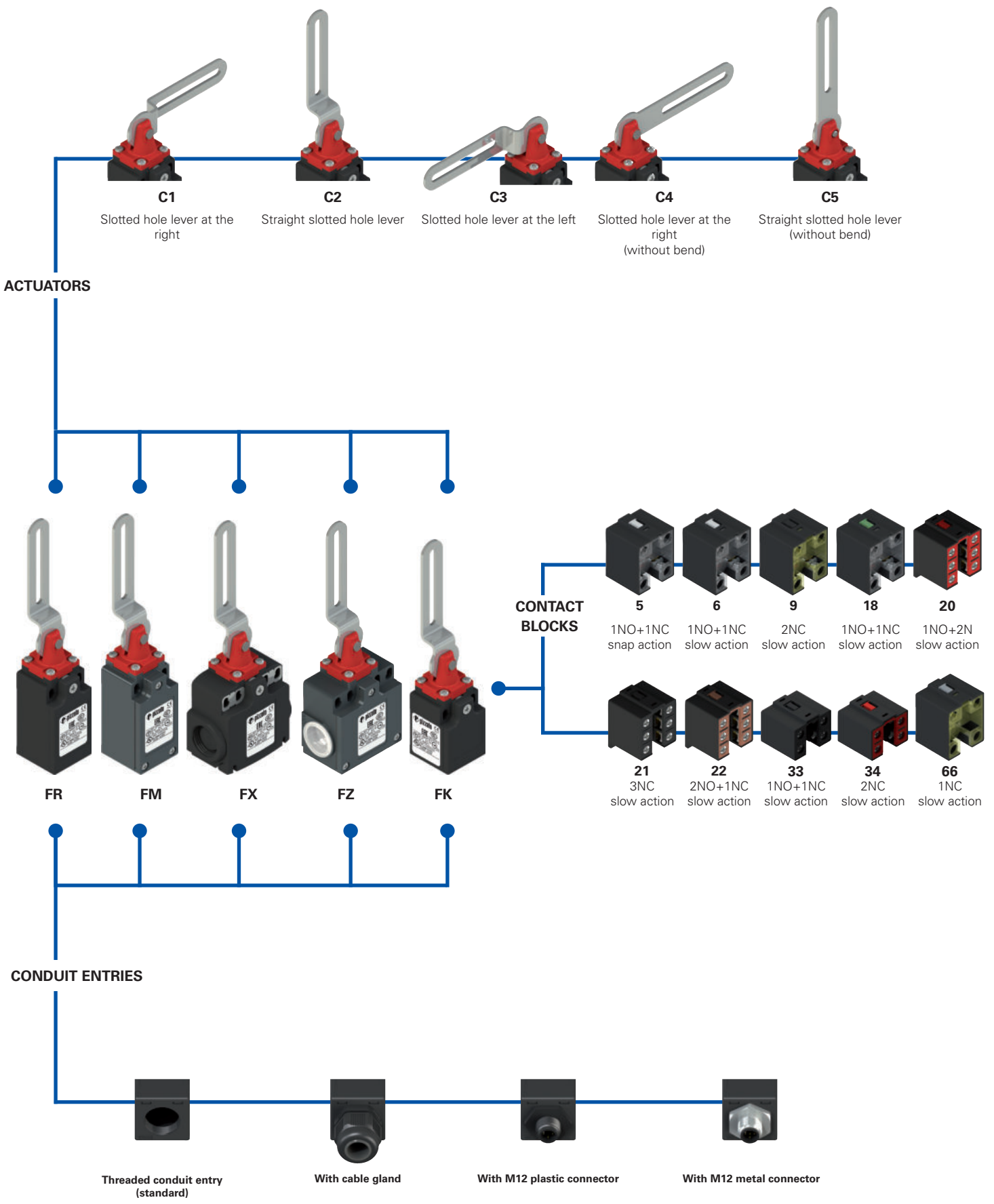


Selection diagram





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)

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

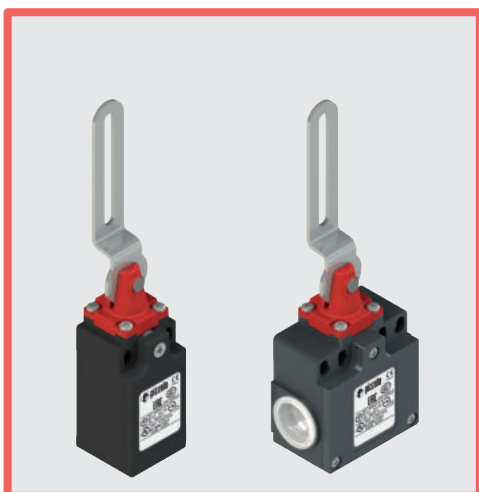
Actuators	
C1	slotted hole lever at the right
C2	straight slotted hole lever
C3	slotted hole lever at the left
C4	slotted hole lever at the right (without bend)
C5	straight slotted hole lever (without bend)

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
UL approval:	E131787
CCC approval:	2020970305002284
EAC approval:	RU C-IT.YT03.B.00035/19

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 381

Wire cross-sections and

wire stripping lengths: see page 399

In compliance with standards:

IEC 60947-5-1, IEC 60947-1, IEC 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN IEC 63000, UL 508, CSA 22.2 No.14

Approvals:

EN 60947-5-1, UL 508, CSA 22.2 No.14, GB/T14048.5

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.

If not expressly indicated in this chapter, for correct installation and utilization of all articles see the instructions given on pages 377 to 392.

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
	Rated impulse withstand voltage (U_{imp}):	6 kV 4 kV (contact blocks 20, 21, 22, 33, 34)	I_e (A)	6	4	1
	Conditional short circuit current: Protection against short circuits: Pollution degree:	1000 A acc. to EN 60947-5-1 type aM fuse 10 A 500 V 3	Direct current: DC13 U_e (V)	24	125	250

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: Pollution degree:	type gG fuse 4 A 500 V 3	I_e (A)	4	4	4
			Direct current: DC13 U_e (V)	24	125	250

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: Pollution degree:	type gG fuse 2 A 500 V 3	I_e (A)	2		
			Direct current: DC13 U_e (V)	24		

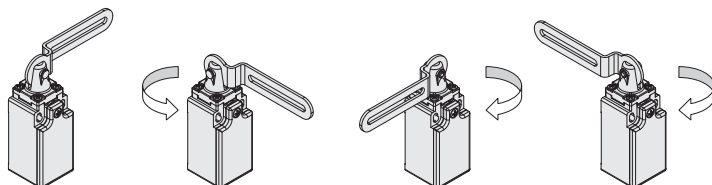


Description



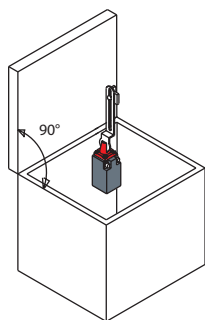
These safety switches are used to control gates or guards with hinges protecting dangerous parts of machines without inertia. Easy to install, they do not need the interaction with the hinge of the guard. They are very sensitive, open the contacts after few degrees of rotation and immediately send the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

Head with variable orientation

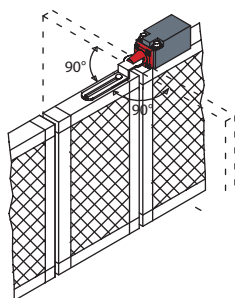


For all switches, the head can be adjusted in 90° steps after removing the four fastening screws. This allows you to use the same switch on both right- and left-facing door fronts.

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 (Ui):	500 Vac 400 Vac (for contact blocks 2, 11, 12, 20, 21, 22, 28, 29, 30, 37, 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, 28, 29, 30, 33, 34)
Protection degree of the housing:	IP67
MV terminals (screw terminals)	3
Pollution degree:	AC15
Utilization category:	400 Vac (50 Hz)
Operating voltage (U _e):	3 A
Operating current (I _e):	
Forms of the contact element:	Za, Za+Za, X+X, Zb, Y+Y, Y+Y+X, Y+Y+Y, Y+X+X, Y, X.
Positive opening of contacts on contact blocks	5, 6, 7, 8, 9, 11, 13, 14, 16, 17, 18, 19, 20, 21, 22, 28, 29, 30, 33, 34, 37, 38, 39, 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

	Technopolymer housing		Technopolymer housing		Technopolymer housing						
<p>Contact type:</p> <p>R = snap action L = slow action LA = slow action close</p>											
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 384 - group 10			page 384 - group 11			page 384 - group 10				

	Technopolymer housing		Technopolymer housing					
<p>Contact type:</p> <p>R = snap action L = slow action LA = slow action close</p>								
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 384 - group 10			page 384 - group 11				

All values in the drawings are in mm



		Metal housing	Metal housing	Metal housing			
Contact type:		<p>R = snap action L = slow action LA = slow action close</p>					
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 384 - group 10		page 384 - group 11		page 384 - group 10	

		Metal housing	Metal housing		
Contact type:		<p>R = snap action L = slow action LA = slow action close</p>			
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 384 - group 10		page 384 - group 11	

Safety switches with slotted hole lever

Contact type:

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

	Technopolymer housing		Technopolymer housing		Technopolymer housing					
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 ↻)		0.11 Nm (0.15 Nm ↻)		0.11 Nm (0.15 Nm ↻)	
Travel diagrams	page 384 - group 10		page 384 - group 11		page 384 - group 11		page 384 - group 10		page 384 - group 10	

Contact type:

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

	Technopolymer housing		Technopolymer housing				
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 384 - group 10		page 384 - group 11				



		Metal housing	Metal housing	Metal housing			
Contact type:		<p>R = snap action L = slow action LA = slow action close</p>					
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 384 - group 10		page 384 - group 11		page 384 - group 10	

		Metal housing	Metal housing		
Contact type:		<p>R = snap action L = slow action LA = slow action close</p>			
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 384 - group 10		page 384 - group 11	

All values in the drawings are in mm

	Technopolymer housing	Technopolymer housing	Technopolymer housing
Contact type:			
= slow action			
Contact blocks			
33	FK 33C1-M1 1NO+1NC	FK 33C2-M1 1NO+1NC	FK 33C3-M1 1NO+1NC
34	FK 34C1-M1 2NC	FK 34C2-M1 2NC	FK 34C3-M1 2NC
Actuating force	0.11 Nm (0.15 Nm		
Travel diagrams	page 384 - group 10		

	Technopolymer housing	Technopolymer housing
Contact type:		
= slow action		
Contact blocks		
33	FK 33C4-M1 1NO+1NC	FK 33C5-M1 1NO+1NC
34	FK 34C4-M1 2NC	FK 34C5-M1 2NC
Actuating force	0.11 Nm (0.15 Nm	
Travel diagrams	page 384 - group 10	

