)
Travel diagrams		page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4	page 7/7 - group 4

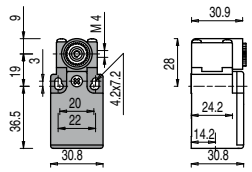
Items with code on the **green** background are available in stock

Position switches **FK** series

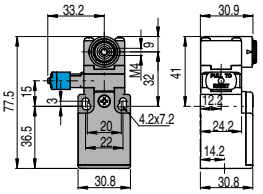
Position switches with revolving lever without actuator

Contacts type:

R = snap action
L = slow action



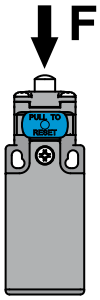
With manual reset knob



Contact blocks			
3	R	FK 338 1NO-1NC	
33	L	FK 3338 ⊖ 1NO+1NC	FK 3338-W3 ⊖ 1NO+1NC
34	L	FK 3438 ⊖ 2NC	FK 3438-W3 ⊖ 2NC
Min. force		0,05 Nm (0,25 Nm ⊖)	0,07 Nm (0,25 Nm ⊖)
Travel diagrams		page 7/6 - group 5	page 7/7 - group 4

IMPORTANT
For safety applications: join only switches and actuators marked with symbol ⊖.
For more information about safety applications see page 7/1.

Increased actuating force



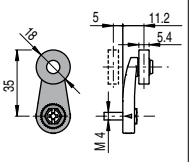
The switch can be supplied with an increased actuating force (option W4); ideal for applications with vibrations.

Actuator	Force
01, 14, 15, 16	7 N
02, 05	6 N
07	3,5 N
30 ... 57	0,08 Nm

Loose actuators

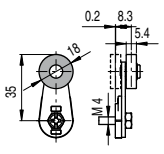
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Polymer roller Ø 18 mm



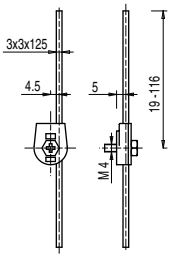
VF LE30 ⊖

Polymer roller Ø 18 mm



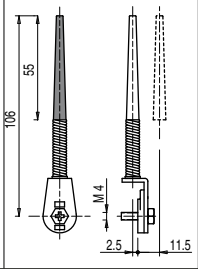
VF LE31 ⊖

Adjustable square rod 3x3x125 mm



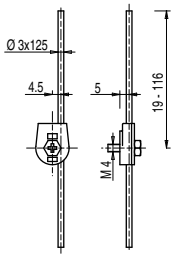
VF LE33

Flexible rod actuator



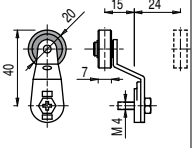
VF LE34

Adjustable round rod Ø 3x125 mm



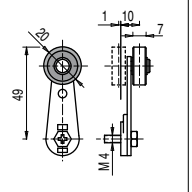
VF LE50

Polymer roller Ø 20 mm



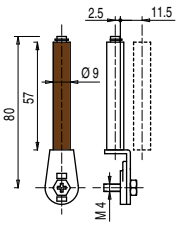
VF LE51 ⊖

Polymer roller Ø 20 mm



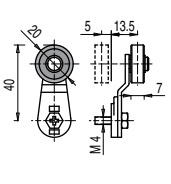
VF LE52 ⊖

Porcelain roller



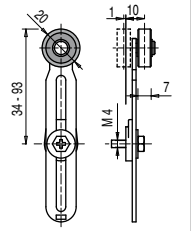
VF LE53 ⊖ (2)

Polymer roller Ø 20 mm



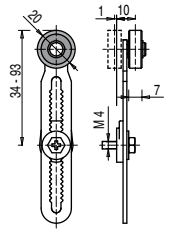
VF LE54 ⊖

Adjustable actuator with polymer roller



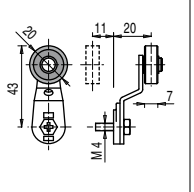
VF LE55 ⊖ (1)

Adjustable safety actuator with polymer roller



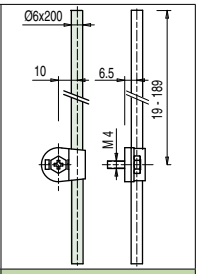
VF LE56 ⊖

Polymer roller Ø 20 mm



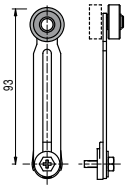
VF LE57 ⊖

Adjustable fiber glass rod



VF LE69

- 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.
- (2) The position switch obtained by assembling the switch FK •38 (e.g. FK 338, FK 3338) with the actuator VF LE53 will not present the same travel diagrams and actuating forces as the position switch FK •53-E0V9 (e.g. FK 353-E0, FK 3353-E0V9...).
- (4) The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

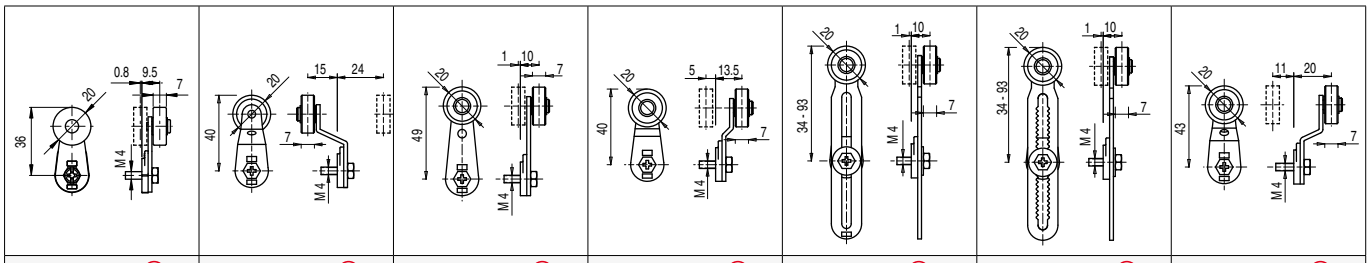


Accessories See page 6/1

Special loose actuators

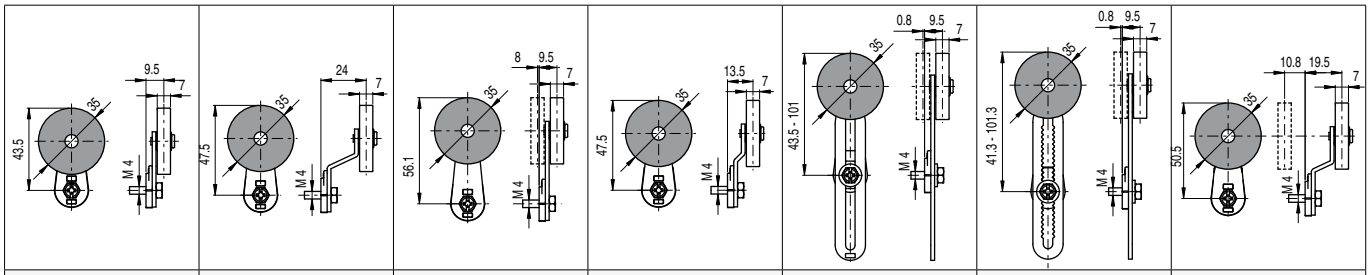
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Ø 20 mm stainless steel rollers



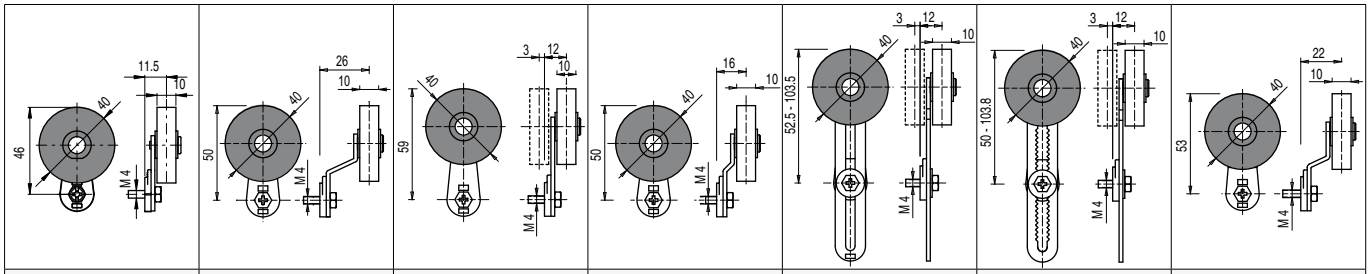
VF LE31-1 | VF LE51-1 | VF LE52-1 | VF LE54-1 | VF LE55-1 (1) | VF LE56-1 | VF LE57-1

Ø 35 mm polymer rollers



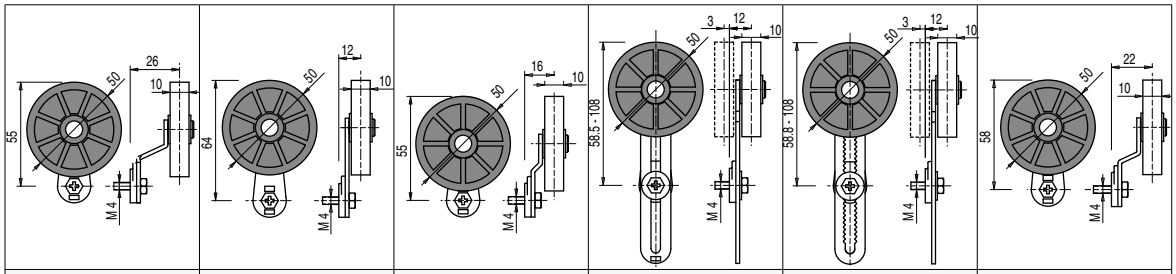
VF LE31-2 (4) | VF LE51-2 (4) | VF LE52-2 | VF LE54-2 (4) | VF LE55-2 (1) | VF LE56-2 | VF LE57-2

Ø 40 mm rubber rollers



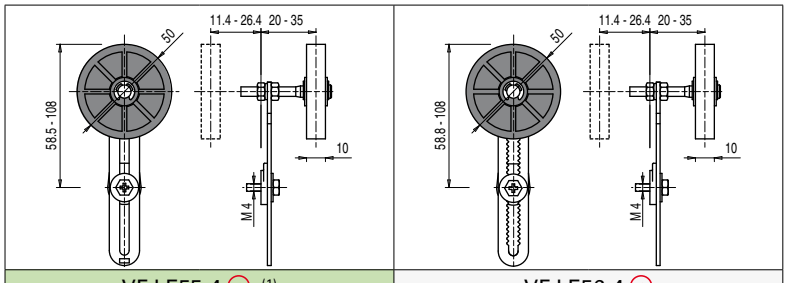
VF LE31-R5 (4) | VF LE51-R5 (4) | VF LE52-R5 | VF LE54-R5 (4) | VF LE55-R5 (1) | VF LE56-R5 | VF LE57-R5 (4)

Ø 50 mm rubber rollers



VF LE51-3 (4) | VF LE52-3 (4) | VF LE54-3 (4) | VF LE55-3 (1) | VF LE56-3 | VF LE57-3 (4)

Ø 50 mm overhanging rubber rollers



VF LE55-4 (1) | VF LE56-4

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