



ATEX



Technical definitions
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FD series position switches
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Category	Zone	EPL	Approvals	Product code extension	ATEX/EPL category				
					M2/Mb	2G/Gb	2D/Db	3G/Gc	3D/Dc
3D	22	Dc	II 3D Ex tc II CT80°C Dc	-EX4	-	-	-	-	■
2G M2	1 M2	Gb Mb	II 2G Ex ia I CT6 Gb I M2 Ex ia I Mb	-EX7	■	■	-	■	-
2D	21	Db	II 2D Ex tb II CT80°C Db	-EX8	-	-	■	-	■

FL series position switches
page 167


Category	Zone	EPL	Approvals	Product code extension	ATEX/EPL category				
					M2/Mb	2G/Gb	2D/Db	3G/Gc	3D/Dc
3D	22	Dc	II 3D Ex tc II CT80°C Dc	-EX4	-	-	-	-	■
2G M2	1 M2	Gb Mb	II 2G Ex ia I CT6 Gb I M2 Ex ia I Mb	-EX7	■	■	-	■	-
2D	21	Db	II 2D Ex tb II CT80°C Db	-EX8	-	-	■	-	■

FM series position switches
page 173


Category	Zone	EPL	Approvals	Product code extension	ATEX/EPL category				
					M2/Mb	2G/Gb	2D/Db	3G/Gc	3D/Dc
2G M2	1 M2	Gb Mb	II 2G Ex ia I CT6 Gb I M2 Ex ia I Mb	-EX7	■	■	-	■	-

FA series pre-wired position switches
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Category	Zone	EPL	Approvals	Product code extension	ATEX/EPL category				
					M2/Mb	2G/Gb	2D/Db	3G/Gc	3D/Dc
3D 3G	22 2	Dc Gc	II 3D Ex tc II CT80°C Dc II 3G Ex nC I CT6 Gc	-EX5	-	-	-	■	■

Accessories
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ATEX Directive

The acronym ATEX (**A**tmospheres **E**xplosives) refers to two European directives concerning the risk of deflagration in potentially explosive atmospheres:

- ATEX 2014/34/EU: concerns the requirements for electrical and non-electrical equipment for use in potentially explosive environments. According to this directive, the manufacturer has to comply with the provided requirements and mark its articles according to specific categories.
- ATEX 99/92/EC: lays down minimum requirements for the safety and health protection of workers potentially at risk from explosive atmospheres.

These directives define the requirements for the protection of safety and health of persons, domestic animals and property, as well as the conformity assessment procedures to prove that the devices comply with the directives' requirements.

Classification of potentially explosive atmospheres

A potentially explosive atmosphere is an atmosphere which could become explosive due to local and/or operational conditions. These environments present a mixture with air under atmospheric conditions of flammable substances in the form of in the form of gases, vapours, mists or dusts.

The ATEX 99/92/EC Directive classifies two types of potentially explosive atmospheres, depending on presence of combustible gases or dusts in the zone. These two types of explosive atmospheres are in turn classified in three zones each, according to the frequency and duration of the explosive atmosphere. Areas in atmospheres with explosive gases are classified in zones 0, 1 and 2; whereas in atmospheres with explosive dusts in zones 20, 21 and 22:

- **Zone 0/20:** A place in which the presence of flammable gas or dust is continuously present. Constant danger. It requires at least Category 1 equipment.
- **Zone 1/21:** A place in which the presence of flammable gas or dust is likely to occur in normal operation occasionally. Potential danger. It requires at least Category 2 equipment.
- **Zone 2/22:** A place in which the presence of flammable gas or dust is not likely to occur in normal operation or, if it does occur, will persist for a short period only. Or it occurs due to a failure. Lower danger. It requires at least Category 3 equipment.

The end user has the responsibility to identify and classify the different zones and to install appropriate equipment.

Equipment categories acc. to ATEX directive and IEC standards

According to the ATEX Directive 2014/34/EU equipment is classified into two main groups:

- **Group I:** equipment and systems for mining
- **Group II:** equipment and systems for all other applications

Equipment of the group I is divided in two further categories according to the required protection level:

- **Category M1:** Equipment designed to ensure a very high level of protection
- **Category M2:** Equipment designed to ensure a high level of protection

Equipment of the group II is further subdivided into three categories according to the required protection level:

- **Category 1:** Equipment designed to ensure a very high level of protection (for use in zone 0 and 20, 1 and 21, 2 and 22)
- **Category 2:** Equipment designed to ensure a high level of protection (for use in zone 1 and 21, 2 and 22)
- **Category 3:** Equipment designed to ensure a normal level of protection (for use in zone 2 and 22)

A comparison between the EPL (Equipment Protection Levels) defined by the IEC 60079-0 standard and the categories and applications of the ATEX Directive are shown in table 1.

Environment features				Equipment features				
Field of application	Flammable substance	Potentially explosive atmosphere	Classification of potentially explosive atmospheres: ZONE	acc. to ATEX 2014/34/EU		acc. to IEC 60079-0		Required protection level
				Required marking of the device: CATEGORY	Required marking of the device: GROUP	Group	EPL	
Mining				M1	I	I	Ma	very high
				M2			Mb	high
Surface	Gases	It is present continuously, or for long periods or frequently	0	1G	II	II	Ga	very high
		It is likely to occur	1	2G			Gb	high
		It is not likely to occur but, if it does occur, will persist for a short period only	2	3G			Gc	normal
	Dusts	It is present continuously, or for long periods or frequently	20	1D		III	Da	very high
		It is likely to occur	21	2D			Db	high
		It is not likely to occur but, if it does occur, will persist for a short period only	22	3D			Dc	normal

Table 1 – Classification of environment and equipment according to ATEX directive and IEC 60079-0 standard

Protective measures

To avoid the risk of explosions caused by an electrical trigger in a potentially explosive atmosphere, different protective measures can be taken:

- use of enclosures to encapsulate dangerous part in order to limit explosions to the inside of the housing itself;
- avoid contact between hot spots and the potentially explosive atmosphere by interposing solid, liquid or gaseous bodies;
- take measures to limit the generation of dangerous hot spots, eliminating the possibility of failures or limiting the system power so that it is insufficient to cause the ignition.

Various protective modes have been developed and standardised for each of these modes as listed in table 2.

Protective measure	Symbol	Engraving	Zone GAS	Zone DUSTS	IEC / EN standard
General requirements	/	/	0, 1, 2	20, 21, 22	IEC 60079-0 EN 60079-0
Oil immersion		Ex ob Ex oc	1 2	/	IEC 60079-6 EN 60079-6
Pressurized enclosure		Ex pv Ex pxb Ex pyb Ex pzc	1, 2 1 1 2	/ 21 21 22	IEC 60079-2 EN 60079-2
Powder filling		Ex q	1	/	IEC 60079-5 EN 60079-5
Flameproof enclosure		Ex da Ex db Ex dc	0 1 2	/	IEC 60079-1 EN 60079-1
Increased safety		Ex eb Ex ec	1 2	/	IEC 60079-7 EN 60079-7
Intrinsic safety		Ex ia Ex ib Ex ic	0 1 2	20 21 22	IEC 60079-11 EN 60079-11
Encapsulation		Ex ma Ex mb Ex mc	0 1 2	20 21 22	IEC 60079-18 EN 60079-18
Non sparking		Ex nA Ex nC Ex nR	2 2 2	/	IEC 60079-15 EN 60079-15
Protective housing		Ex ta Ex tb Ex tc	/	20 21 22	IEC 60079-31 EN 60079-31
Optical radiation		Ex op is Ex op pr Ex op sh	0, 1, 2 1, 2 0, 1, 2	20, 21, 22 21, 22 20, 21, 22	IEC 60079-28 EN 60079-28

Table 2 - Protective measures and applicable standards

Marking examples

Devices for places with presence of gas

Ex II 2G Ex ia IIC T6 Gb

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① EU marking
- ② Equipment group (see table 1)
- ③ Protection category (see table 1)
- ④ Prefix for safety devices according to the IEC / EN standards
- ⑤ Type of protection (see table 2)
- ⑥ Classification of gases (see table 4)
- ⑦ Temperature class (see table 3)
- ⑧ EPL acc. to IEC 60079-0 (see table 1)

Devices for places with presence of dusts

Ex II 3D Ex tc IIIC T80°C Dc

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

- ① EU marking
- ② Equipment group (see table 1)
- ③ Protection category (see table 1)
- ④ Prefix for safety devices according to the IEC / EN standards
- ⑤ Type of protection (see table 2)
- ⑥ Classification of dusts (see table 5)
- ⑦ Maximum surface temperature of the equipment
- ⑧ EPL acc. to IEC 60079-0 (see table 1)

Class	T1	T2	T3	T4	T5	T6
Maximum surface temperature of the equipment	450 °C	300 °C	200 °C	135 °C	100 °C	85 °C

Table 3 - Temperature classes

	I	IIA	IIB	IIC
T1	methane	propane, industrial methane, ethane, benzene, ammoniac, acetic acid, carbon monoxide, methanol, toluene	acrylonitrile	hydrogen
T2		ethanol, amyl acetate, butane	ethylene	acetylene
T3		nafta, benzene, esano	hydrogen sulfide	
T4		acetaldehyde	ethyl ether	
T5				
T6				carbon disulfide

Table 4 - Classification of gases (excerpt from standard IEC/CENELEC/NEC 505)

IIIA	IIB	IIC
combustible particles	non-conductive powder	conductive powder




Table 5 - Classification of dusts




Main features

- ATEX approval.
- Metal housing, one conduit entry
- Protection degree IP66
- Versions with gold-plated silver contacts

ATEX markings:

Product code extension	Quality mark	Certificate type and notified body
-EX4		EU declaration of conformity Pizzato Elettrica S.r.l.
-EX7		EC type examination certificate DEKRA EXAM GmbH
-EX8		EC type examination certificate DEKRA EXAM GmbH

Installation for safety applications:

Use only switches marked with the symbol  next to the product code. Always connect the safety circuit to the **NC contacts** (normally closed contacts: 11-12, 21-22 or 31-32) as required by **EN ISO 14119, paragraph 5.4** for specific interlock applications and **EN ISO 13849-2 tables D3** (well-tried components) and **D.8** (failure exclusions) for safety applications in general. Actuate the switch **at least up to the positive opening travel** shown in the travel diagrams on page 228. Actuate the switch **at least with the positive opening force**, reported in brackets below each article, next to the actuating force value.

⚠ If not expressly indicated in this chapter, for correct installation and utilization of all articles see the instructions given on pages 225 to 240 and in the certificate.

⚠ For the correct use of the switch, please use appropriate cable glands suitable for the zone in compliance with the ATEX directive, see Accessories on page 183.

Technical data

Housing

Metal housing, powder-coated	
One threaded conduit entry:	M20x1.5
Protection degree acc. to EN 60529:	IP66 with cable gland of equal or higher protection degree

General data

Ambient temperature (-EX7):	-20°C ... +60°C
Ambient temperature (-EX4/-EX8):	-20°C ... +70°C
Max. actuation frequency:	3600 operating cycles/hour
Mechanical endurance:	
FD ••••-EX•	10 million operating cycles
FD ••93-EX•, FD ••78-EX•, FD ••8•-EX•, FD ••95-EX•	500,000 operating cycles
FD ••99-EX•, FD ••R2-EX•	250,000 operating cycles
Mounting position:	any
Safety parameters B _{10D} (NC contacts):	
FD ••••-EX•	20,000,000
FD ••93-EX•, FD ••78-EX•, FD ••8•-EX•	1,000,000
FD ••99-EX•, FD ••R2-EX•	500,000
FD ••95-EX•	2,500,00
Mechanical interlock, not coded:	type 1 acc. to EN ISO 14119
Tightening torques for installation:	see page 227
Wire cross-sections and wire stripping lengths:	see page 247

Contact blocks available:

2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 28, 29, 30, 33, 34, 37, 66, 67
 Note: contact blocks 2 and 3 are not available for articles FD ••••-EX7

In compliance with standards:





IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50041, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, UL 508, CSA 22.2 No.14, IEC 60079-0, EN 60079-0, IEC 60079-11, EN 60079-11, EN IEC 63000.

Compliance with the requirements of:

ATEX Directive 2014/34/EU, 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.

Product code extension	Category	Zone	EPL	Approvals	Electrical data	Utilization category
-EX4	3D	22	Dc	 II 3D Ex tc IICT80°C Dc	Thermal current (I _{th}): 10 A Rated insulation voltage (U _i): 500 Vac 600 Vdc 400 Vac for contact blocks 20, 28 Conditional short circuit current: 1000 A acc. to EN 60947-5-1 Protection against short circuits: type aM fuse 10 A 500 V Pollution degree: 3	Alternating current: AC15 (50÷60 Hz) U _e (V) 250 400 500 I _e (A) 6 4 1 Direct current: DC13 U _e (V) 24 125 250 I _e (A) 3 0.55 0.3
-EX7	2G M2	1 M2	Gb Mb	 II 2G Ex ia IIC T6 Gb  I M2 Ex ia I Mb	Maximum current (I _i): 2.5 A Maximum voltage (U _i): 30 Vdc Conditional short circuit current: 1000 A acc. to EN 60947-5-1 Protection against short circuits: type gG fuse 4 A 250 V Pollution degree: 3	⚠ This switch type must be used only in intrinsic safety circuits in compliance with standard IEC 60079-11, EN 60079-11
-EX8	2D	21	Db	 II 2D Ex tb IICT80°C Db	Thermal current (I _{th}): 6 A Rated insulation voltage (U _i): 250 Vac/Vdc Conditional short circuit current: 1000 A acc. to EN 60947-5-1 Protection against short circuits: type aM fuse 6 A 500 V Pollution degree: 3	Alternating current: AC15 (50÷60 Hz) U _e (V) 250 I _e (A) 6 Direct current: DC13 U _e (V) 24 125 250 I _e (A) 3 0.55 0.3

Quality marks of the product



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

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

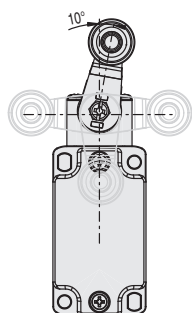
For all contact blocks except 2 and 3 use 60 or 75°C copper (Cu) conductors, rigid or flexible, wire size 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).

For contact blocks 2 and 3 use 60 or 75°C copper (Cu) conductors, rigid or flexible, wire size 14 AWG. Tightening torque for terminal screws of 12 lb in (1.4 Nm).

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

Adjustable levers

For these switches the lever can be adjusted in 10° steps over the entire 360° range. The positive movement transmission

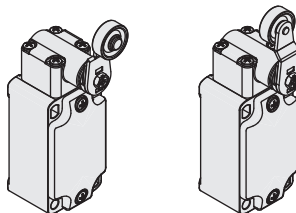


is always guaranteed thanks to the particular geometrical coupling between the lever and the revolving shaft as prescribed for safety applications by the German standard BG-GS-ET-15.

Reversible levers

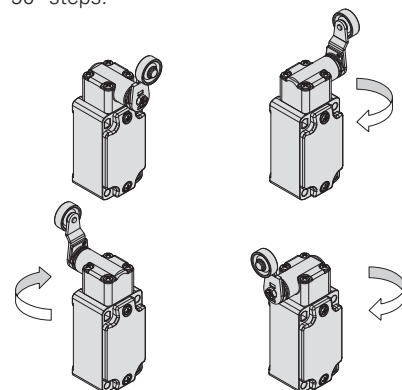
With these switches, the lever can be secured in either the normal or reverse position, whereby positive coupling is retained.

In this way two different working planes of the lever are possible.



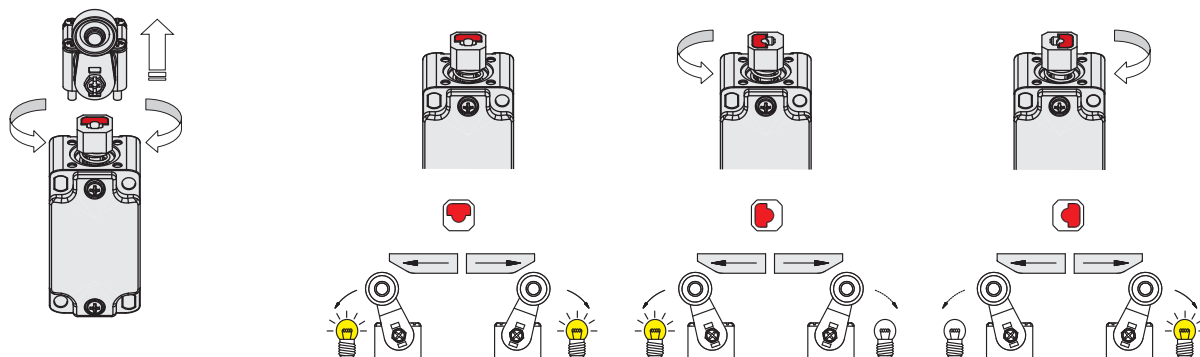
Head with variable orientation

For all switches the head can be rotated in 90° steps.



Unidirectional heads

For switches with swivelling lever, the unidirectional operation can be set by removing the four head screws and rotating the internal plunger.



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 product code extension
FD 502-GM2-EX7

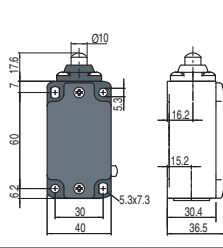
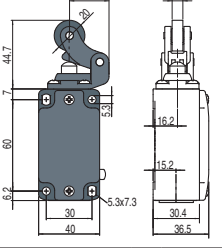
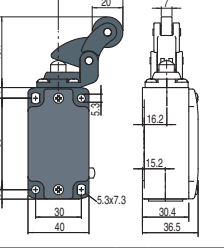
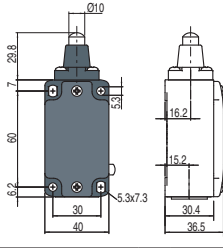
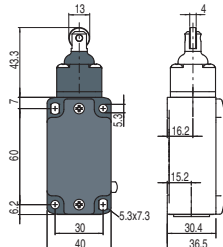
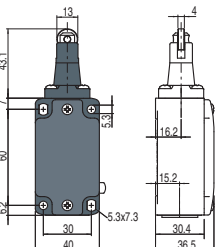
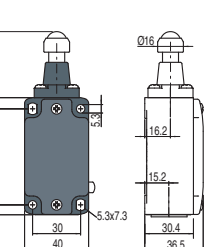
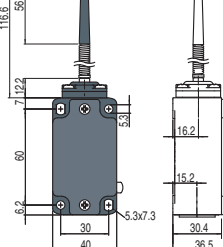
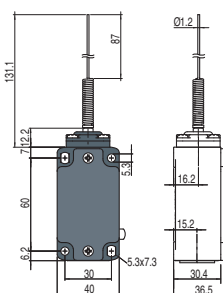
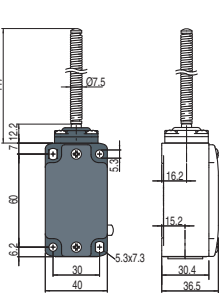
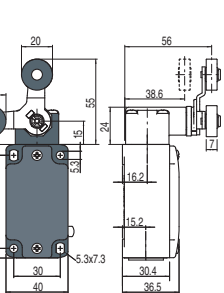
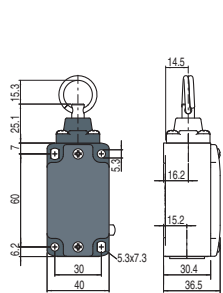
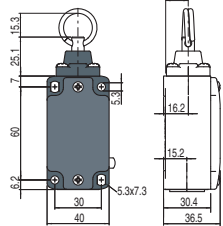
Housing	
FD	metal, one conduit entry

Contact block	
5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action, make before break
...

Actuators	
01	short plunger
02	roller lever
...

ATEX approval	
-EX4	Ex II 3D Ex tc IIIC T80°C Dc
-EX7	Ex II 2G Ex ia IICT6 Gb Ex I M2 Ex ia I Mb
-EX8	Ex II 2D Ex tb IIIC T80°C Db

Contact type	
	silver contacts (standard)
G	silver contacts, 1 µm gold coating
G1	silver contacts, 2.5 µm gold coating (not for contact block 2, 20, 21, 22, 28, 29, 30)

Contact type: R = snap action L = slow action		With stainless steel roller on request		With stainless steel roller on request			
Category	Contact block						
3D	2 R	FD 201-M2-EX4	2x(1NO-1NC)	FD 202-M2-EX4	2x(1NO-1NC)	FD 205-M2-EX4	2x(1NO-1NC)
	5 R	FD 501-M2-EX4	1NO+1NC	FD 502-M2-EX4	1NO+1NC	FD 505-M2-EX4	1NO+1NC
	6 L	FD 601-M2-EX4	1NO+1NC	FD 602-M2-EX4	1NO+1NC	FD 605-M2-EX4	1NO+1NC
	20 L	FD 2001-M2-EX4	1NO+2NC	FD 2002-M2-EX4	1NO+2NC	FD 2005-M2-EX4	1NO+2NC
2G M2	5 R	FD 501-M2-EX7	1NO+1NC	FD 502-M2-EX7	1NO+1NC	FD 505-M2-EX7	1NO+1NC
	20 L	FD 2001-M2-EX7	1NO+2NC	FD 2002-M2-EX7	1NO+2NC	FD 2005-M2-EX7	1NO+2NC
2D	5 R	FD 501-M2-EX8	1NO+1NC	FD 502-M2-EX8	1NO+1NC	FD 505-M2-EX8	1NO+1NC
	20 L	FD 2001-M2-EX8	1NO+2NC	FD 2002-M2-EX8	1NO+2NC	FD 2005-M2-EX8	1NO+2NC
Max. speed		0.5 m/s		0.5 m/s with cam at 30°		0.5 m/s with cam at 30°	
Actuating force		8 N (25 N ⊕)		6 N (25 N ⊕)		6 N (25 N ⊕)	
Travel diagrams		page 228 - group 1		page 228 - group 2		page 228 - group 2	
Contact type: R = snap action L = slow action		External gasket		Ball, Ø 12.7 mm, stainless steel		External gasket	
Category	Contact block						
3D	2 R	FD 215-M2-EX4	2x(1NO-1NC)	FD 216-M2-EX4	2x(1NO-1NC)	FD 219-M2-EX4	2x(1NO-1NC)
	5 R	FD 515-M2-EX4	1NO+1NC	FD 516-M2-EX4	1NO+1NC	FD 519-M2-EX4	1NO+1NC
	6 L	FD 615-M2-EX4	1NO+1NC	FD 616-M2-EX4	1NO+1NC	FD 619-M2-EX4	1NO+1NC
	20 L	FD 2015-M2-EX4	1NO+2NC	FD 2016-M2-EX4	1NO+2NC	FD 2019-M2-EX4	1NO+2NC
2G M2	5 R	FD 515-M2-EX7	1NO+1NC	FD 516-M2-EX7	1NO+1NC	FD 519-M2-EX7	1NO+1NC
	20 L	FD 2015-M2-EX7	1NO+2NC	FD 2016-M2-EX7	1NO+2NC	FD 2019-M2-EX7	1NO+2NC
2D	5 R	/		FD 516-M2-EX8	1NO+1NC	FD 519-M2-EX8	1NO+1NC
	20 L	/		FD 2016-M2-EX8	1NO+2NC	FD 2019-M2-EX8	1NO+2NC
Max. speed		0.5 m/s with cam at 30°		0.5 m/s with cam at 30°		0.5 m/s	
Actuating force		11 N (25 N ⊕)		8 N (25 N ⊕)		8 N (25 N ⊕)	
Travel diagrams		page 228 - group 1		page 228 - group 1		page 228 - group 1	
Contact type: R = snap action L = slow action		External gasket		External gasket		Bistable	
Category	Contact block						
3D	2 R	FD 221-M2-EX4	2x(1NO-1NC)	FD 225-M2-EX4	2x(1NO-1NC)	/	FD 276-M2-EX4
	5 R	FD 521-M2-EX4	1NO+1NC	FD 525-M2-EX4	1NO+1NC	FD 541-M2-EX4	1NO+1NC
	6 L	/		/		/	FD 576-M2-EX4
	20 L	FD 2021-M2-EX4	1NO+2NC	FD 2025-M2-EX4	1NO+2NC	/	FD 2076-M2-EX4
2G M2	5 R	FD 521-M2-EX7	1NO+1NC	FD 525-M2-EX7	1NO+1NC	FD 541-M2-EX7	1NO+1NC
	20 L	FD 2021-M2-EX7	1NO+2NC	FD 2025-M2-EX7	1NO+2NC	/	FD 2076-M2-EX7
2D	5 R	/		/		FD 541-M2-EX8	1NO+1NC
	20 L	/		/		FD 2076-M2-EX8	2NO+1NC
Max. speed		1 m/s		1 m/s		0.5 m/s with cam at 30°	
Actuating force		0.08 Nm		0.14 Nm		0.21 Nm (0.36 Nm ⊕)	
Travel diagrams		page 228 - group 3		page 228 - group 3		page 228 - group 4	
						Rope switch for signalling	
							
						FD 276-M2-EX4	
						FD 576-M2-EX4	
						FD 676-M2-EX4	
						FD 2076-M2-EX4	
						FD 576-M2-EX7	
						FD 2076-M2-EX7	
						FD 576-M2-EX8	
						FD 2076-M2-EX8	
Max. speed		1 m/s		1 m/s		0.5 m/s	
Actuating force		0.08 Nm		0.14 Nm		initial 20 N - final 40 N	
Travel diagrams		page 228 - group 3		page 228 - group 3		page 228 - group 6	

All values in the drawings are in mm

Accessories See page 207

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

Position switches with swivelling lever without actuator

Contact type:

R = snap action
L = slow action

Category	Contact block	Regular head		Compact head	
		Article	Configuration	Article	Configuration
3D	2 R	FD 238-M2-EX4	2x(1NO-1NC)	FD 258-M2-EX4	2x(1NO-1NC)
	5 R	FD 538-M2-EX4	1NO+1NC	FD 558-M2-EX4	1NO+1NC
	6 L	FD 638-M2-EX4	1NO+1NC	FD 658-M2-EX4	1NO+1NC
	20 L	FD 2038-M2-EX4	1NO+2NC	FD 2058-M2-EX4	1NO+2NC
2G M2	5 R	FD 538-M2-EX7	1NO+1NC	FD 558-M2-EX7	1NO+1NC
	20 L	FD 2038-M2-EX7	1NO+2NC	FD 2058-M2-EX7	1NO+2NC
2D	5 R	FD 538-M2-EX8	1NO+1NC	FD 558-M2-EX8	1NO+1NC
	20 L	FD 2038-M2-EX8	1NO+2NC	FD 2058-M2-EX8	1NO+2NC
Actuating force		0.1 Nm (0.25 Nm \rightarrow)		0.06 Nm (0.25 Nm \rightarrow)	
Travel diagrams		page 228 - group 4		page 228 - group 4	

IMPORTANT

For safety applications: join only switches and actuators marked with symbol \rightarrow next to the product code.

For more information about safety applications see details on page 225.

Separate actuators

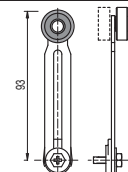
IMPORTANT: These separate actuators can be used only with items of the FD series.

	Technopolymer roller Ø 20 mm	Adjustable round rod Ø 3x125 mm	Adjustable square rod, 3x3x125 mm	Spring rod with plastic tip	Adjustable actuator with techno- polymer roller	Adjustable glass fibre rod
Article	VF L31 \rightarrow	VF L32 ⁽²⁾	VF L33 ⁽²⁾	VF L34	VF L35 \rightarrow ^{(1) (2)}	VF L36 ⁽²⁾
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s	1.5 m/s	1 m/s	1.5 m/s (cam at 30°)	1.5 m/s
	Technopolymer roller Ø 20 mm	Technopolymer roller Ø 20 mm	Porcelain roller	Adjustable safety actuator with technopolymer roller	Technopolymer roller Ø 20 mm	
Article	VF L51 \rightarrow	VF L52 \rightarrow	VF L53 \rightarrow	VF L56 \rightarrow ⁽²⁾	VF L57 \rightarrow	
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	0.5 m/s	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	
Stainless steel rollers, Ø 20 mm						
Article	VF L31-R24 \rightarrow	VF L35-R24 \rightarrow ^{(1) (2)}	VF L51-R24 \rightarrow	VF L52-R24 \rightarrow	VF L56-R24 \rightarrow ⁽²⁾	VF L57-R24 \rightarrow
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)

- ⁽¹⁾ Lever VF L35 can only be used in safety applications if adjusted to its max. length, as shown in the figure to the right.

If an adjustable lever is required for safety applications, use the VF L56 adjustable safety lever.

- ⁽²⁾ If installed with switch FD •58-M2-EX (e.g. FD 558-M2-EX•, FD 658-M2-EX•...) the actuator may hit the housing of the switch upon actuation. This possible interference depends on the fixing position of actuator and switch head.


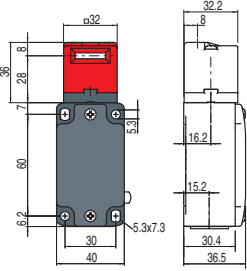
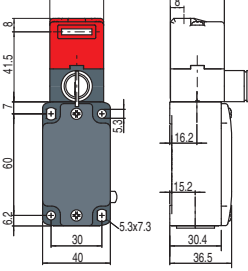
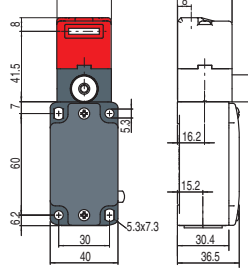




























All values in the drawings are in mm

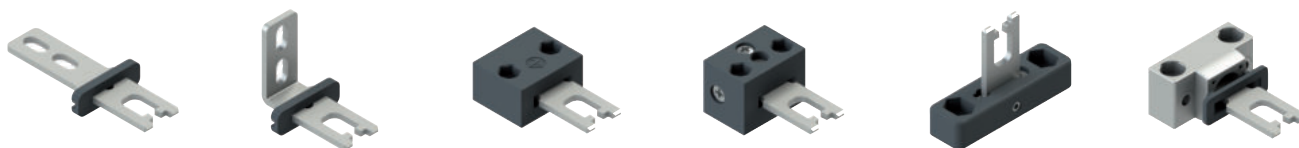
Accessories See page 207

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

Safety switches with separate actuator

		Switches with separate actuator	Switches with separate actuator and key release	Switches with manual mechanical delay
		Switch without actuator	Switch without actuator	Switch without actuator
Contact type:  = slow action				
Category	Contact block			
3D	6 	FD 693-M2-EX4  1NO+1NC	/	FD 6R2-M2-EX4  1NO+1NC
	18 	/	FD 1899-M2-EX4  1NO+1NC	/
	20 	FD 2093-M2-EX4  1NO+2NC	FD 2099-M2-EX4  1NO+2NC	FD 20R2-M2-EX4  1NO+2NC
	28 	/	FD 2899-M2-EX4  1NO+2NC	/
2G M2	20 	FD 2093-M2-EX7  1NO+2NC	FD 2099-M2-EX7  1NO+2NC	FD 20R2-M2-EX7  1NO+2NC
	28 	/	FD 2899-M2-EX7  1NO+2NC	/
2D	20 	FD 2093-M2-EX8  1NO+2NC	FD 2099-M2-EX8  1NO+2NC	FD 20R2-M2-EX8  1NO+2NC
	28 	/	FD 2899-M2-EX8  1NO+2NC	/
Actuating force		10 N (18 N )	30 N (40 N )	10 N (18 N )
Travel diagrams		page 19, General Catalogue Safety	page 118, General Catalogue Safety	page 110, General Catalogue Safety


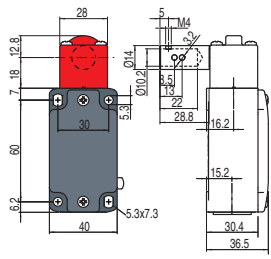








Actuators



VF KEYF	VF KEYF1	VF KEYF2	VF KEYF3	VF KEYF7	VF KEYF8
Straight actuator	Angled actuator	Swivelling actuator	Actuator adjustable in two directions	Actuator adjustable in one direction	Universal actuator

IMPORTANT: These actuators can be used only with items of the FD series (e.g. FD 2093-M2-EX7).
Actuators with low level of coding acc. to EN ISO 14119.

Safety switches for hinges

		Switch without actuator
Contact type:  = slow action		
Category	Contact block	
3D	18 	FD 1895-M2-EX4  1NO+1NC
	20 	FD 2095-M2-EX4  1NO+2NC
2G M2	20 	FD 2095-M2-EX7  1NO+2NC
	2D	20 
Actuating force		0,15 Nm (0,4 Nm )
Travel diagrams		page 87, General Catalogue Safety

Safety rope switches with reset for emergency stops

Contact type:

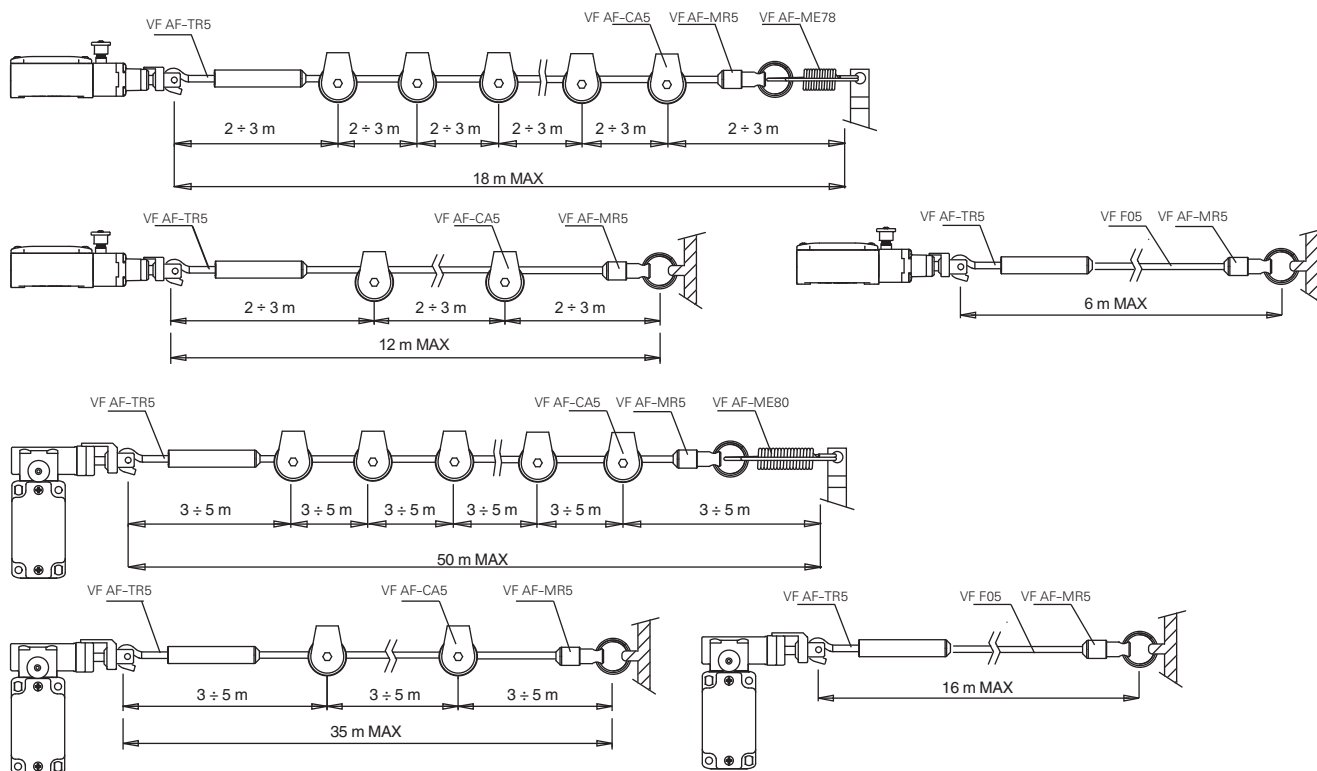
= slow action

Category	Contact block	Diagram 1	Diagram 2	Diagram 3
3D	18 FD 1878-M2-EX4 1NO+1NC	 	 	
	20 FD 2078-M2-EX4 1NO+2NC			
2G M2	20 FD 2078-M2-EX7 1NO+2NC	 	 	
2D	18 FD 1878-M2-EX8 1NO+1NC			
	20 FD 2078-M2-EX8 1NO+2NC	FD 2083-M2-EX8 1NO+2NC	FD 2084-M2-EX8 1NO+2NC	
Actuating force	initial 63 N...final 83 N (90 N)		initial 147 N...final 235 N (250 N)	
Travel diagrams	page 214 - group 1 General Catalogue Safety		page 214 - group 2 General Catalogue Safety	

Accessories for rope installation

VF AF-TR5	VF AF-TR8	VF AF-MR5	VF AF-ME78	VF AF-ME80	VF F05-100	VF AF-IF1GR11	VF AF-CA5	VF AF-CA10
Adjustable stay bolt	Stay bolt	End clamp	Safety spring for longitudinal heads	Safety spring for transversal heads	Rope coil Ø 5 mm length 100 m	Rope function indicator	Stainless steel pulley	Angular pulley, stainless steel

Application examples and max. rope length



All values in the drawings are in mm

Accessories See page 207




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




Main features

- ATEX approval
- Metal housing, three conduit entries
- Protection degree IP66
- Versions with gold-plated silver contacts

ATEX markings:

Product code extension	Quality mark	Certificate type and notified body
-EX4		EU declaration of conformity Pizzato Elettrica S.r.l.
-EX7		EC type examination certificate DEKRA EXAM GmbH
-EX8		EC type examination certificate by DEKRA EXAM GmbH

Installation for safety applications:

Use only switches marked with the symbol  next to the product code. Always connect the safety circuit to the **NC contacts** (normally closed contacts: 11-12, 21-22 or 31-32) as required by **EN ISO 14119, paragraph 5.4** for specific interlock applications and **EN ISO 13849-2 tables D3** (well-tried components) and **D.8** (failure exclusions) for safety applications in general. Actuate the switch **at least up to the positive opening travel** shown in the travel diagrams on page 228. Actuate the switch **at least with the positive opening force**, reported in brackets below each article, next to the actuating force value.

⚠ If not expressly indicated in this chapter, for correct installation and utilization of all articles see the instructions given on pages 225 to 240 and in the certificate.

⚠ For the correct use of the switch, please use appropriate cable glands suitable for the zone in compliance with the ATEX directive, see Accessories on page 183.

Technical data

Housing

Metal housing, powder-coated
 Three threaded conduit entries: M20x1.5
 Protection degree acc. to EN 60529: IP66 with cable gland of equal or higher protection degree

General data

Ambient temperature (-EX7): -20°C ... +60°C
 Ambient temperature (-EX4/-EX8): -20°C ... +70°C
 Max. actuation frequency: 3600 operating cycles/hour
 Mechanical endurance:
 FL ●●●-EX● 10 million operating cycles
 FL ●●93-EX●, FL ●●78-EX●, FL ●●8●-EX●, FL ●●95-EX● 500,000 operating cycles
 Mounting position: any
 Safety parameters B_{10D} (NC contacts):
 FL ●●●-EX● 20,000,000
 FL ●●93-EX●, FL ●●78-EX●, FL ●●8●-EX● 1,000,000
 FL ●●95-EX● 2,500,000
 Mechanical interlock, not coded: type 1 acc. to EN ISO 14119
 Tightening torques for installation: see page 227
 Wire cross-sections and wire stripping lengths: see page 247

Contact blocks available:

2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 28, 29, 30, 33, 34, 37, 66, 67
 Note: contact blocks 2 and 3 are not available for articles FL ●●●-EX7

In compliance with standards:





IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50041, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, UL 508, CSA 22.2 No.14, IEC 60079-0, EN 60079-0, IEC 60079-11, EN 60079-11, EN IEC 63000.

Compliance with the requirements of:

ATEX Directive 2014/34/EU, 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.

Product code extension	Category	Zone	EPL	Approvals	Electrical data	Utilization category
-EX4	3D	22	Dc	 II 3D Ex tc IICT80°C Dc	Thermal current (I _{th}): 10 A Rated insulation voltage (U _i): 500 Vac 600 Vdc 400 Vac for contact blocks 20, 28 Conditional short circuit current: 1000 A acc. to EN 60947-5-1 Protection against short circuits: type aM fuse 10 A 500 V Pollution degree: 3	Alternating current: AC15 (50÷60 Hz) U _e (V) 250 400 500 I _e (A) 6 4 1 Direct current: DC13 U _e (V) 24 125 250 I _e (A) 3 0.55 0.3
-EX7	2G M2	1 M2	Gb Mb	 II 2G Ex ia IIC T6 Gb  I M2 Ex ia I Mb	Maximum current (I _i): 2.5 A Maximum voltage (U _i): 30 Vdc Conditional short circuit current: 1000 A acc. to EN 60947-5-1 Protection against short circuits: type gG fuse 4 A 250 V Pollution degree: 3	⚠ This switch type must be used only in intrinsic safety circuits in compliance with standard IEC 60079-11, EN 60079-11
-EX8	2D	21	Db	 II 2D Ex tb IICT80°C DDb	Thermal current (I _{th}): 6 A Rated insulation voltage (U _i): 250 Vac/Vdc Conditional short circuit current: 1000 A acc. to EN 60947-5-1 Protection against short circuits: type aM fuse 6 A 500 V Pollution degree: 3	Alternating current: AC15 (50÷60 Hz) U _e (V) 250 I _e (A) 6 Direct current: DC13 U _e (V) 24 125 250 I _e (A) 3 0.55 0.3

Quality marks of the product


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

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

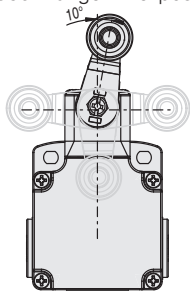
For all contact blocks except 2 and 3 use 60 or 75°C copper (Cu) conductors, rigid or flexible, wire size 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).

For contact blocks 2 and 3 use 60 or 75°C copper (Cu) conductors, rigid or flexible, wire size 14 AWG. Tightening torque for terminal screws of 12 lb in (1.4 Nm).

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

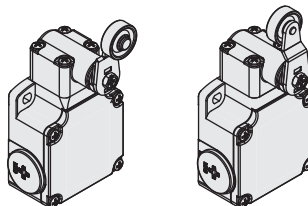
Adjustable levers

For switches with swivelling lever, the lever can be adjusted in 10° steps over the entire 360° range. The positive movement transmission is always guaranteed thanks to the particular geometrical coupling between the lever and the revolving shaft as prescribed for safety applications by the German standard BG-GS-ET-15.

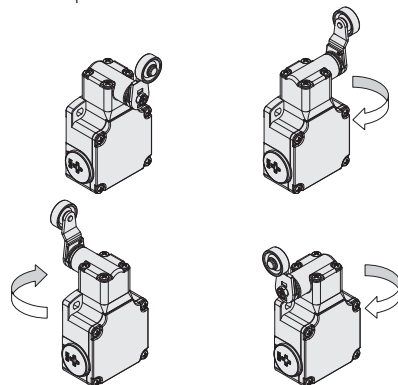

Reversible levers

For switches with swivelling lever, the lever can be fastened on straight or reverse side maintaining the positive coupling.

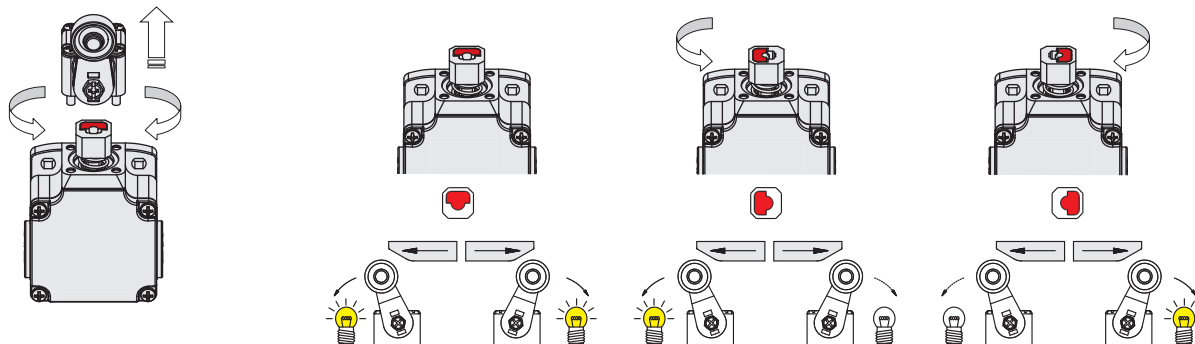
In this way two different working planes of the lever are possible.


Head with variable orientation

For all switches the head can be rotated in 90° steps.


Unidirectional heads

For switches with swivelling lever, the unidirectional operation can be set by removing the four head screws and rotating the internal plunger (except contact block 16).


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 product code extension
FL 502-GM2-EX7

Housing	
FL	metal, three conduit entries

Contact block	
5	1NO+1NC, snap action
6	1NO+1NC, slow action
7	1NO+1NC, slow action, make before break
...

Actuators	
01	short plunger
02	roller lever
...

ATEX approval	
-EX4	Ex II 3D Ex tc IIIC T80°C Dc
-EX7	Ex II 2G Ex ia IIC T6 Gb Ex I M2 Ex ia I Mb
-EX8	Ex II 2D Ex tb IIIC T80°C Db

Contact type	
	silver contacts (standard)
G	silver contacts, 1 µm gold coating
G1	silver contacts, 2.5 µm gold coating (not for contact block 2, 20, 21, 22, 28, 29, 30)

Contact type:
R = snap action
L = slow action

Category	Contact block	With stainless steel roller on request		With stainless steel roller on request			
		FL 201-M2-EX4	FL 202-M2-EX4	FL 205-M2-EX4	FL 211-M2-EX4	2x(1NO-1NC)	2x(1NO-1NC)
3D	2 R	FL 201-M2-EX4	FL 202-M2-EX4	FL 205-M2-EX4	FL 211-M2-EX4	2x(1NO-1NC)	2x(1NO-1NC)
	5 R	FL 501-M2-EX4	FL 502-M2-EX4	FL 505-M2-EX4	FL 511-M2-EX4	1NO+1NC	1NO+1NC
	6 L	FL 601-M2-EX4	FL 602-M2-EX4	FL 605-M2-EX4	FL 611-M2-EX4	1NO+1NC	1NO+1NC
	20 L	FL 2001-M2-EX4	FL 2002-M2-EX4	FL 2005-M2-EX4	FL 2011-M2-EX4	1NO+2NC	1NO+2NC
2G M2	5 R	FL 501-M2-EX7	FL 502-M2-EX7	FL 505-M2-EX7	FL 511-M2-EX7	1NO+1NC	1NO+1NC
	20 L	FL 2001-M2-EX7	FL 2002-M2-EX7	FL 2005-M2-EX7	FL 2011-M2-EX7	1NO+2NC	1NO+2NC
2D	5 R	FL 501-M2-EX8	FL 502-M2-EX8	FL 505-M2-EX8	FL 511-M2-EX8	1NO+1NC	1NO+1NC
	20 L	FL 2001-M2-EX8	FL 2002-M2-EX8	FL 2005-M2-EX8	FL 2011-M2-EX8	1NO+2NC	1NO+2NC
Max. speed		0.5 m/s		0.5 m/s with cam at 30°		0.5 m/s	
Actuating force		8 N (25 N ⊕)		6 N (25 N ⊕)		6 N (25 N ⊕)	
Travel diagrams		page 228 - group 1		page 228 - group 2		page 228 - group 1	

Contact type:
R = snap action
L = slow action

Category	Contact block	External gasket		Ball, Ø 12.7 mm, stainless steel		External gasket	
		FL 215-M2-EX4	FL 216-M2-EX4	FL 219-M2-EX4	FL 220-M2-EX4	2x(1NO-1NC)	2x(1NO-1NC)
3D	2 R	FL 215-M2-EX4	FL 216-M2-EX4	FL 219-M2-EX4	FL 220-M2-EX4	2x(1NO-1NC)	2x(1NO-1NC)
	5 R	FL 515-M2-EX4	FL 516-M2-EX4	FL 519-M2-EX4	FL 520-M2-EX4	1NO+1NC	1NO+1NC
	6 L	FL 615-M2-EX4	FL 616-M2-EX4	FL 619-M2-EX4	FL 620-M2-EX4	1NO+1NC	/
	20 L	FL 2015-M2-EX4	FL 2016-M2-EX4	FL 2019-M2-EX4	FL 2020-M2-EX4	1NO+2NC	1NO+2NC
2G M2	5 R	FL 515-M2-EX7	FL 516-M2-EX7	FL 519-M2-EX7	FL 520-M2-EX7	1NO+1NC	1NO+1NC
	20 L	FL 2015-M2-EX7	FL 2016-M2-EX7	FL 2019-M2-EX7	FL 2020-M2-EX7	1NO+2NC	1NO+2NC
2D	5 R	/	FL 516-M2-EX8	FL 519-M2-EX8	/	/	/
	20 L	/	FL 2016-M2-EX8	FL 2019-M2-EX8	/	/	/
Max. speed		0.5 m/s with cam at 30°		0.5 m/s		1 m/s	
Actuating force		11 N (25 N ⊕)		8 N (25 N ⊕)		0.09 Nm	
Travel diagrams		page 228 - group 1		page 228 - group 1		page 228 - group 3	

Contact type:
R = snap action
L = slow action

Category	Contact block	External gasket		External gasket		Bistable		Rope switch for signalling	
		FL 221-M2-EX4	FL 225-M2-EX4	FL 225-M2-EX4	FL 225-M2-EX4	FL 541-M2-EX4	FL 541-M2-EX4	FL 276-M2-EX4	FL 276-M2-EX4
3D	2 R	FL 221-M2-EX4	FL 225-M2-EX4	FL 225-M2-EX4	FL 225-M2-EX4	/	/	FL 276-M2-EX4	2x(1NO-1NC)
	5 R	FL 521-M2-EX4	FL 525-M2-EX4	FL 525-M2-EX4	FL 525-M2-EX4	1NO+1NC	1NO+1NC	FL 576-M2-EX4	1NO+1NC
	6 L	/	/	/	/	/	/	FL 676-M2-EX4	1NO+1NC
	20 L	FL 2021-M2-EX4	FL 2025-M2-EX4	FL 2025-M2-EX4	FL 2025-M2-EX4	1NO+2NC	1NO+2NC	FL 2076-M2-EX4	2NO+1NC
2G M2	5 R	FL 521-M2-EX7	FL 525-M2-EX7	FL 525-M2-EX7	FL 525-M2-EX7	1NO+1NC	1NO+1NC	FL 576-M2-EX7	1NO+1NC
	20 L	FL 2021-M2-EX7	FL 2025-M2-EX7	FL 2025-M2-EX7	FL 2025-M2-EX7	1NO+2NC	1NO+2NC	FL 2076-M2-EX7	2NO+1NC
2D	5 R	/	/	/	/	FL 541-M2-EX8	FL 541-M2-EX8	FL 576-M2-EX8	1NO+1NC
	20 L	/	/	/	/	/	/	FL 2076-M2-EX8	2NO+1NC
Max. speed		1 m/s		1 m/s		0.5 m/s with cam at 30°		0.5 m/s	
Actuating force		0.08 Nm		0.14 Nm		0.21 Nm (0.36 Nm ⊕)		initial 20 N - final 40 N	
Travel diagrams		page 228 - group 3		page 228 - group 3		page 228 - group 4		page 228 - group 6	

All values in the drawings are in mm

Accessories See page 207

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

Position switches with swivelling lever without actuator

Contact type:

R = snap action
L = slow action

		Regular head		Compact head	
Category	Contact block				
		28	41.5	28	31.1
3D	2 R	FL 238-M2-EX4	2x(1NO-1NC)	FL 258-M2-EX4	2x(1NO-1NC)
	5 R	FL 538-M2-EX4	1NO+1NC	FL 558-M2-EX4	1NO+1NC
	6 L	FL 638-M2-EX4	1NO+1NC	FL 658-M2-EX4	1NO+1NC
	20 L	FL 2038-M2-EX4	1NO+2NC	FL 2058-M2-EX4	1NO+2NC
2G M2	5 R	FL 538-M2-EX7	1NO+1NC	FL 558-M2-EX7	1NO+1NC
	20 L	FL 2038-M2-EX7	1NO+2NC	FL 2058-M2-EX7	1NO+2NC
2D	5 R	FL 538-M2-EX8	1NO+1NC	FL 558-M2-EX8	1NO+1NC
	20 L	FL 2038-M2-EX8	1NO+2NC	FL 2058-M2-EX8	1NO+2NC
Actuating force		0.1 Nm (0.25 Nm \ominus)		0.06 Nm (0.25 Nm \ominus)	
Travel diagrams		page 228 - group 4		page 228 - group 4	

IMPORTANT

For safety applications: join only switches and actuators marked with symbol \ominus next to the product code.

For more information about safety applications see details on page 225.

Separate actuators

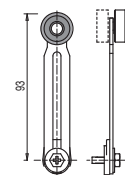
IMPORTANT: These separate actuators can be used only with items of the FL series.

	Technopolymer roller Ø 20 mm	Adjustable round rod Ø 3x125 mm	Adjustable square rod, 3x3x125 mm	Spring rod with plastic tip	Adjustable actuator with technopolymer roller	Adjustable glass fibre rod
Article	VF L31 \ominus	VF L32 ⁽²⁾	VF L33 ⁽²⁾	VF L34	VF L35 \ominus ^{(1) (2)}	VF L36 ⁽²⁾
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s	1.5 m/s	1 m/s	1.5 m/s (cam at 30°)	1.5 m/s
	Technopolymer roller Ø 20 mm	Technopolymer roller Ø 20 mm	Porcelain roller	Adjustable safety actuator with technopolymer roller	Technopolymer roller Ø 20 mm	
Article	VF L51 \ominus	VF L52 \ominus	VF L53 \ominus	VF L56 \ominus ⁽²⁾	VF L57 \ominus	
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	0.5 m/s	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	
Stainless steel rollers, Ø 20 mm						
Article	VF L31-R24 \ominus	VF L35-R24 \ominus ^{(1) (2)}	VF L51-R24 \ominus	VF L52-R24 \ominus	VF L56-R24 \ominus ⁽²⁾	VF L57-R24 \ominus
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)


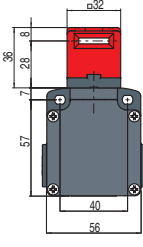
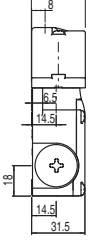









- ⁽¹⁾ Lever VF L35 can only be used in safety applications if adjusted to its max. length, as shown in the figure to the right.

If an adjustable lever is required for safety applications, use the VF L56 adjustable safety lever.

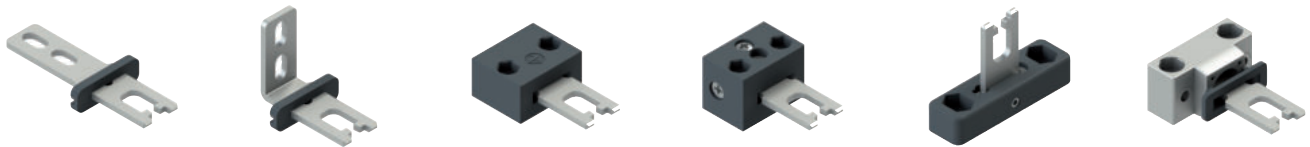
- ⁽²⁾ If installed with switch FL •58-M2-EX (e.g. FL 558-M2-EX•, FL 658-M2-EX•...) the actuator may hit the housing of the switch upon actuation. This possible interference depends on the fixing position of actuator and switch head.



Safety switches with separate actuator

		Switches with separate actuator	
		Switch without actuator	
Contact type:  = slow action			
Category	Contact block		
3D	6 	FL 693-M2-EX4	 1NO+1NC
	20 	FL 2093-M2-EX4	 1NO+2NC
2G M2	20 	FL 2093-M2-EX7	 1NO+2NC
2D	20 	FL 2093-M2-EX8	 1NO+2NC
Actuating force		10 N (18 N )	
Travel diagrams		page 19, General Catalogue Safety	


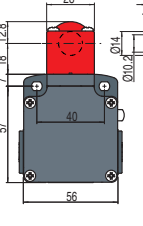
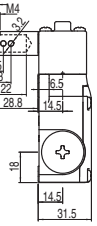









Actuators



VF KEYF	VF KEYF1	VF KEYF2	VF KEYF3	VF KEYF7	VF KEYF8
Straight actuator	Angled actuator	Swivelling actuator	Actuator adjustable in two directions	Actuator adjustable in one direction	Universal actuator

IMPORTANT: These actuators can be used only with items of the FL series (e.g. FL 2093-M2-EX7).
Actuators with low level of coding acc. to EN ISO 14119.

Safety switches for hinges

		Switches with separate actuator	
Contact type:  = slow action			
Category	Contact block		
3D	18 	FL 1895-M2-EX4	 1NO+1NC
	20 	FL 2095-M2-EX4	 1NO+2NC
2G M2	20 	FL 2095-M2-EX7	 1NO+2NC
2D	20 	FL 2095-M2-EX8	 1NO+2NC
Actuating force		0,15 Nm (0,4 Nm )	
Travel diagrams		page 87, General Catalogue Safety	

Safety rope switches with reset for emergency stops

Contact type:

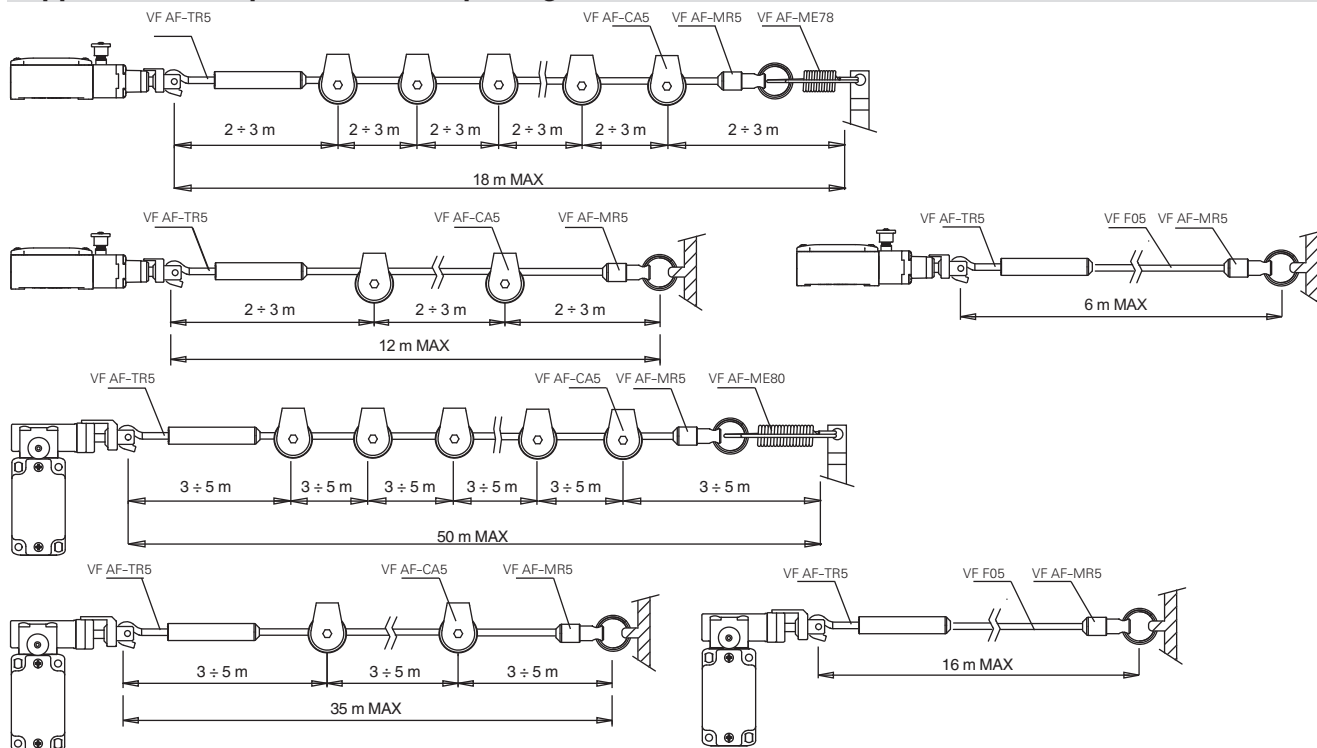
= slow action

Category	Contact block	Dimensions (mm)	Dimensions (mm)	Dimensions (mm)	Dimensions (mm)
3D	18 FL 1878-M2-EX4 1NO+1NC	66, 28, 7, 57, 40, 56	14.5, 28, 16.7-20.2, 14.5, 31.5, 18	84, 20, 14.5, 30.8-34.3, 14.5, 31.5, 18	84, 20, 14.5, 30.8-34.3, 14.5, 31.5, 18
	20 FL 2078-M2-EX4 1NO+2NC				
2G M2	20 FL 2078-M2-EX7 1NO+2NC				
2D	18 FL 1878-M2-EX8 1NO+1NC				
	20 FL 2078-M2-EX8 1NO+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 214 - group 1 General Catalogue Safety		page 214 - group 2 General Catalogue Safety		page 214 - group 2 General Catalogue Safety

Accessories for rope installation

VF AF-TR5	VF AF-TR8	VF AF-MR5	VF AF-ME78	VF AF-ME80	VF F05-100	VF AF-IF1GR11	VF AF-CA5	VF AF-CA10
Adjustable stay bolt	Stay bolt	End clamp	Safety spring for longitudinal heads	Safety spring for transversal heads	Rope coil Ø 5 mm length 100 m	Rope function indicator.	Stainless steel pulley	Angular pulley, stainless steel

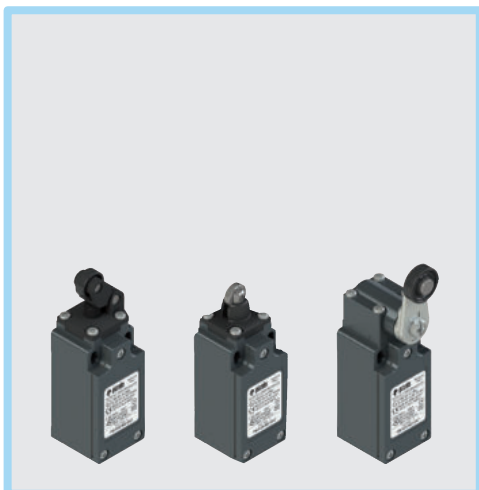
Application examples and max. rope length



All values in the drawings are in mm

Accessories See page 207

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



Main features

- ATEX approval
- Metal housing, one conduit entry
- Protection degree IP67
- Versions with gold-plated silver contacts

ATEX markings:

Product code extension

Quality mark

Certificate type and notified body

-EX7EC type examination certificate
DEKRA EXAM GmbH

Technical data

Housing

Metal housing, powder-coated

One threaded conduit entry: M20x1.5

Protection degree acc. to EN 60529:

IP67 with cable gland of equal or higher protection degree

General data

Ambient temperature: -20°C ... +60°C

Max. actuation frequency: 3600 operating cycles/hour

Mechanical endurance:

FM ●●●●-EX●

10 million operating cycles

FM ●●C●-EX●, FM ●●96-EX●

500,000 operating cycles

Mounting position: any

Safety parameters B_{10D} (NC contacts):

FM ●●●●-EX●

20,000,000

FM ●●C●-EX●

1,000,000

FM ●●96-EX●

2,500,000

Mechanical interlock, not coded: type 1 acc. to EN ISO 14119

Tightening torques for installation: see page 229

Wire cross-sections and

wire stripping lengths: see page 247

Contact blocks available:

5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 28, 29, 30, 33, 34, 37, 66, 67

In compliance with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50047, IEC 60204-1, EN 60204-1, EN ISO 14119, EN ISO 12100, IEC 60529, EN 60529, UL 508, CSA 22.2 No.14, IEC 60079-0, EN 60079-0, IEC 60079-11, EN 60079-11, EN IEC 63000.


Compliance with the requirements of:


ATEX Directive 2014/34/EU, 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.

Installation for safety applications:

Use only switches marked with the symbol  next to the product code. Always connect the safety circuit to the **NC contacts** (normally closed contacts: 11-12, 21-22 or 31-32) as required by **EN ISO 14119, paragraph 5.4** for specific interlock applications and **EN ISO 13849-2 tables D3** (well-tried components) and **D.8** (failure exclusions) for safety applications in general. Actuate the switch **at least up to the positive opening travel** shown in the travel diagrams on page 230. Actuate the switch **at least with the positive opening force**, reported in brackets below each article, next to the actuating force value.

 **If not expressly indicated in this chapter, for correct installation and utilization of all articles see the instructions given on pages 225 to 240 and in the certificate.**

 **For the correct use of the switch, please use appropriate cable glands suitable for the zone in compliance with the ATEX directive, see Accessories on page 183.**

Product code extension	Category	Zone	EPL	Approvals	 This switch type must be used only in intrinsic safety circuits in compliance with standard IEC 60079-11, EN 60079-11
	-EX7	2G M2	1 M2	Gb Mb	
	Electrical data				
	Maximum current (Ii):				2.5 A
	Maximum voltage (Ui):				30 Vdc
	Conditional short circuit current:				1000 A acc. to EN 60947-5-1
	Protection against short circuits:				type gG fuse 4 A 250 V
	Pollution degree:				3

Quality marks of the product


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

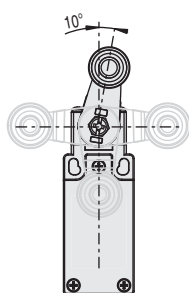
Features approved by UL

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
 For all contact blocks except 2 and 3 use 60 or 75°C copper (Cu) conductors, rigid or flexible, wire size 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).
 For contact blocks 2 and 3 use 60 or 75°C copper (Cu) conductors, rigid or flexible, wire size 14 AWG. Tightening torque for terminal screws of 12 lb in (1.4 Nm).

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

Adjustable levers

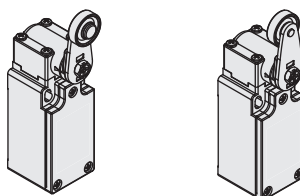
For these switches the lever can be adjusted in 10° steps over the entire 360° range. The positive movement transmission



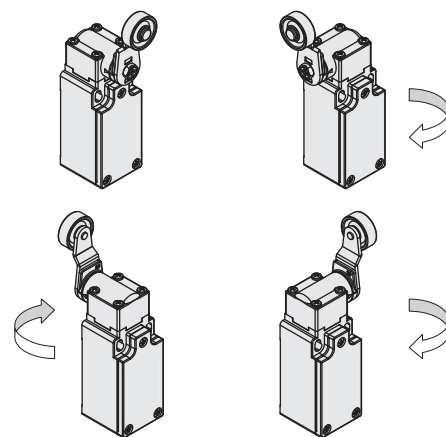
is always guaranteed thanks to the particular geometrical coupling between the lever and the revolving shaft as prescribed for safety applications by the German standard BG-GS-ET-15.

Reversible levers

With these switches, the lever can be secured in either the normal or reverse position, whereby positive coupling is retained. In this way two different working planes of the lever are possible.


Head with variable orientation

For all switches the head can be rotated in 90° steps.


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 product code extension
FM 502-GM2-EX7

Housing	
FM	metal, one conduit entry

Contact block	
5	1NO+1NC, snap action
11	2NC, snap action
12	2NO, snap action
20	1NO+2NC, slow action
21	3NC, slow action
22	2NO+1NC, slow action

Actuators	
01	short plunger
02	roller lever
...

ATEX approval	
-EX7	II 2G Ex ia IIC T6 Gb I M2 Ex ia I Mb

Contact type	
	silver contacts (standard)
G	silver contacts, 1 µm gold coating
G1	silver contacts, 2.5 µm gold coating (not for contact block 20, 21, 22, 28, 29, 30, 33, 34)

Category		Contact block		With stainless steel roller on request	With stainless steel roller on request						
			Contact type: R = snap action L = slow action								
2G	5	R	FM 501-M2-EX7	1NO+1NC	FM 502-M2-EX7	1NO+1NC	FM 505-M2-EX7	1NO+1NC	FM 507-M2-EX7	1NO+1NC	
M2	20	L	FM 2001-M2-EX7	1NO+2NC	FM 2002-M2-EX7	1NO+2NC	FM 2005-M2-EX7	1NO+2NC	FM 2007-M2-EX7	1NO+2NC	
Max. speed		0.5 m/s		0.5 m/s with cam at 30°		0.5 m/s with cam at 30°		0.5 m/s with cam at 30°		0.5 m/s with cam at 30°	
Actuating force		8 N (25 N \ominus)		6 N (25 N \ominus)		6 N (25 N \ominus)		4 N (25 N \ominus)		4 N (25 N \ominus)	
Travel diagrams		page 230 - group 1		page 230 - group 2		page 230 - group 2		page 230 - group 3		page 230 - group 3	

Category		Contact block		External gasket	External gasket	External gasket	External gasket				
			Contact type: R = snap action L = slow action								
2G	5	R	FM 508-M2-EX7	1NO+1NC	FM 512-M2-EX7	1NO+1NC	FM 513-M2-EX7	1NO+1NC	FM 515-M2R28-EX7	1NO+1NC	
M2	20	L	FM 2008-M2-EX7	1NO+2NC	FM 2012-M2-EX7	1NO+2NC	FM 2013-M2-EX7	1NO+2NC	FM 2015-M2R28-EX7	1NO+2NC	
Max. speed		0.5 m/s		0.5 m/s		0.5 m/s with cam at 30°		0.5 m/s with cam at 30°		0.5 m/s with cam at 30°	
Actuating force		8 N (25 N \ominus)		8 N (25 N \ominus)		8 N (25 N \ominus)		8 N (25 N \ominus)		8 N (25 N \ominus)	
Travel diagrams		page 230 - group 1		page 230 - group 1		page 230 - group 1		page 230 - group 1		page 230 - group 1	

Category		Contact block		External gasket	External gasket	External gasket	Rope switch for signalling				
			Contact type: R = snap action L = slow action								
2G	5	R	FM 520-M2-EX7	1NO+1NC	FM 521-M2-EX7	1NO+1NC	FM 525-M2-EX7	1NO+1NC	FM 576-M2-EX7	1NO+1NC	
M2	20	L	FM 2020-M2-EX7	1NO+2NC	FM 2021-M2-EX7	1NO+2NC	FM 2025-M2-EX7	1NO+2NC	FM 2076-M2-EX7	2NO+1NC	
Max. speed		1 m/s		1 m/s		1 m/s		0.5 m/s		0.5 m/s	
Actuating force		0.06 Nm		0.04 Nm		0.11 Nm		initial 20 N - final 40 N		initial 20 N - final 40 N	
Travel diagrams		page 230 - group 4		page 230 - group 4		page 230 - group 4		page 230 - group 7		page 230 - group 7	

Position switches with swivelling lever without actuator

Contact type:

R = snap action
L = slow action

Category	Contact block	Dimensions
2G	5 R	
M2	20 L	
Actuating force	0.06 Nm (0.25 Nm \ominus)	
Travel diagrams	page 230 - group 5	

IMPORTANT

For safety applications: join only switches and actuators marked with symbol \ominus next to the product code.

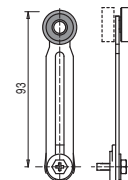
For more information about safety applications see details on page 225.

Separate actuators

IMPORTANT: These separate actuators can be used only with items of the FM series.

	Technopolymer roller Ø 18 mm	Technopolymer roller Ø 18 mm	Adjustable square rod, 3x3x125 mm	Spring rod with plastic tip	Adjustable round rod Ø 3x125 mm	Technopolymer roller Ø 20 mm	
Article	VF LE30 \ominus	VF LE31 \ominus	VF LE33	VF LE34	VF LE50	VF LE51 \ominus	
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s	1.5 m/s	1.5 m/s	1.5 m/s (cam at 30°)	
	Technopolymer roller Ø 20 mm	Porcelain roller	Technopolymer roller Ø 20 mm	Adjustable actuator with technopolymer roller	Adjustable safety actuator with technopolymer roller	Technopolymer roller Ø 20 mm	Adjustable glass fibre rod
Article	VF LE52 \ominus	VF LE53 \ominus	VF LE54 \ominus	VF LE55 \ominus ⁽¹⁾	VF LE56 \ominus	VF LE57 \ominus	VF LE69
Max. speed	1.5 m/s (cam at 30°)	0.5 ms	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s
Stainless steel rollers, Ø 20 mm							
Article	VF LE31-R24 \ominus	VF LE51-R24 \ominus	VF LE52-R24 \ominus	VF LE54-R24 \ominus	VF LE55-R24 \ominus ⁽¹⁾	VF LE56-R24 \ominus	VF LE57-R24 \ominus
Max. speed	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)	1.5 m/s (cam at 30°)

- ⁽¹⁾ Lever VF LE55 can only be used in safety applications if adjusted to its max. length, as shown in the figure to the right. If an adjustable lever is required for safety applications, use the VF LE56 adjustable safety lever.




All values in the drawings are in mm


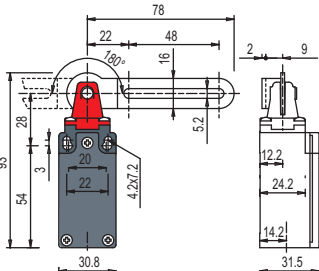

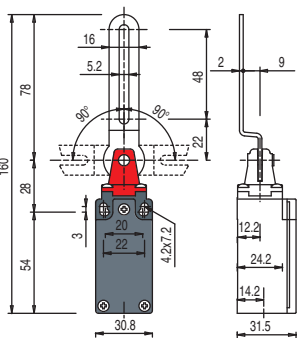

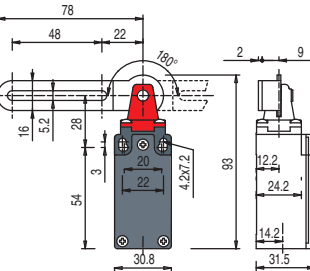

Accessories See page 207

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

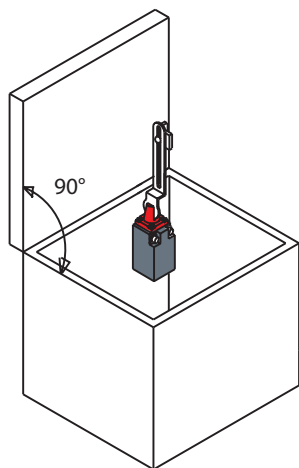
Safety switches with slotted hole lever

Contact type:

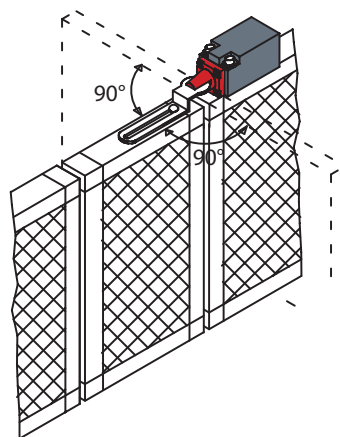
 = slow action

Category	Contact block	Dimensions and Features	Actuating force	Travel diagrams
2G M2	20 		11 N (15 N )	page 232 - group 10
			11 N (15 N )	page 232 - group 11
			11 N (15 N )	page 232 - group 10

Application examples



Safety switch with slotted hole lever, mounting inside the safety guard


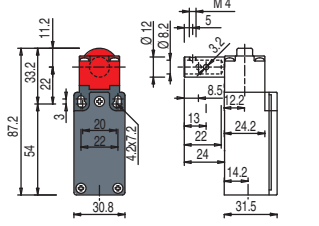



Safety switch with slotted hole lever, mounting on doors with a pivoting range of 180°

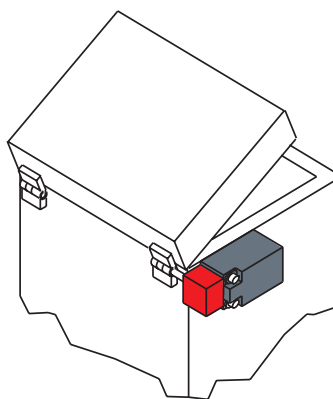
Safety switches for hinges

Contact type:

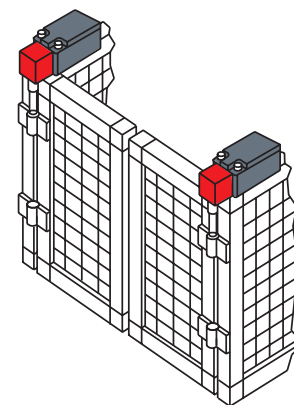
 = slow action

Category	Contact block	Dimensions and Features	Actuating force	Travel diagrams
2G M2	20 		0,15 Nm (0,4 Nm )	page 232 - group 9

Application examples



Safety switch for hinges, mounting outside the safety guard



Safety switches for hinges, mounting on double door



Technical data

Housing

Metal housing, powder-coated
With cable in halogen-free polyurethane, 2 m, other lengths on request
Protection degree acc. to EN 60529: IP67

General data

Ambient temperature: -20°C ... +60°C
Max. actuation frequency: 3600 operating cycles/hour
Mechanical endurance: 10 million operating cycles
Mounting position: any
Safety parameters B_{10D} (NC contacts): 20,000,000
Mechanical interlock, not coded: type 1 acc. to EN ISO 14119
Tightening torques for installation: see page 235

Main features

- ATEX approval
- Metal housing
- Protection degree IP67
- Cable, halogen-free polyurethane

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, UL 508, CSA 22.2 No.14, IEC 60079-0, EN 60079-0, IEC 60079-31, EN 60079-31, IEC 60079-15, EN 60079-15, EN IEC 63000.

ATEX markings:

Product code extension
Quality mark

Certificate type and notified body

-EX5



EU declaration of conformity
Pizzato Elettrica S.r.l.


Compliance with the requirements of:

ATEX Directive 2014/34/EU, 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.

Installation for safety applications:

Use only switches marked with the symbol  next to the product code. Always connect the safety circuit to the **NC contacts** (normally closed contacts: see "Internal wiring") as required by **EN ISO 14119, paragraph 5.4** for specific interlock applications and **EN ISO 13849-2 tables D3** (well-tried components) and **D.8** (failure exclusions) for safety applications in general. Actuate the switch **at least up to the positive opening travel** shown in the travel diagrams on page 236. Actuate the switch **at least with the positive opening force**, reported in brackets below each article, next to the actuating force value.

⚠ If not expressly indicated in this chapter, for correct installation and utilization of all articles see the instructions given on pages 225 to 240 and in the certificate.

Category	Zone	EPL	Approvals
3D	22	Dc	 II 3D Ex tc III CT80°C Dc
3G	2	Gc	 II 3G Ex nC IIC T6 Gc

Product code extension
-EX5

Electrical data
Thermal current (I_{th}): 10 A
Rated insulation voltage (U_i): 400 Vac/dc
Conditional short circuit current: 1000 A acc. to EN 60947-5-1
Protection against short circuits: type aM fuse 10 A 500 V
Pollution degree: 3

Utilization category

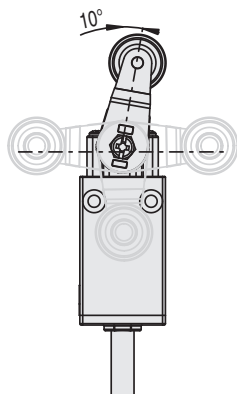
Alternating current: AC15 (50÷60 Hz)

U_e (V)	120	250	400
I_e (A)	6	4	3

 Direct current: DC13

U_e (V)	24	125	250
I_e (A)	2.5	0.55	0.27

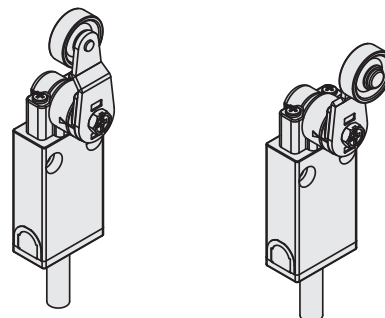
Adjustable levers



For these switches the lever can be adjusted in 10° steps over the entire 360° range. The positive movement transmission is always guaranteed thanks to the particular geometrical coupling between the lever and the revolving shaft as prescribed for safety applications by the German standard BG-GS-ET-15.

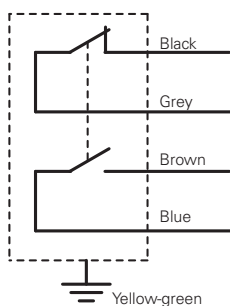
Reversible levers

With these switches, the lever can be secured in either the normal or reverse position, whereby positive coupling is retained. In this way two different working planes of the lever are possible.



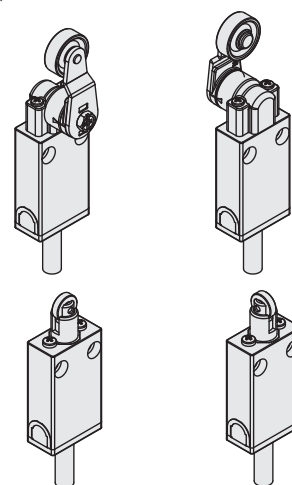
Internal wiring

1NO+1NC



Head with variable orientation

Depending on the model, it is possible to rotate the head in 90° or 180° steps.





























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
product code
extension
FA 4501-2SHG-EX5

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td colspan="2">Housing</td></tr> <tr><td>FA</td><td>metal</td></tr> <tr><td colspan="2">Contact block</td></tr> <tr><td>45</td><td>1NO+1NC, snap action</td></tr> <tr><td>46</td><td>1NO+1NC, slow action</td></tr> <tr><td colspan="2">Actuators</td></tr> <tr><td>01</td><td>short plunger</td></tr> <tr><td>02</td><td>unidirectional lever</td></tr> <tr><td>08</td><td>plunger</td></tr> <tr><td>...</td><td>.....</td></tr> <tr><td colspan="2">Connection type</td></tr> <tr><td>1</td><td>cable, length: 1 m</td></tr> <tr><td>2</td><td>cable length: 2 m</td></tr> <tr><td>...</td><td>.....</td></tr> <tr><td>0</td><td>cable, length: 10 m</td></tr> </table>	Housing		FA	metal	Contact block		45	1NO+1NC, snap action	46	1NO+1NC, slow action	Actuators		01	short plunger	02	unidirectional lever	08	plunger	Connection type		1	cable, length: 1 m	2	cable length: 2 m	0	cable, length: 10 m	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td colspan="2">ATEX approval</td></tr> <tr><td>-EX5</td><td> II 3D Ex tc IIIC T80°C Dc II 3G Ex nC IICT6 Gc </td></tr> <tr><td colspan="2">Contact type</td></tr> <tr><td></td><td>silver contacts (standard)</td></tr> <tr><td>G</td><td>silver contacts, 1 µm gold coating</td></tr> <tr><td colspan="2">Cable type</td></tr> <tr><td>H</td><td>PUR cable, halogen free</td></tr> <tr><td colspan="2">Output direction</td></tr> <tr><td>S</td><td>bottom output</td></tr> </table>	ATEX approval		-EX5	II 3D Ex tc IIIC T80°C Dc II 3G Ex nC IICT6 Gc	Contact type			silver contacts (standard)	G	silver contacts, 1 µm gold coating	Cable type		H	PUR cable, halogen free	Output direction		S	bottom output
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Other lengths on request

		Unidirectional operation		External gasket		Secured only by means of threaded head	
Contact type: R = snap action L = slow action							
Category	Contact block	45 R	FA 4501-2SH-EX5  1NO+1NC	FA 4502-2SH-EX5  1NO+1NC	FA 4508-2SH-EX5  1NO+1NC	FA 4510-2SH-EX5  1NO+1NC	FA 4511-2SH-EX5  1NO+1NC
		46 L	FA 4601-2SH-EX5  1NO+1NC	FA 4602-2SH-EX5  1NO+1NC	FA 4608-2SH-EX5  1NO+1NC	FA 4610-2SH-EX5  1NO+1NC	FA 4611-2SH-EX5  1NO+1NC
Max. speed		0.5 m/s		0.5 m/s		0.5 m/s	
Actuating force		10 N (25 N )		5 N (25 N )		10 N (25 N )	
Travel diagrams		page 236 - group 1		page 236 - group 2		page 236 - group 1	

		Secured only by means of threaded head		External gasket		Roller, Ø 12 mm, stainless steel	
Contact type: R = snap action L = slow action							
Category	Contact block	45 R	FA 4511-2SH-EX5  1NO+1NC	FA 4512-2SH-EX5  1NO+1NC	FA 4513-2SH-EX5  1NO+1NC	FA 4515-2SH-EX5  1NO+1NC	FA 4516-2SH-EX5  1NO+1NC
		46 L	FA 4611-2SH-EX5  1NO+1NC	FA 4612-2SH-EX5  1NO+1NC	FA 4613-2SH-EX5  1NO+1NC	FA 4615-2SH-EX5  1NO+1NC	FA 4616-2SH-EX5  1NO+1NC
Max. speed		0.1 m/s with cam at 30°		0.1 m/s with cam at 30°		0.5 m/s	
Actuating force		10 N (25 N )		10 N (25 N )		10 N (25 N )	
Travel diagrams		page 236 - group 1		page 236 - group 1		page 236 - group 1	

		Roller, Ø 12 mm, stainless steel		External gasket		External gasket		With Ø 20 mm stainless steel roller on request	
Contact type: R = snap action L = slow action									
Category	Contact block	45 R	FA 4517-2SH-EX5  1NO+1NC	FA 4520-2SH-EX5  1NO+1NC	FA 4525-2SH-EX5  1NO+1NC	FA 4530-2SH-EX5  1NO+1NC	FA 4531-2SH-EX5  1NO+1NC	FA 4532-2SH-EX5  1NO+1NC	FA 4533-2SH-EX5  1NO+1NC
		46 L	FA 4617-2SH-EX5  1NO+1NC	/	/	FA 4630-2SH-EX5  1NO+1NC	FA 4631-2SH-EX5  1NO+1NC	FA 4632-2SH-EX5  1NO+1NC	FA 4633-2SH-EX5  1NO+1NC
Max. speed		0.1 m/s with cam at 30°		1 m/s		1 m/s		1.5 m/s with cam at 30°	
Actuating force		10 N (25 N )		0.03 Nm		0.06 Nm		0.03 Nm (25 N )	
Travel diagrams		page 236 - group 1		page 236 - group 3		page 236 - group 3		page 236 - group 4	



		With stainless steel roller on request	Square rod, 3x3 mm	With stainless steel roller on request
Category	Contact block			
3D	45 R	FA 4531-2SH-EX5 (→) 1NO+1NC	FA 4533-2SH-EX5 1NO+1NC	FA 4534-2SH-EX5 1NO+1NC
3G	46 L	FA 4631-2SH-EX5 (→) 1NO+1NC	FA 4633-2SH-EX5 1NO+1NC	FA 4634-2SH-EX5 1NO+1NC
Max. speed		1.5 m/s with cam at 30°	1.5 m/s	1.5 m/s
Actuating force		0.03 Nm (0.25 Nm (→))	0.03 Nm	0.03 Nm
Travel diagrams		page 236 - group 4	page 236 - group 4	page 236 - group 4

		Round rod, Ø 3 mm, stainless steel	With stainless steel roller on request	With stainless steel roller on request	With stainless steel roller on request
Category	Contact block				
3D	45 R	FA 4550-2SH-EX5 1NO+1NC	FA 4551-2SH-EX5 (→) 1NO+1NC	FA 4552-2SH-EX5 (→) 1NO+1NC	FA 4554-2SH-EX5 (→) 1NO+1NC
3G	46 L	FA 4650-2SH-EX5 1NO+1NC	FA 4651-2SH-EX5 (→) 1NO+1NC	FA 4652-2SH-EX5 (→) 1NO+1NC	FA 4654-2SH-EX5 (→) 1NO+1NC
Max. speed		1.5 m/s	1.5 m/s with cam at 30°	1.5 m/s with cam at 30°	1.5 m/s with cam at 30°
Actuating force		0.03 Nm	0.03 Nm (0.25 Nm (→))	0.03 Nm (0.25 Nm (→))	0.03 Nm (0.25 Nm (→))
Travel diagrams		page 236 - group 4	page 236 - group 4	page 236 - group 4	page 236 - group 4

		With stainless steel roller on request	With stainless steel roller on request	With stainless steel roller on request	Glass fibre rod
Category	Contact block				
3D	45 R	FA 4555-2SH-EX5 (→) ⁽¹⁾ 1NO+1NC	FA 4556-2SH-EX5 (→) 1NO+1NC	FA 4557-2SH-EX5 (→) 1NO+1NC	FA 4569-2SH-EX5 1NO+1NC
3G	46 L	FA 4655-2SH-EX5 (→) ⁽¹⁾ 1NO+1NC	FA 4656-2SH-EX5 (→) 1NO+1NC	FA 4657-2SH-EX5 (→) 1NO+1NC	FA 4669-2SH-EX5 1NO+1NC
Max. speed		1.5 m/s with cam at 30°	1.5 m/s with cam at 30°	1.5 m/s with cam at 30°	1.5 m/s
Actuating force		0.03 Nm (0.25 Nm (→))	0.03 Nm (0.25 Nm (→))	0.03 Nm (0.25 Nm (→))	0.03 Nm
Travel diagrams		page 236 - group 4	page 236 - group 4	page 236 - group 4	page 236 - group 4


⁽¹⁾ Positive opening only with actuator set to max.

Accessories

ATEX cable gland, technopolymer

**Technical data:**

ATEX marking:

 II 2G Ex eb IIC Gb II 1D Ex ta IIIC Da

Body and ring material:

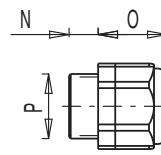
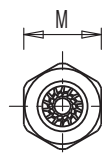
Plastic PA V0 acc. to UL 94

Ambient temperature:

-20 ... +85 °C

Protection degree:

IP68 (≤ 10 bar)




Article	Description	ATEX certificate number	 M	N	O	P
VF PBM20C6P-2GD	M20x1.5 technopolymer cable gland for multipolar cables Ø 6.5 ... 12 mm	IECEX BVS 14.0020X BVS 14 ATEX E 025 X	24	9	24	M20x1.5

ATEX cable gland, metal

**Technical data:**

ATEX marking:

 II 2G Ex e II II 1D Ex tD A20 IP68

Body and ring material:

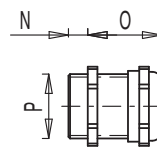
Nickel-plated brass

Ambient temperature:

-20 ... +95 °C

Protection degree:

IP68 (≤ 10 bar)



Article	Description	ATEX certificate number	 M	N	O	P
VF PBM20C6M-2GD	M20x1.5 brass cable gland for multipolar cables Ø 6 ... 12 mm	KEMA 99ATEX6971 X	24	9	24	M20x1.5

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[6PA109](#) [7LS51](#) [83547001](#) [83725002](#) [83830001](#) [83840701](#) [83841001](#) [83881140](#) [8AS42](#) [8LS10](#) [8LS125-4PG](#) [8LS152-4PGN20](#) [914CE16-](#)
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[X5](#) [924CE31-Y3L1](#) [GL-10054](#) [GLDB03C-6](#) [GLZ324](#) [H3141CAKAA](#) [RDI-G-L5B](#) [DD-10000](#) [DT-2R3-A7](#) [14CE16-3N28](#) [14CE18-N15](#)
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