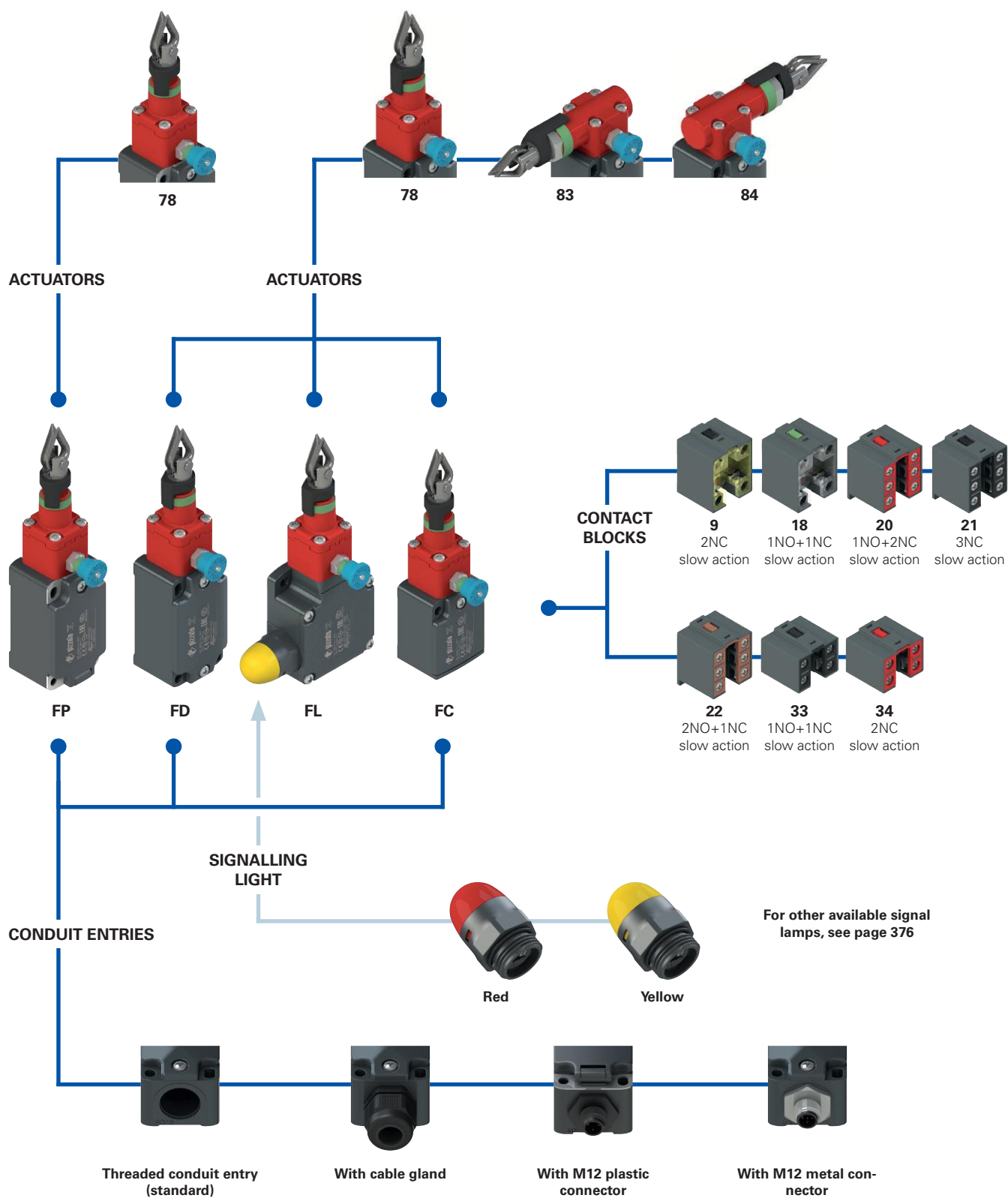


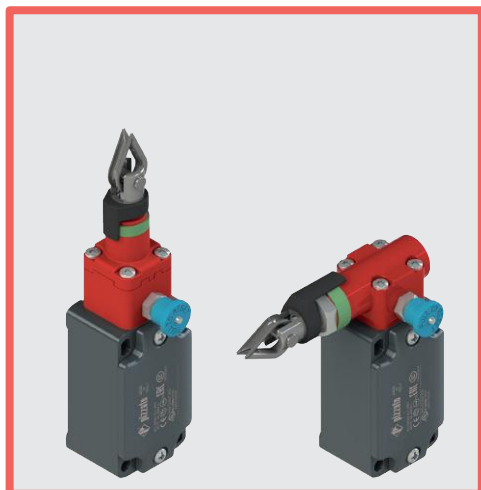
Selection diagram



**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	
FD 1878		E7GM2		K50T6	
Housing				Ambient temperature	
FD	metal, one conduit entry				-25°C ... +80°C (standard)
FL	metal, three conduit entries				
FP	technopolymer, one conduit entry			T6	-40°C ... +80°C
Contact block				Pre-installed cable glands or connectors	
9	2NC, slow action				no cable gland or connector (standard)
18	1NO+1NC, slow action			K23	cable gland for cables Ø 6 ... 12 mm
20	1NO+2NC, slow action			...	...
21	3NC, slow action			K50	M12 metal connector, 5-pole
22	2NO+1NC, slow action			...	...
33	1NO+1NC, slow action			For the complete list of possible combinations please contact our technical department.	
34	2NC, slow action				
Actuating head				Threaded conduit entry	
78	longitudinal head			M2	M20x1.5 (standard)
83	left transversal head (FD-FL housing only)				PG 13.5
84	right transversal head (FD-FL housing only)				
Actuating force				Contact type	
	standard				silver contacts (standard)
E7	initial 20 N...final 40 N (only head 78)			G	silver contacts with 1 µm gold coating
E9	initial 13 N...final 75 N (only head 83-84)			G1	Silver contacts, 2.5 µm gold coating (not for contact blocks 20, 21, 22, 33, 34)

article		options		options	
FC 3378		E7GM2		K50T6	
Housing				Ambient temperature	
FC	metal, one conduit entry				-25°C ... +80°C (standard)
				T6	-40°C ... +80°C
Contact block				Pre-installed cable glands or connectors	
33	1NO+1NC, slow action				no cable gland (standard)
34	2NC, slow action			K23	cable gland for cables Ø 6 ... 12 mm
				K50	M12 metal connector, 5-pole
Actuating head				Threaded conduit entry	
78	longitudinal head			M2	M20x1.5 (standard)
83	left transversal head				PG 11
84	right transversal head				
Actuating force				Contact type	
	standard				silver contacts (standard)
E7	initial 20 N...final 40 N (only head 78)			G	silver contacts with 1 µm gold coating
E9	initial 13 N...final 75 N (only head 83-84)				



Main features

- Metal or plastic housing, from one to three conduit entries
- Protection degree IP67
- In compliance with EN ISO 13850
- 7 contact blocks available
- Versions with vertical or horizontal actuation
- Versions with assembled M12 connector
- Versions with gold-plated silver contacts

Quality marks:



IMQ approval:
(Low Voltage Directive): EG605
Approval IMQ
(Machinery Directive): CA02.07002
UL approval: E131787
CCC approval: 2024010305654835
EAC approval: RU Д-IT.PA07.B.37848/24

Technical data

Housing

FP series housing made of glass fibre reinforced technopolymer, self-extinguishing, shock-proof and with double insulation: 
FD, FL and FC series: metal housing, baked powder coating.
FD, FP, FC series: one threaded conduit entry: M20x1.5 (standard)
FL series: three threaded conduit entries: M20x1.5 (standard)
Protection degree: IP67 acc. to EN 60529 with cable gland of equal or higher protection degree

General data

"Maximum SIL" up to: SIL 3 acc. to EN IEC 62061
Performance Level (PL) up to: PL e acc. to EN ISO 13849-1
Safety parameters:
B_{10D}: 200,000 for NC contacts
Mission time: 20 years
Ambient temperature: -25°C ... +80°C (standard)
-40°C ... +80°C (T6 option)
Max. actuation frequency: 1 cycle / 6 s
Mechanical endurance: 100,000 operating cycles
Max. actuation speed: 0.5 m/s
Min. actuation speed: 1 mm/s
Tightening torques for installation: see page 387
Wire cross-sections and wire stripping lengths: see page 407

In compliance with standards:

IEC 60947-5-1, IEC 60947-5-5, IEC 60947-1, IEC 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN ISO 13850, EN IEC 63000, UL 508, CSA C22.2 No. 14.

Approvals:

EN 60947-5-1, EN 60947-5-5, UL 508, CSA C22.2 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 chapter Utilization requirements from page 385 to page 400.

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	U_e (V)	250	400
		400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)	I_e (A)	6	4
	Rated impulse withstand voltage (U_{imp}):	6 kV		1	
		4 kV (contact blocks 20, 21, 22, 33, 34)	Direct current: DC13		
with M12 connector, 4 and 5-pole	Conditional short circuit current:	1000 A acc. to EN 60947-5-1	U_e (V)	24	125
	Protection against short circuits:	type aM fuse 10 A 500 V	I_e (A)	3	0.55
	Pollution degree:	3		0.3	
	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
with M12 connector, 8-pole	Protection against short circuits:	type gG fuse 4 A 500 V	I_e (A)	4	4
	Pollution degree:	3	Direct current: DC13		
	Thermal current (I_{th}):	2 A	U_e (V)	24	125
	Rated insulation voltage (U_i):	30 Vac 36 Vdc	I_e (A)	2	0.55
	Protection against short circuits:	type gG fuse 2 A 500 V		0.3	
	Pollution degree:	3	Direct current: DC13		
with M12 connector, 8-pole	Thermal current (I_{th}):	2 A	U_e (V)	24	
	Rated insulation voltage (U_i):	30 Vac 36 Vdc	I_e (A)	2	
	Protection against short circuits:	type gG fuse 2 A 500 V	Direct current: DC13		
	Pollution degree:	3	U_e (V)	24	
			I_e (A)	2	

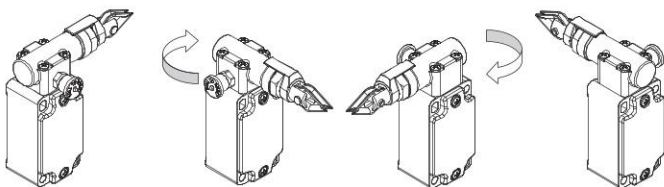


Description



These rope-operated safety switches are installed on machines or conveyor belts and allow the machine to be brought to an emergency stop from any point and with any pull on the rope. This means significant cost savings for medium and large machines, since multiple emergency-stop buttons can be replaced with a single switch. They are equipped with a self-control function that constantly checks the correct function and signals a possible loosening or breaking of the rope through the opening of the contacts. These safety switches keep the contacts open after activation until the reset is performed, even if the rope is released.

Heads with variable orientation



For all switches, the head can be adjusted in 90° steps after removing the four fastening screws.

Laser engraving



All devices are marked using a dedicated indelebible laser system. These engravings are therefore suitable for extreme environments too. Thanks to this system that does not use labels, the loss of plate data is prevented and a greater resistance of the marking is achieved over time.

Protection degree IP67

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

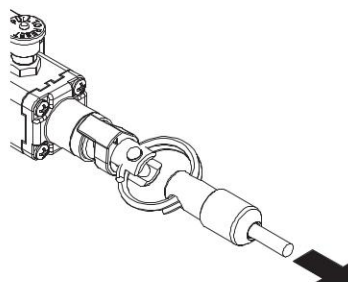
Extended temperature range

-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.

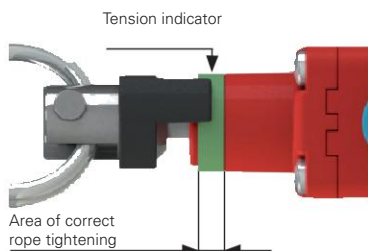
They can therefore be used for applications in cold stores, sterilisers and other equipment with low temperature environments. The special materials used to produce these versions retain their characteristics even under these conditions, thereby expanding the installation possibilities.

Reduced actuating force



These switches can be supplied with reduced hardness internal springs on request. The force required to actuate the switch can thereby be reduced without changing the actuating path of the electrical contacts. This is particularly advantageous for smaller spans, but must, however, always make use of rope pulleys.

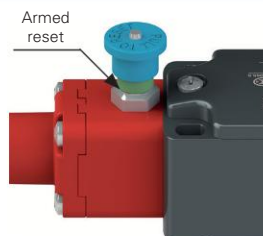
Indicator for rope adjustment



All switches are provided with a green ring that shows the area of the correct tightening of the rope. The installer has only to tighten the rope until the black indicator will be in the middle of the green area. With this setting, the switch can be reset by pulling the blue knob to close the electrical safety contacts.

If the tension (or loosening) on the rope is so high that the black indicator exits the green area, the electrical safety contacts will open and the reset device will trigger.

Indicator for the state of the reset



If the tension indicator is in the green area, the electrical safety contacts can be closed by pulling the blue knob. The reset status can be identified quickly by the green ring under the blue knob.

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	9, 18, 20, 21, 22, 33, 34.
In compliance with standards:	EN 60947-1, EN 60947-5-1, fundamental requirements of the Low Voltage Directive 2014/35/EU, EN 60947-5-5.

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

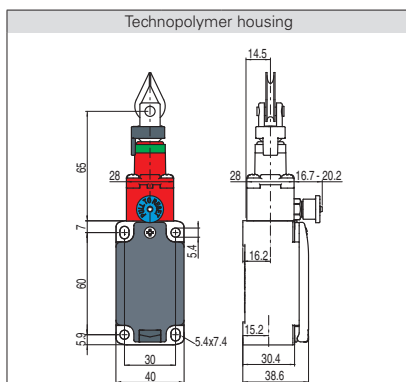
Features approved by UL

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 FP 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.

Contact type:

L = slow action

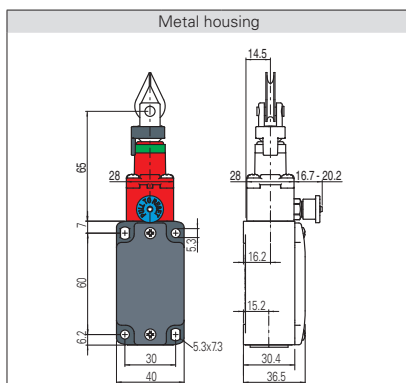


Contact block

9	L	FP 978-M2	→	2NC
18	L	FP 1878-M2	→	1NO+1NC
20	L	FP 2078-M2	→	1NO+2NC
21	L	FP 2178-M2	→	3NC
22	L	FP 2278-M2	→	2NO+1NC
33	L	FP 3378-M2	→	1NO+1NC
34	L	FP 3478-M2	→	2NC
Actuating force		Initial 63 N ... final 83 N (90 N →)		
Travel diagrams		Page 282 - group 1		

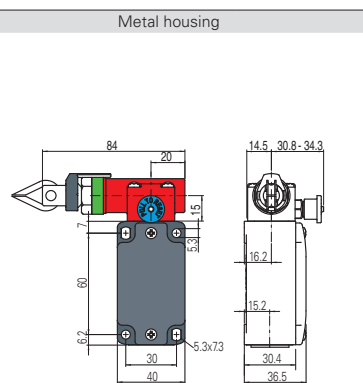
Contact type:

L = slow action



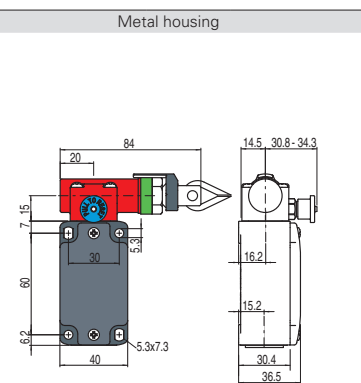
Contact block

9	L	FD 978-M2	→	2NC
18	L	FD 1878-M2	→	1NO+1NC
20	L	FD 2078-M2	→	1NO+2NC
21	L	FD 2178-M2	→	3NC
22	L	FD 2278-M2	→	2NO+1NC
33	L	FD 3378-M2	→	1NO+1NC
34	L	FD 3478-M2	→	2NC
Actuating force		Initial 63 N ... final 83 N (90 N →)		
Travel diagrams		Page 282 - group 1		



Contact block

9	L	FD 983-M2	→	2NC
18	L	FD 1883-M2	→	1NO+1NC
20	L	FD 2083-M2	→	1NO+2NC
21	L	FD 2183-M2	→	3NC
22	L	FD 2283-M2	→	2NO+1NC
33	L	FD 3383-M2	→	1NO+1NC
34	L	FD 3483-M2	→	2NC
Actuating force		Initial 147 N ... final 235 N (250 N →)		
Travel diagrams		Page 282 - group 2		

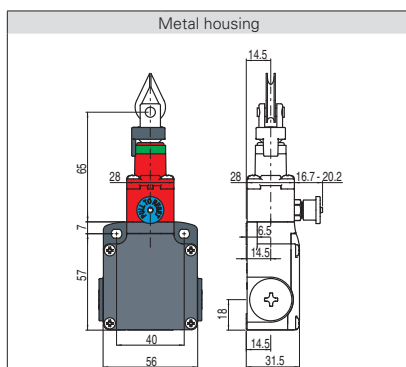


Contact block

9	L	FD 984-M2	→	2NC
18	L	FD 1884-M2	→	1NO+1NC
20	L	FD 2084-M2	→	1NO+2NC
21	L	FD 2184-M2	→	3NC
22	L	FD 2284-M2	→	2NO+1NC
33	L	FD 3384-M2	→	1NO+1NC
34	L	FD 3484-M2	→	2NC
Actuating force		Initial 147 N ... final 235 N (250 N →)		
Travel diagrams		Page 282 - group 2		

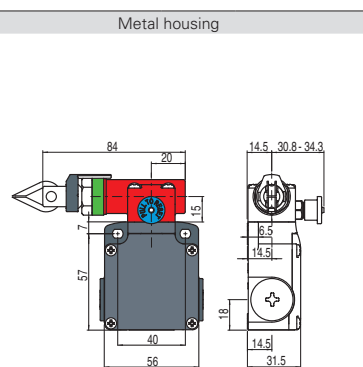
Contact type:

L = slow action



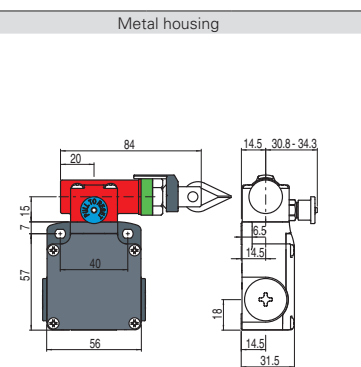
Contact block

9	L	FL 978-M2	→	2NC
18	L	FL 1878-M2	→	1NO+1NC
20	L	FL 2078-M2	→	1NO+2NC
21	L	FL 2178-M2	→	3NC
22	L	FL 2278-M2	→	2NO+1NC
33	L	FL 3378-M2	→	1NO+1NC
34	L	FL 3478-M2	→	2NC
Actuating force		Initial 63 N ... final 83 N (90 N →)		
Travel diagrams		Page 282 - group 1		



Contact block

9	L	FL 983-M2	→	2NC
18	L	FL 1883-M2	→	1NO+1NC
20	L	FL 2083-M2	→	1NO+2NC
21	L	FL 2183-M2	→	3NC
22	L	FL 2283-M2	→	2NO+1NC
33	L	FL 3383-M2	→	1NO+1NC
34	L	FL 3483-M2	→	2NC
Actuating force		Initial 147 N ... final 235 N (250 N →)		
Travel diagrams		Page 282 - group 2		



Contact block

9	L	FL 984-M2	→	2NC
18	L	FL 1884-M2	→	1NO+1NC
20	L	FL 2084-M2	→	1NO+2NC
21	L	FL 2184-M2	→	3NC
22	L	FL 2284-M2	→	2NO+1NC
33	L	FL 3384-M2	→	1NO+1NC
34	L	FL 3484-M2	→	2NC
Actuating force		Initial 147 N ... final 235 N (250 N →)		
Travel diagrams		Page 282 - group 2		

All values in the drawings are in mm

Accessories See page 357

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



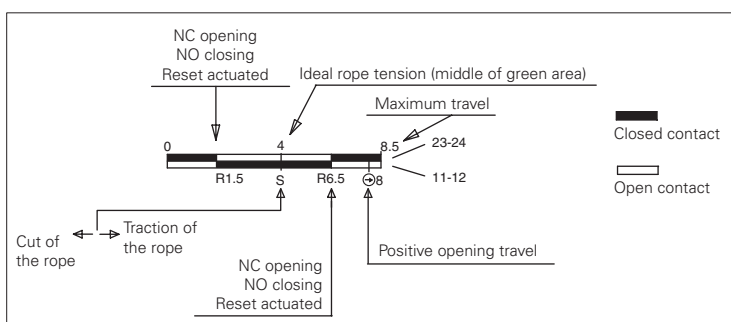
Contact type:

L = slow action

Contact block

	Metal housing	Metal housing	Metal housing
33	L FC 3378-M2 1NO+1NC	FC 3383-M2 1NO+1NC	FC 3384-M2 1NO+1NC
34	L FC 3478-M2 2NC	FC 3483-M2 2NC	FC 3484-M2 2NC
Actuating force	Initial 63 N ... final 83 N (90 N ⊕)	Initial 147 N ... final 235 N (250 N ⊕)	Initial 147 N ... final 235 N (250 N ⊕)
Travel diagrams	Page 282 - group 1	Page 282 - group 2	Page 282 - group 2

How to read travel diagrams



Travel diagrams table

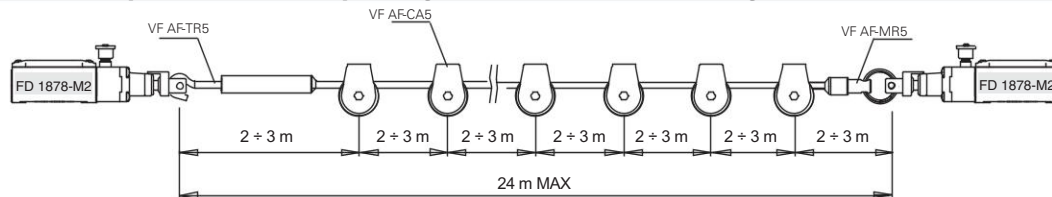
Contact block	Group 1	Group 2
9 2NC		
18 1NO+1NC		
20 1NO+2NC		
21 3NC		
22 2NO+1NC		
33 1NC+1NO		
34 2NC		

IMPORTANT:

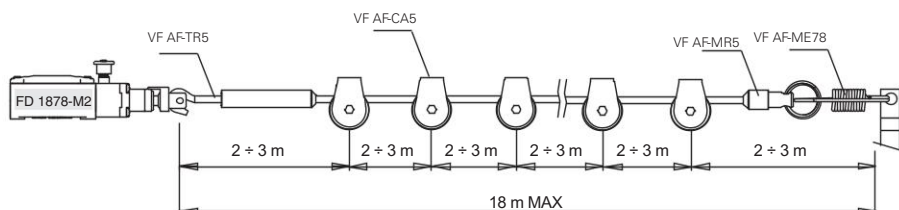
In **safety applications**, actuate the switch **at least up to the positive opening travel** shown in the travel diagrams with symbol ⊕. Actuate the switch **at least with the positive opening force**, reported in brackets below each article, next to the actuating force value.

Application examples and max. rope length for switches with longitudinal head

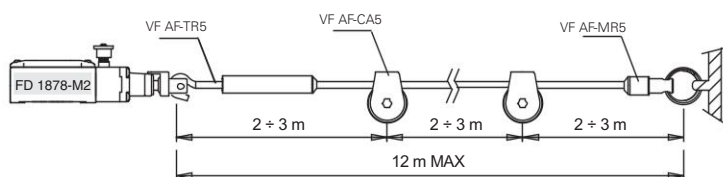
Example A



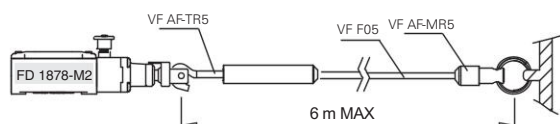
Example B



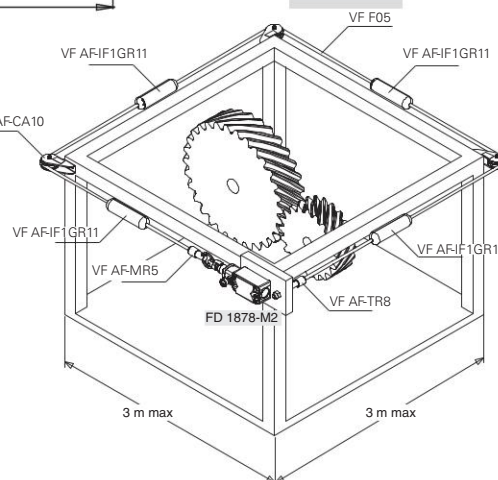
Example C



Example D

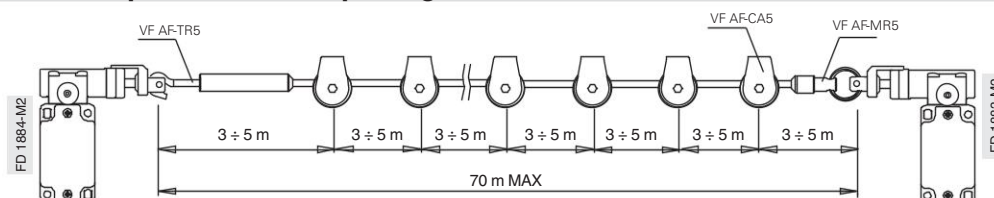


Example E

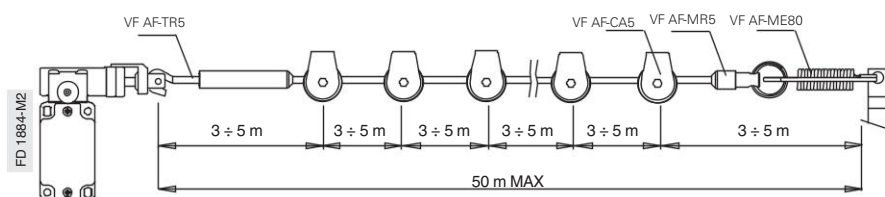


Application examples and max. rope length for switches with transversal head

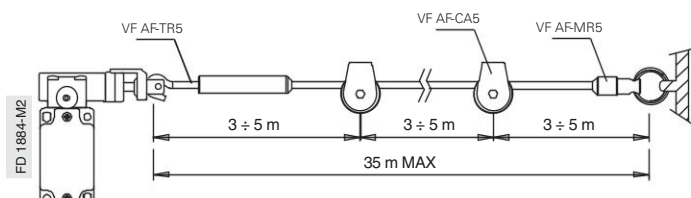
Example F



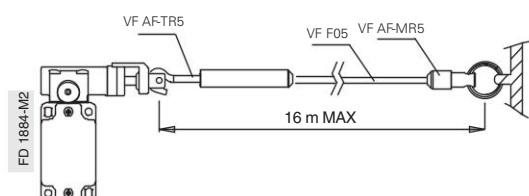
Example G



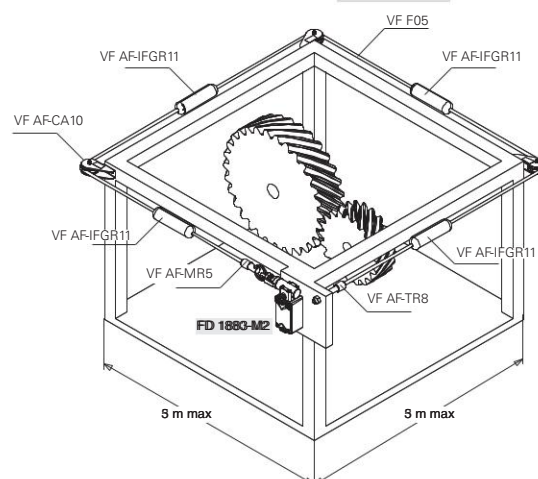
Example H



Example I



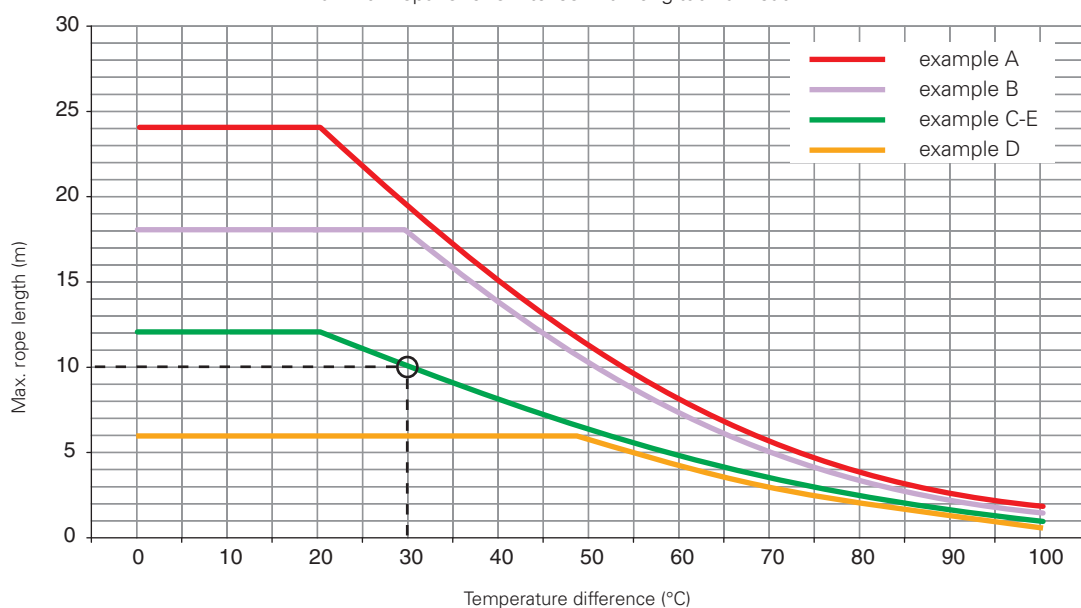
Example J





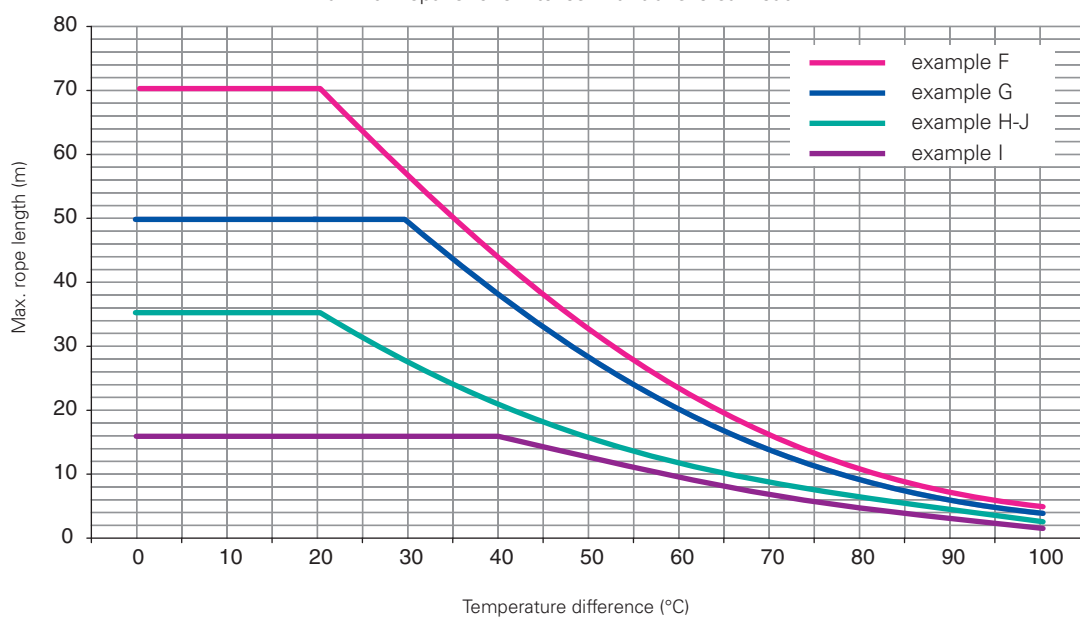
Maximum spans

Maximum spans for switches with longitudinal head



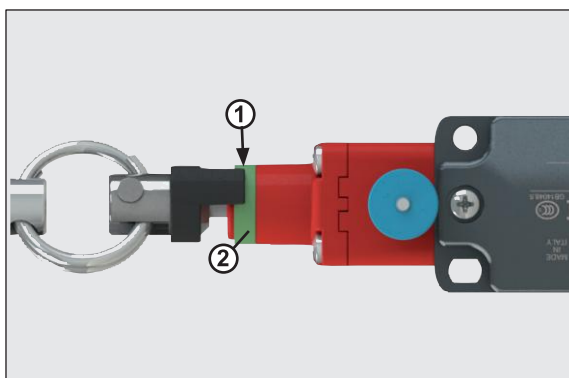
The max. recommended spans are indicated in the diagram as a function of the temperature fluctuations (temperature differences) to which the switch may be exposed at the point of use. For instance, with installation of type C and a temperature difference of 30°C, the max. recommended rope length is 10 metres.

Maximum spans for switches with transversal head

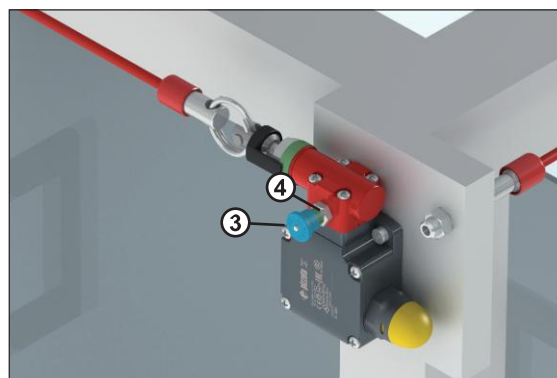


Important: The above data are guaranteed only using original rope and accessories. See page 293.

Adjustment of the switching point



Tighten the rope connected to the switch, until the end of the indicator (1) reaches about the middle of the green ring (2).



Pull the knob (3) in order to close the safety contacts inside the switch. Below the knob a green ring (4) will be disclosed.