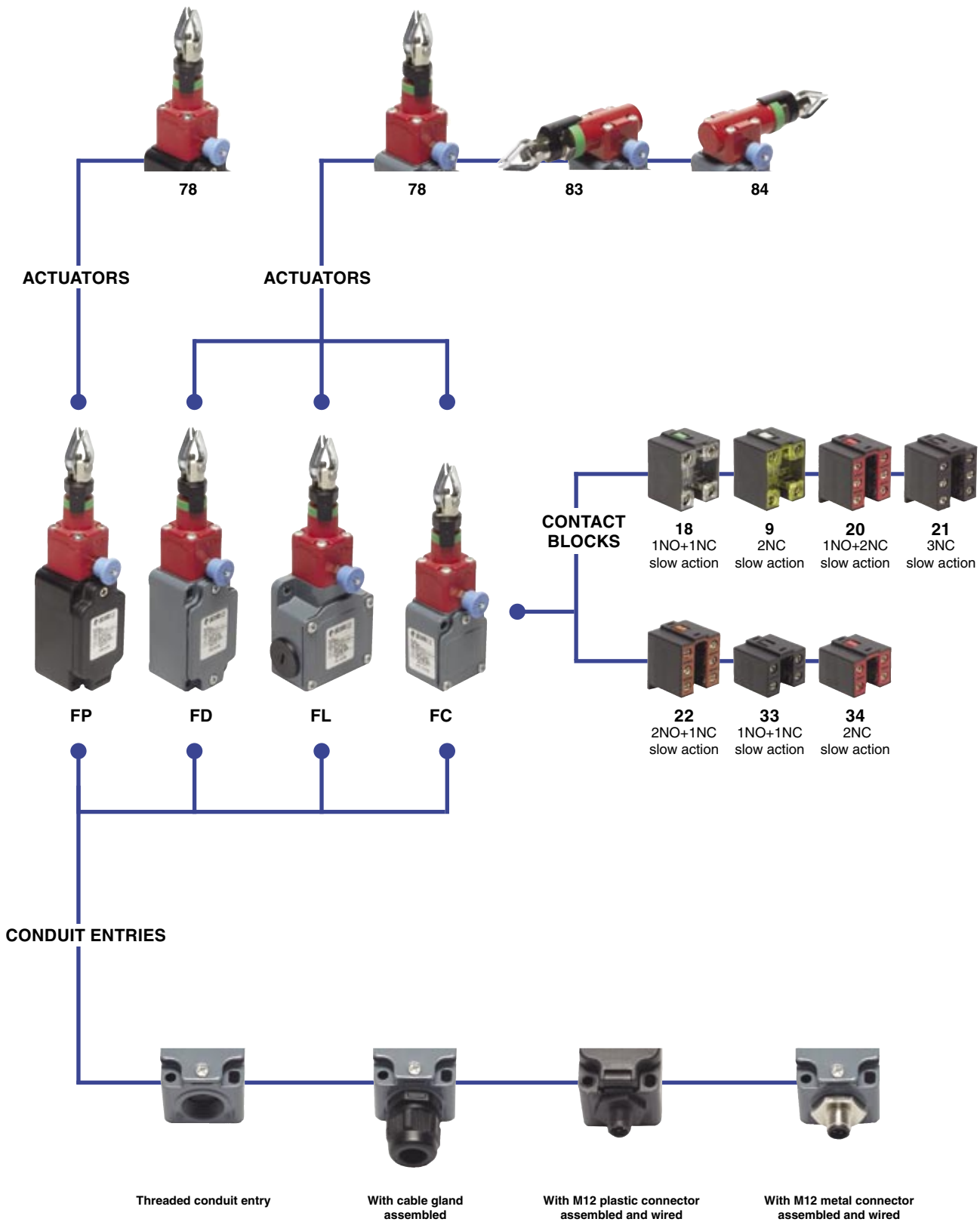


Selection diagram



Code structure

Attention! The feasibility of a code number does not mean the effective availability of a product. Please contact our sales office.

FD 1878-GM2K50

Housing		Preinstalled cable gland or connectors	
FD	metal housing, one conduit entry		no cable gland or connector (standard)
FL	metal housing, three conduit entries	K21	with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range
FP	polymer housing, one conduit entry	K40	with M12 metal connector assembled and wired, 8 poles (only for contact blocks 20, 21, 22)
	
Contact blocks		For the complete list of all combinations, please contact our technical office.	
18	1NO+1NC, slow action	Threaded conduit entry	
9	2NC, slow action		PG 13,5 (standard)
20	1NO+2NC, slow action	M2	M20x1,5
21	3NC, slow action	Contacts type	
22	2NO+1NC, slow action		silver contacts (standard)
33	1NO+1NC, slow action	G	silver contacts gold plated 1 µm
34	2NC, slow action	Actuating head	
		78	longitudinal head
		83	left transversal head (FD-FL housing only)
		84	right transversal head (FD-FL housing only)

FC 3378-GM1K22

Housing		Preinstalled cable gland	
FC	metal housing, one conduit entry		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
Contact blocks		Threaded conduit entry	
33	1NO+1NC, slow action		PG 11 (standard)
34	2NC, slow action	M1	M16x1,5
Actuating head		Contacts type	
78	longitudinal head		silver contacts (standard)
83	left transversal head	G	silver contacts gold plated 1 µm
84	right transversal head		



Main data

- Metal or polymer housing, from one to three conduit entries
- Protection degree IP67
- In conformity with EN 418
- 7 contact blocks available
- Transversal head or longitudinal head versions
- M12 assembled connector versions
- Silver contacts gold plated versions
- Several accessories available

Markings and quality marks:



Approval IMQ:	EG605 (FD-FL-FC series)
	EG606 (FP series)
Approval UL:	E131787
Approval EZU:	1010151

Technical data

Housing

Housing type FP made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin with double insulation ☐
Housing type FD and FC made of metal, coated with baked epoxy powder.

FD, FP and FC series one conduit entry

FL series three 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: 1 operation cycles / 6 s

Mechanical endurance: 1 million of operations cycles¹

Max actuating speed: 0,5 m/s

Min. actuating speed: 1 mm/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 mm ²	(1 x AWG 22)
	max.	2 x 1,5 mm ²	(2 x AWG 16)
Contact blocks 18, 9:	min.	1 x 0,5 mm ²	(1 x AWG 20)
	max.	2 x 2,5 mm ²	(2 x AWG 14)

In conformity with standards:

IEC 947-5-1, IEC 337-1, EN 60947-5-1, CEI EN 60947-5-1, CEI 17-45, EN 1088, EN ISO 12100-1, EN ISO 12100-2, EN 418, NFC 63-140, VDE 0660-200, VDE 0113, CENELEC EN 50013.

Approvals:

IEC 947-5-1, UL 508.

In conformity with requirements requested by:

Low Voltage Directive 73/23/EEC and subsequent modifications and completions.
Machinery Directive 98/37/EEC.

Electromagnetic Compatibility 89/336/EEC and subsequent modifications and completions.

Positive contact opening in conformity with standards:

IEC 947-5-1, EN 60947-5-1, CEI EN 60947-5-1, VDE 0660-206.

⚠ For the correct installation of all articles, please see "Utilization requirements" chapter, from page 6/1 to page 6/4.

Electrical data

Utilization categories

without connector	Thermal current (I _{th}):	10 A	Alternate current: AC15 (50...60 Hz)			
	Rated insulation voltage (U _i):	500 VAC 600 VDC	U _e (V)	250	400	500
		400 VAC for contact blocks 20, 21, 22, 33, 34	I _e (A)	6	4	1
Protection against short circuits:	fuse 10 A 500 V type aM	Direct current: DC13				
Pollution degrees:	3	U _e (V)	24	125	250	
		I _e (A)	6	1,1	0,4	

with 4 or 5 poles M12 connector	Thermal current (I _{th}):	4 A	Alternate current: AC15 (50...60 Hz)			
	Rated insulation voltage (U _i):	250 VAC 300 VDC	U _e (V)	24	120	250
		Protection against short circuits:	fuse 4 A 500 V type gG	I _e (A)	4	4
Pollution degrees:	3	Direct current: DC13				
		U _e (V)	24	125	250	
		I _e (A)	4	1,1	0,4	

with 8 poles M12 connector	Thermal current (I _{th}):	2 A	Alternate current: AC15 (50...60 Hz)		
	Rated insulation voltage (U _i):	30 VAC 36 VDC	U _e (V)	24	
		Protection against short circuits:	fuse 2 A 500 V type gG	I _e (A)	2
Pollution degrees:	3	Direct current: DC13			
		U _e (V)	24		
		I _e (A)	2		

Description

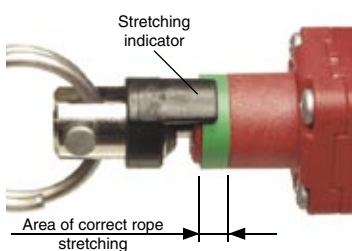
These rope operated safety switches are installed on machines or conveyor belts, to activate the emergency stop of the machine on every hand intervention on the rope, from any point. They allow cost savings on machines of medium-large size, where normally many emergency stop push buttons can be replaced by one single switch. Provided with **self-control function**, they constantly check their correct working operation, signalling with the opening of the contacts an eventual loosening or breaking of the rope. These safety switches, after their activation, keep the contacts open till the reset push button is manually pulled, even if the rope is left free.

Rotating heads



Removing the four fastening screws, in all switches, it is possible to rotate the head in 90° steps.

Rope regulation point indicator



All switches are provided with a green ring that shows the area of the correct stretching of the rope. The installer has only to stretch the rope until the black indicator will be in the middle of the green area. In this position it is possible to reset the switch, pulling the reset button, and to close

the electrical safety contacts. If a traction (or loosening) of the rope it is high enough to permit the black indicator to go outside the correct stretching area, there will be the reset action and the opening of the safety contacts.

Reset button indicator



If the rope stretching indicator is in the correct operation area, it is possible to close the electric safety contacts pulling the blue reset button. The green ring signal allows to know the switch condition quickly.

Extracts from Standards

EN 418 point 4.1.11

“Any action on the actuator that causes the intervention of the emergency stop signal must cause the mechanical block of the control device as well...”.

EN 418 point 4.5.2 (requirements referring to ropes, when used as actuators)

“In case of break or disconnection of a rope, the emergency stop signal must be automatically generated”.

Data type approved by IMQ 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 degrees 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 18, 9, 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.

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.

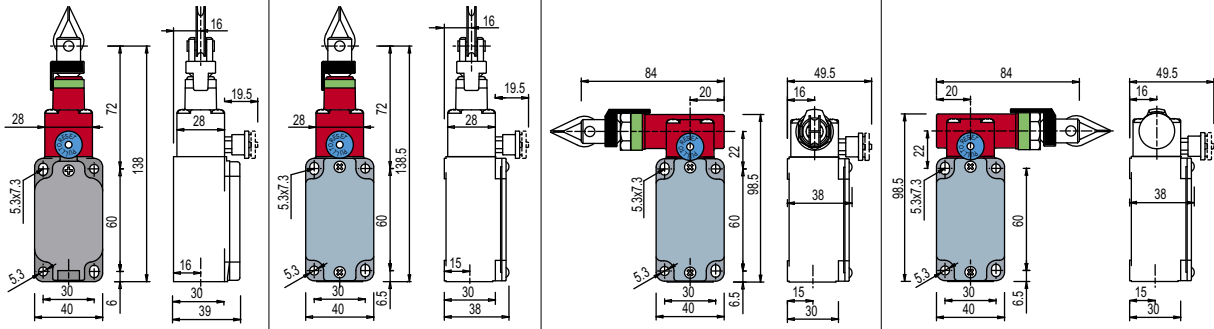
Please contact our technical service for the list of type approved products.

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

Dimensional drawings

Contacts type:

L = slow action

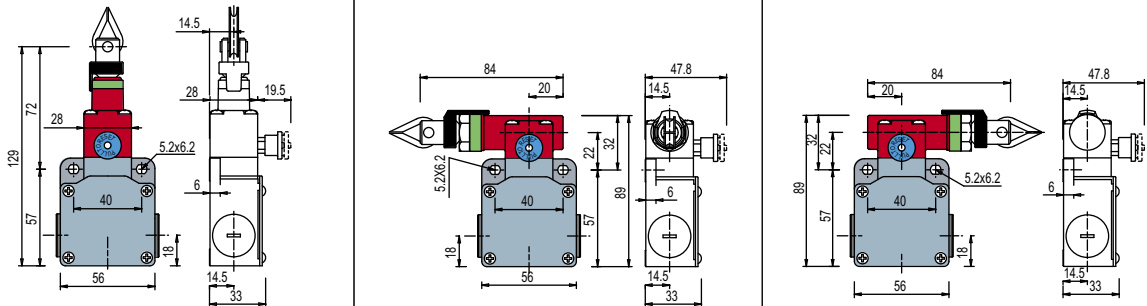


Contact blocks

18	L	FP 1878	⊕	1NO+1NC	FD 1878	⊕	1NO+1NC	FD 1883	⊖	1NO+1NC	FD 1884	⊕	1NO+1NC
9	L	FP 978	⊕	2NC	FD 978	⊕	2NC	FD 983	⊖	2NC	FD 984	⊕	2NC
20	L	FP 2078	⊕	1NO+2NC	FD 2078	⊕	1NO+2NC	FD 2083	⊖	1NO+2NC	FD 2084	⊕	1NO+2NC
21	L	FP 2178	⊕	3NC	FD 2178	⊕	3NC	FD 2183	⊖	3NC	FD 2184	⊕	3NC
22	L	FP 2278	⊕	2NO+1NC	FD 2278	⊕	2NO+1NC	FD 2283	⊖	2NO+1NC	FD 2284	⊕	2NO+1NC
33	L	FP 3378	⊕	1NO+1NC	FD 3378	⊕	1NO+1NC	FD 3383	⊖	1NO+1NC	FD 3384	⊕	1NO+1NC
34	L	FP 3478	⊕	2NC	FD 3478	⊕	2NC	FD 3483	⊖	2NC	FD 3484	⊕	2NC
Min. 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 4/72 - group 1			page 4/72 - group 1			page 4/72 - group 2			page 4/72 - group 1		

Contacts type:

L = slow action

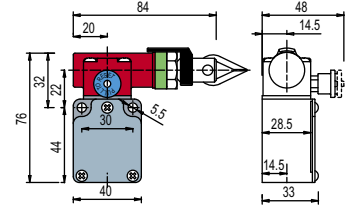
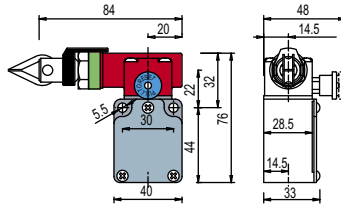
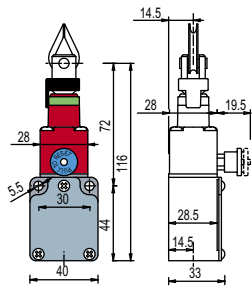


Contact blocks

18	L	FL 1878	⊕	1NO+1NC	FL 1883	⊕	1NO+1NC	FL 1884	⊕	1NO+1NC
9	L	FL 978	⊕	2NC	FL 983	⊕	2NC	FL 984	⊕	2NC
20	L	FL 2078	⊕	1NO+2NC	FL 2083	⊕	1NO+2NC	FL 2084	⊕	1NO+2NC
21	L	FL 2178	⊕	3NC	FL 2183	⊕	3NC	FL 2184	⊕	3NC
22	L	FL 2278	⊕	2NO+1NC	FL 2283	⊕	2NO+1NC	FL 2284	⊕	2NO+1NC
33	L	FL 3378	⊕	1NO+1NC	FL 3383	⊕	1NO+1NC	FL 3384	⊕	1NO+1NC
34	L	FL 3478	⊕	2NC	FL 3483	⊕	2NC	FL 3484	⊕	2NC
Min. 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 4/72 - group 1			page 4/72 - group 2			page 4/72 - group 1		

Rope accessories
See page 4/83

Items with code on the green background are available in stock

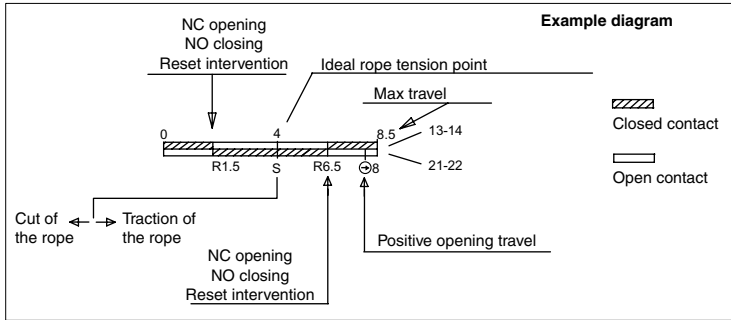


Contact blocks

33	L	FC 3378	⊕	1NO+1NC	FC 3383	⊕	1NO+1NC	FC 3384	⊕	1NO+1NC
34	L	FC 3478	⊕	2NC	FC 3483	⊕	2NC	FC 3484	⊕	2NC
Min. 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 4/72 - group 1			page 4/72 - group 1			page 4/72 - group 1		

How to read travel diagrams

All measures in the diagrams are in mm



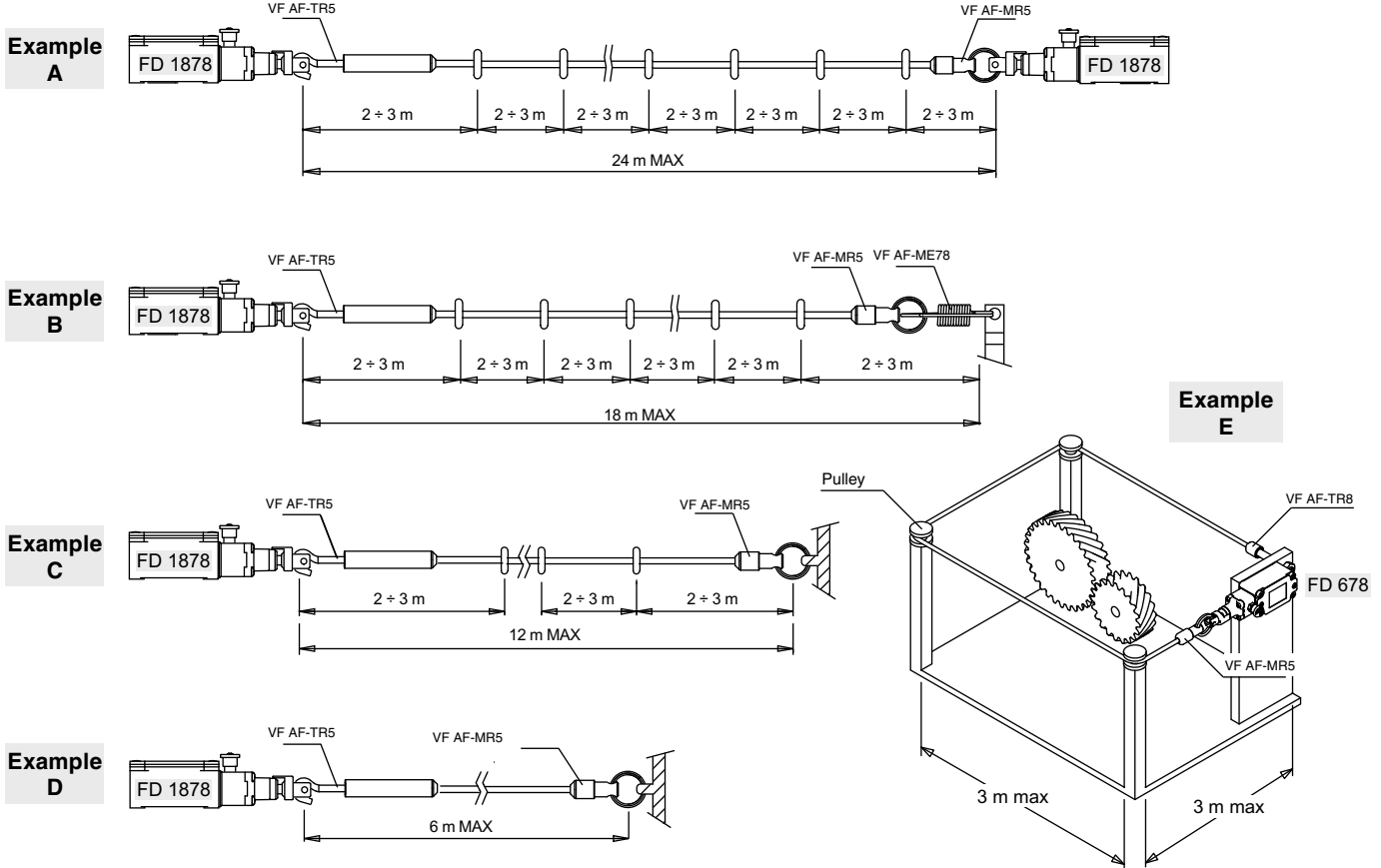
Travel diagrams table

Contact blocks	Group 1	Group 2
18 1NO+1NC 13 21 14 22		
9 2NC 11 21 12 22		
20 1NO+2NC 11 21 33 12 22 34		
21 3NC 11 21 31 12 22 32		
22 2NO+1NC 11 23 33 12 24 34		
33 1NC+1NO 13 21 14 22		
34 2NC 11 21 12 22		

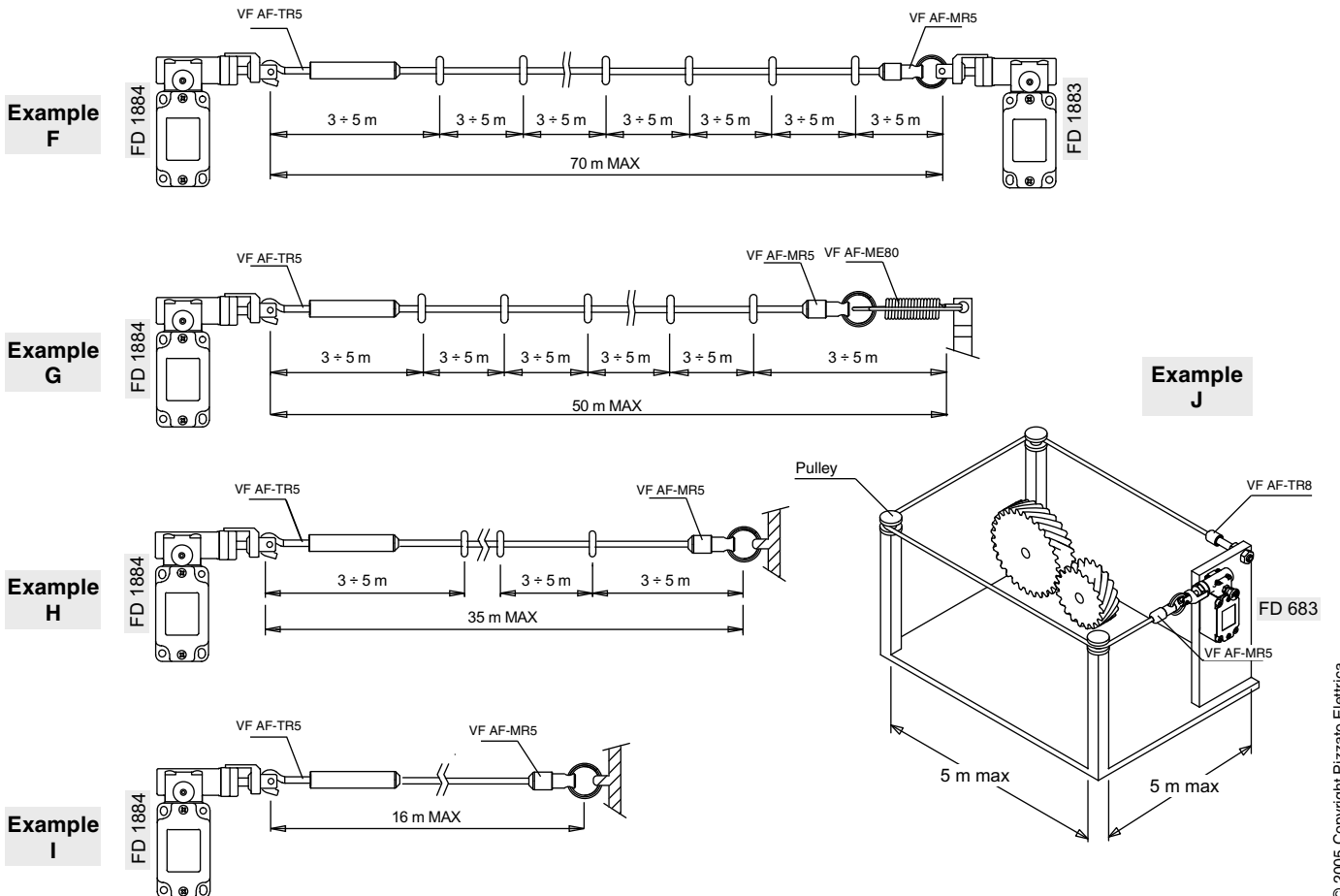
IMPORTANT:

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.

Application examples and max rope length for switches with longitudinal heads

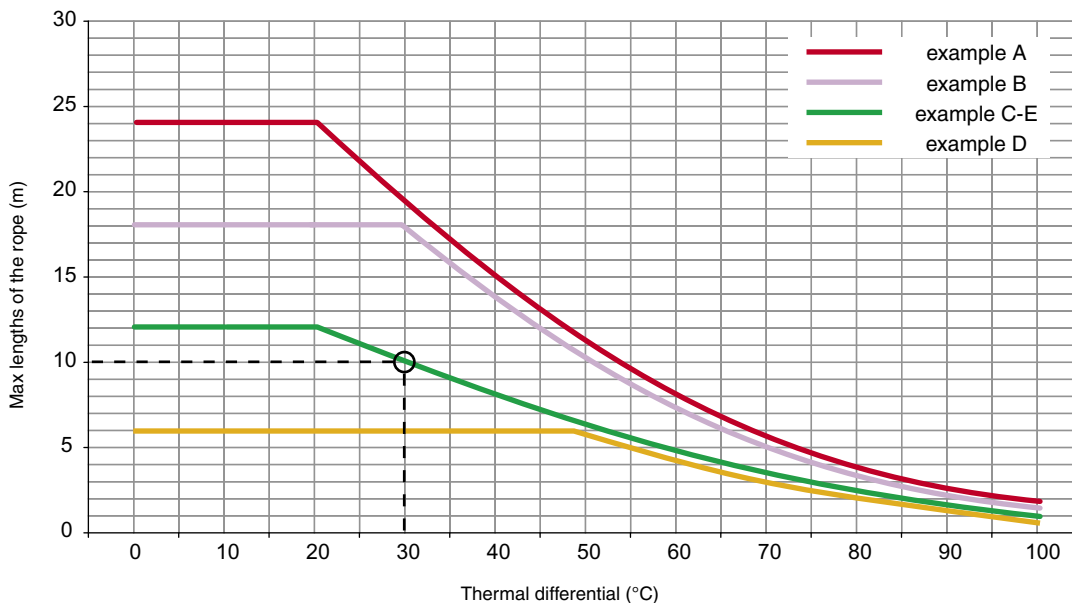


Application examples and max rope length for switches with transversal heads



Max rope length

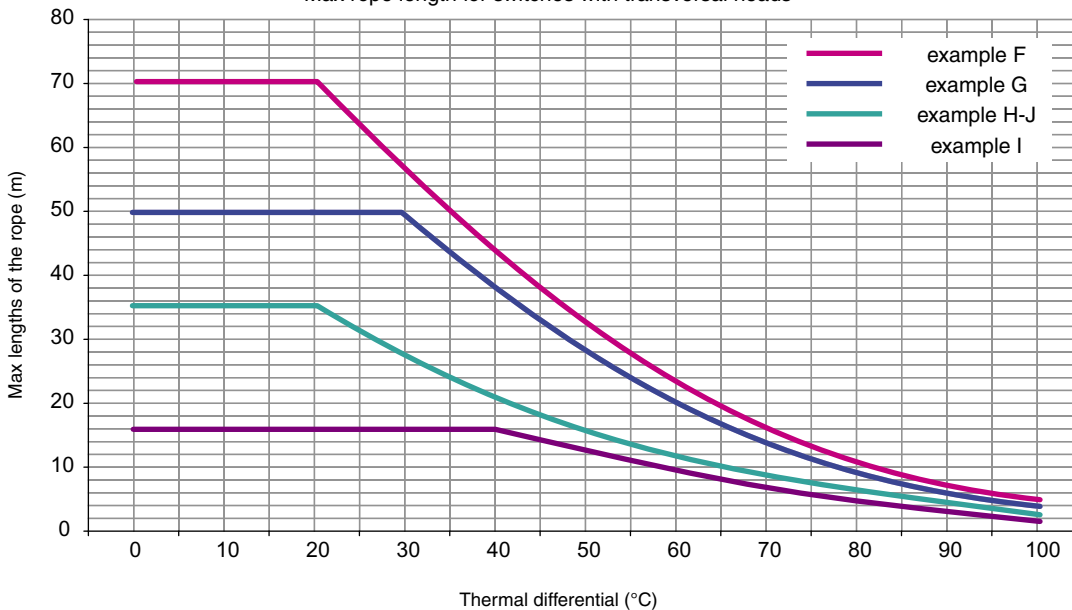
Max rope length for switches with longitudinal heads



In the diagram, the suggested max. rope lengths with regard to changes of temperature (thermal differential) to which the switch is expected to be exposed in the working area are indicated.

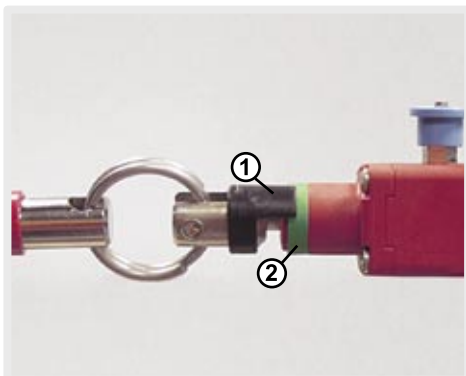
For instance, for an example C installation which expects a thermal differential of 30°C, a max rope length of 10 meters is suggested.

Max rope length for switches with transversal heads

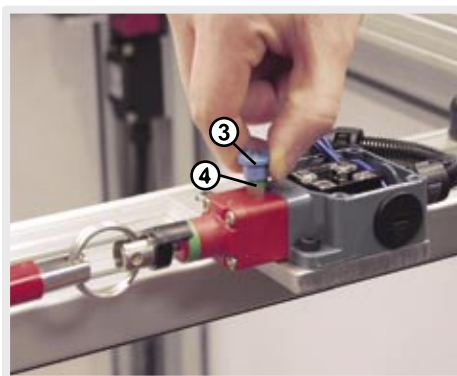


Important: The above data are guaranteed only using original rope and accessories. See page 4/83.

Regulation of intervention point



Stretch 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.