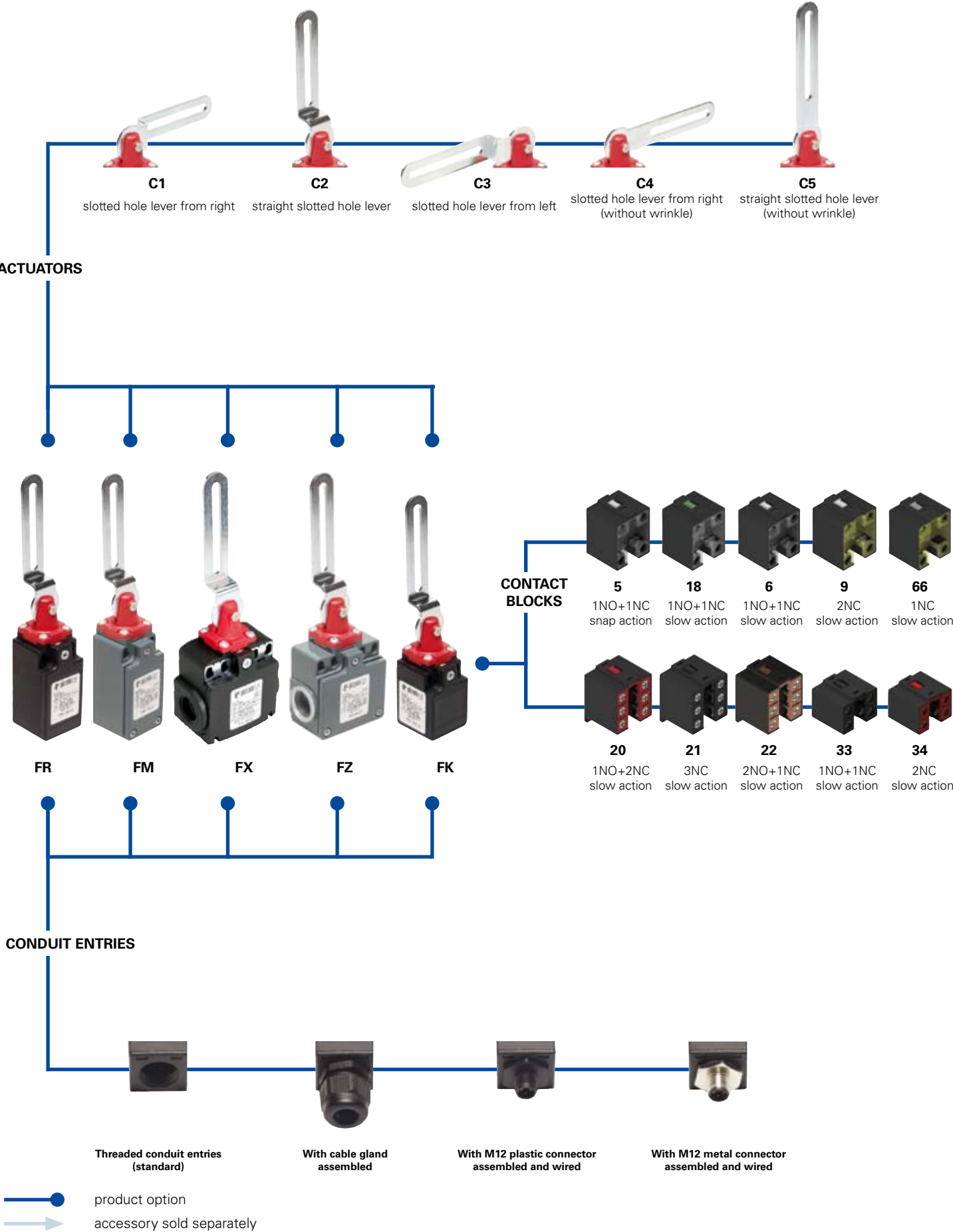


Selection diagram





Code structure

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

article options
FR 18C1-GM2K70

Housing	
FR	polymer housing, one conduit entry
FM	metal housing, one conduit entry
FX	polymer housing, two conduit entries
FZ	metal housing, two conduit entries

Contact blocks	
18	1NO+1NC, slow action
5	1NO+1NC, snap action
6	1NO+1NC, slow action
9	2NC, slow action
20	1NO+2NC, slow action
21	3NC, slow action
22	2NO+1NC, slow action
33	1NO+1NC, slow action
34	2NC, slow action
66	1NC, slow action

Head type	
C1	slotted hole lever from right
C2	straight slotted hole lever
C3	slotted hole lever from left
C4	slotted hole lever from right (without wrinkle)
C5	straight slotted hole lever (without wrinkle)

Preinstalled cable gland or connectors	
	no cable gland or connector (standard)
K21	with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range
...	
K70	with assembled 4 poles M12 plastic connector
...	

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

Threaded conduit entry	
	PG 13,5 (standard)
A	PG 11 (only for FR-FX housing)
M1	M16x1,5 (only for FR-FX housing)
M2	M20x1,5

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

article options
FK 33C1-GM1K22

Housing	
FK	polymer housing, one conduit entry

Contact blocks	
33	1NO+1NC, slow action
34	2NC, slow action

Head type	
C1	slotted hole lever from right
C2	straight slotted hole lever
C3	slotted hole lever from left
C4	slotted hole lever from right (without wrinkle)
C5	straight slotted hole lever (without wrinkle)

Preinstalled cable gland	
	no cable gland (standard)
K22	with assembled cable gland suitable for Ø 5 to Ø 10 mm cables range
K26	with assembled cable gland suitable for Ø 3 to Ø 7 mm cables range

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

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



Main data

- Metal housing or polymer housing, from one to two conduit entries
- Protection degree IP67
- 10 contact blocks available
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:



Approval IMQ:	EG610 (FR-FX-FK series) EG609 (FM-FZ series)
Approval UL:	E131787
Approval CCC:	2007010305230013 (FR-FX-FK series) 2007010305229998 (FM-FZ series)
Approval ECU:	1010151
Approval GOST:	POCC IT.AB24.B04512

Technical data

Housing

Housing type FR, FX and FK made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin 
Housing type FM and FZ made of metal, coated with baked epoxy powder.
FR, FM and FK series one conduit entry
FX and FZ series two conduit entries
Protection degree: IP67 according to EN 60529 with cable gland having equal or higher protection degree

General data

For safety applications up to SIL 3 / PL e
Safety parameters: see page 7/34
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 cycles¹/hour
Mechanical endurance: 1 million of operations cycles¹
Max actuating speed: 180°/s
Min. actuating speed: 2°/s
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 mm ²	(1 x AWG 22)
	max.	2 x 1,5 mm ²	(2 x AWG 16)
Contact blocks 5, 7, 9, 18:	min.	1 x 0,5 mm ²	(1 x AWG 20)
	max.	2 x 2,5 mm ²	(2 x AWG 14)

In conformity with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, 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.

 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 (I _{th}):	10 A	Alternate current: AC15 (50...60 Hz)			
	Rated insulation voltage (U _i):	500 Vac 600 Vdc	U _e (V)	250	400	500
		400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)	I _e (A)	6	4	1
	Rated impulse withstand voltage (U _{imp}):	6 kV	Direct current: DC13			
		4 kV (contact blocks 20, 21, 22, 33, 34)	U _e (V)	24	125	250
with 4 or 5 poles M12 connector	Conditional short circuit current:	1000 A according to EN 60947-5-1	I _e (A)	6	1,1	0,4
	Protection against short circuits:	fuse 10 A 500 V type aM	Alternate current: AC15 (50...60 Hz)			
	Pollution degree:	3	U _e (V)	24	120	250
	Thermal current (I _{th}):	4 A	I _e (A)	4	4	4
	Rated insulation voltage (U _i):	250 Vac 300 Vdc	Direct current: DC13			
with 8 poles M12 connector	Protection against short circuits:	fuse 4 A 500 V type gG	U _e (V)	24	125	250
	Pollution degree:	3	I _e (A)	4	1,1	0,4
	Thermal current (I _{th}):	2 A	Alternate current: AC15 (50...60 Hz)			
	Rated insulation voltage (U _i):	30 Vac 36 Vdc	U _e (V)	24		
	Protection against short circuits:	fuse 2 A 500 V type gG	I _e (A)	2		
	Pollution degree:	3	Direct current: DC13			
			U _e (V)	24		
			I _e (A)	2		



Description

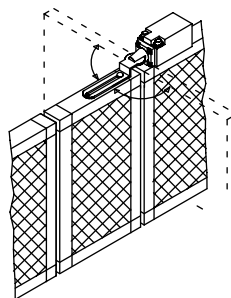
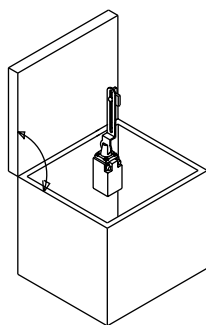
These safety switches are used to control gates or doors with hinge protecting hazardous parts of machines. Easy to install, they do not need the interaction with the hinge of the guard. Very sensitive, they positively open the contacts after few rotation degrees, sending the stop signal immediately.

Rotating heads



Removing the four fastening screws, in all switches, it is possible to rotate the head in 90° steps.

Installation examples



Data type approved by IMQ, CCC and EZU

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 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: Zb, Y+Y, Y+Y+X, Y+Y+Y, Y+X+X
Positive opening of contacts on contact block 5, 7, 9, 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

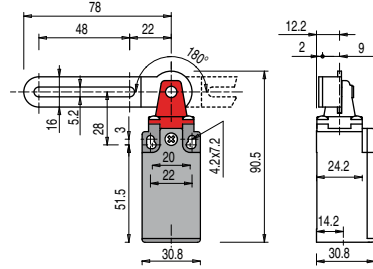
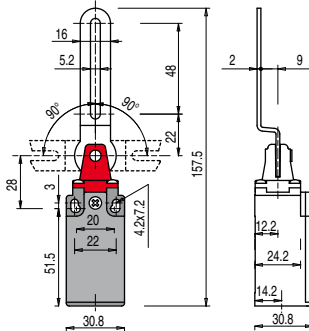
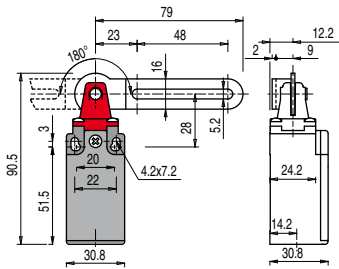
Utilization categories Q300 (69 VA, 125-250 Vdc)
A600 (720 VA, 120-600 Vac)
Data of the housing type 1, 4X "indoor use only", 12, 13
For all contact blocks use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 lb in (0.8 Nm).
In conformity with standard: UL 508

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

Dimensional drawings

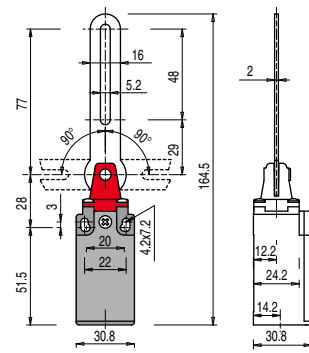
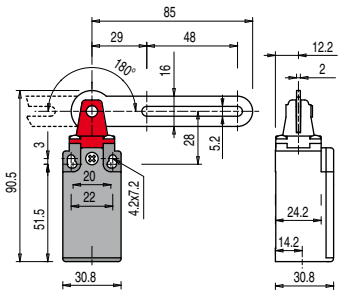
Contacts type:

- R = snap action
- L = slow action
- LA = slow action closer



Contact blocks

5	R	FR 5C1	➔	1NO+1NC	FR 5C2	➔	1NO+1NC	FR 5C3	➔	1NO+1NC
6	L	FR 6C1	➔	1NO+1NC	FR 6C2	➔	1NO+1NC	FR 6C3	➔	1NO+1NC
9	L	FR 9C1	➔	2NC	FR 9C2	➔	2NC	FR 9C3	➔	2NC
18	LA	FR 18C1	➔	1NO+1NC	FR 18C2	➔	1NO+1NC	FR 18C3	➔	1NO+1NC
20	L	FR 20C1	➔	1NO+2NC	FR 20C2	➔	1NO+2NC	FR 20C3	➔	1NO+2NC
21	L	FR 21C1	➔	3NC	FR 21C2	➔	3NC	FR 21C3	➔	3NC
22	L	FR 22C1	➔	2NO+1NC	FR 22C2	➔	2NO+1NC	FR 22C3	➔	2NO+1NC
33	L	FR 33C1	➔	1NO+1NC	FR 33C2	➔	1NO+1NC	FR 33C3	➔	1NO+1NC
34	L	FR 34C1	➔	2NC	FR 34C2	➔	2NC	FR 34C3	➔	2NC
66	L	FR 66C1	➔	1NC	FR 66C2	➔	1NC	FR 66C3	➔	1NC
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)		
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			page 7/8 - group 10		



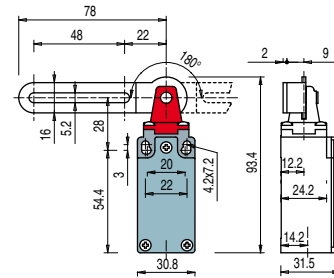
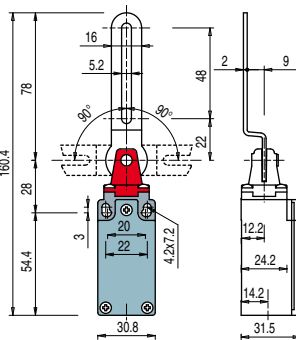
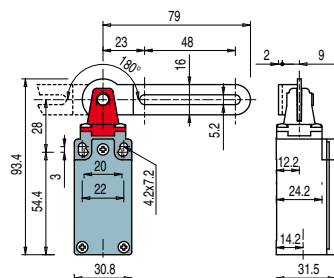
Contact blocks

5	R	FR 5C4	➔	1NO+1NC	FR 5C5	➔	1NO+1NC			
6	L	FR 6C4	➔	1NO+1NC	FR 6C5	➔	1NO+1NC			
9	L	FR 9C4	➔	2NC	FR 9C5	➔	2NC			
18	LA	FR 18C4	➔	1NO+1NC	FR 18C5	➔	1NO+1NC			
20	L	FR 20C4	➔	1NO+2NC	FR 20C5	➔	1NO+2NC			
21	L	FR 21C4	➔	3NC	FR 21C5	➔	3NC			
22	L	FR 22C4	➔	2NO+1NC	FR 22C5	➔	2NO+1NC			
33	L	FR 33C4	➔	1NO+1NC	FR 33C5	➔	1NO+1NC			
34	L	FR 34C4	➔	2NC	FR 34C5	➔	2NC			
66	L	FR 66C4	➔	1NC	FR 66C5	➔	1NC			
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)					
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11					



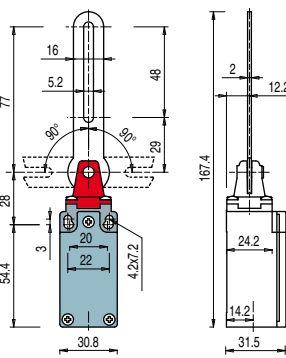
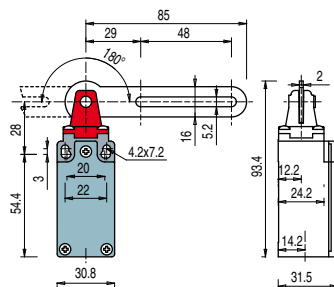
Contacts type:

R = snap action
L = slow action
LA = slow action
closer



Contact blocks

5	R	FM 5C1	➔	1NO+1NC	FM 5C2	➔	1NO+1NC	FM 5C3	➔	1NO+1NC
6	L	FM 6C1	➔	1NO+1NC	FM 6C2	➔	1NO+1NC	FM 6C3	➔	1NO+1NC
9	L	FM 9C1	➔	2NC	FM 9C2	➔	2NC	FM 9C3	➔	2NC
18	LA	FM 18C1	➔	1NO+1NC	FM 18C2	➔	1NO+1NC	FM 18C3	➔	1NO+1NC
20	L	FM 20C1	➔	1NO+2NC	FM 20C2	➔	1NO+2NC	FM 20C3	➔	1NO+2NC
21	L	FM 21C1	➔	3NC	FM 21C2	➔	3NC	FM 21C3	➔	3NC
22	L	FM 22C1	➔	2NO+1NC	FM 22C2	➔	2NO+1NC	FM 22C3	➔	2NO+1NC
33	L	FM 33C1	➔	1NO+1NC	FM 33C2	➔	1NO+1NC	FM 33C3	➔	1NO+1NC
34	L	FM 34C1	➔	2NC	FM 34C2	➔	2NC	FM 34C3	➔	2NC
66	L	FM 66C1	➔	1NC	FM 66C2	➔	1NC	FM 66C3	➔	1NC
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)		
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			page 7/8 - group 10		

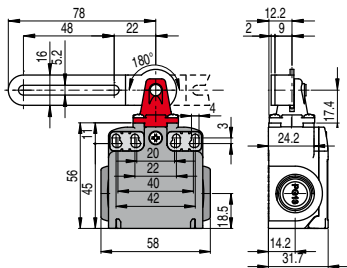
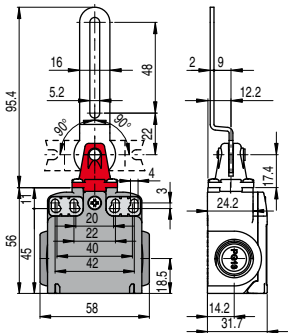
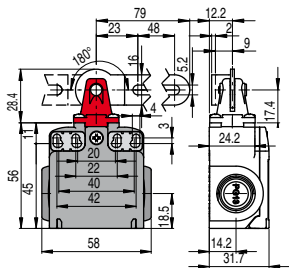


Contact blocks

5	R	FM 5C4	➔	1NO+1NC	FM 5C5	➔	1NO+1NC	
6	L	FM 6C4	➔	1NO+1NC	FM 6C5	➔	1NO+1NC	
9	L	FM 9C4	➔	2NC	FM 9C5	➔	2NC	
18	LA	FM 18C4	➔	1NO+1NC	FM 18C5	➔	1NO+1NC	
20	L	FM 20C4	➔	1NO+2NC	FM 20C5	➔	1NO+2NC	
21	L	FM 21C4	➔	3NC	FM 21C5	➔	3NC	
22	L	FM 22C4	➔	2NO+1NC	FM 22C5	➔	2NO+1NC	
33	L	FM 33C4	➔	1NO+1NC	FM 33C5	➔	1NO+1NC	
34	L	FM 34C4	➔	2NC	FM 34C5	➔	2NC	
66	L	FM 66C4	➔	1NC	FM 66C5	➔	1NC	
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)			
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			

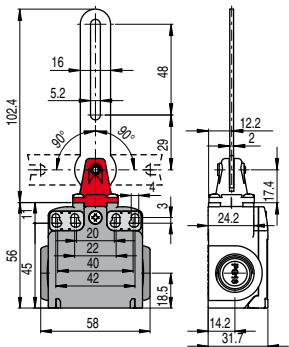
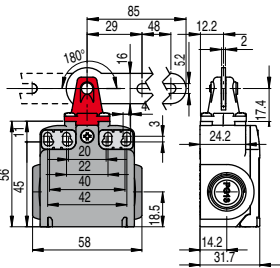
Contacts type:

- R** = snap action
- L** = slow action
- LA** = slow action closer



Contact blocks

5	R	FX 5C1	➔	1NO+1NC	FX 5C2	➔	1NO+1NC	FX 5C3	➔	1NO+1NC
6	L	FX 6C1	➔	1NO+1NC	FX 6C2	➔	1NO+1NC	FX 6C3	➔	1NO+1NC
9	L	FX 9C1	➔	2NC	FX 9C2	➔	2NC	FX 9C3	➔	2NC
18	LA	FX 18C1	➔	1NO+1NC	FX 18C2	➔	1NO+1NC	FX 18C3	➔	1NO+1NC
20	L	FX 20C1	➔	1NO+2NC	FX 20C2	➔	1NO+2NC	FX 20C3	➔	1NO+2NC
21	L	FX 21C1	➔	3NC	FX 21C2	➔	3NC	FX 21C3	➔	3NC
22	L	FX 22C1	➔	2NO+1NC	FX 22C2	➔	2NO+1NC	FX 22C3	➔	2NO+1NC
33	L	FX 33C1	➔	1NO+1NC	FX 33C2	➔	1NO+1NC	FX 33C3	➔	1NO+1NC
34	L	FX 34C1	➔	2NC	FX 34C2	➔	2NC	FX 34C3	➔	2NC
66	L	FX 66C1	➔	1NC	FX 66C2	➔	1NC	FX 66C3	➔	1NC
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)		
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			page 7/8 - group 10		



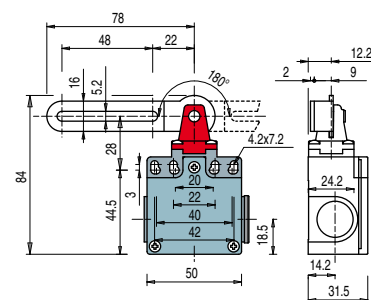
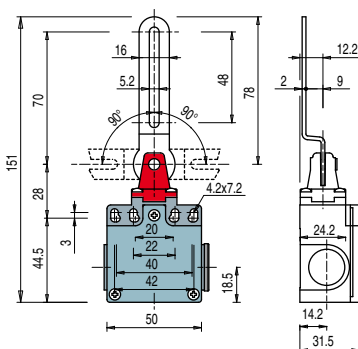
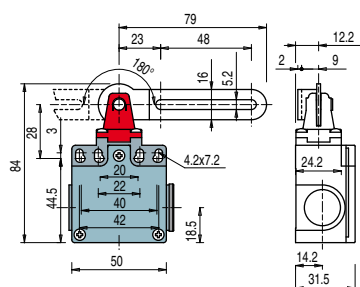
Contact blocks

5	R	FX 5C4	➔	1NO+1NC	FX 5C5	➔	1NO+1NC	
6	L	FX 6C4	➔	1NO+1NC	FX 6C5	➔	1NO+1NC	
9	L	FX 9C4	➔	2NC	FX 9C5	➔	2NC	
18	LA	FX 18C4	➔	1NO+1NC	FX 18C5	➔	1NO+1NC	
20	L	FX 20C4	➔	1NO+2NC	FX 20C5	➔	1NO+2NC	
21	L	FX 21C4	➔	3NC	FX 21C5	➔	3NC	
22	L	FX 22C4	➔	2NO+1NC	FX 22C5	➔	2NO+1NC	
33	L	FX 33C4	➔	1NO+1NC	FX 33C5	➔	1NO+1NC	
34	L	FX 34C4	➔	2NC	FX 34C5	➔	2NC	
66	L	FX 66C4	➔	1NC	FX 66C5	➔	1NC	
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)			
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			



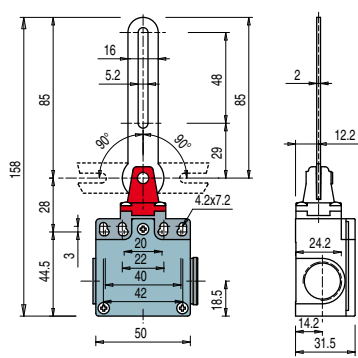
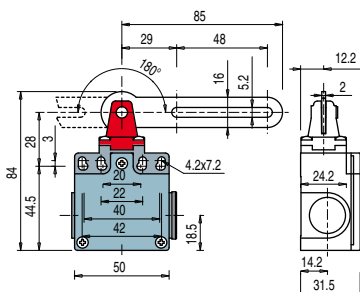
Contacts type:

R = snap action
L = slow action
LA = slow action
closer



Contact blocks

5	R	FZ 5C1	➔	1NO+1NC	FZ 5C2	➔	1NO+1NC	FZ 5C3	➔	1NO+1NC
6	L	FZ 6C1	➔	1NO+1NC	FZ 6C2	➔	1NO+1NC	FZ 6C3	➔	1NO+1NC
9	L	FZ 9C1	➔	2NC	FZ 9C2	➔	2NC	FZ 9C3	➔	2NC
18	LA	FZ 18C1	➔	1NO+1NC	FZ 18C2	➔	1NO+1NC	FZ 18C3	➔	1NO+1NC
20	L	FZ 20C1	➔	1NO+2NC	FZ 20C2	➔	1NO+2NC	FZ 20C3	➔	1NO+2NC
21	L	FZ 21C1	➔	3NC	FZ 21C2	➔	3NC	FZ 21C3	➔	3NC
22	L	FZ 22C1	➔	2NO+1NC	FZ 22C2	➔	2NO+1NC	FZ 22C3	➔	2NO+1NC
33	L	FZ 33C1	➔	1NO+1NC	FZ 33C2	➔	1NO+1NC	FZ 33C3	➔	1NO+1NC
34	L	FZ 34C1	➔	2NC	FZ 34C2	➔	2NC	FZ 34C3	➔	2NC
66	L	FZ 66C1	➔	1NC	FZ 66C2	➔	1NC	FZ 66C3	➔	1NC
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)		
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			page 7/8 - group 10		



Contact blocks

5	R	FZ 5C4	➔	1NO+1NC	FZ 5C5	➔	1NO+1NC	
6	L	FZ 6C4	➔	1NO+1NC	FZ 6C5	➔	1NO+1NC	
9	L	FZ 9C4	➔	2NC	FZ 9C5	➔	2NC	
18	LA	FZ 18C4	➔	1NO+1NC	FZ 18C5	➔	1NO+1NC	
20	L	FZ 20C4	➔	1NO+2NC	FZ 20C5	➔	1NO+2NC	
21	L	FZ 21C4	➔	3NC	FZ 21C5	➔	3NC	
22	L	FZ 22C4	➔	2NO+1NC	FZ 22C5	➔	2NO+1NC	
33	L	FZ 33C4	➔	1NO+1NC	FZ 33C5	➔	1NO+1NC	
34	L	FZ 34C4	➔	2NC	FZ 34C5	➔	2NC	
66	L	FZ 66C4	➔	1NC	FZ 66C5	➔	1NC	
Min. force		0,11 Nm (0,15 Nm ➔)			0,11 Nm (0,15 Nm ➔)			
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			

Contacts type:

- R** = snap action
L = slow action

Contact blocks

33	L	FK 33C1	➡	1NO+1NC	FK 33C2	➡	1NO+1NC	FK 33C3	➡	1NO+1NC
34	L	FK 34C1	➡	2NC	FK 34C2	➡	2NC	FK 34C3	➡	2NC
Min. force		0,11 Nm (0,15 Nm ➡)			0,11 Nm (0,15 Nm ➡)			0,11 Nm (0,15 Nm ➡)		
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11			page 7/8 - group 10		

Contact blocks

33	L	FK 33C4	➡	1NO+1NC	FK 33C5	➡	1NO+1NC			
34	L	FK 34C4	➡	2NC	FK 34C5	➡	2NC			
Min. force		0,11 Nm (0,15 Nm ➡)			0,11 Nm (0,15 Nm ➡)					
Travel diagrams		page 7/8 - group 10			page 7/8 - group 11					

[illegible][illegible]

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