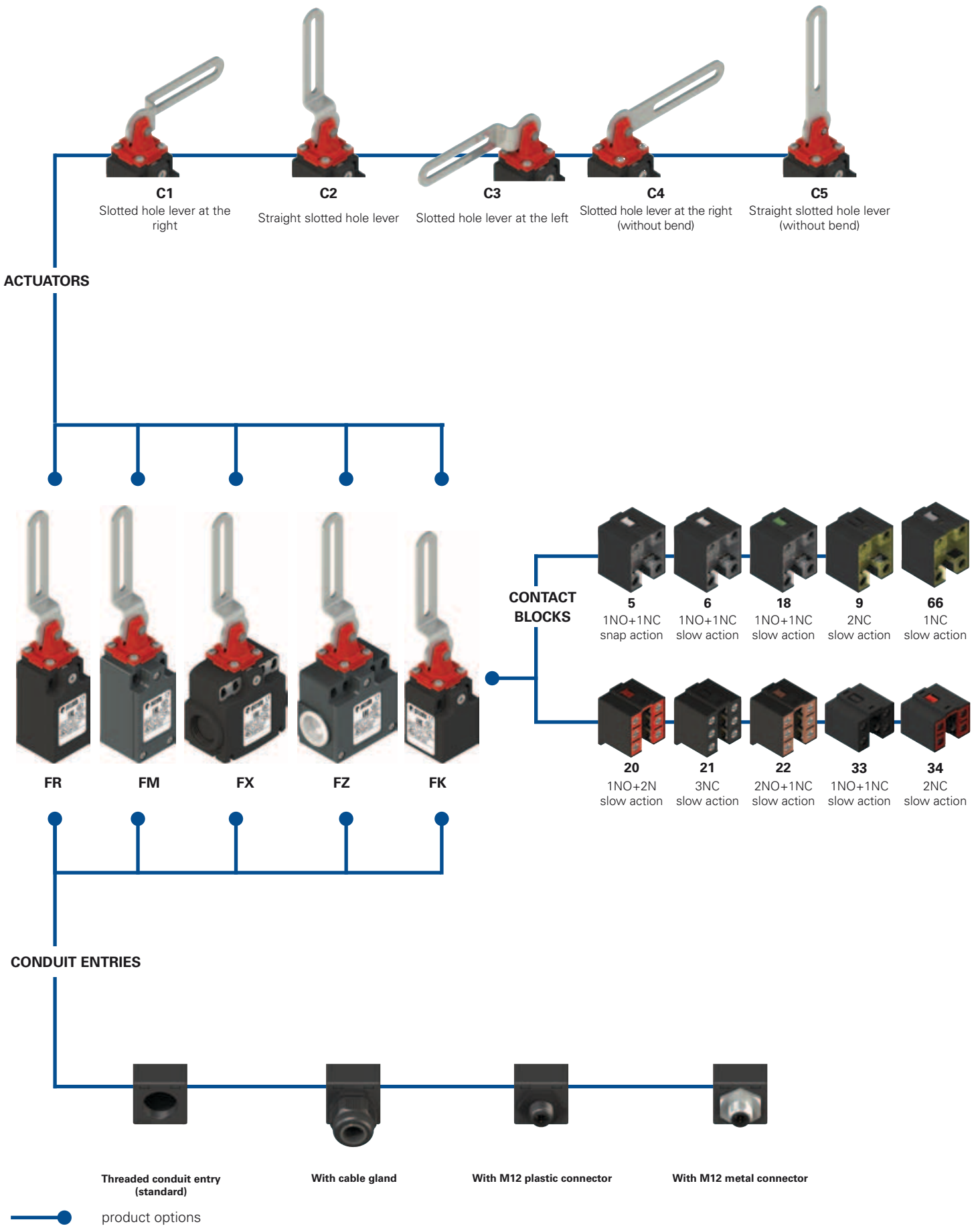


Selection diagram





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 options
FR 18C1-GM2K70T6

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

Contact block	
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

Actuators	
C1	slotted hole lever at the right
C2	straight slotted hole lever
C3	slotted hole lever at the left
C4	slotted hole lever at the right (without bend)
C5	straight slotted hole lever (without bend)

Ambient temperature	
	-25°C ... +80°C (standard)
T6	-40°C ... +80°C

Pre-installed cable glands or connectors	
	no cable gland or connector (standard)
K23	cable gland for cables Ø 6 ... 12 mm
...
K70	M12 plastic connector, 4-pole
...

For the complete list of possible combinations please contact our technical department.

Threaded conduit entry	
M2	M20x1.5 (standard)
M1	M16x1.5 (FR-FX housing only)
	PG 13.5
A	PG 11 (FR-FX housing only)

Contact type	
	silver contacts (standard)
G	silver contacts with 1 µm gold coating
G1	silver contacts, 2.5 µm gold coating (not for contact blocks 20, 21, 22, 33, 34)

article options options
FK 33C1-GM1K24T6

Housing	
FK	technopolymer, one conduit entry

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

Actuators	
C1	slotted hole lever at the right
C2	straight slotted hole lever
C3	slotted hole lever at the left
C4	slotted hole lever at the right (without bend)
C5	straight slotted hole lever (without bend)

Ambient temperature	
	-25°C ... +80°C (standard)
T6	-40°C ... +80°C

Pre-installed cable glands	
	no cable gland (standard)
K24	cable gland for cables Ø 5 ... 10°mm
K28	cable gland for cables Ø 3 ... 7°mm

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

Contact type	
	silver contacts (standard)
G	silver contacts with 1 µm gold coating



Main features

- Metal housing or technopolymer housing, from one to two conduit entries
- Protection degree IP67
- 10 contact blocks available
- Versions with M12 connector
- Versions with gold-plated silver contacts

Quality marks:



IMQ approval:	EG610 (FR-FX-FK series) EG609 (FM-FZ series)
UL approval:	E131787
CCC approval:	2007010305230013 (FR-FX-FK series) 2007010305229998 (FM-FZ series)
EAC approval:	RU C-IT.A.135.B.00454

Technical data

Housing

FR, FX and FK series housing made of glass fibre reinforced technopolymer, self-extinguishing, shock-proof and with double insulation:

FM and FZ series: metal housing, baked powder coating.

FR, FM series: one threaded conduit entry: M20x1.5 (standard)

FK series: one threaded conduit entry: M16x1.5 (standard)

FX series: two knock-out threaded conduit entries: M20x1.5 (standard)

entries:

FZ series: two threaded conduit entries: M20x1.5 (standard)

Protection degree: IP67 acc. to EN 60529 with cable gland of equal or higher protection degree

General data

For safety applications up to: SIL 3 acc. to EN 62061
PL e acc. to EN ISO 13849-1
type 1 acc. to EN ISO 14119

Mechanical interlock, not coded:

Safety parameters:

B_{10D} : 2,000,000 for NC contacts

Service life: 20 years

Ambient temperature: -25°C ... +80°C

Max. actuation frequency: 3600 operating cycles/hour

Mechanical endurance: 1 million operating cycles

Max. actuation speed: 180°/s

Min. actuation speed: 2°/s

Tightening torques for installation: see page 313-324

Cable cross section (flexible copper strands)

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, 7, 9, 18:

min. 1 x 0.5 mm² (1 x AWG 20)

max. 2 x 2.5 mm² (2 x AWG 14)

In compliance with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, UL 508, CSA 22.2 No.14

Approvals:

IEC 60947-5-1, UL 508, CSA 22.2 No.14, GB14048.5-2001.

Compliance with the requirements of:

Machinery Directive 2006/42/EC and EMC Directive 2014/30/EU.

Positive contact opening in conformity with standards:

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

⚠ If not expressly indicated in this chapter, for correct installation and utilization of all articles see chapter utilization requirements from page 313 to page 324.

Electrical data

Utilization category

without connector	with M12 connector 4 and 5-pole	with M12 connector 8-pole
Thermal current (I_{th}):	4 A	2 A
Rated insulation voltage (U):	250 Vac 300 Vdc	30 Vac 36 Vdc
Rated impulse withstand voltage (U_{imp}):	type gG fuse 4 A 500 V	type gG fuse 2 A 500 V
Conditional short circuit current:	3	3
Protection against short circuits:		
Pollution degree:		
Thermal current (I_{th}):	10 A	4 A
Rated insulation voltage (U):	500 Vac 600 Vdc	250 Vac 300 Vdc
Rated impulse withstand voltage (U_{imp}):	400 Vac 500 Vdc	type gG fuse 4 A 500 V
Conditional short circuit current:	(contact blocks 20, 21, 22, 33, 34)	3
Protection against short circuits:	6 kV	
Pollution degree:	4 kV (contact blocks 20, 21, 22, 33, 34)	
Thermal current (I_{th}):	1000 A acc. to EN 60947-5-1	
Rated insulation voltage (U):	type aM fuse 10 A 500 V	
Rated impulse withstand voltage (U_{imp}):	3	
Conditional short circuit current:		
Protection against short circuits:		
Pollution degree:		

Alternating current: AC15 (50±60 Hz)

U_e (V) 250 400 500

I_e (A) 6 4 1

Direct current: DC13

U_e (V) 24 125 250

I_e (A) 6 1.1 0.4

Alternating current: AC15 (50±60 Hz)

U_e (V) 24 120 250

I_e (A) 4 4 4

Direct current: DC13

U_e (V) 24 125 250

I_e (A) 4 1.1 0.4

Alternating current: AC15 (50±60 Hz)

U_e (V) 24

I_e (A) 2

Direct current: DC13

U_e (V) 24

I_e (A) 2

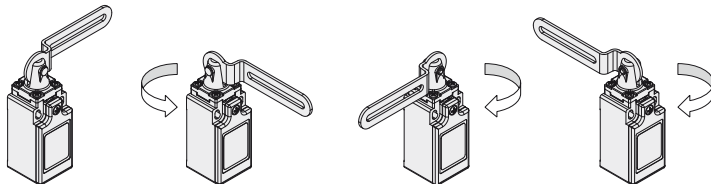


Description



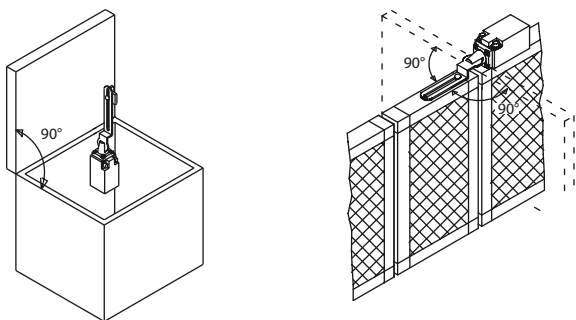
These safety switches are used to control gates or doors with hinges protecting dangerous parts of machines without inertia. Easy to install, they do not need the interaction with the hinge of the guard. They are very sensitive, open the contacts after few degrees of rotation and immediately send the stop signal.

Head with variable orientation



For all switches, the head can be adjusted in 90° steps after removing the four fastening screws. This allows you to use the same switch on both right- and left-facing door fronts.

Application examples



Protection degree IP67

IP67 These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where maximum protection degree of the housing is required.

Extended temperature range

-40°C These devices are also available in a special version suitable for an ambient operating temperature range from -40°C up to +80°C.

They can therefore be used for applications in cold stores, sterilisers and other equipment with low temperature environments. The special materials used to produce these versions retain their characteristics even under these conditions, thereby expanding the installation possibilities.

Features approved by IMQ

Rated insulation voltage (U_i):	500 Vac 400 Vac (for contact blocks 20, 21, 22, 33, 34)
Conventional free air thermal current (I_{th}):	10 A
Protection against short circuits:	type aM fuse 10 A 500 V
Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV (for contact blocks 20, 21, 22, 33, 34)
Protection degree of the housing:	IP67
MV terminals (screw terminals)	
Pollution degree:	3
Utilization category:	AC15
Operating voltage (U_o):	400 Vac (50 Hz)
Operating current (I_o):	3 A
Forms of the contact element:	Zb, Y+Y, Y+Y+X, Y+Y+Y, Y+X+X

Positive opening contacts on contact blocks 5, 7, 9, 18, 20, 21, 22, 33, 34, 66

In compliance with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2014/35/EU.

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

Features approved by UL

Utilization categories	Q300 (69 VA, 125-250 Vdc) A600 (720 VA, 120-600 Vac)
Housing features type 1, 4X "indoor use only", 12, 13	
For all contact blocks use 60 or 75 °C copper (Cu) conductor, rigid or flexible, wire size 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).	
In compliance with standard:	UL 508, CSA 22.2 No.14

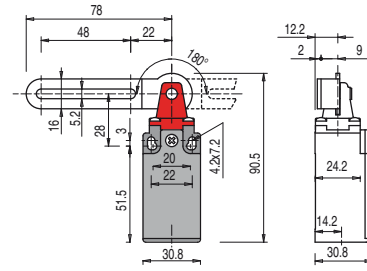
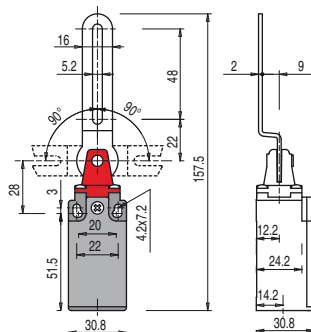
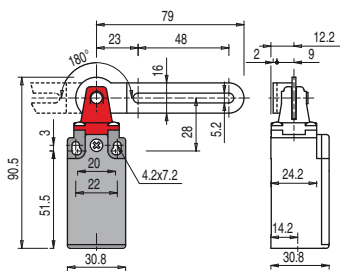
Please contact our technical department for the list of approved products.

Dimensional drawings

All values in the drawings are in mm

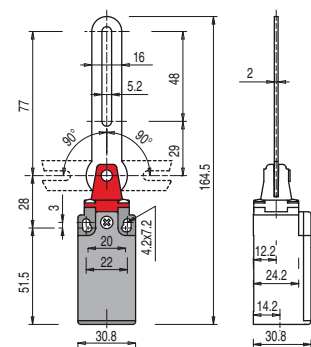
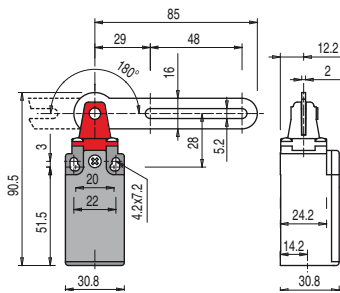
Contact type:

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



Contact block

5	R	FR 5C1-M2	⊕	1NO+1NC	FR 5C2-M2	⊕	1NO+1NC	FR 5C3-M2	⊕	1NO+1NC
6	L	FR 6C1-M2	⊕	1NO+1NC	FR 6C2-M2	⊕	1NO+1NC	FR 6C3-M2	⊕	1NO+1NC
9	L	FR 9C1-M2	⊕	2NC	FR 9C2-M2	⊕	2NC	FR 9C3-M2	⊕	2NC
18	LA	FR 18C1-M2	⊕	1NO+1NC	FR 18C2-M2	⊕	1NO+1NC	FR 18C3-M2	⊕	1NO+1NC
20	L	FR 20C1-M2	⊕	1NO+2NC	FR 20C2-M2	⊕	1NO+2NC	FR 20C3-M2	⊕	1NO+2NC
21	L	FR 21C1-M2	⊕	3NC	FR 21C2-M2	⊕	3NC	FR 21C3-M2	⊕	3NC
22	L	FR 22C1-M2	⊕	2NO+1NC	FR 22C2-M2	⊕	2NO+1NC	FR 22C3-M2	⊕	2NO+1NC
33	L	FR 33C1-M2	⊕	1NO+1NC	FR 33C2-M2	⊕	1NO+1NC	FR 33C3-M2	⊕	1NO+1NC
34	L	FR 34C1-M2	⊕	2NC	FR 34C2-M2	⊕	2NC	FR 34C3-M2	⊕	2NC
66	L	FR 66C1-M2	⊕	1NC	FR 66C2-M2	⊕	1NC	FR 66C3-M2	⊕	1NC
Actuating force		0.11 Nm (0.15 Nm ⊕)			0.11 Nm (0.15 Nm ⊕)			0.11 Nm (0.15 Nm ⊕)		
Travel diagrams		page 320 - group 10			page 320 - group 11			page 320 - group 10		



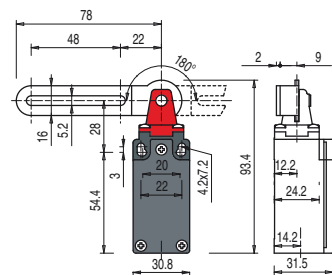
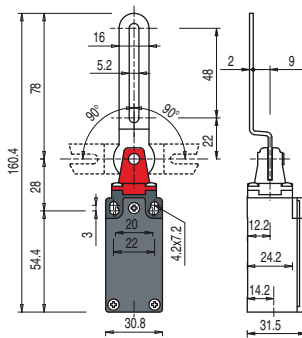
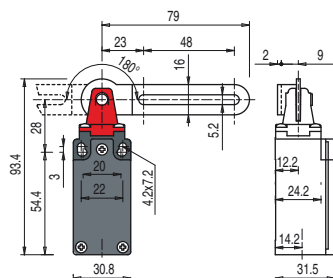
Contact block

5	R	FR 5C4-M2	⊕	1NO+1NC	FR 5C5-M2	⊕	1NO+1NC			
6	L	FR 6C4-M2	⊕	1NO+1NC	FR 6C5-M2	⊕	1NO+1NC			
9	L	FR 9C4-M2	⊕	2NC	FR 9C5-M2	⊕	2NC			
18	LA	FR 18C4-M2	⊕	1NO+1NC	FR 18C5-M2	⊕	1NO+1NC			
20	L	FR 20C4-M2	⊕	1NO+2NC	FR 20C5-M2	⊕	1NO+2NC			
21	L	FR 21C4-M2	⊕	3NC	FR 21C5-M2	⊕	3NC			
22	L	FR 22C4-M2	⊕	2NO+1NC	FR 22C5-M2	⊕	2NO+1NC			
33	L	FR 33C4-M2	⊕	1NO+1NC	FR 33C5-M2	⊕	1NO+1NC			
34	L	FR 34C4-M2	⊕	2NC	FR 34C5-M2	⊕	2NC			
66	L	FR 66C4-M2	⊕	1NC	FR 66C5-M2	⊕	1NC			
Actuating force		0.11 Nm (0.15 Nm ⊕)			0.11 Nm (0.15 Nm ⊕)					
Travel diagrams		page 320 - group 10			page 320 - group 11					



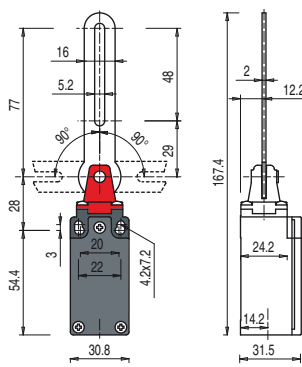
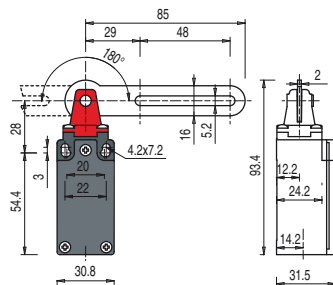
Contact type:

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



Contact block

5	R	FM 5C1-M2	↻	1NO+1NC	FM 5C2-M2	↻	1NO+1NC	FM 5C3-M2	↻	1NO+1NC
6	L	FM 6C1-M2	↻	1NO+1NC	FM 6C2-M2	↻	1NO+1NC	FM 6C3-M2	↻	1NO+1NC
9	L	FM 9C1-M2	↻	2NC	FM 9C2-M2	↻	2NC	FM 9C3-M2	↻	2NC
18	LA	FM 18C1-M2	↻	1NO+1NC	FM 18C2-M2	↻	1NO+1NC	FM 18C3-M2	↻	1NO+1NC
20	L	FM 20C1-M2	↻	1NO+2NC	FM 20C2-M2	↻	1NO+2NC	FM 20C3-M2	↻	1NO+2NC
21	L	FM 21C1-M2	↻	3NC	FM 21C2-M2	↻	3NC	FM 21C3-M2	↻	3NC
22	L	FM 22C1-M2	↻	2NO+1NC	FM 22C2-M2	↻	2NO+1NC	FM 22C3-M2	↻	2NO+1NC
33	L	FM 33C1-M2	↻	1NO+1NC	FM 33C2-M2	↻	1NO+1NC	FM 33C3-M2	↻	1NO+1NC
34	L	FM 34C1-M2	↻	2NC	FM 34C2-M2	↻	2NC	FM 34C3-M2	↻	2NC
66	L	FM 66C1-M2	↻	1NC	FM 66C2-M2	↻	1NC	FM 66C3-M2	↻	1NC
Actuating force		0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)		
Travel diagrams		page 320 - group 10			page 320 - group 11			page 320 - group 10		



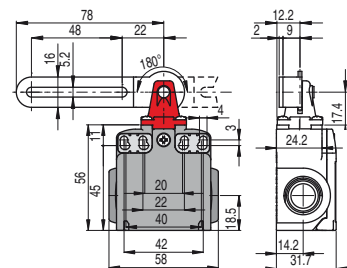
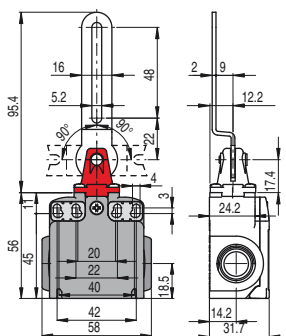
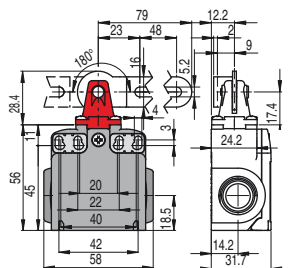
Contact block

5	R	FM 5C4-M2	↻	1NO+1NC	FM 5C5-M2	↻	1NO+1NC			
6	L	FM 6C4-M2	↻	1NO+1NC	FM 6C5-M2	↻	1NO+1NC			
9	L	FM 9C4-M2	↻	2NC	FM 9C5-M2	↻	2NC			
18	LA	FM 18C4-M2	↻	1NO+1NC	FM 18C5-M2	↻	1NO+1NC			
20	L	FM 20C4-M2	↻	1NO+2NC	FM 20C5-M2	↻	1NO+2NC			
21	L	FM 21C4-M2	↻	3NC	FM 21C5-M2	↻	3NC			
22	L	FM 22C4-M2	↻	2NO+1NC	FM 22C5-M2	↻	2NO+1NC			
33	L	FM 33C4-M2	↻	1NO+1NC	FM 33C5-M2	↻	1NO+1NC			
34	L	FM 34C4-M2	↻	2NC	FM 34C5-M2	↻	2NC			
66	L	FM 66C4-M2	↻	1NC	FM 66C5-M2	↻	1NC			
Actuating force		0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)					
Travel diagrams		page 320 - group 10			page 320 - group 11					

Safety switches with slotted hole lever

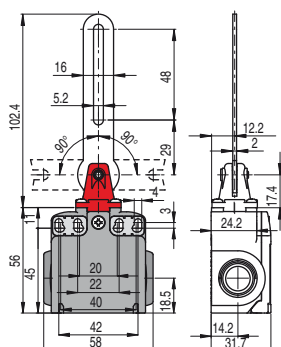
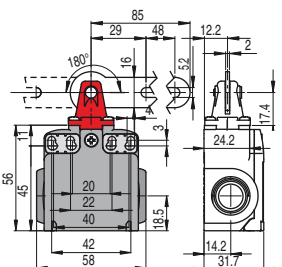
Contact type:

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



Contact block

5	R	FX 5C1-M2	↻	1NO+1NC	FX 5C2-M2	↻	1NO+1NC	FX 5C3-M2	↻	1NO+1NC
6	L	FX 6C1-M2	↻	1NO+1NC	FX 6C2-M2	↻	1NO+1NC	FX 6C3-M2	↻	1NO+1NC
9	L	FX 9C1-M2	↻	2NC	FX 9C2-M2	↻	2NC	FX 9C3-M2	↻	2NC
18	LA	FX 18C1-M2	↻	1NO+1NC	FX 18C2-M2	↻	1NO+1NC	FX 18C3-M2	↻	1NO+1NC
20	L	FX 20C1-M2	↻	1NO+2NC	FX 20C2-M2	↻	1NO+2NC	FX 20C3-M2	↻	1NO+2NC
21	L	FX 21C1-M2	↻	3NC	FX 21C2-M2	↻	3NC	FX 21C3-M2	↻	3NC
22	L	FX 22C1-M2	↻	2NO+1NC	FX 22C2-M2	↻	2NO+1NC	FX 22C3-M2	↻	2NO+1NC
33	L	FX 33C1-M2	↻	1NO+1NC	FX 33C2-M2	↻	1NO+1NC	FX 33C3-M2	↻	1NO+1NC
34	L	FX 34C1-M2	↻	2NC	FX 34C2-M2	↻	2NC	FX 34C3-M2	↻	2NC
66	L	FX 66C1-M2	↻	1NC	FX 66C2-M2	↻	1NC	FX 66C3-M2	↻	1NC
Actuating force		0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)		
Travel diagrams		page 320 - group 10			page 320 - group 11			page 320 - group 10		



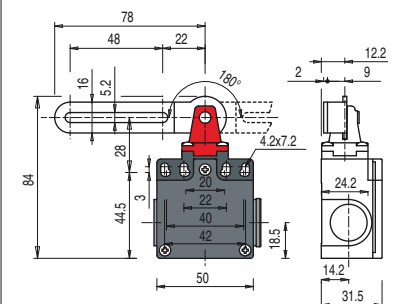
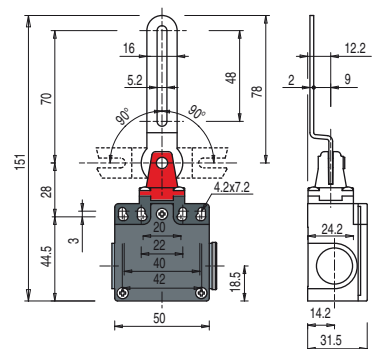
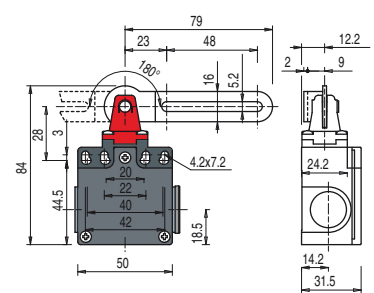
Contact block

5	R	FX 5C4-M2	↻	1NO+1NC	FX 5C5-M2	↻	1NO+1NC			
6	L	FX 6C4-M2	↻	1NO+1NC	FX 6C5-M2	↻	1NO+1NC			
9	L	FX 9C4-M2	↻	2NC	FX 9C5-M2	↻	2NC			
18	LA	FX 18C4-M2	↻	1NO+1NC	FX 18C5-M2	↻	1NO+1NC			
20	L	FX 20C4-M2	↻	1NO+2NC	FX 20C5-M2	↻	1NO+2NC			
21	L	FX 21C4-M2	↻	3NC	FX 21C5-M2	↻	3NC			
22	L	FX 22C4-M2	↻	2NO+1NC	FX 22C5-M2	↻	2NO+1NC			
33	L	FX 33C4-M2	↻	1NO+1NC	FX 33C5-M2	↻	1NO+1NC			
34	L	FX 34C4-M2	↻	2NC	FX 34C5-M2	↻	2NC			
66	L	FX 66C4-M2	↻	1NC	FX 66C5-M2	↻	1NC			
Actuating force		0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)					
Travel diagrams		page 320 - group 10			page 320 - group 11					



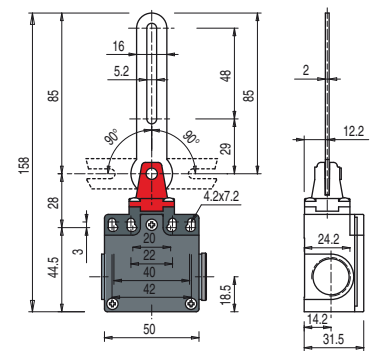
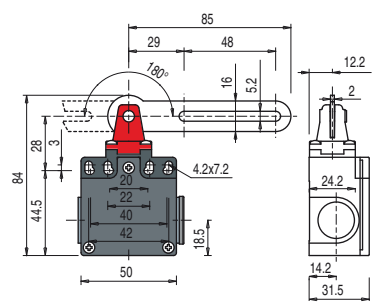
Contact type:

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



Contact block

5	R	FZ 5C1-M2	↻	1NO+1NC	FZ 5C2-M2	↻	1NO+1NC	FZ 5C3-M2	↻	1NO+1NC
6	L	FZ 6C1-M2	↻	1NO+1NC	FZ 6C2-M2	↻	1NO+1NC	FZ 6C3-M2	↻	1NO+1NC
9	L	FZ 9C1-M2	↻	2NC	FZ 9C2-M2	↻	2NC	FZ 9C3-M2	↻	2NC
18	LA	FZ 18C1-M2	↻	1NO+1NC	FZ 18C2-M2	↻	1NO+1NC	FZ 18C3-M2	↻	1NO+1NC
20	L	FZ 20C1-M2	↻	1NO+2NC	FZ 20C2-M2	↻	1NO+2NC	FZ 20C3-M2	↻	1NO+2NC
21	L	FZ 21C1-M2	↻	3NC	FZ 21C2-M2	↻	3NC	FZ 21C3-M2	↻	3NC
22	L	FZ 22C1-M2	↻	2NO+1NC	FZ 22C2-M2	↻	2NO+1NC	FZ 22C3-M2	↻	2NO+1NC
33	L	FZ 33C1-M2	↻	1NO+1NC	FZ 33C2-M2	↻	1NO+1NC	FZ 33C3-M2	↻	1NO+1NC
34	L	FZ 34C1-M2	↻	2NC	FZ 34C2-M2	↻	2NC	FZ 34C3-M2	↻	2NC
66	L	FZ 66C1-M2	↻	1NC	FZ 66C2-M2	↻	1NC	FZ 66C3-M2	↻	1NC
Actuating force		0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)		
Travel diagrams		page 320 - group 10			page 320 - group 11			page 320 - group 10		

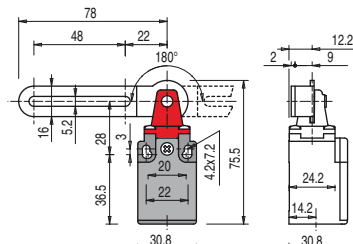
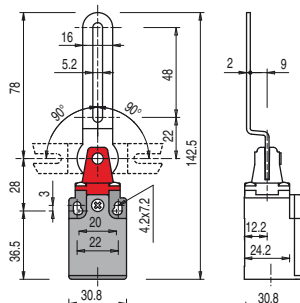
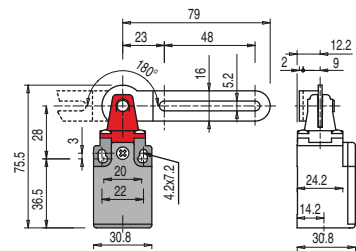


Contact block

5	R	FZ 5C4-M2	↻	1NO+1NC	FZ 5C5-M2	↻	1NO+1NC			
6	L	FZ 6C4-M2	↻	1NO+1NC	FZ 6C5-M2	↻	1NO+1NC			
9	L	FZ 9C4-M2	↻	2NC	FZ 9C5-M2	↻	2NC			
18	LA	FZ 18C4-M2	↻	1NO+1NC	FZ 18C5-M2	↻	1NO+1NC			
20	L	FZ 20C4-M2	↻	1NO+2NC	FZ 20C5-M2	↻	1NO+2NC			
21	L	FZ 21C4-M2	↻	3NC	FZ 21C5-M2	↻	3NC			
22	L	FZ 22C4-M2	↻	2NO+1NC	FZ 22C5-M2	↻	2NO+1NC			
33	L	FZ 33C4-M2	↻	1NO+1NC	FZ 33C5-M2	↻	1NO+1NC			
34	L	FZ 34C4-M2	↻	2NC	FZ 34C5-M2	↻	2NC			
66	L	FZ 66C4-M2	↻	1NC	FZ 66C5-M2	↻	1NC			
Actuating force		0.11 Nm (0.15 Nm ↻)			0.11 Nm (0.15 Nm ↻)					
Travel diagrams		page 320 - group 10			page 320 - group 11					

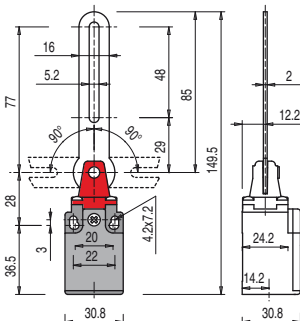
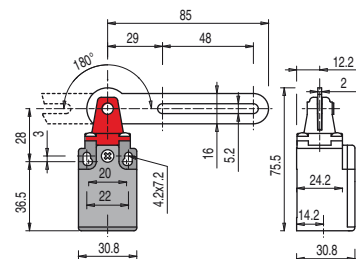
Contact type:

L = slow action



Contact block

33	L	FK 33C1-M1	1NO+1NC	FK 33C2-M1	1NO+1NC	FK 33C3-M1	1NO+1NC
34	L	FK 34C1-M1	2NC	FK 34C2-M1	2NC	FK 34C3-M1	2NC
Actuating force		0.11 Nm (0.15 Nm)		0.11 Nm (0.15 Nm)		0.11 Nm (0.15 Nm)	
Travel diagrams		page 320 - group 10		page 320 - group 11		page 320 - group 10	



Contact block

33	L	FK 33C4-M1	1NO+1NC	FK 33C5-M1	1NO+1NC		
34	L	FK 34C4-M1	2NC	FK 34C5-M1	2NC		
Actuating force		0.11 Nm (0.15 Nm)		0.11 Nm (0.15 Nm)			
Travel diagrams		page 320 - group 10		page 320 - group 11			

