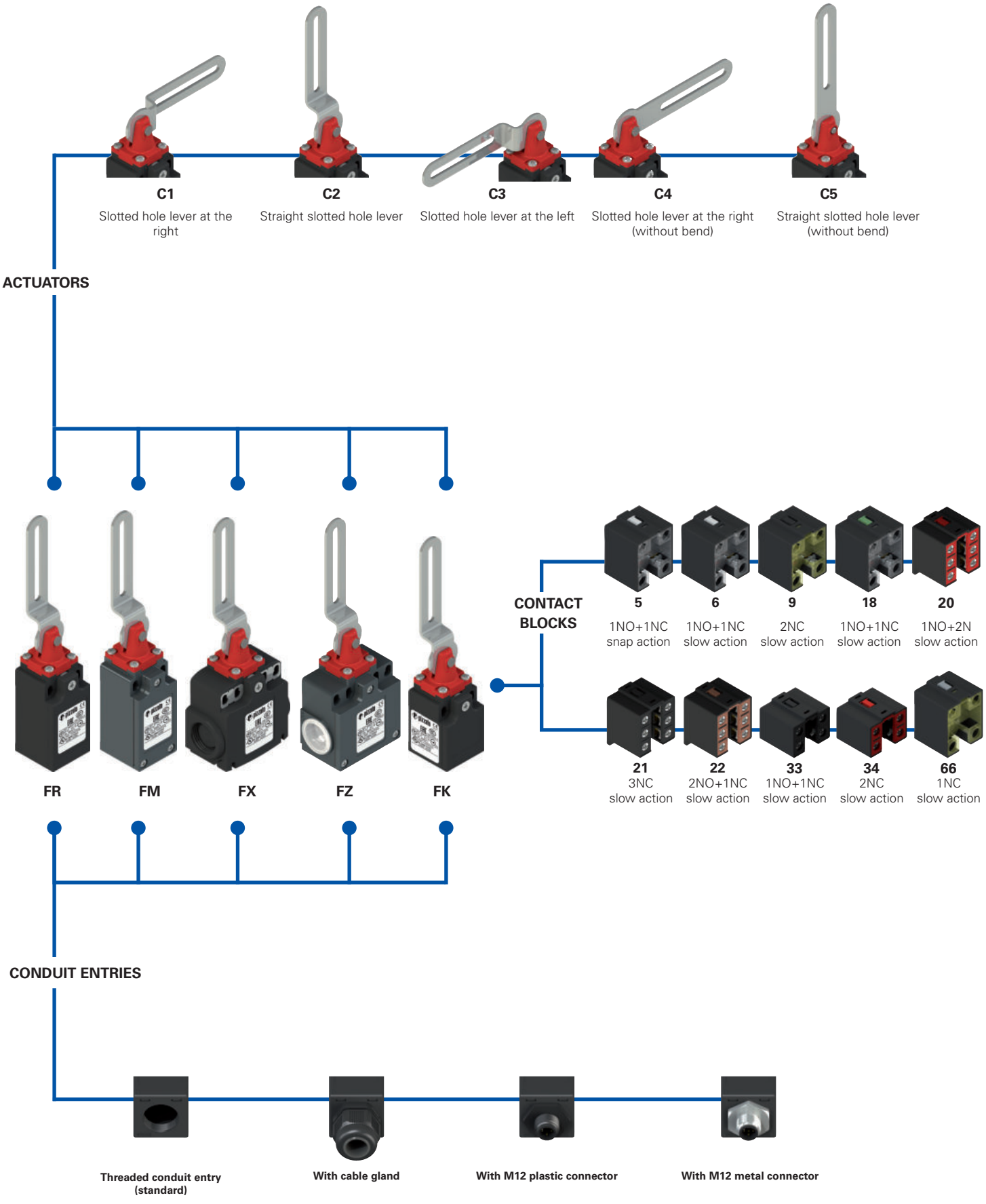
Selection diagram



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	
5	1NO+1NC, snap action
6	1NO+1NC, slow action
9	2NC, slow action
18	1NO+1NC, 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
G1	silver contacts, 2.5 µm gold coating (not for contact blocks 20, 21, 22, 33, 34)

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

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.

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

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)

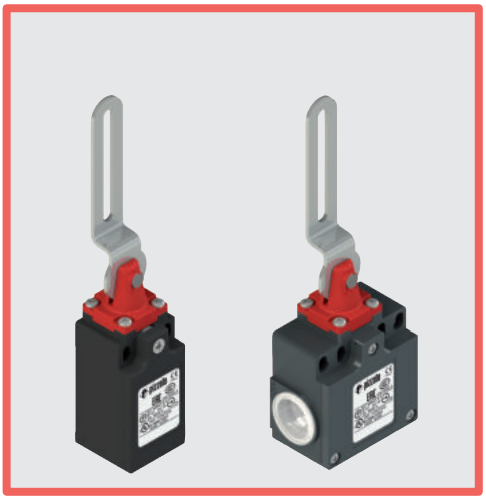
Contact type	
	silver contacts (standard)
G	silver contacts with 1 µm gold coating

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

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

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

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 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)
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

SIL (SIL CL) up to:	SIL 3 acc. to EN 62061
Performance Level (PL) up to:	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
Mission time:	20 years
Ambient temperature:	-25°C … +80°C (standard) -40°C … +80°C (T6 option)
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 341
Wire cross-sections and wire stripping lengths:	see page 357

In compliance with standards:
IEC 60947-5-1, IEC 60947-1, IEC 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 50581, UL 508, CSA 22.2 No.14
Approvals:
EN 60947-5-1, UL 508, CSA 22.2 No.14, GB/T14048.5-2017.

Compliance with the requirements of:
Machinery Directive 2006/42/EC, EMC Directive 2014/30/EU, RoHS Directive 2011/65/EU.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1.

Quality marks:

IMQ approval:	EG610
UL approval:	E131787
CCC approval:	2007010305230013
EAC approval:	RU C-IT.УТ03.B.00035/19

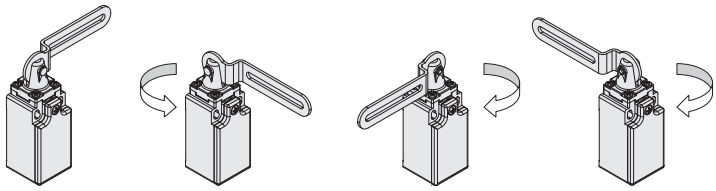
⚠ **If not expressly indicated in this chapter, for correct installation and utilization of all articles see the instructions given on pages 337 to 350.**

	Electrical data		Utilization category
without connector	Thermal current (I_{th}):	10 A	Alternating current: AC15 (50÷60 Hz)
	Rated insulation voltage (U_i):	500 Vac 600 Vdc 400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)	U_e (V) 250 400 500 I_e (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	U_e (V) 24 125 250
	Protection against short circuits:	type aM fuse 10 A 500 V	I_e (A) 3 0.55 0.3
	Pollution degree:	3	
with M12 connector, 4 and 5-pole	Thermal current (I_{th}):	4 A	Alternating current: AC15 (50÷60 Hz)
	Rated insulation voltage (U_i):	250 Vac 300 Vdc	U_e (V) 24 120 250
	Protection against short circuits:	type gG fuse 4 A 500 V	I_e (A) 4 4 4
	Pollution degree:	3	Direct current: DC13
			U_e (V) 24 125 250
			I_e (A) 3 0.55 0.3
with M12 connector, 8-pole	Thermal current (I_{th}):	2 A	Alternating current: AC15 (50÷60 Hz)
	Rated insulation voltage (U_i):	30 Vac 36 Vdc	U_e (V) 24
	Protection against short circuits:	type gG fuse 2 A 500 V	I_e (A) 2
	Pollution degree:	3	Direct current: DC13
			U_e (V) 24
			I_e (A) 2

Description

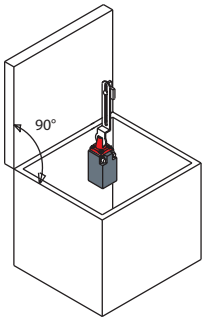
These safety switches are used to control gates or guards with hinges protecting dangerous parts of machines without inertia. Easy to install, they do not need the interaction with the hinge of the guard. They are very sensitive, open the contacts after few degrees of rotation and immediately send the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

Head with variable orientation

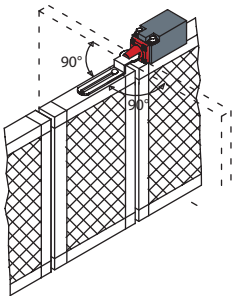


For all switches, the head can be adjusted in 90° steps after removing the four fastening screws. This allows you to use the same switch on both right- and left-facing door fronts.

Application examples



Safety switch with slotted hole lever, mounting inside the safety guard



Safety switch with slotted hole lever, mounting on guards which open up to 180°

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_e):	400 Vac (50 Hz)
Operating current (I_e):	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, 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

Electrical Ratings:	Q300 pilot duty (69 VA, 125-250 V dc) A600 pilot duty (720 VA, 120-600 V ac)
Environmental Ratings:	Types 1, 4X, 12, 13

Use 60 or 75 °C copper (Cu) conductor and wire size range 12, 14 AWG, stranded or solid. The terminal tightening torque of 7.1 lb in (0.8 Nm).

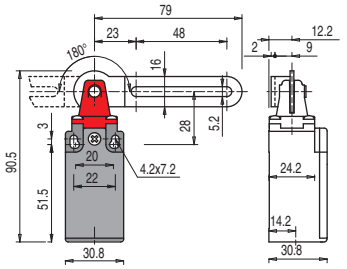
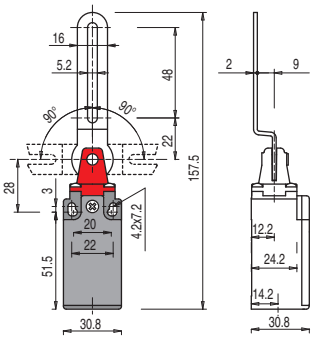
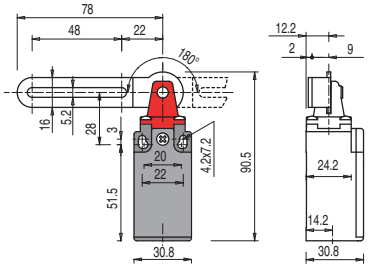
For FR, FX, FK series: the hub is to be connected to the conduit before the hub is connected to the enclosure.

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

Safety switches **with slotted hole lever**

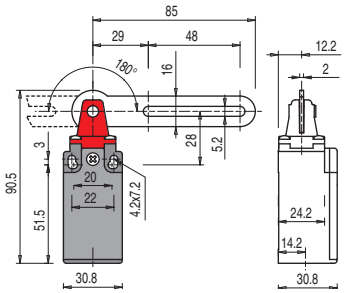
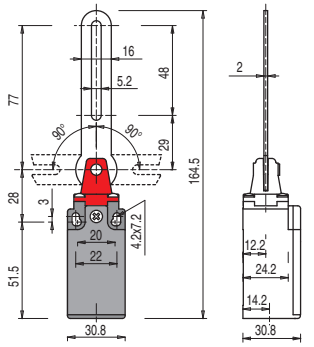
Contact type:

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

Contact blocks		Technopolymer housing	Technopolymer housing	Technopolymer housing
				
5	R	FR 5C1-M2	FR 5C2-M2	FR 5C3-M2
6	L	FR 6C1-M2	FR 6C2-M2	FR 6C3-M2
9	L	FR 9C1-M2	FR 9C2-M2	FR 9C3-M2
18	LA	FR 18C1-M2	FR 18C2-M2	FR 18C3-M2
20	L	FR 20C1-M2	FR 20C2-M2	FR 20C3-M2
21	L	FR 21C1-M2	FR 21C2-M2	FR 21C3-M2
22	L	FR 22C1-M2	FR 22C2-M2	FR 22C3-M2
33	L	FR 33C1-M2	FR 33C2-M2	FR 33C3-M2
34	L	FR 34C1-M2	FR 34C2-M2	FR 34C3-M2
66	L	FR 66C1-M2	FR 66C2-M2	FR 66C3-M2
		1NO+1NC / 2NC / 1NO+2NC / 3NC / 2NO+1NC / 1NC	1NO+1NC / 2NC / 1NO+2NC / 3NC / 2NO+1NC / 1NC	1NO+1NC / 2NC / 1NO+2NC / 3NC / 2NO+1NC / 1NC
Actuating force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams		page 344 - group 10	page 344 - group 11	page 344 - group 10

Contact type:

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

Contact blocks		Technopolymer housing	Technopolymer housing
			
5	R	FR 5C4-M2	FR 5C5-M2
6	L	FR 6C4-M2	FR 6C5-M2
9	L	FR 9C4-M2	FR 9C5-M2
18	LA	FR 18C4-M2	FR 18C5-M2
20	L	FR 20C4-M2	FR 20C5-M2
21	L	FR 21C4-M2	FR 21C5-M2
22	L	FR 22C4-M2	FR 22C5-M2
33	L	FR 33C4-M2	FR 33C5-M2
34	L	FR 34C4-M2	FR 34C5-M2
66	L	FR 66C4-M2	FR 66C5-M2
		1NO+1NC / 2NC / 1NO+2NC / 3NC / 2NO+1NC / 1NC	1NO+1NC / 2NC / 1NO+2NC / 3NC / 2NO+1NC / 1NC
Actuating force		0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams		page 344 - group 10	page 344 - group 11

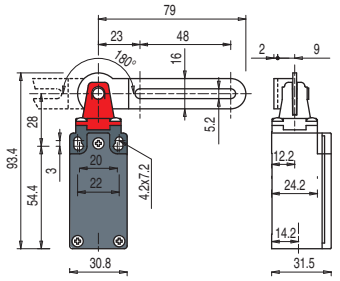
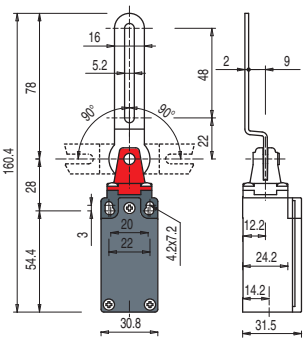
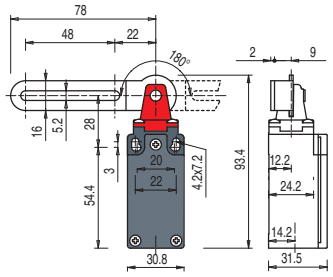
All values in the drawings are in mm

Accessories See page 321

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

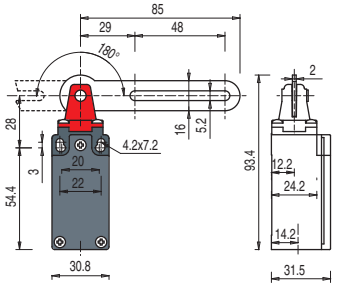
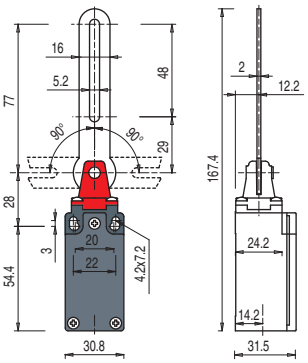
Contact type:

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

Contact blocks		Metal housing	Metal housing	Metal housing
				
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 344 - group 10	page 344 - group 11	page 344 - group 10

Contact type:

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

Contact blocks		Metal housing	Metal housing
			
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 344 - group 10	page 344 - group 11

All values in the drawings are in mm

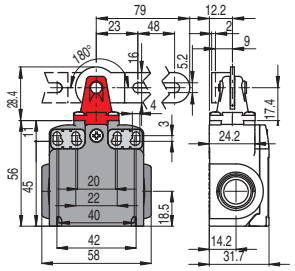
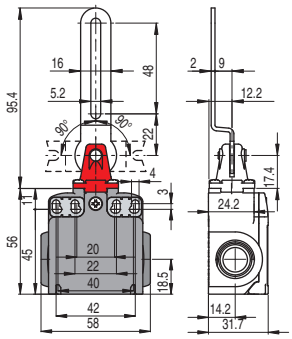
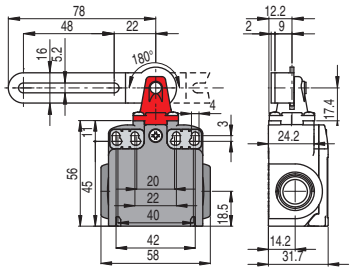
Accessories See page 321

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

Safety switches **with slotted hole lever**

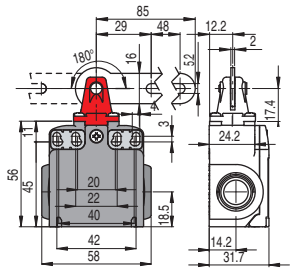
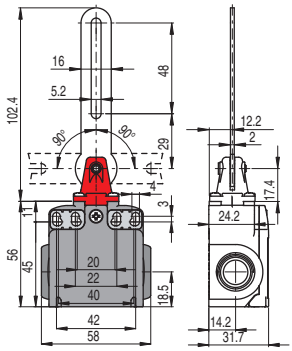
Contact type:

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

Contact blocks		Technopolymer housing	Technopolymer housing	Technopolymer housing
				
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 344 - group 10	page 344 - group 11	page 344 - group 10

Contact type:

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

Contact blocks		Technopolymer housing	Technopolymer housing
			
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 344 - group 10	page 344 - group 11

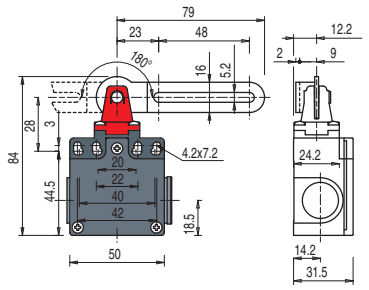
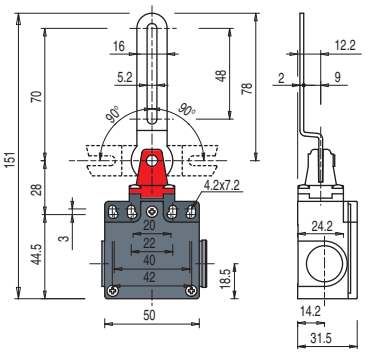
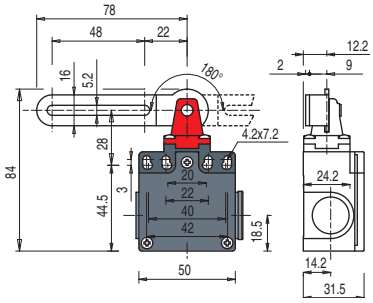
All values in the drawings are in mm

Accessories See page 321

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

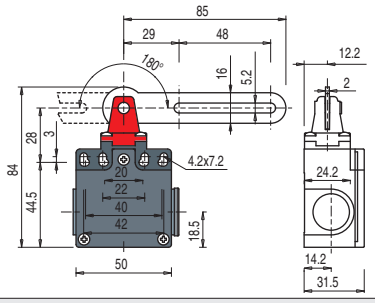
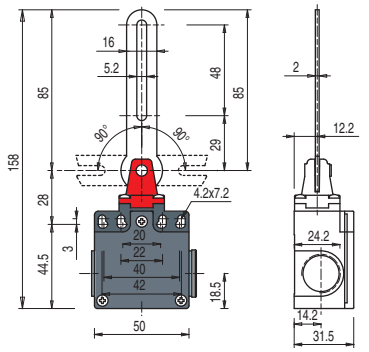
Contact type:

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

Contact blocks		Metal housing	Metal housing	Metal housing
				
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 344 - group 10	page 344 - group 11	page 344 - group 10

Contact type:

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

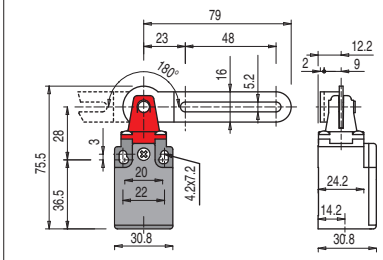
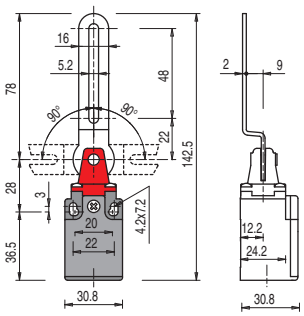
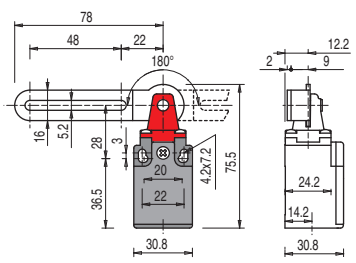
Contact blocks		Metal housing	Metal housing
			
5	R	FZ 5C4-M2 → 1NO+1NC	FZ 5C5-M2 → 1NO+1NC
6	L	FZ 6C4-M2 → 1NO+1NC	FZ 6C5-M2 → 1NO+1NC
9	L	FZ 9C4-M2 → 2NC	FZ 9C5-M2 → 2NC
18	LA	FZ 18C4-M2 → 1NO+1NC	FZ 18C5-M2 → 1NO+1NC
20	L	FZ 20C4-M2 → 1NO+2NC	FZ 20C5-M2 → 1NO+2NC
21	L	FZ 21C4-M2 → 3NC	FZ 21C5-M2 → 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 344 - group 10	page 344 - group 11

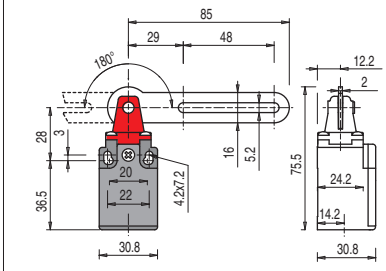
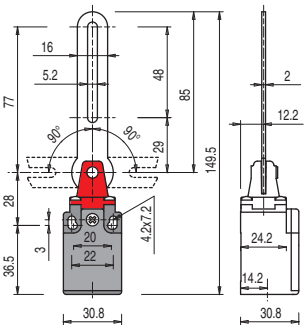
All values in the drawings are in mm

Accessories See page 321

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

Safety switches **with slotted hole lever**

Contact type: L = slow action	Technopolymer housing	Technopolymer housing	Technopolymer housing
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
Actuating force	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)	0.11 Nm (0.15 Nm →)
Travel diagrams	page 344 - group 10	page 344 - group 11	page 344 - group 10

Contact type: L = slow action	Technopolymer housing	Technopolymer housing
Contact blocks		
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 344 - group 10	page 344 - group 11

All values in the drawings are in mm

Accessories See page 321

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

Notes