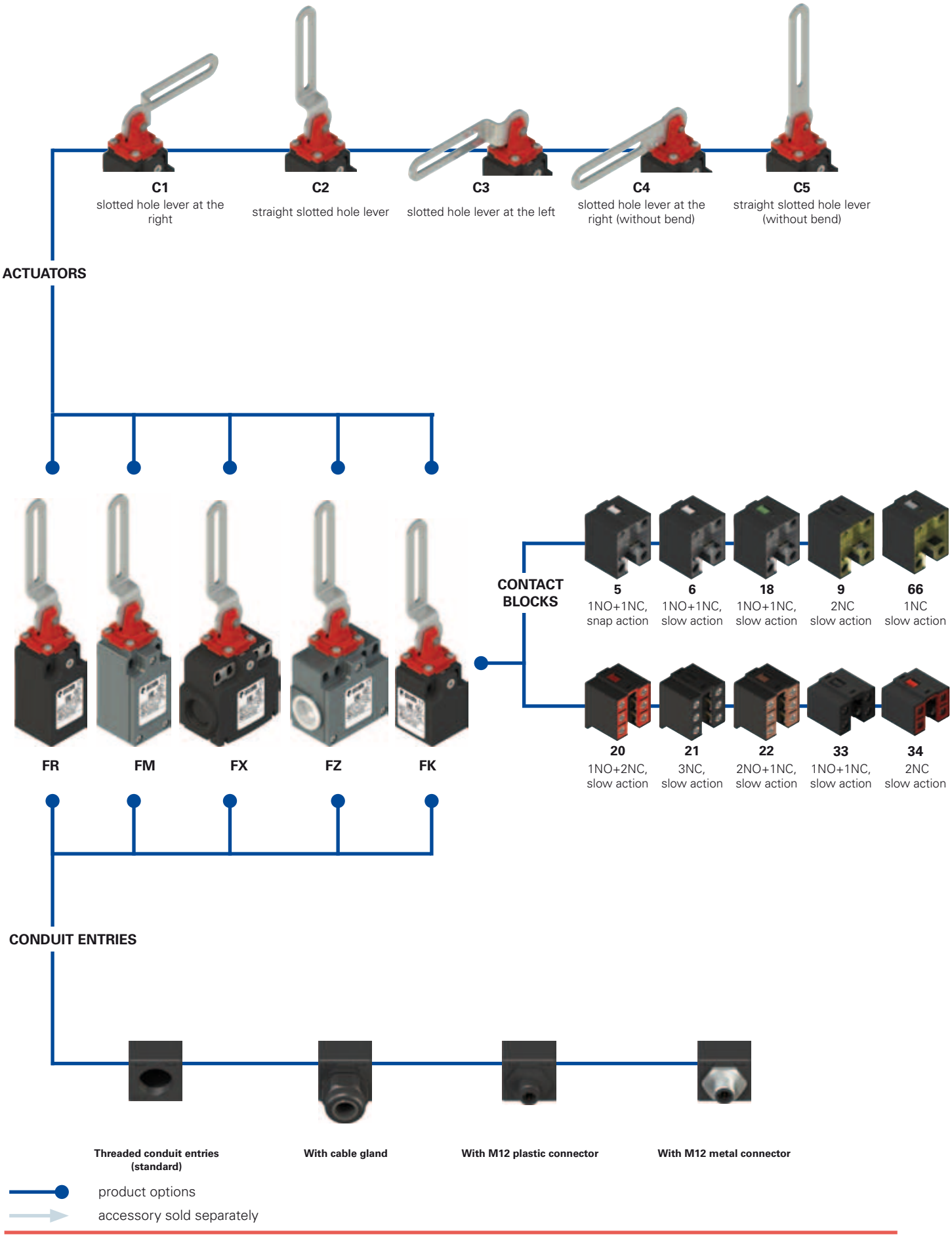
Selection diagram



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 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

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)

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

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

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

Pre-installed cable glands or connectors	
	without cable gland or connector (standard)
K23	cable gland for cables Ø 6…Ø 12 mm
...	.....
K70	M12 plastic connector, 4 poles
...	.....

Please contact our technical service for the complete list of possible combinations.

article | options | options

FK 33C1-GM1K24T6

Housing	
FK	technopolymer, one conduit entry

Contact blocks	
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)

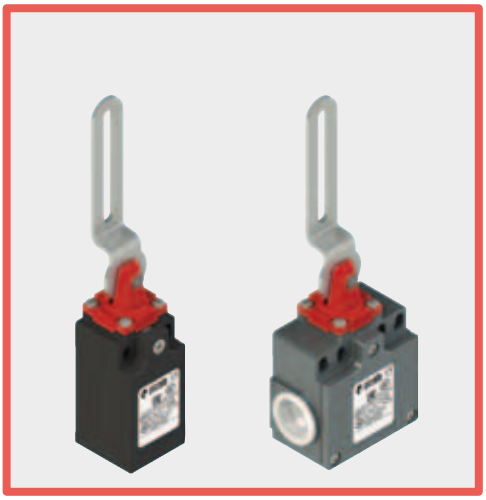
Contact type	
	silver contacts (standard)
G	silver contacts with 1 µm gold coating

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

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

Pre-installed cable glands	
	without cable gland (standard)
K24	cable gland for cables Ø 5…Ø 10 mm
K28	cable gland for cables Ø 3…Ø 7 mm

Safety switches **with slotted hole lever**



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

Technical data

Housing

FR, FX and FK series housing made of glass fiber 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)
FZ series - two threaded conduit entries:	M20x1.5 (standard)
Protection degree:	IP67 acc. to EN 60529 with cable gland having 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
Mechanical interlock, not coded:	type 1 acc. to EN ISO 14119
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[1]/hour
Mechanical endurance:	1 million operating cycles[1]
Max. actuation speed:	180°/s
Min. actuation speed:	2°/s
Tightening torques for installation:	see pages 297-308

(1) One operation cycle means two movements, one to close and one to open contacts, as defined in EN 60947-5-1.

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)

Markings and 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 ДМ94.B.01024

In conformity 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.

In conformity with the requirements of:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and EMC Directive 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1.

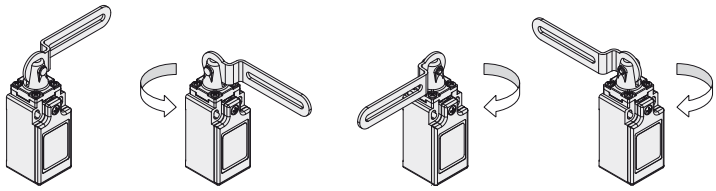
⚠ **If not expressly indicated in this chapter, for correct installation and utilization of all articles see chapter utilization requirements from page 297 to page 308.**

	Electrical data		Utilization category
without connector	Thermal current (Ith):	10 A	Alternating current: AC15 (50÷60 Hz)
	Rated insulation voltage (Ui):	500 Vac 600 Vdc 400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)	Ue (V) 250 400 500 Ie (A) 6 4 1
	Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV (contact blocks 20, 21, 22, 33, 34)	Direct current: DC13
	Conditional short circuit current:	1000 A acc. to EN 60947-5-1	Ue (V) 24 125 250 Ie (A) 6 1.1 0.4
	Protection against short circuits:	type aM fuse 10 A 500 V	
	Pollution degree:	3	
with M12 connector 4 and 5 poles	Thermal current (Ith):	4 A	Alternating current: AC15 (50÷60 Hz)
	Rated insulation voltage (Ui):	250 Vac 300 Vdc	Ue (V) 24 120 250 Ie (A) 4 4 4
	Protection against short circuits:	type gG fuse 4 A 500 V	Direct current: DC13
	Pollution degree:	3	Ue (V) 24 125 250 Ie (A) 4 1.1 0.4
with M12 connector 8 poles	Thermal current (Ith):	2 A	Alternating current: AC15 (50÷60 Hz)
	Rated insulation voltage (Ui):	30 Vac 36 Vdc	Ue (V) 24 Ie (A) 2
	Protection against short circuits:	type gG fuse 2 A 500 V	Direct current: DC13
	Pollution degree:	3	Ue (V) 24 Ie (A) 2

Description

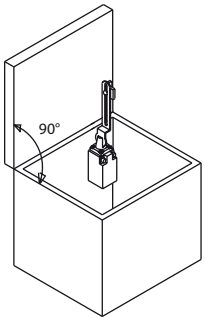
These safety switches are used to control gates or doors with hinge protecting hazardous parts of machines without inertia. Easy to install, they do not need the interaction with the hinge of the guard. They are very sensitive and positively open the contacts after few degrees of rotation, sending an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

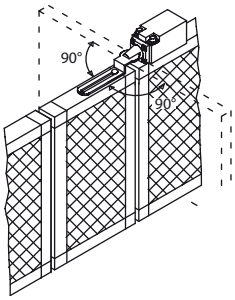
Orientable heads



Removing the four fastening screws, in all switches, it is possible to rotate the head in 90° steps. 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 IEC 60529.
They can therefore be used in all environments where the maximum protection of the housing is required.

Extended temperature range

-40°C

This range of switches is also available in a special version with an ambient operating temperature range of -40°C to +80°C.
They can be used for applications in cold stores, sterilisers and other devices with low temperature environments. Special materials that have been used to realize these versions, maintain unchanged their features also in these conditions, widening the installation possibilities.

Characteristics approved by IMQ

Rated insulation voltage (Ui): 500 Vac
400 Vac (for contact blocks 20, 21, 22, 33, 34)
Conventional free air thermal current (Ith): 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 (Ue): 400 Vac (50 Hz)
Operating 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 blocks 5, 7, 9, 18, 20, 21, 22, 33, 34, 66

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

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

Characteristics approved by UL

Utilization categories Q300 (69 VA, 125 … 250 Vdc)
A600 (720 VA, 120 … 600 Vac)
Data of housing 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 AWG 12-14. Terminal tightening torque of 7.1 lb in (0.8 Nm).

In conformity with standard: UL 508, CSA 22.2 No.14

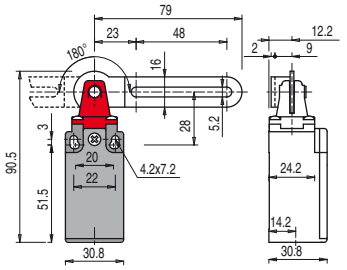
Please contact our technical service for the list of approved products.

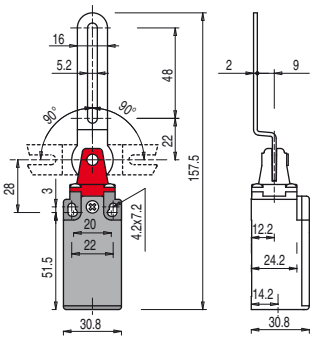
Dimensional drawings

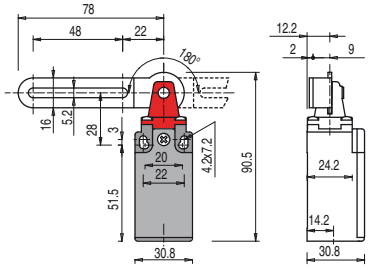
All measures in the drawings are in mm

Contact type:

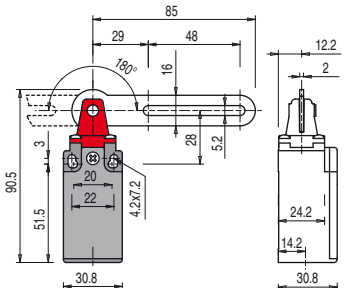
R = snap action
L = slow action
LA = slow action closer

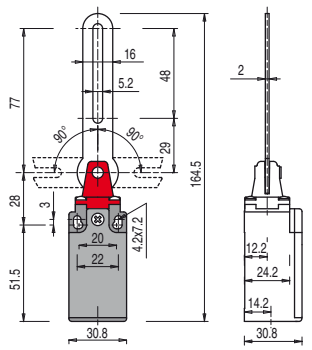






Contact blocks				
5	R	FR 5C1-M2 → 1NO+1NC	FR 5C2-M2 → 1NO+1NC	FR 5C3-M2 → 1NO+1NC
6	L	FR 6C1-M2 → 1NO+1NC	FR 6C2-M2 → 1NO+1NC	FR 6C3-M2 → 1NO+1NC
9	L	FR 9C1-M2 → 2NC	FR 9C2-M2 → 2NC	FR 9C3-M2 → 2NC
18	LA	FR 18C1-M2 → 1NO+1NC	FR 18C2-M2 → 1NO+1NC	FR 18C3-M2 → 1NO+1NC
20	L	FR 20C1-M2 → 1NO+2NC	FR 20C2-M2 → 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
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams		page 304 - group 10	page 304 - group 11	page 304 - group 10





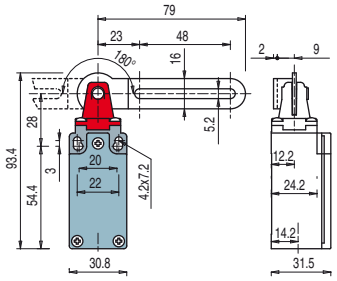
Contact blocks				
5	R	FR 5C4-M2 → 1NO+1NC	FR 5C5-M2 → 1NO+1NC	
6	L	FR 6C4-M2 → 1NO+1NC	FR 6C5-M2 → 1NO+1NC	
9	L	FR 9C4-M2 → 2NC	FR 9C5-M2 → 2NC	
18	LA	FR 18C4-M2 → 1NO+1NC	FR 18C5-M2 → 1NO+1NC	
20	L	FR 20C4-M2 → 1NO+2NC	FR 20C5-M2 → 1NO+2NC	
21	L	FR 21C4-M2 → 3NC	FR 21C5-M2 → 3NC	
22	L	FR 22C4-M2 → 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	
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	
Travel diagrams		page 304 - group 10	page 304 - group 11	

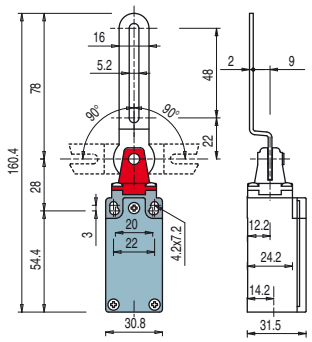
Accessories See page 287

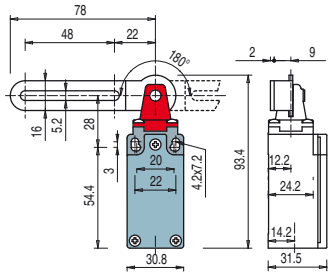
→ The 2D and 3D files are available at **www.pizzato.com**

Contact type:

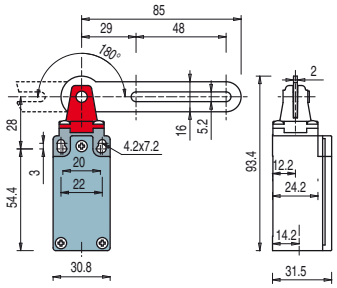
R = snap action
L = slow action
LA = slow action closer

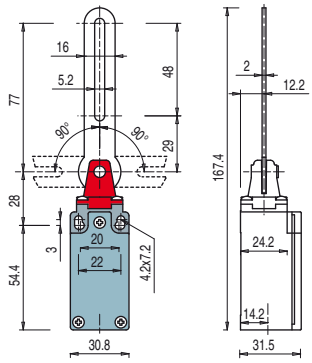






Contact blocks				
5	R	FM 5C1-M2 → 1NO+1NC	FM 5C2-M2 → 1NO+1NC	FM 5C3-M2 → 1NO+1NC
6	L	FM 6C1-M2 → 1NO+1NC	FM 6C2-M2 → 1NO+1NC	FM 6C3-M2 → 1NO+1NC
9	L	FM 9C1-M2 → 2NC	FM 9C2-M2 → 2NC	FM 9C3-M2 → 2NC
18	LA	FM 18C1-M2 → 1NO+1NC	FM 18C2-M2 → 1NO+1NC	FM 18C3-M2 → 1NO+1NC
20	L	FM 20C1-M2 → 1NO+2NC	FM 20C2-M2 → 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
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams		page 304 - group 10	page 304 - group 11	page 304 - group 10





Contact blocks				
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	
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	
Travel diagrams		page 304 - group 10	page 304 - group 11	

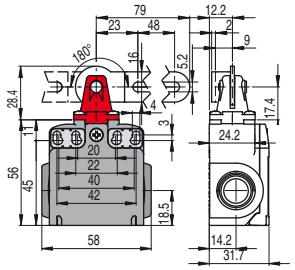
Accessories See page 287

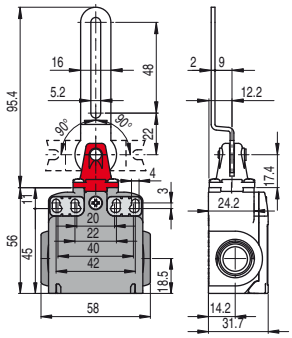
→ The 2D and 3D files are available at **www.pizzato.com**

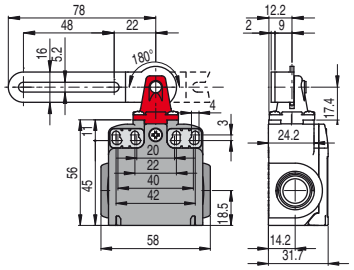
Safety switches **with slotted hole lever**

Contact type:

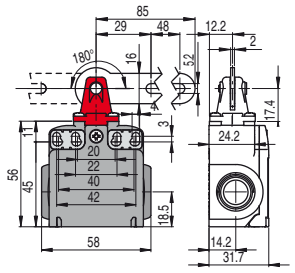
R = snap action
L = slow action
LA = slow action closer

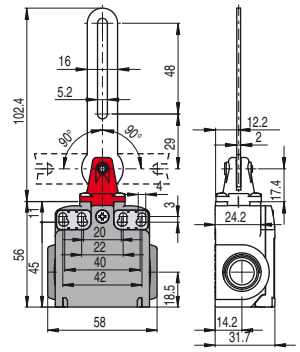






Contact blocks				
5	R	FX 5C1-M2 → 1NO+1NC	FX 5C2-M2 → 1NO+1NC	FX 5C3-M2 → 1NO+1NC
6	L	FX 6C1-M2 → 1NO+1NC	FX 6C2-M2 → 1NO+1NC	FX 6C3-M2 → 1NO+1NC
9	L	FX 9C1-M2 → 2NC	FX 9C2-M2 → 2NC	FX 9C3-M2 → 2NC
18	LA	FX 18C1-M2 → 1NO+1NC	FX 18C2-M2 → 1NO+1NC	FX 18C3-M2 → 1NO+1NC
20	L	FX 20C1-M2 → 1NO+2NC	FX 20C2-M2 → 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
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams		page 304 - group 10	page 304 - group 11	page 304 - group 10





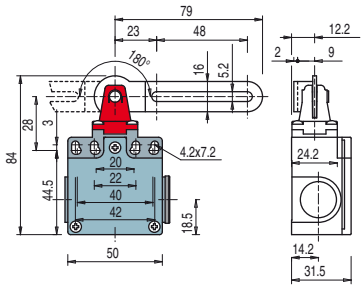
Contact blocks				
5	R	FX 5C4-M2 → 1NO+1NC	FX 5C5-M2 → 1NO+1NC	
6	L	FX 6C4-M2 → 1NO+1NC	FX 6C5-M2 → 1NO+1NC	
9	L	FX 9C4-M2 → 2NC	FX 9C5-M2 → 2NC	
18	LA	FX 18C4-M2 → 1NO+1NC	FX 18C5-M2 → 1NO+1NC	
20	L	FX 20C4-M2 → 1NO+2NC	FX 20C5-M2 → 1NO+2NC	
21	L	FX 21C4-M2 → 3NC	FX 21C5-M2 → 3NC	
22	L	FX 22C4-M2 → 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	
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	
Travel diagrams		page 304 - group 10	page 304 - group 11	

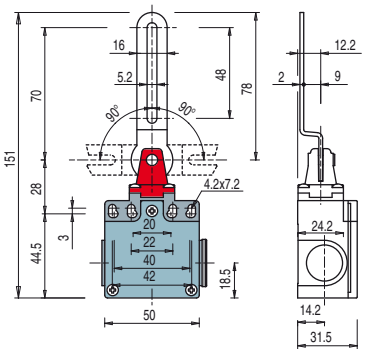
Accessories See page 287

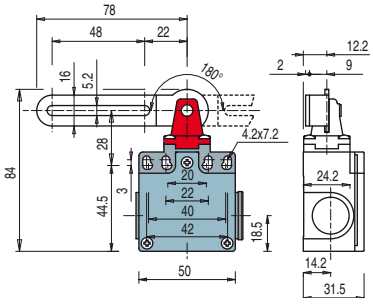
→ The 2D and 3D files are available at **www.pizzato.com**

Contact type:

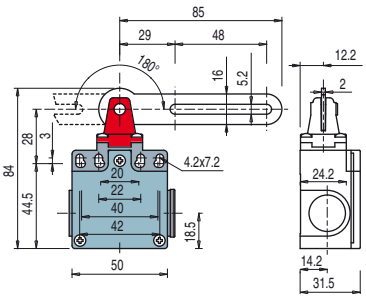
R = snap action
L = slow action
LA = slow action closer

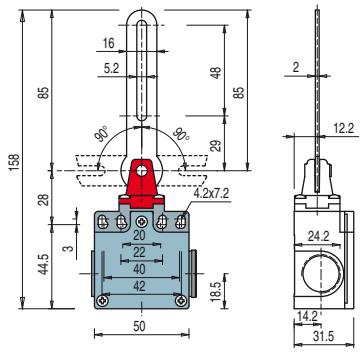






Contact blocks				
5	R	FZ 5C1-M2 → 1NO+1NC	FZ 5C2-M2 → 1NO+1NC	FZ 5C3-M2 → 1NO+1NC
6	L	FZ 6C1-M2 → 1NO+1NC	FZ 6C2-M2 → 1NO+1NC	FZ 6C3-M2 → 1NO+1NC
9	L	FZ 9C1-M2 → 2NC	FZ 9C2-M2 → 2NC	FZ 9C3-M2 → 2NC
18	LA	FZ 18C1-M2 → 1NO+1NC	FZ 18C2-M2 → 1NO+1NC	FZ 18C3-M2 → 1NO+1NC
20	L	FZ 20C1-M2 → 1NO+2NC	FZ 20C2-M2 → 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
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams		page 304 - group 10	page 304 - group 11	page 304 - group 10





Contact blocks				
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	
Min. force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	
Travel diagrams		page 304 - group 10	page 304 - group 11	

Accessories See page 287

→ The 2D and 3D files are available at **www.pizzato.com**

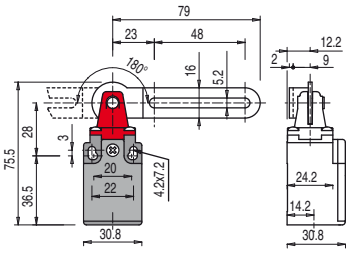
Safety switches **with slotted hole lever**

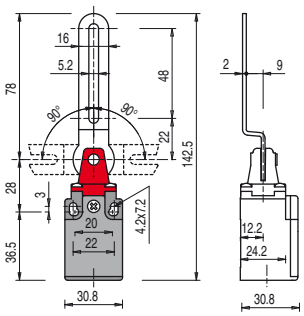
Contact type:

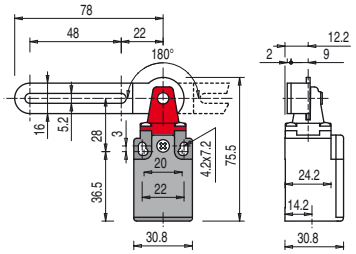
L = slow action

Contact blocks

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
Min. force	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams	page 304 - group 10	page 304 - group 11	page 304 - group 10

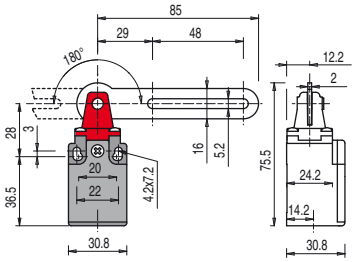


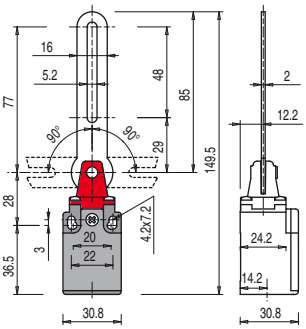




Contact blocks

33 L	FK 33C4-M1 → 1NO+1NC	FK 33C5-M1 → 1NO+1NC	
34 L	FK 34C4-M1 → 2NC	FK 34C5-M1 → 2NC	
Min. force	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	
Travel diagrams	page 304 - group 10	page 304 - group 11	





Accessories See page 287

→ The 2D and 3D files are available at **www.pizzato.com**

Notes