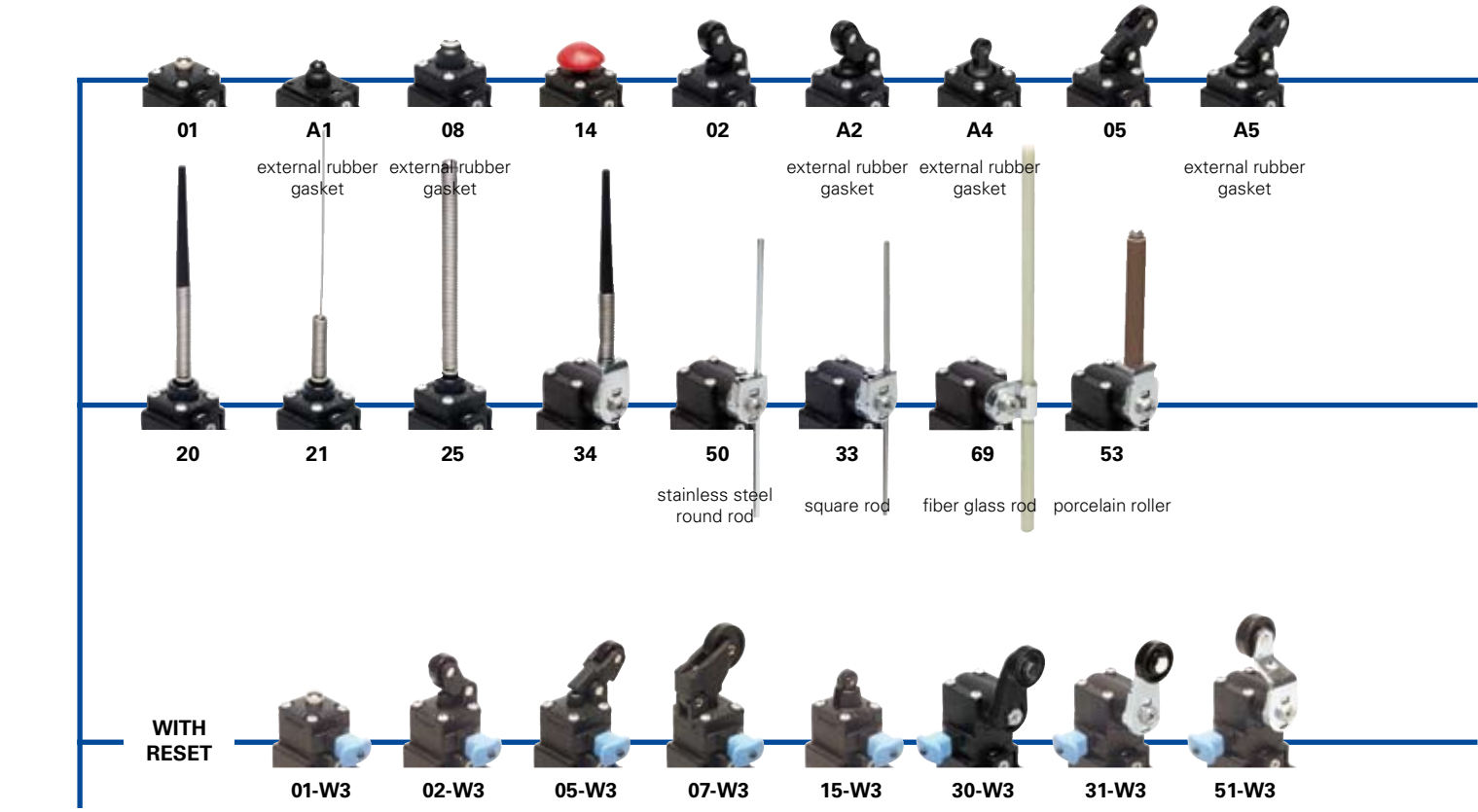
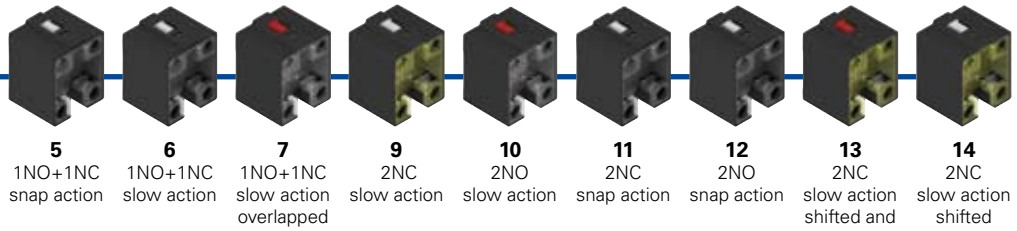
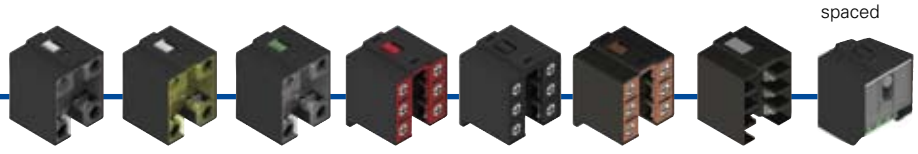
Selection diagram



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

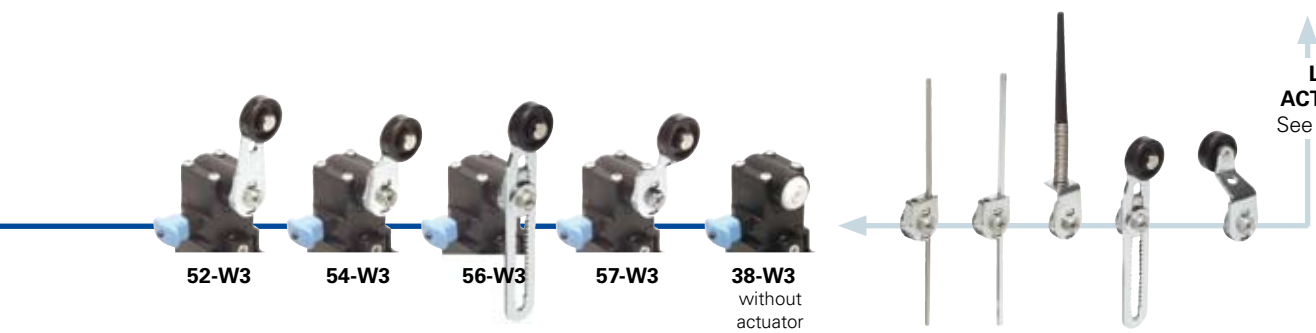
54

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

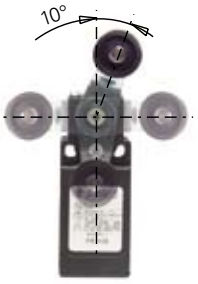
Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks except 2 and 3 use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb in (0.8 Nm).
For contact blocks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

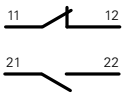
In all switches, it is possible to rotate the head in 90° steps.

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.

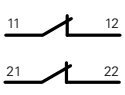
Lever turned to left

Contacts diagram



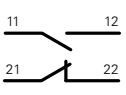
Lever not turned

Contacts diagram



Lever turned to right

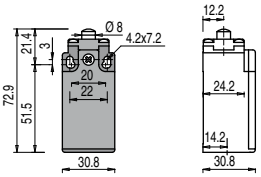
Contacts diagram



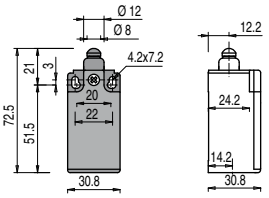
Position switches **FR** series

Contacts type:

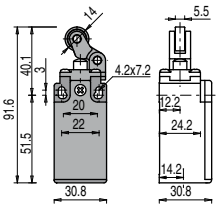
- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



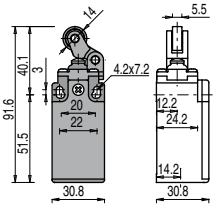
With external rubber gasket



With stainless steel roller on request



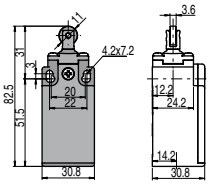
With external rubber gasket
With stainless steel roller on request



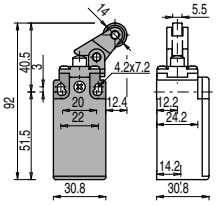
Contact blocks

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	

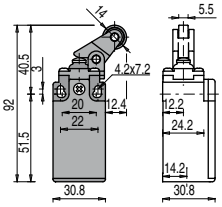
With external rubber gasket
With Ø 12 mm stainless steel roller on request

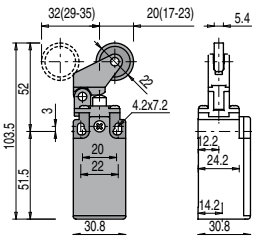


With stainless steel roller on request



With external rubber gasket
With stainless steel roller on request





Contact blocks

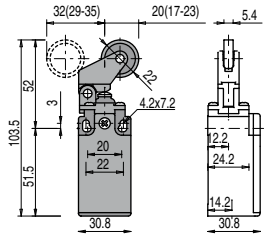
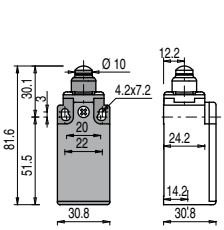
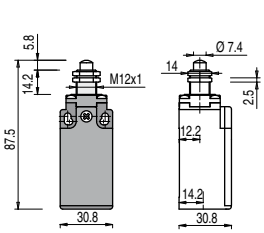
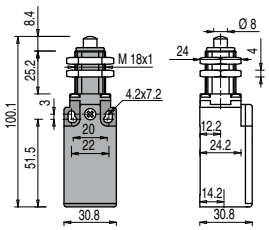
5	R	FR 5A4	1NO+1NC		FR 505	1NO+1NC		FR 5A5	1NO+1NC		FR 507	1NO+1NC
6	L	FR 6A4	1NO+1NC		FR 605	1NO+1NC		FR 6A5	1NO+1NC		FR 607	1NO+1NC
7	LO	FR 7A4	1NO+1NC		FR 705	1NO+1NC		FR 7A5	1NO+1NC		FR 707	1NO+1NC
9	L	FR 9A4	2NC		FR 905	2NC		FR 9A5	2NC		FR 907	2NC
10	L	FR 10A4	2NO		FR 1005	2NO		FR 10A5	2NO		FR 1007	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	

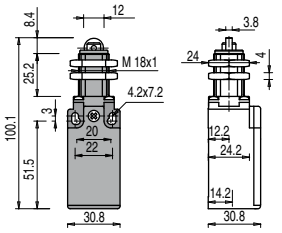
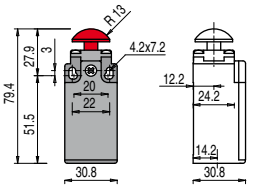
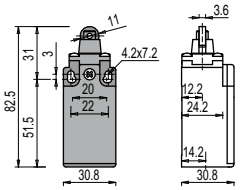
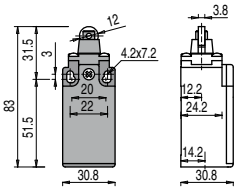
Accessories See page 6/1

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

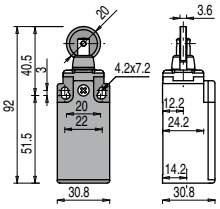
Contact blocks				Ø 11 mm polymer roller	Ø 12 mm stainless steel roller
					
5	R	FR 513 1NO+1NC	FR 514 1NO+1NC	FR 515 1NO+1NC	FR 515-1 1NO+1NC
6	L	FR 613 1NO+1NC	FR 614 1NO+1NC	FR 615 1NO+1NC	FR 615-1 1NO+1NC
7	LO	FR 713 1NO+1NC	FR 714 1NO+1NC	FR 715 1NO+1NC	FR 715-1 1NO+1NC
9	L	FR 913 2NC	FR 914 2NC	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

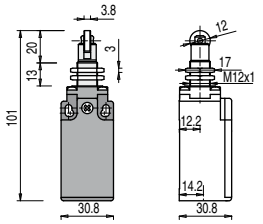
Position switches **FR** series

Contacts type:

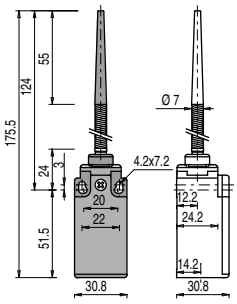
- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP



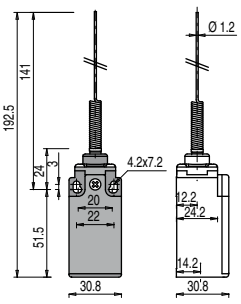
Fixed only by threaded head in vertical position



With external rubber gasket

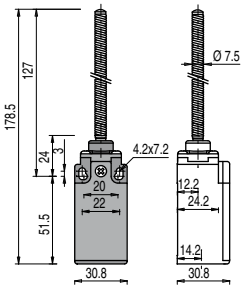


With external rubber gasket

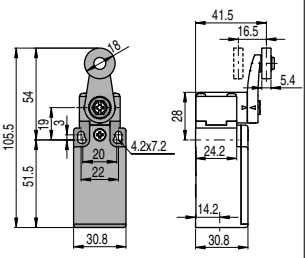


Contact blocks												
5	R	FR 516	1NO+1NC		FR 517	1NO+1NC		FR 520	1NO+1NC		FR 521	1NO+1NC
6	L	FR 616	1NO+1NC		FR 617	1NO+1NC						
7	LO	FR 716	1NO+1NC		FR 717	1NO+1NC						
9	L	FR 916	2NC		FR 917	2NC						
10	L	FR 1016	2NO		FR 1017	2NO		FR 1020	2NO		FR 1021	2NO
11	R	FR 1116	2NC		FR 1117	2NC						
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	

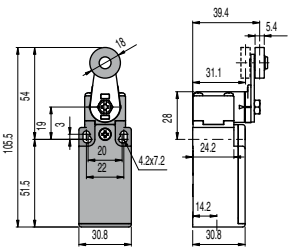
With external rubber gasket



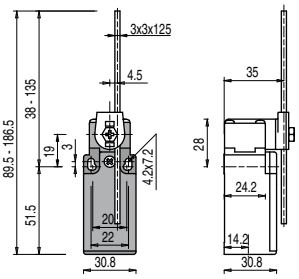
With Ø 20 mm stainless steel roller on request



Other rollers available. See page 2/52



3x3 mm square rod

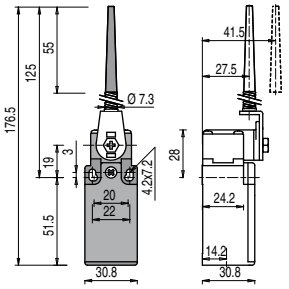
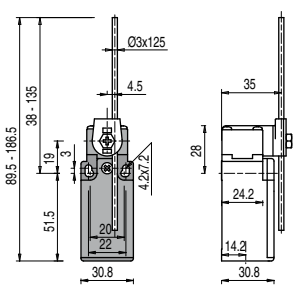
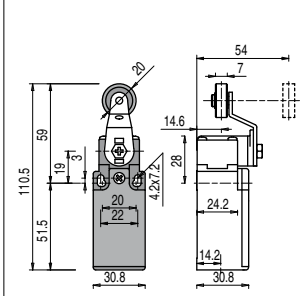
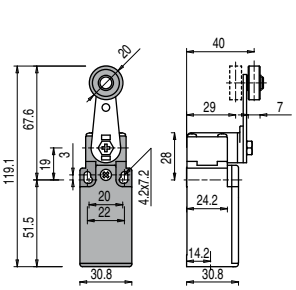


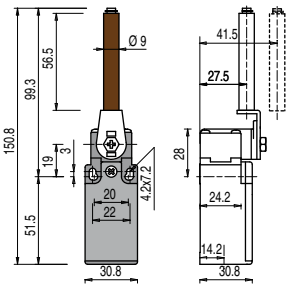
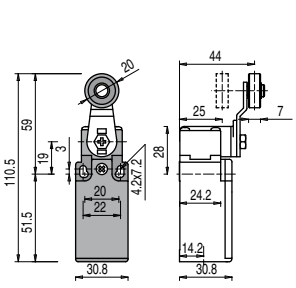
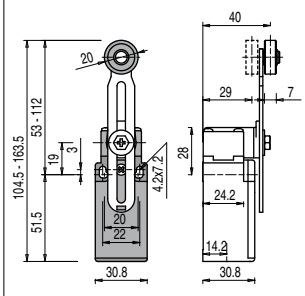
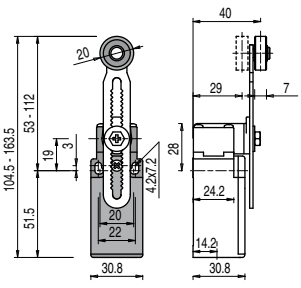
Contact blocks												
5	R	FR 525	1NO+1NC		FR 530	1NO+1NC		FR 531	1NO+1NC		FR 533	1NO+1NC
6	L				FR 630	1NO+1NC		FR 631	1NO+1NC		FR 633	1NO+1NC
7	LO				FR 730	1NO+1NC		FR 731	1NO+1NC		FR 733	1NO+1NC
9	L				FR 930	2NC		FR 931	2NC		FR 933	2NC
10	L	FR 1025	2NO		FR 1030	2NO		FR 1031	2NO		FR 1033	2NO
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		

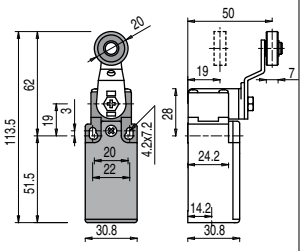
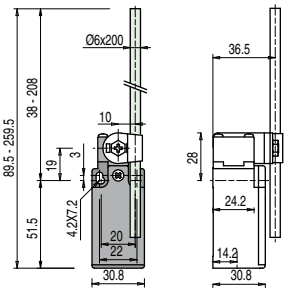
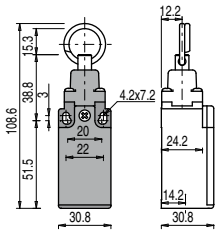
Items with code on the **green** background are available in stock

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

Position switches **FR** series

Contacts type:

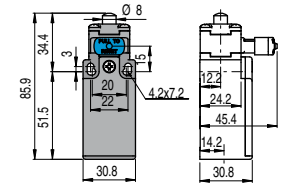
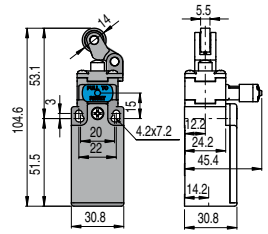
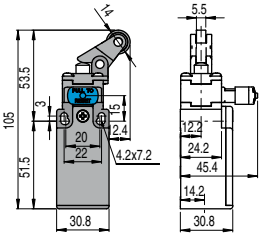
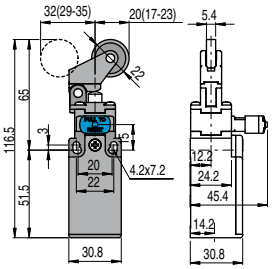
- R = snap action
- L = slow action
- LO = slow action overlapped
- LS = slow action shifted
- LV = slow action shifted and spaced
- LI = slow action independent
- LA = slow action closer
- = electronic PNP

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:

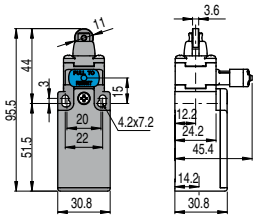
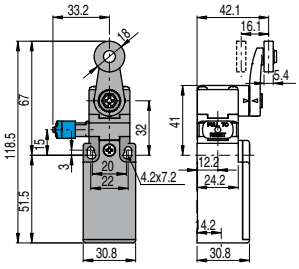
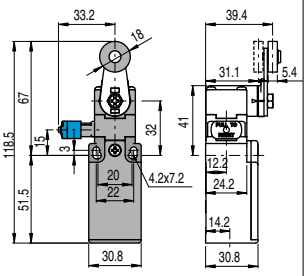
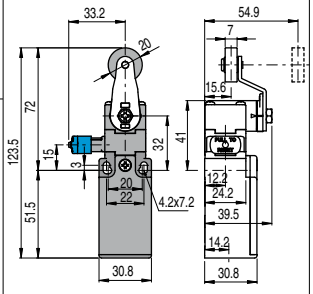
- The reset device integrate in almost all standard actuation head
- Contact blocks with snap action are no more necessary because the tripping movement is made by the reset device itself
- The reset device can be rotated independently from the head for the maximum flexibility during the assembling
-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

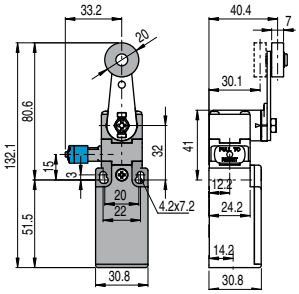
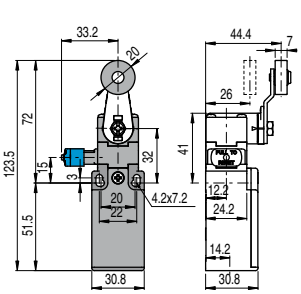
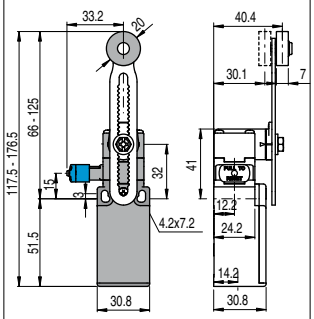
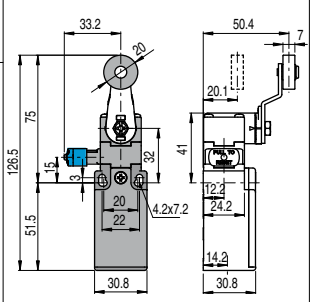
Contact blocks			With stainless steel roller on request	With stainless steel roller on request	
					
6	L	FR 601-W3 ⊖ 1NO+1NC	FR 602-W3 ⊖ 1NO+1NC	FR 605-W3 ⊖ 1NO+1NC	FR 607-W3 ⊖ 1NO+1NC
9	L	FR 901-W3 ⊖ 2NC	FR 902-W3 ⊖ 2NC	FR 905-W3 ⊖ 2NC	FR 907-W3 ⊖ 2NC
10	L	FR 1001-W3 2NO	FR 1002-W3 2NO	FR 1005-W3 2NO	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

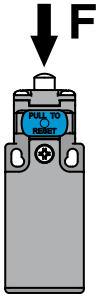
Contacts type:

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.

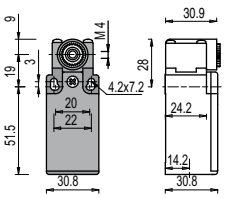
Actuator	Force
01, 14, 15, 16	7 N
02, 05	6 N
07	3,5 N
30 ... 57	0,08 Nm

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

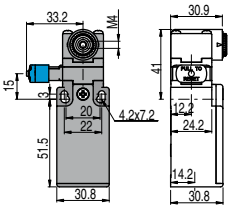
Position switches with revolving lever without actuator

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

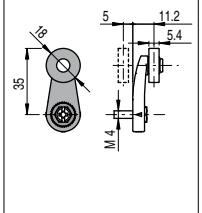
For safety applications: join only switches and actuators marked with symbol ⊖.

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

Loose actuators

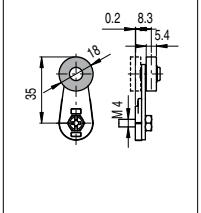
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Polymer roller Ø 18 mm



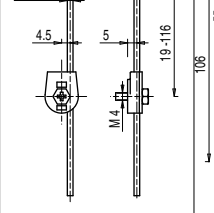
VF LE30 ⊖

Polymer roller Ø 18 mm



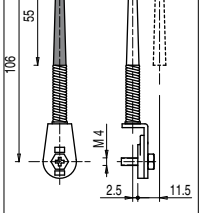
VF LE31 ⊖

Adjustable square rod 3x3x125 mm



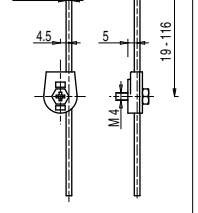
VF LE33

Flexible rod actuator



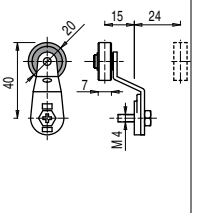
VF LE34

Adjustable round rod Ø 3x125 mm



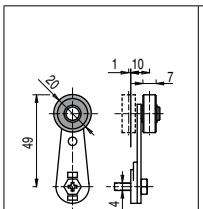
VF LE50

Polymer roller Ø 20 mm



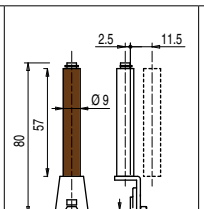
VF LE51 ⊖

Polymer roller Ø 20 mm



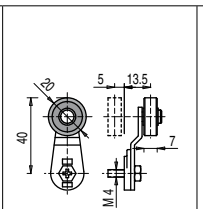
VF LE52 ⊖

Porcelain roller



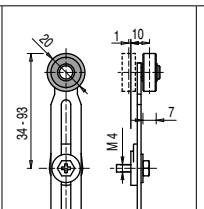
VF LE53 ⊖ (2)

Polymer roller Ø 20 mm



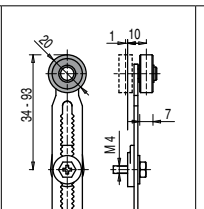
VF LE54 ⊖

Adjustable actuator with polymer roller



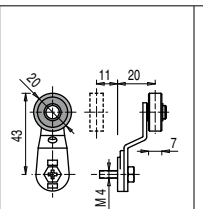
VF LE55 ⊖ (1)

Adjustable safety actuator with polymer roller



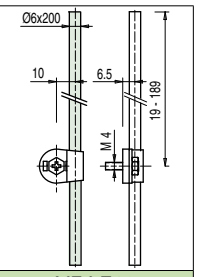
VF LE56 ⊖

Polymer roller Ø 20 mm



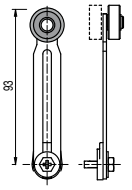
VF LE57 ⊖

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.

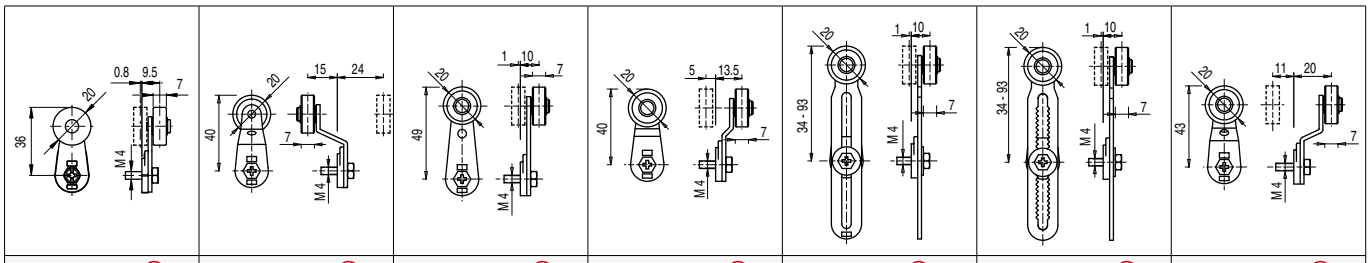


Accessories See page 6/1

Special loose actuators

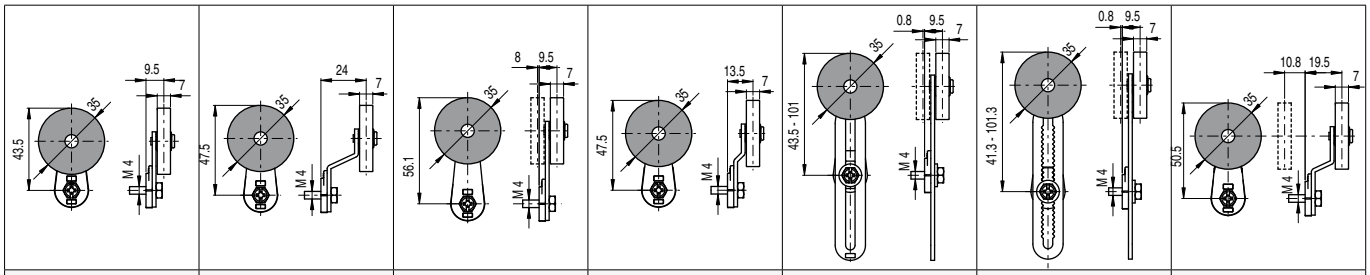
IMPORTANT: These loose actuators can be used with items of series FR, FM, FX, FZ, FK only.

Ø 20 mm stainless steel rollers



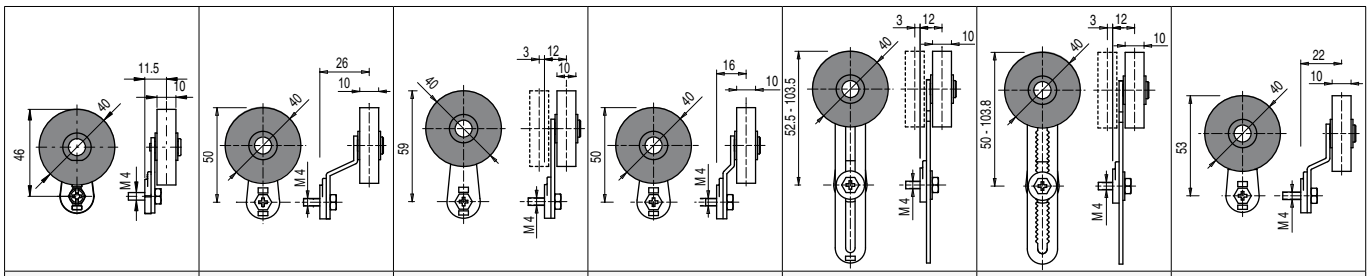
VF LE31-1 | VF LE51-1 | VF LE52-1 | VF LE54-1 | VF LE55-1 (1) | VF LE56-1 | VF LE57-1

Ø 35 mm polymer rollers



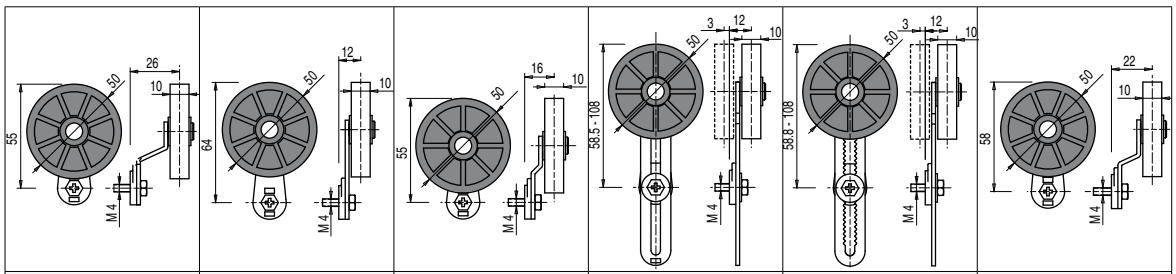
VF LE31-2 (4) | VF LE51-2 (4) | VF LE52-2 | VF LE54-2 (4) | VF LE55-2 (1) | VF LE56-2 | VF LE57-2

Ø 40 mm rubber rollers



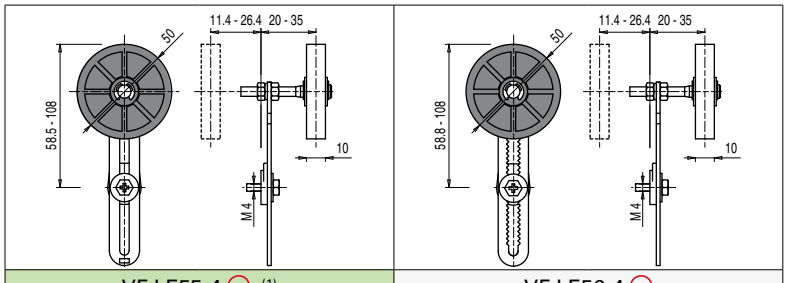
VF LE31-R5 (4) | VF LE51-R5 (4) | VF LE52-R5 | VF LE54-R5 (4) | VF LE55-R5 (1) | VF LE56-R5 | VF LE57-R5 (4)

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