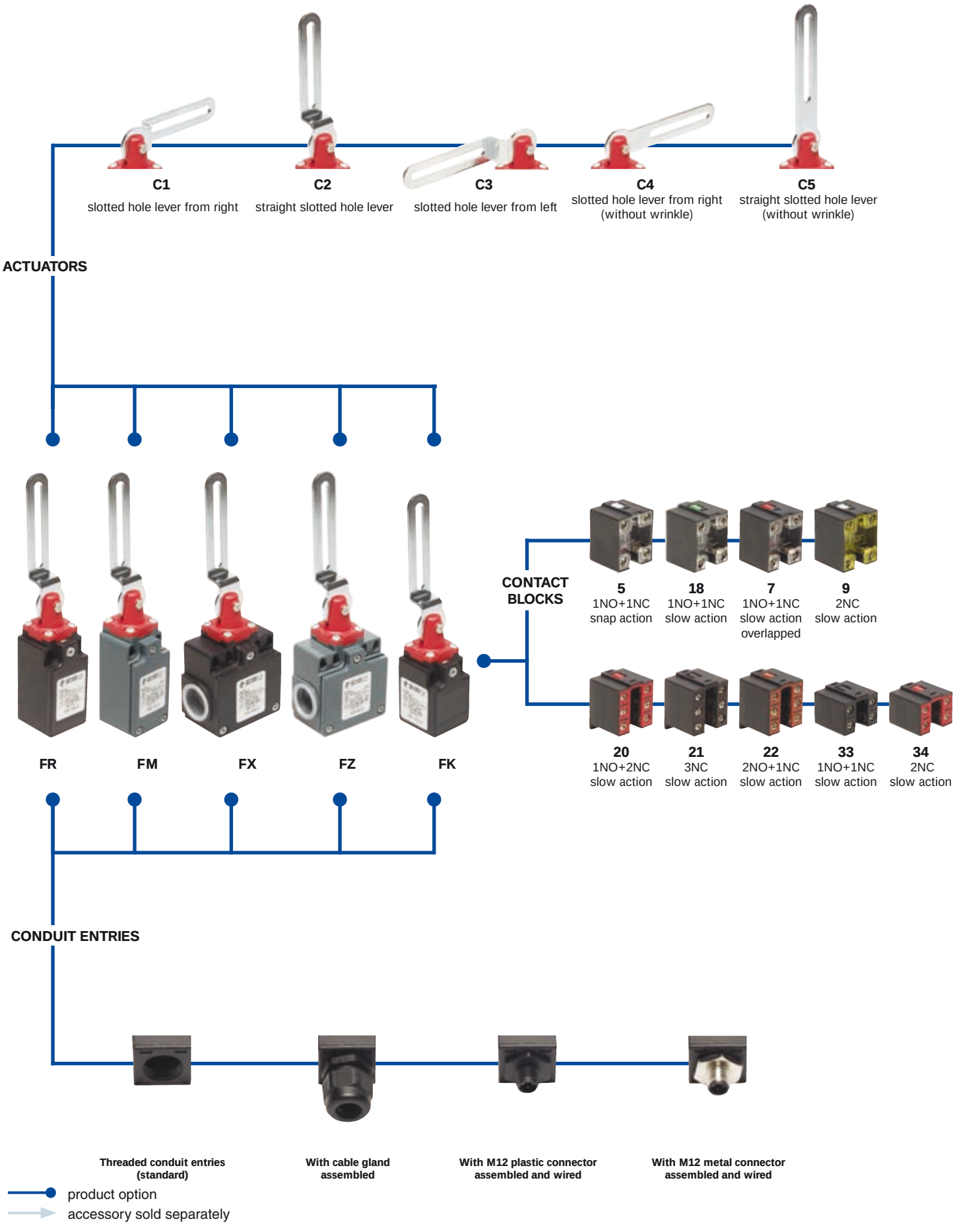
Selection diagram



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
7	1NO+1NC, slow action overlapped
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

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	slotted hole lever from left (without wrinkle)

Contacts type

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

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
M3	1/2 NPT (only for FR housing)

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
K40	with M12 metal connector assembled and wired, 8 poles (only for contact blocks 20, 21, 22)
...	.....

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

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	slotted hole lever from left (without wrinkle)

Contacts type

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

Threaded conduit entry

	PG 11 (standard)
M1	M16x1,5

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



Main data

- Metal housing or polymer housing, from one to two conduit entries
- Protection degree IP67
- 9 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 EZU:	1010151

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

General data

Ambient temperature:	from -25°C to +80°C

Version for operation in ambient temperature from -40°C to +80° C on request

Max operating frequency:	3600 operations cycles[1]/hour
Mechanical endurance:	1 million of operations cycles[1]
Max actuating speed:	180°/s
Min. actuating speed:	2°/s

(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by IEC 947-5-1 standard.

Cross section of the conductors (flexible copper wire)

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 conformity with standards:
IEC 60947-5-1, EN 60947-5-1, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113, CENELEC EN 50013.
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 6/1 to page 6/8.**

Electrical data			**Utilization categories**
without connector	Thermal current (Ith):	10 A	Alternate current: AC15 (50...60 Hz) Ue (V) 250 400 500 Ie (A) 6 4 1 Direct current: DC13 Ue (V) 24 125 250 Ie (A) 6 1,1 0,4
	Rated insulation voltage (Ui):	500 VAC 600 VDC 400 VAC for contact blocks 20, 21, 22, 33, 34	
	Protection against short circuits:	fuse 10 A 500 V type aM	
	Pollution degree:	3	
with 4 or 5 poles M12 connector	Thermal current (Ith):	4 A	Alternate current: AC15 (50...60 Hz) Ue (V) 24 120 250 Ie (A) 4 4 4 Direct current: DC13 Ue (V) 24 125 250 Ie (A) 4 1,1 0,4
	Rated insulation voltage (Ui):	250 VAC 300 VDC	
	Protection against short circuits:	fuse 4 A 500 V type gG	
	Pollution degree:	3	
with 8 poles M12 connector	Thermal current (Ith):	2 A	Alternate current: AC15 (50...60 Hz) Ue (V) 24 Ie (A) 2 Direct current: DC13 Ue (V) 24 Ie (A) 2
	Rated insulation voltage (Ui):	30 VAC 36 VDC	
	Protection against short circuits:	fuse 2 A 500 V type gG	
	Pollution degree:	3	

Description

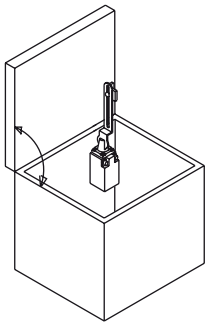
These safety switches are used to control gates or doors with hinge protecting hazardous parts of machines. Easy to install, they do not need the interaction with the hinge of the guard. Very sensitive, they positively open the contacts after few rotation degrees, sending the stop signal immediately.

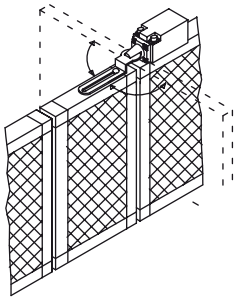
Rotating heads



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
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: EN60947-1, EN 60947-5-1 and subsequent modifications and completions, fundamental requirements of the Low Voltage Directive 73/23 EEC and subsequent modifications and completions.

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

Data type approved by UL

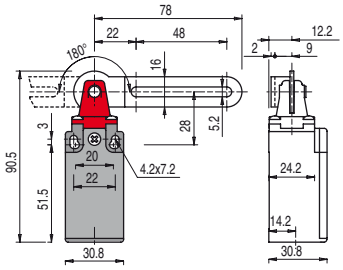
Utilization categories Q300 (69 VA, 125-250 VDC)
A600 (720 VA, 120-600 VAC)
Data of the housing type 1, 4X (indoor use only), 12, 13
In conformity with standard: UL 508
For all contact blocks use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 7,1 Lb-In.

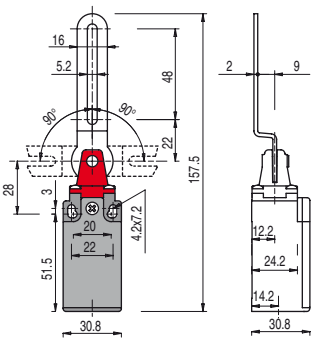
Please contact our technical service for the list of type approved products.

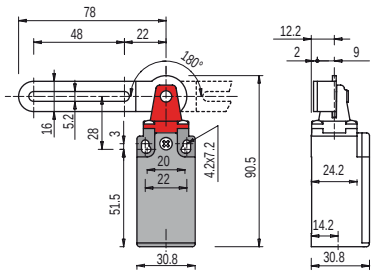
Dimensional drawings

Contacts type:

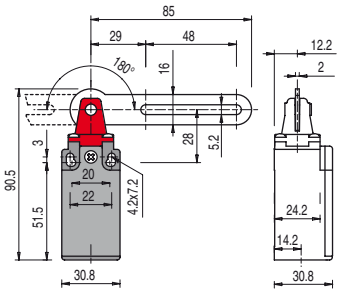
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L = slow action
LO = slow action overlapped

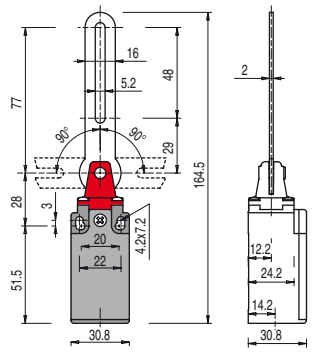






Contact blocks								
18	L	FR 18C1	1NO+1NC		FR 18C2	1NO+1NC		FR 18C3	1NO+1NC
5	R	FR 5C1	1NO+1NC		FR 5C2	1NO+1NC		FR 5C3	1NO+1NC
7	LO	FR 7C1	1NO+1NC		FR 7C2	1NO+1NC		FR 7C3	1NO+1NC
9	L	FR 9C1	2NC		FR 9C2	2NC		FR 9C3	2NC
20	L	FR 20C1	1NO+2NC		FR 20C2	1NO+2NC		FR 20C3	1NO+2NC
21	L	FR 21C1	3NC		FR 21C2	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
Min. force		0,11 Nm (0,15 Nm)			0,11 Nm (0,15 Nm)			0,11 Nm (0,15 Nm)	
Travel diagrams		page 4/46 - group 1			page 4/46 - group 2			page 4/46 - group 1	





Contact blocks								
18	L	FR 18C4	1NO+1NC		FR 18C5	1NO+1NC		
5	R	FR 5C4	1NO+1NC		FR 5C5	1NO+1NC		
7	LO	FR 7C4	1NO+1NC		FR 7C5	1NO+1NC		
9	L	FR 9C4	2NC		FR 9C5	2NC		
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		
Min. force		0,11 Nm (0,15 Nm)			0,11 Nm (0,15 Nm)			
Travel diagrams		page 4/46 - group 1			page 4/46 - group 2			

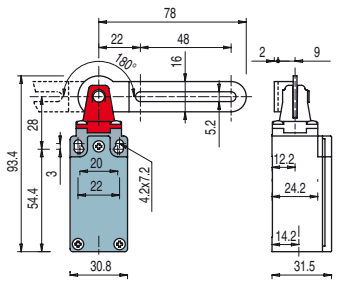
Accessories See page 5/1

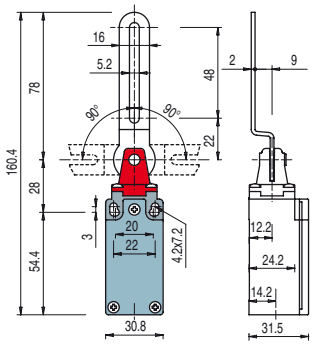
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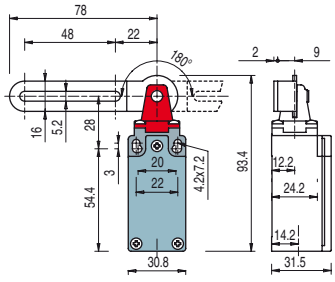
All measures in the drawings are in mm

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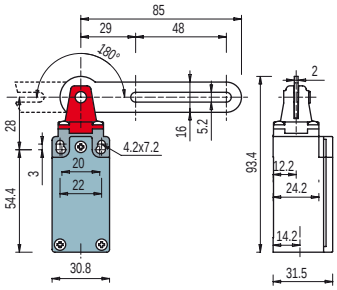
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LO = slow action overlapped

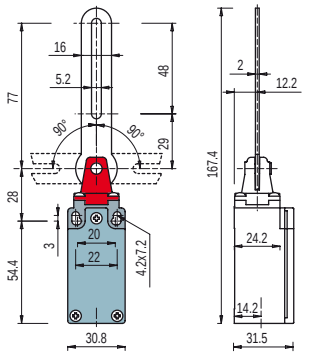






Contact blocks							
18	L	FM 18C1	1NO+1NC	FM 18C2	1NO+1NC	FM 18C3	1NO+1NC
5	R	FM 5C1	1NO+1NC	FM 5C2	1NO+1NC	FM 5C3	1NO+1NC
7	LO	FM 7C1	1NO+1NC	FM 7C2	1NO+1NC	FM 7C3	1NO+1NC
9	L	FM 9C1	2NC	FM 9C2	2NC	FM 9C3	2NC
20	L	FM 20C1	1NO+2NC	FM 20C2	1NO+2NC	FM 20C3	1NO+2NC
21	L	FM 21C1	3NC	FM 21C2	3NC	FM 21C3	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
Min. force		0,11 Nm (0,15 Nm)		0,11 Nm (0,15 Nm)		0,11 Nm (0,15 Nm)	
Travel diagrams		page 4/46 - group 1		page 4/46 - group 2		page 4/46 - group 1	





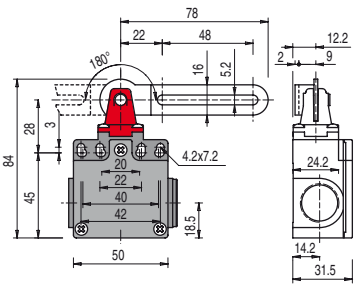
Contact blocks							
18	L	FM 18C4	1NO+1NC	FM 18C5	1NO+1NC		
5	R	FM 5C4	1NO+1NC	FM 5C5	1NO+1NC		
7	LO	FM 7C4	1NO+1NC	FM 7C5	1NO+1NC		
9	L	FM 9C4	2NC	FM 9C5	2NC		
20	L	FM 20C4	1NO+2NC	FM 20C5	1NO+2NC		
21	L	FM 21C4	3NC	FM 21C5	3NC		
22	L	FM 22C4	2NO+1NC	FM 22C5	2NO+1NC		
33	L	FM 33C4	1NO+1NC	FM 33C5	1NO+1NC		
34	L	FM 34C4	2NC	FM 34C5	2NC		
Min. force		0,11 Nm (0,15 Nm)		0,11 Nm (0,15 Nm)			
Travel diagrams		page 4/46 - group 1		page 4/46 - group 2			

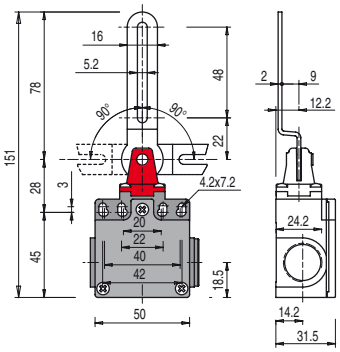
Accessories See page 5/1

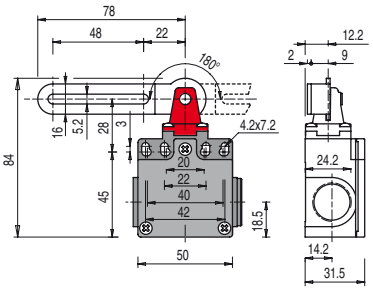
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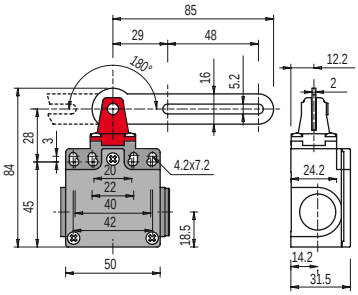
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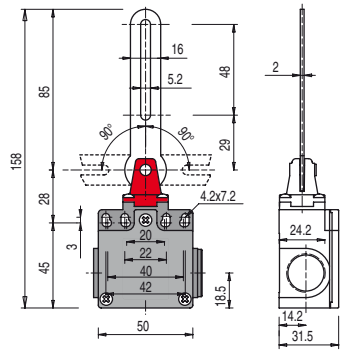






Contact blocks								
18	L	FX 18C1	→	1NO+1NC	FX 18C2	→	1NO+1NC	FX 18C3	→	1NO+1NC
5	R	FX 5C1	→	1NO+1NC	FX 5C2	→	1NO+1NC	FX 5C3	→	1NO+1NC
7	LO	FX 7C1	→	1NO+1NC	FX 7C2	→	1NO+1NC	FX 7C3	→	1NO+1NC
9	L	FX 9C1	→	2NC	FX 9C2	→	2NC	FX 9C3	→	2NC
20	L	FX 20C1	→	1NO+2NC	FX 20C2	→	1NO+2NC	FX 20C3	→	1NO+2NC
21	L	FX 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
Min. force		0,11 Nm (0,15 Nm →)			0,11 Nm (0,15 Nm →)			0,11 Nm (0,15 Nm →)		
Travel diagrams		page 4/46 - group 1			page 4/46 - group 2			page 4/46 - group 1		





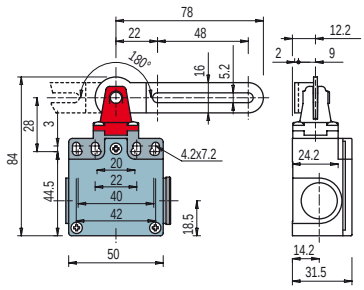
Contact blocks								
18	L	FX 18C4	→	1NO+1NC	FX 18C5	→	1NO+1NC	
5	R	FX 5C4	→	1NO+1NC	FX 5C5	→	1NO+1NC	
7	LO	FX 7C4	→	1NO+1NC	FX 7C5	→	1NO+1NC	
9	L	FX 9C4	→	2NC	FX 9C5	→	2NC	
20	L	FX 20C4	→	1NO+2NC	FX 20C5	→	1NO+2NC	
21	L	FX 21C4	→	3NC	FX 21C5	→	3NC	
22	L	FX 22C4	→	2NO+1NC	FX 22C5	→	2NO+1NC	
33	L	FX 33C4	→	1NO+1NC	FX 33C5	→	1NO+1NC	
34	L	FX 34C4	→	2NC	FX 34C5	→	2NC	
Min. force		0,11 Nm (0,15 Nm →)			0,11 Nm (0,15 Nm →)			
Travel diagrams		page 4/46 - group 1			page 4/46 - group 2			

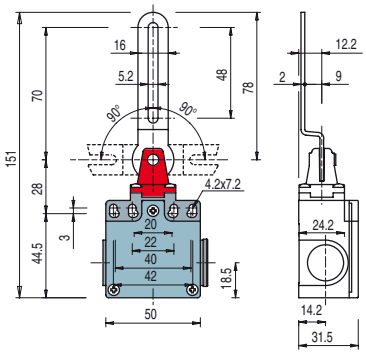
Accessories See page 5/1

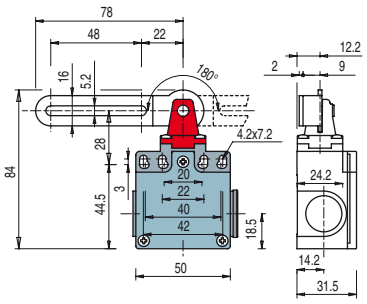
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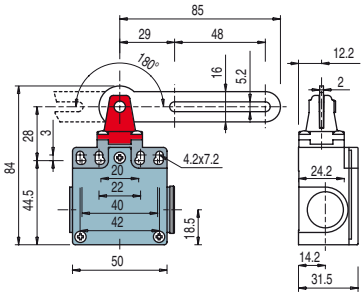
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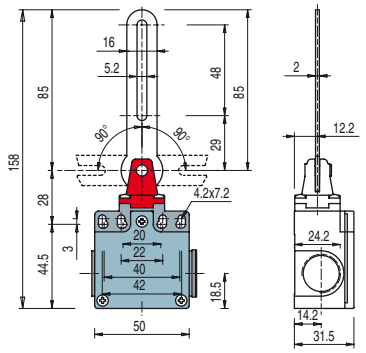






Contact blocks								
18	L	FZ 18C1	1NO+1NC		FZ 18C2	1NO+1NC		FZ 18C3	1NO+1NC
5	R	FZ 5C1	1NO+1NC		FZ 5C2	1NO+1NC		FZ 5C3	1NO+1NC
7	LO	FZ 7C1	1NO+1NC		FZ 7C2	1NO+1NC		FZ 7C3	1NO+1NC
9	L	FZ 9C1	2NC		FZ 9C2	2NC		FZ 9C3	2NC
20	L	FZ 20C1	1NO+2NC		FZ 20C2	1NO+2NC		FZ 20C3	1NO+2NC
21	L	FZ 21C1	3NC		FZ 21C2	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
Min. force		0,11 Nm (0,15 Nm)			0,11 Nm (0,15 Nm)			0,11 Nm (0,15 Nm)	
Travel diagrams		page 4/46 - group 1			page 4/46 - group 2			page 4/46 - group 1	





Contact blocks								
18	L	FZ 18C4	1NO+1NC		FZ 18C5	1NO+1NC		
5	R	FZ 5C4	1NO+1NC		FZ 5C5	1NO+1NC		
7	LO	FZ 7C4	1NO+1NC		FZ 7C5	1NO+1NC		
9	L	FZ 9C4	2NC		FZ 9C5	2NC		
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		
Min. force		0,11 Nm (0,15 Nm)			0,11 Nm (0,15 Nm)			
Travel diagrams		page 4/46 - group 1			page 4/46 - group 2			

Accessories See page 5/1

Items with code on the **green** background are available in stock

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 4/46 - group 1		page 4/46 - group 2		page 4/46 - group 1	

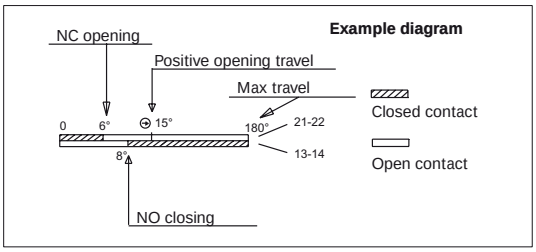
Contact blocks							
33	L	FK 33C4	1NO+1NC	FK 33C5	1NO+1NC		
34	L	FK 34C4	2NC	FK 34C5	2NC		
Min. force		0,11 Nm (0,15 Nm)		0,11 Nm (0,15 Nm)			
Travel diagrams		page 4/46 - group 1		page 4/46 - group 2			

Accessories See page 5/1

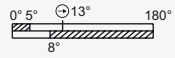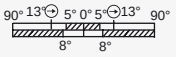
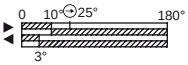
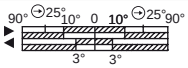
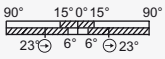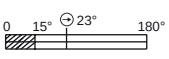
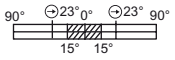
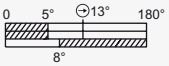
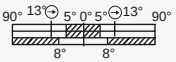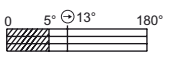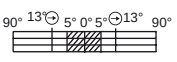
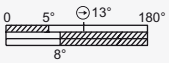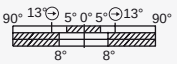
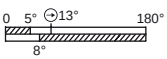
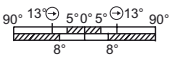
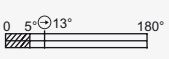
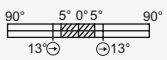
Items with code on the **green** background are available in stock

How to read travel diagrams

All measures in the diagrams are in degrees



Travel diagrams table

Contact blocks		Group 1	Group 2
18 1NO+1NC			
5 1NO+1NC			
7 1NO+1NC			
9 2NC			
20 1NO+2NC			
21 3NC			
22 2NO+1NC			
33 1NC+1NO			
34 2NC			

IMPORTANT:
In safety applications it is necessary to activate the switch **at least up to the positive opening point** indicated in the diagrams with the symbol ⊖. Operate the switch **at least with the positive opening force**, indicated between brackets, below each article, next the value of minimum force.