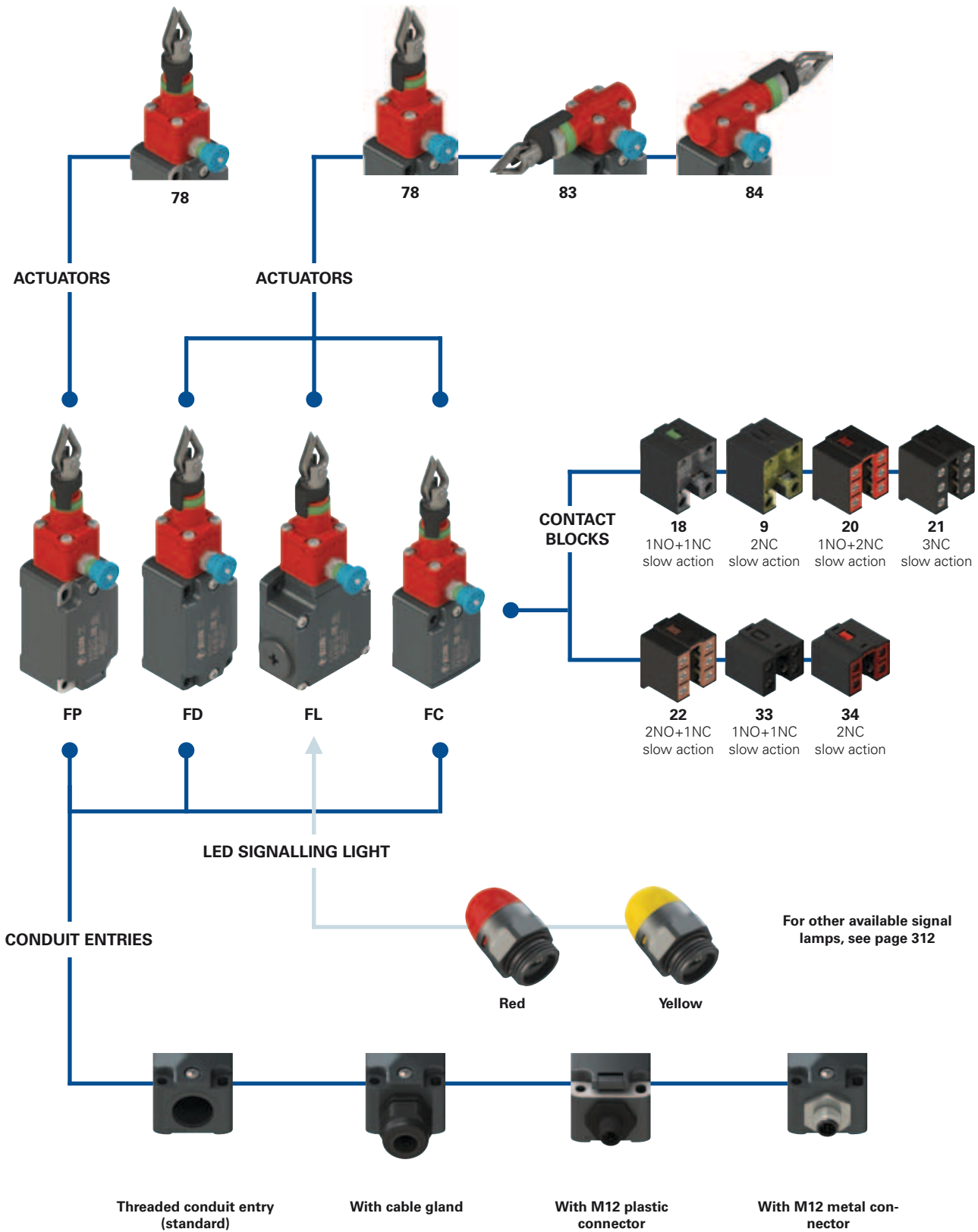


Selection diagram



—●— product option  
—▶— accessory sold separately



### 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-E7GM2K50T6**

Housing	
<b>FD</b>	metal, one conduit entry
<b>FL</b>	metal, three conduit entries
<b>FP</b>	technopolymer, one conduit entry

Ambient temperature	
	-25°C ... +80°C (standard)
<b>T6</b>	-40°C ... +80°C

Contact block	
<b>18</b>	1NO+1NC, slow action
<b>9</b>	2NC, slow action
<b>20</b>	1NO+2NC, slow action
<b>21</b>	3NC, slow action
<b>22</b>	2NO+1NC, slow action
<b>33</b>	1NO+1NC, slow action
<b>34</b>	2NC, slow action

Pre-installed cable glands or connectors	
	no cable gland or connector (standard)
<b>K23</b>	cable gland for cables Ø 6 ... 12 mm
...	.....
<b>K50</b>	M12 metal connector, 5-pole
...	.....

For the complete list of possible combinations please contact our technical department.

Actuating head	
<b>78</b>	longitudinal head
<b>83</b>	left transversal head (FD-FL housing only)
<b>84</b>	right transversal head (FD-FL housing only)

Threaded conduit entry	
<b>M2</b>	M20x1.5 (standard)
	PG 13.5

Actuating force	
	standard
<b>E7</b>	initial 20 N...final 40 N (only head 78)
<b>E9</b>	initial 13 N...final 75 N (only head 83-84)

Contact type	
	silver contacts (standard)
<b>G</b>	silver contacts with 1 µm gold coating
<b>G1</b>	Silver contacts, 2.5 µm gold coating (not for contact blocks 20, 21, 22, 33, 34)

article options options  
**FC 3378-E7GM2K50T6**

Housing	
<b>FC</b>	metal, one conduit entry

Ambient temperature	
	-25°C ... +80°C (standard)
<b>T6</b>	-40°C ... +80°C

Contact block	
<b>33</b>	1NO+1NC, slow action
<b>34</b>	2NC, slow action

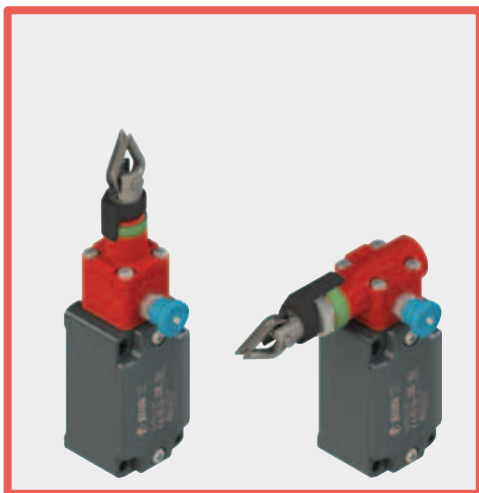
Pre-installed cable glands or connectors	
	no cable gland (standard)
<b>K23</b>	cable gland for cables Ø 6 ... 12 mm
<b>K50</b>	M12 metal connector, 5-pole

Actuating head	
<b>78</b>	longitudinal head
<b>83</b>	left transversal head
<b>84</b>	right transversal head

Threaded conduit entry	
<b>M2</b>	M20x1.5 (standard)
	PG 11

Actuating force	
	standard
<b>E7</b>	initial 20 N...final 40 N (only head 78)
<b>E9</b>	initial 13 N...final 75 N (only head 83-84)

Contact type	
	silver contacts (standard)
<b>G</b>	silver contacts with 1 µm gold coating



### 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:	EG605
UL approval:	E131787
CCC approval:	2007010305230000 (FD-FL-FC series) 2007010305230014 (FP series)
EAC approval:	RU C-IT.AQ35.B.00454

### 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

For safety applications up to: SIL 3 acc. to EN 62061  
 PL e acc. to EN ISO 13849-1

Safety parameters:

$B_{100}$ :	2,000,000 for NC contacts
Service life:	20 years
Ambient temperature:	-25°C ... +80°C
Max. actuation frequency:	1 cycle / 6 s
Mechanical endurance:	1 million operating cycles
Max. actuation speed:	0.5 m/s
Min. actuation speed:	1 mm/s
Tightening torques for installation:	see page 313-324

#### Max. cable cross section (flexible copper strands)

Contact blocks 20, 21, 22, 33, 34:	min. 1 x 0.34 mm <sup>2</sup> (1 x AWG 22) max. 2 x 1.5 mm <sup>2</sup> (2 x AWG 16)
Contact blocks 18, 9:	min. 1 x 0.5 mm <sup>2</sup> (1 x AWG 20) max. 2 x 2.5 mm <sup>2</sup> (2 x AWG 14)

#### In compliance 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, EN ISO 13850, EN 418, UL 508, CSA 22.2 No.14.

#### Approvals:

IEC 60947-5-1, UL 508, CSA 22.2 No.14, GB14048.5-2001.

#### Compliance with the requirements of:

Machinery Directive 2006/42/EC and EMC Directive 2004/122/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 313 to page 324.**

	Electrical data	Utilization category
without connector	Thermal current ( $I_{th}$ ):	10 A
	Rated insulation voltage ( $U_i$ ):	500 Vac 600 Vdc 400 Vac 500 Vdc (contact blocks 20, 21, 22, 33, 34)
	Rated impulse withstand voltage ( $U_{imp}$ ):	6 kV 4 kV (contact blocks 20, 21, 22, 33, 34)
	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
with M12 connector 4 and 5-pole	Thermal current ( $I_{th}$ ):	4 A
	Rated insulation voltage ( $U_i$ ):	250 Vac 300 Vdc
	Protection against short circuits: Pollution degree:	type gG fuse 4 A 500 V 3
		Alternating current: AC15 (50±60 Hz) $U_e$ (V) 24 120 250 $I_e$ (A) 4 4 4 Direct current: DC13 $U_e$ (V) 24 125 250 $I_e$ (A) 4 1.1 0.4
with M12 connector 8-pole	Thermal current ( $I_{th}$ ):	2 A
	Rated insulation voltage ( $U_i$ ):	30 Vac 36 Vdc
	Protection against short circuits: Pollution degree:	type gG fuse 2 A 500 V 3
		Alternating current: AC15 (50±60 Hz) $U_e$ (V) 24 $I_e$ (A) 2 Direct current: DC13 $U_e$ (V) 24 $I_e$ (A) 2

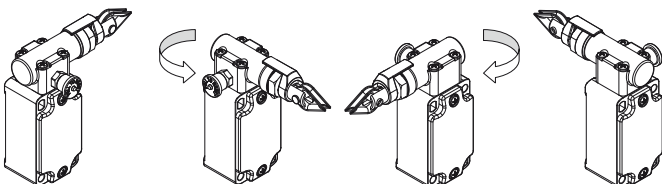


## Description



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.

## Head with variable orientation



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

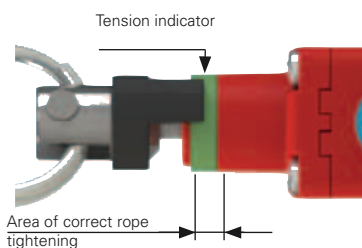
## Extended temperature range

# -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.

## 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.

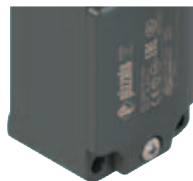
## Features approved by IMQ

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 (Uimp):	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 contacts on contact blocks 18, 9, 20, 21, 22, 33, 34  
In compliance with standards: EN 60947-1, EN 60947-5-1 + A1:2009, fundamental requirements of the Low Voltage Directive 2014/35/EU.

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

## Laser engraving

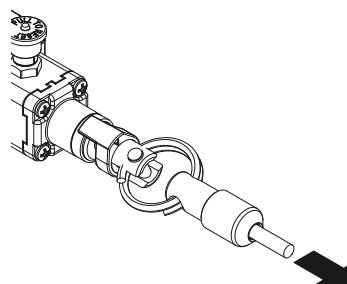


All devices are marked using a dedicated indelible laser system. These engravings are therefore suitable for extreme environments too. Thanks to this system that does not use labels, the loss of plate data is prevented and a greater resistance of the marking is achieved over time.

## Protection degree IP67

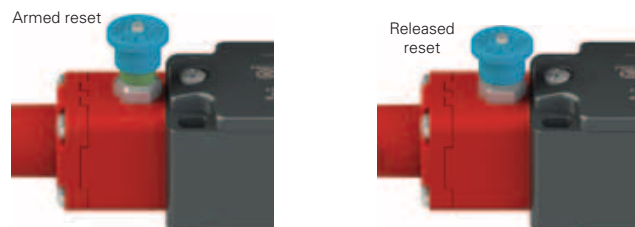
**IP67** These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where maximum protection degree of the housing is required.

## 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 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 UL

Utilization categories	Q300 (69 VA, 125-250 Vdc) A600 (720 VA, 120-600 Vac)
Housing features 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 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).	
In compliance with standard:	UL 508, CSA 22.2 No.14

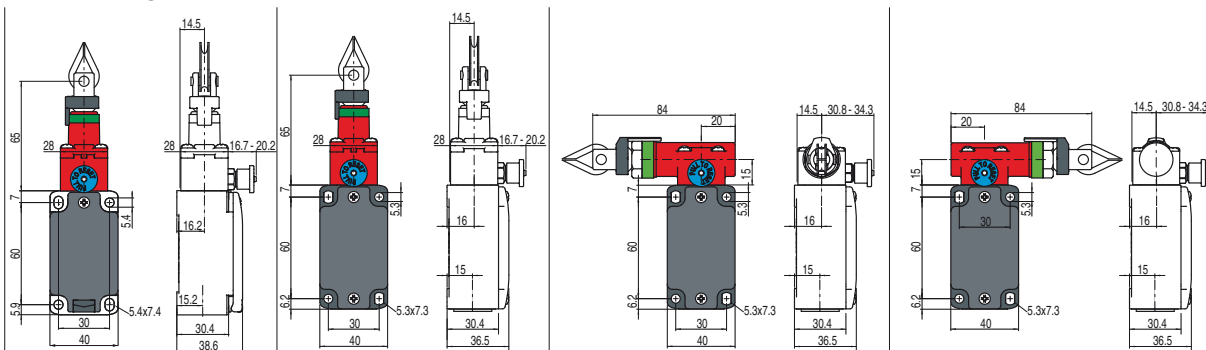
Please contact our technical department for the list of approved products.

## Dimensional drawings

All values in the drawings are in mm

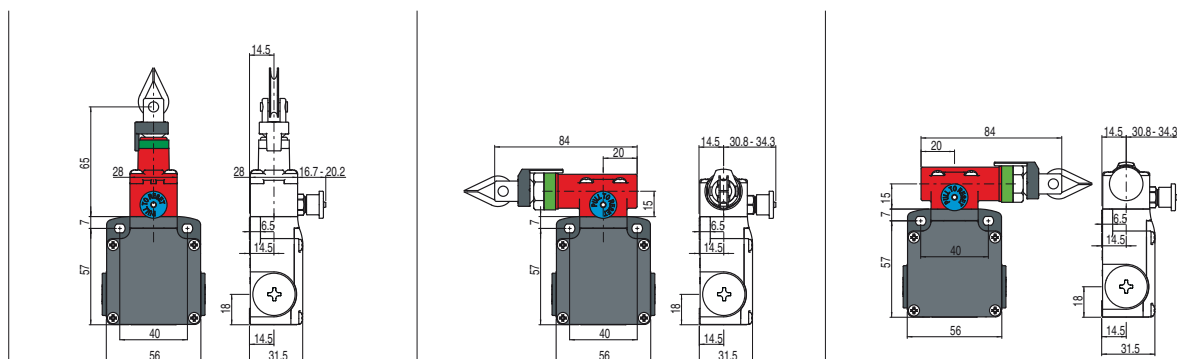
Contact type:

L = slow action



Contact block

18	L	FP 1878-M2	➔	1NO+1NC	FD 1878-M2	➔	1NO+1NC	FD 1883-M2	➔	1NO+1NC	FD 1884-M2	➔	1NO+1NC
9	L	FP 978-M2	➔	2NC	FD 978-M2	➔	2NC	FD 983-M2	➔	2NC	FD 984-M2	➔	2NC
20	L	FP 2078-M2	➔	1NO+2NC	FD 2078-M2	➔	1NO+2NC	FD 2083-M2	➔	1NO+2NC	FD 2084-M2	➔	1NO+2NC
21	L	FP 2178-M2	➔	3NC	FD 2178-M2	➔	3NC	FD 2183-M2	➔	3NC	FD 2184-M2	➔	3NC
22	L	FP 2278-M2	➔	2NO+1NC	FD 2278-M2	➔	2NO+1NC	FD 2283-M2	➔	2NO+1NC	FD 2284-M2	➔	2NO+1NC
33	L	FP 3378-M2	➔	1NO+1NC	FD 3378-M2	➔	1NO+1NC	FD 3383-M2	➔	1NO+1NC	FD 3384-M2	➔	1NO+1NC
34	L	FP 3478-M2	➔	2NC	FD 3478-M2	➔	2NC	FD 3483-M2	➔	2NC	FD 3484-M2	➔	2NC
Actuating force		Initial 63 N...final 83 N (90 N) ➔		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 174 - group 1		page 174 - group 1		page 174 - group 2		page 174 - group 2					



Contact block

18	L	FL 1878-M2	➔	1NO+1NC	FL 1883-M2	➔	1NO+1NC	FL 1884-M2	➔	1NO+1NC	
9	L	FL 978-M2	➔	2NC	FL 983-M2	➔	2NC	FL 984-M2	➔	2NC	
20	L	FL 2078-M2	➔	1NO+2NC	FL 2083-M2	➔	1NO+2NC	FL 2084-M2	➔	1NO+2NC	
21	L	FL 2178-M2	➔	3NC	FL 2183-M2	➔	3NC	FL 2184-M2	➔	3NC	
22	L	FL 2278-M2	➔	2NO+1NC	FL 2283-M2	➔	2NO+1NC	FL 2284-M2	➔	2NO+1NC	
33	L	FL 3378-M2	➔	1NO+1NC	FL 3383-M2	➔	1NO+1NC	FL 3384-M2	➔	1NO+1NC	
34	L	FL 3478-M2	➔	2NC	FL 3483-M2	➔	2NC	FL 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 174 - group 1		page 174 - group 2		page 174 - group 2					

Items with code on green background are stock items

Accessories See page 299

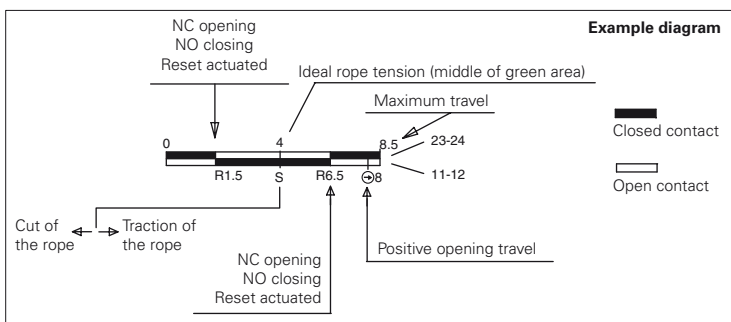
➔ The 2D and 3D files are available at [www.pizzato.com](http://www.pizzato.com)



Contact type: <b>L</b> = slow action			
Contact block			
33 <b>L</b>	FC 3378-M2 ⊕ 1NO+1NC	FC 3383-M2 ⊕ 1NO+1NC	FC 3384-M2 ⊕ 1NO+1NC
34 <b>L</b>	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 174 - group 1	page 174 - group 2	page 174 - group 2

### How to read travel diagrams

All values in the diagrams are in mm



### Travel diagrams table

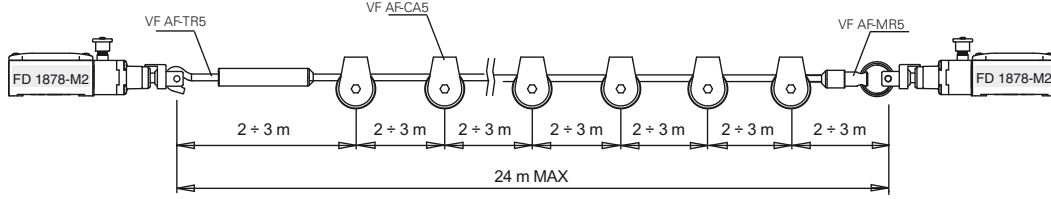
Contact block	Group 1	Group 2
18 1NO+1NC		
9 2NC		
20 1NO+2NC		
21 3NC		
22 2NO+1NC		
33 1NC+1NO		
34 2NC		

#### IMPORTANT:

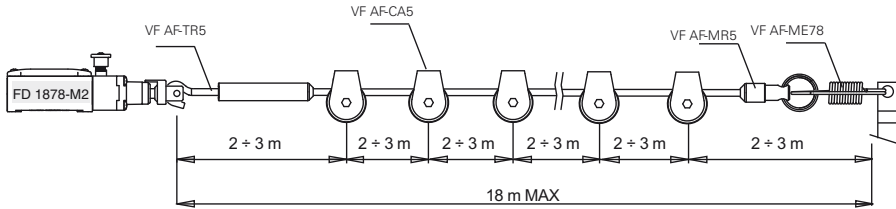
In **safety applications**, actuate the switch **at least up to the positive opening travel** shown in the travel diagrams with symbol ⊕. Actuate the switch **at least with the positive opening force**, reported in brackets below each article, next to the actuating force value.

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

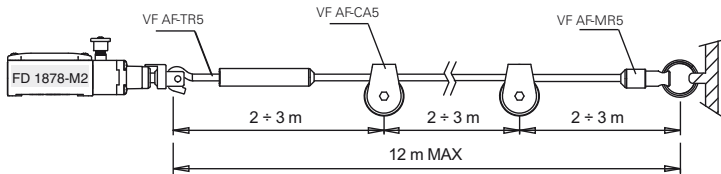
Example A



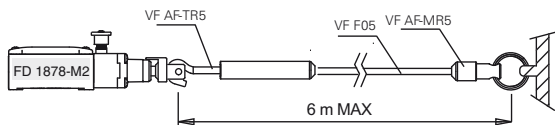
Example B



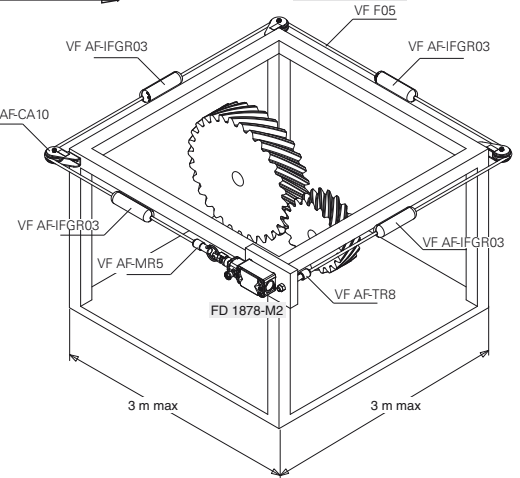
Example C



Example D

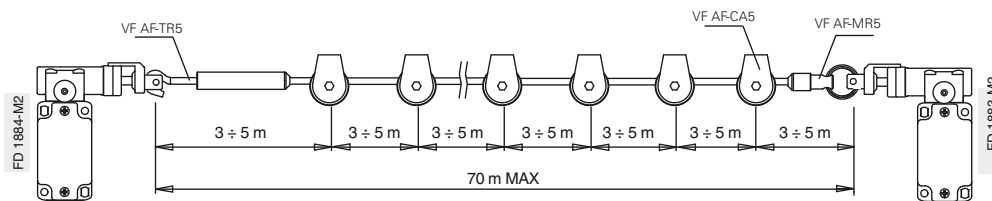


Example E

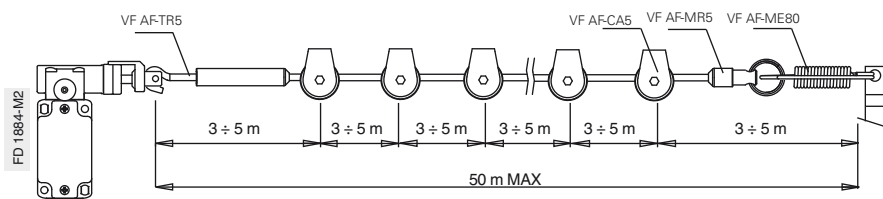


Application examples and max. rope length for switches with transversal head

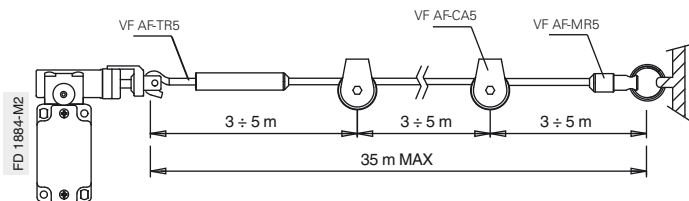
Example F



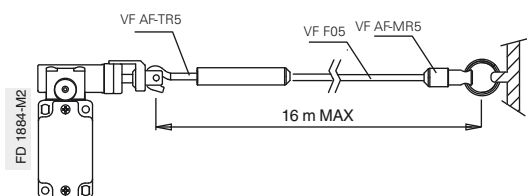
Example G



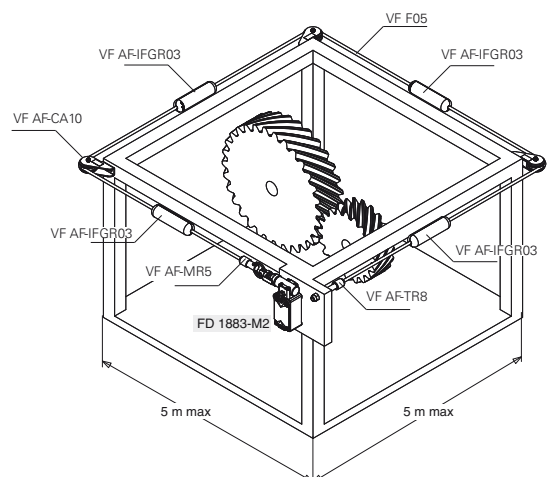
Example H



Example I



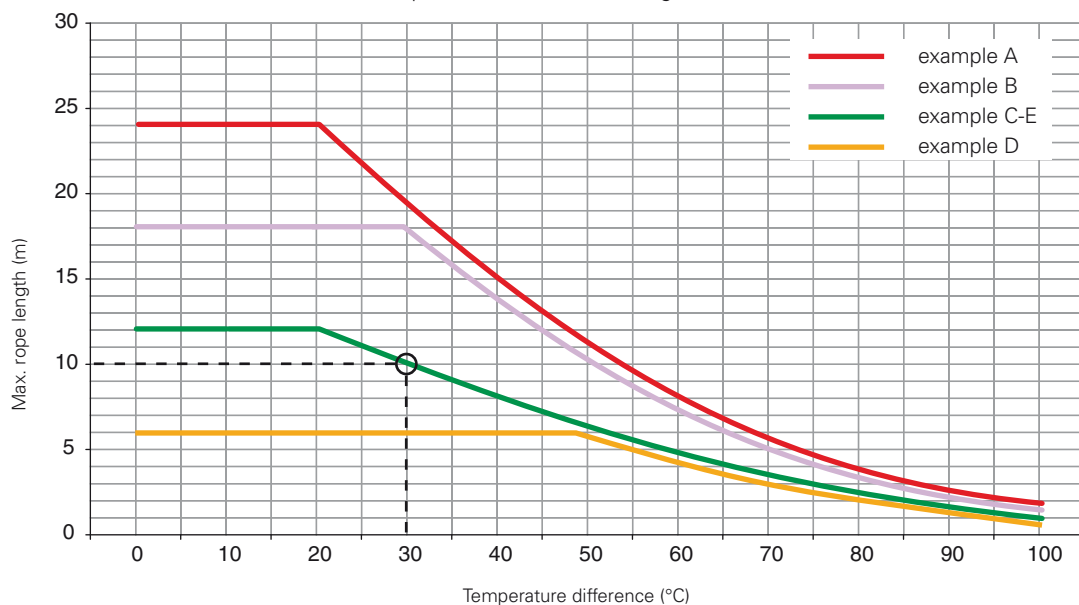
Example J





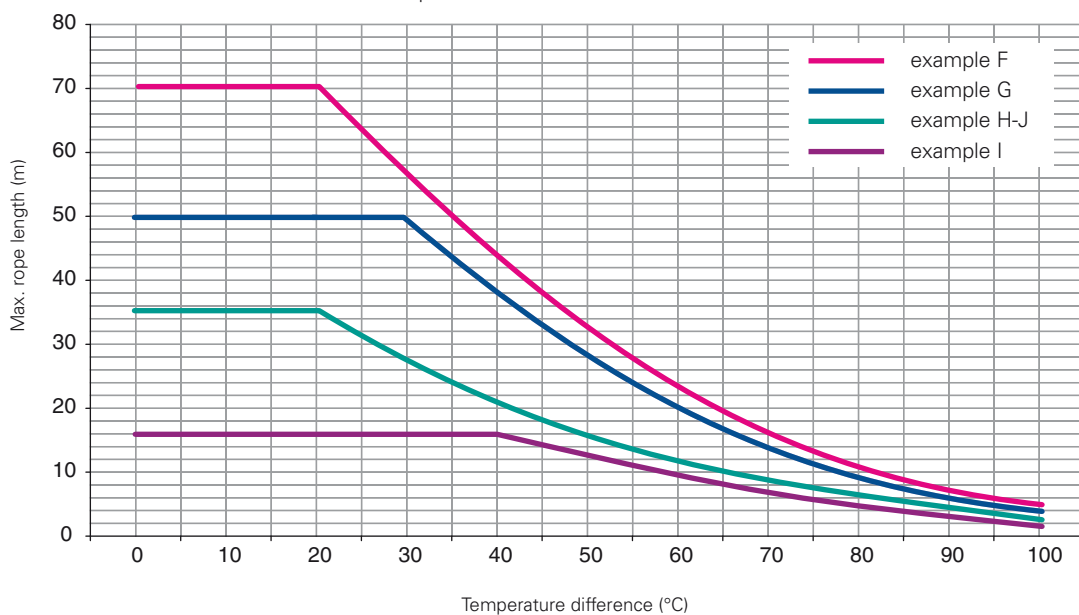
## Maximum spans

Maximum spans for switches with longitudinal head



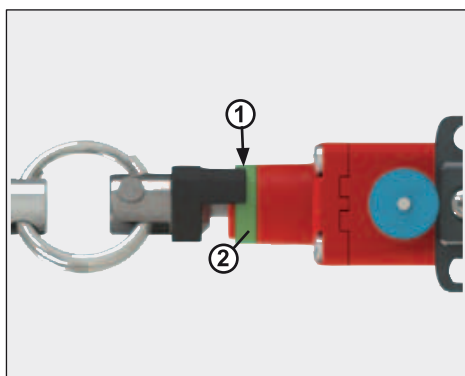
The max. recommended spans are indicated in the diagram as a function of the temperature fluctuations (temperature differences) to which the switch may be exposed at the point of use. For instance, with installation of type C and a temperature difference of 30°C, the max. recommended rope length is 10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

Maximum spans for switches with transversal head

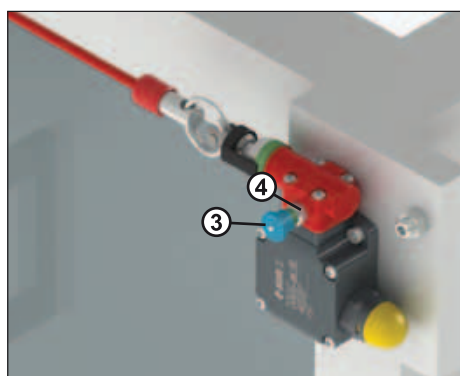


Important: The above data are guaranteed only using original rope and accessories. See page 185.

## 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.