

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 227
Wire cross-sections and wire stripping lengths: see page 243

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 50581.


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** (fault 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 223 to 236 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
	2G M2	1 M2	Gb Mb	II 2G Ex ia IIC T6 Gb I M2 Ex ia I Mb	
-EX7	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

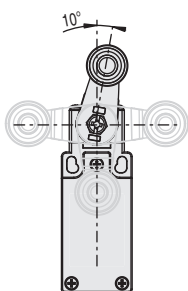
Features approved by UL

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

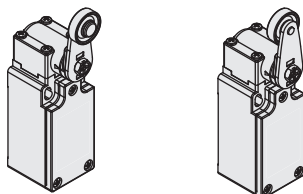
For these switches the lever can be adjusted in 10° steps over the entire 360° range. The positive movement transmission



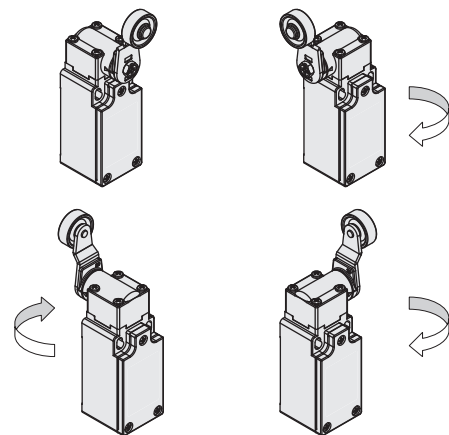
is always guaranteed thanks to the particular geometrical coupling between the lever and the revolving shaft as prescribed for safety applications by the German standard BG-GS-ET-15.

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			
2G M2	5	R	FM 501-M2-EX7	1NO+1NC	FM 502-M2-EX7	1NO+1NC	FM 505-M2-EX7	1NO+1NC	
	20	L	FM 2001-M2-EX7	1NO+2NC	FM 2002-M2-EX7	1NO+2NC	FM 2005-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°	
Actuating force		8 N (25 N \rightarrow)		6 N (25 N \rightarrow)		6 N (25 N \rightarrow)		4 N (25 N \rightarrow)	
Travel diagrams		page 228 - group 1		page 228 - group 2		page 228 - group 2		page 228 - group 3	

Category		Contact block		External gasket		External gasket		External gasket		
2G M2	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
	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°		
Actuating force		8 N (25 N \rightarrow)		8 N (25 N \rightarrow)		8 N (25 N \rightarrow)		8 N (25 N \rightarrow)		
Travel diagrams		page 228 - group 1		page 228 - group 1		page 228 - group 1		page 228 - group 1		

Category		Contact block		External gasket		External gasket		External gasket		Rope switch for signalling	
2G M2	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	
	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			
Actuating force		0.06 Nm		0.04 Nm		0.11 Nm		initial 20 N - final 40 N			
Travel diagrams		page 228 - group 4		page 228 - group 4		page 228 - group 4		page 228 - 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 \rightarrow)	
Travel diagrams	page 228 - group 5	

IMPORTANT

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

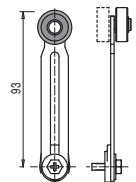
For more information about safety applications see details on page 223.

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 \rightarrow	VF LE31 \rightarrow	VF LE33	VF LE34	VF LE50	VF LE51 \rightarrow	
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 \rightarrow	VF LE53 \rightarrow	VF LE54 \rightarrow	VF LE55 \rightarrow ⁽¹⁾	VF LE56 \rightarrow	VF LE57 \rightarrow	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 \rightarrow	VF LE51-R24 \rightarrow	VF LE52-R24 \rightarrow	VF LE54-R24 \rightarrow	VF LE55-R24 \rightarrow ⁽¹⁾	VF LE56-R24 \rightarrow	VF LE57-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°)	1.5 m/s (cam at 30°)

- ⁽¹⁾ Actuator 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

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