



### Main data

- Polymer housing
- Protection degree IP20 o IP40
- 4 terminal types available
- 32 actuators available

### Markings and quality marks:



Approval IMQ: EL285

### Technical data

#### Housing

Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin.

Protection degree: IP40 (with protection art. VF C02)  
IP20 (with protection art. VF C01, VF C03)

#### General data

Ambient temperature: from -25°C to +85°C

Max operating frequency: 3600 operations cycles<sup>1</sup>/hour

Mechanical endurance: 10 million operations cycles<sup>1</sup>

(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by IEC 947-5-1 standard.

#### Electrical data

Dielectric strength: 2000 VAC/min between terminals and other metallic parts towards

#### Cross section of the conductors (flexible copper wire)

MV, MM series: min. 1 x 0,34 mm<sup>2</sup> (1 x AWG 22)  
max. 1 x 2,5 mm<sup>2</sup> (1 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, CEI 23-11, IEC 529, EN 60529, CEI 70-1, CENELEC EN 50013

#### Approvals:

IEC 947-5-1

#### 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.

### Electrical data

Thermal current (I<sub>th</sub>): 16 A  
Rated insulation voltage (U<sub>i</sub>): 250 VAC 300 VDC  
Protection against short circuits: fuse 10 A 500 V type gG  
Pollution degree: 3

### Utilization categories

Alternate current: AC15 (50÷60 Hz)  
U<sub>e</sub> (V) 250  
I<sub>e</sub> (A) 6  
Direct current: DC13  
U<sub>e</sub> (V) 24 125 250  
I<sub>e</sub> (A) 6 1,1 0,4

**Data type approved by IMQ**

Rated insulation voltage (Ui): 250 VAC  
 Thermal current (Ith): 16 A  
 Protection against short circuits: fuse 16 A 250 V type gG  
 MV, MF, MS terminals  
 Pollution degree 3  
 Utilization category: AC15  
 Operation voltage (Ue): 250 VAC (50 Hz)  
 Operation current (Ie): 5 A  
 Forms of the contact element: C  
 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.

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

**Code structure**

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

**MS 40-1**

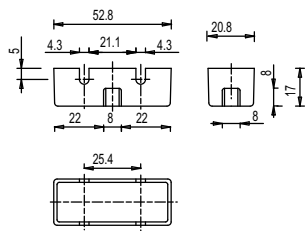
Terminals type		Suffix	
<b>MS</b>	solder terminals		no suffix (standard)
<b>MV</b>	screw terminals	<b>1</b>	Ø 9,5x4 mm metal roller (for actuator 40, 42, 45, 47, 53, 54, 55, 57, 58, 59 only)
<b>MF</b>	faston terminals	<b>2</b>	Ø 9,5x7,8 mm polymer roller (for actuator 40, 42, 53, 54, 55 only)
<b>MM</b>	mantle terminals		

Actuator	
<b>01</b>	with pin
<b>02</b>	with pin
<b>03</b>	with small push button
..	.....

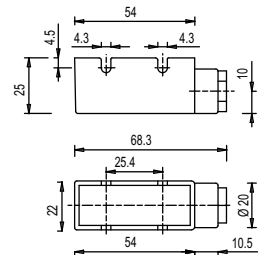
**Accessories**

Article	Description	Pack
<b>VF C01</b>	Protections (terminals covers)	10 pcs



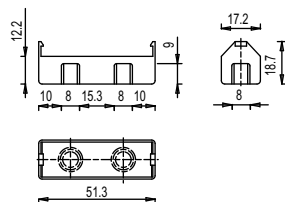
Protection made of self-extinguishing shock-proof material for MS series microswitches.

Article	Description	Pack
<b>VF C02</b>	Protections (terminals covers)	10 pcs



Protection with cable gland PG 9, (multipolar cables Ø min 5 mm, Ø max 7 mm) made of shock-proof glass-reinforced material for MS, MV, MM microswitches.

Article	Description	Pack
<b>VF C03</b>	Protections (terminals covers)	10 pcs





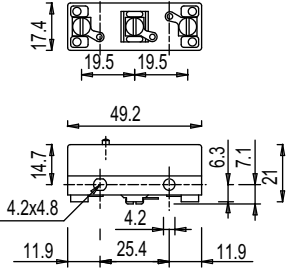
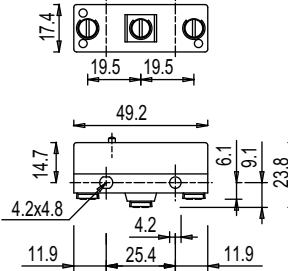
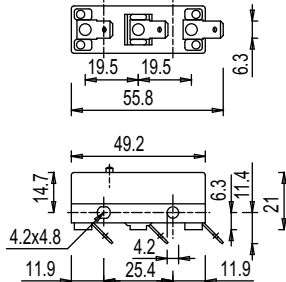
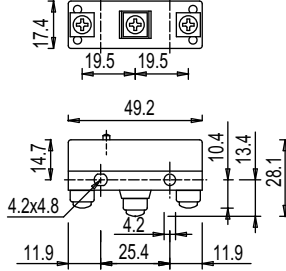


Protection with snap in assembly, made of self-extinguishing shock-proof material. For MS, MV, MM microswitches. It allows the installation of many switches side by side.

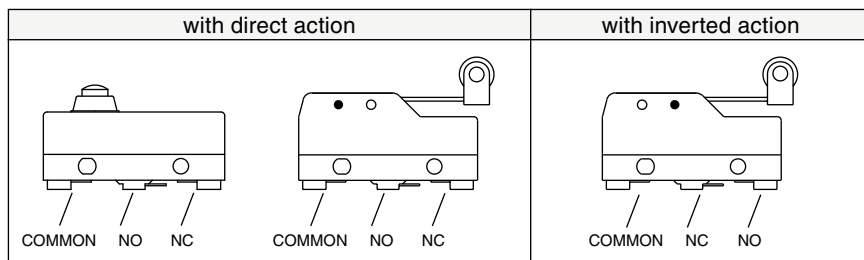
Items with code on the **green** background are available in stock

## Terminals type

All measures in the drawings are in mm

MS solder terminals	MV screw terminals	MF faston terminals	MM mantle terminals
			
			

## Wire diagram



Change-over contact switch having simple gap with three terminals

## Driving torques



Tighten the nut **1** M10 x0,75 with a driving torque **2 ÷ 3** Nm.



Tighten the nut **2** M12 x 1 with a driving torque **2 ÷ 3** Nm.  
Tighten the screw **3** with a driving torque **0,3 ÷ 0,4** Nm.

## Rotating heads

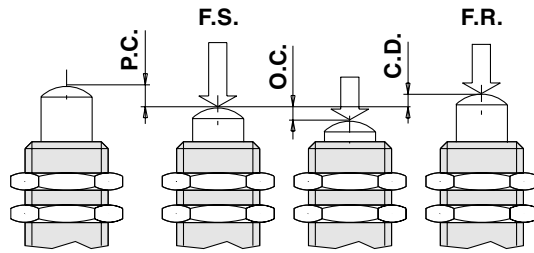
It's possible to rotate the M• 20 microswitch roller in 90° steps.



Tighten the screws **4** M4 with a driving torque **1 ÷ 1,5** Nm.



Tighten the screws **5** with a driving torque **0,6 ÷ 1** Nm.



**Forces and travels symbols**

- F.S.** = operating force
- F.R.** = releasing force
- P.C.** = pretravel
- O.C.** = over-travel
- C.D.** = differential travel

**Microswitches with direct action** (All measures in the drawings are in mm) 10 pcs packs

Dimensions	Article	Forces and travels
	MS 01	F.S. = 350 gr max. F.R. = 200 gr min. P.C. = 0,5 mm max. O.C. = 0,2 mm min. C.D. = 0,05 mm max.
	MV 01	
	MF 01	
	MM 01	
	MS 02	F.S. = 350 gr max. F.R. = 200 gr min. P.C. = 0,5 mm max. O.C. = 0,2 mm min. C.D. = 0,05 mm max.
	MV 02	
	MF 02	
	MM 02	
	MS 03	F.S. = 350 gr max. F.R. = 200 gr min. P.C. = 0,5 mm max. O.C. = 1,5 mm min. C.D. = 0,05 mm max.
	MV 03	
	MF 03	
	MM 03	
	MS 04	F.S. = 350 gr max. F.R. = 200 gr min. P.C. = 0,5 mm max. O.C. = 1,5 mm min. C.D. = 0,05 mm max.
	MV 04	
	MF 04	
	MM 04	
	MS 05	F.S. = 350 gr max. F.R. = 200 gr min. P.C. = 0,5 mm max. O.C. = 2 mm min. C.D. = 0,05 mm max.
	MV 05	
	MF 05	
	MM 05	
	MS 06	F.S. = 350 gr max. F.R. = 200 gr min. P.C. = 0,5 mm max. O.C. = 2 mm min. C.D. = 0,05 mm max.
	MV 06	
	MF 06	
	MM 06	

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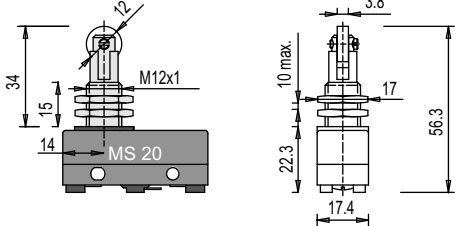
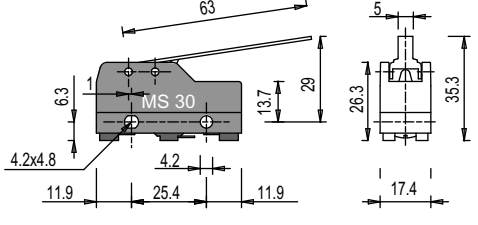
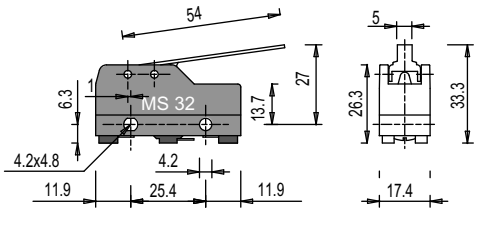
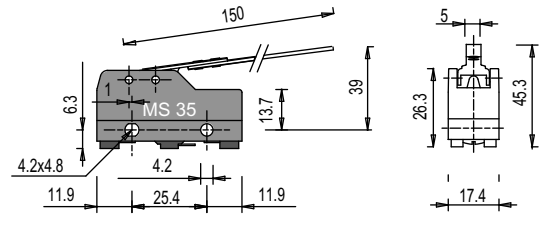
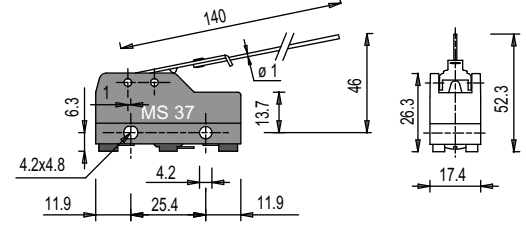
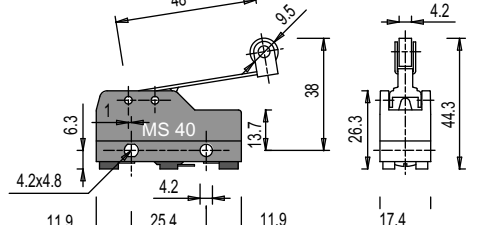
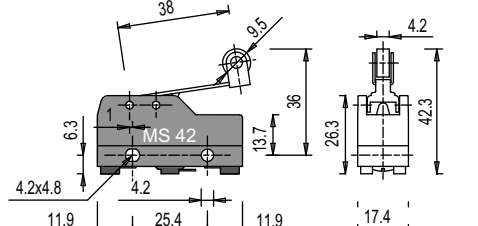
Only orders for multiple quantities of the packs are accepted.

## 2 Microswitches M series

Dimensions	Article	Forces and travels
	MS 08 MV 08 MF 08 MM 08	F.S. = 350 gr. max. F.R. = 200 gr. min. P.C. = 0,5 mm max. O.C. = 5,5 mm min. C.D. = 0,05 mm max.
	MS 09 MV 09 MF 09 MM 09	F.S. = 350 gr. max. F.R. = 200 gr. min. P.C. = 0,5 mm max. O.C. = 5,5 mm min. C.D. = 0,05 mm max.
	MS 10 MV 10 MF 10 MM 10	F.S. = 350 gr. max. F.R. = 200 gr. min. P.C. = 0,5 mm max. O.C. = 5,5 mm min. C.D. = 0,05 mm max.
	MS 12 MV 12 MF 12 MM 12	F.S. = 550 gr. max. F.R. = 400 gr. min. P.C. = 1 mm max. O.C. = 5 mm min. C.D. = 0,05 mm max.
	MS 13 MV 13 MF 13 MM 13	F.S. = 800 gr. max. F.R. = 650 gr. min. P.C. = 1 mm max. O.C. = 5 mm min. C.D. = 0,05 mm max.
Fixed only by threaded head 	MS 15 MV 15 MF 15 MM 15	F.S. = 350 gr. max. F.R. = 200 gr. min. P.C. = 0,5 mm max. O.C. = 5,5 mm min. C.D. = 0,05 mm max.
Fixed only by threaded head 	MS 17 MV 17 MF 17 MM 17	F.S. = 350 gr. max. F.R. = 200 gr. min. P.C. = 0,5 mm max. O.C. = 5,5 mm min. C.D. = 0,05 mm max.

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Only orders for multiple quantities of the packs are accepted.

Dimensions	Article	Forces and travels
<p>Fixed only by threaded head</p> 	<p><b>MS 20</b> MV 20 MF 20 MM 20</p>	<p>F.S. = 350 gr. max. F.R. = 200 gr. min. P.C. = 0,5 mm max. O.C. = 5,5 mm min. C.D. = 0,05 mm max.</p>
	<p><b>MS 30</b> MV 30 MF 30 MM 30</p>	<p>F.S. = 50 gr. max. F.R. = 30 gr. min. P.C. = 10 mm max. O.C. = 6 mm min. C.D. = 1,5 mm max.</p>
	<p><b>MS 32</b> MV 32 MF 32 MM 32</p>	<p>F.S. = 60 gr. max. F.R. = 40 gr. min. P.C. = 8 mm max. O.C. = 5 mm min. C.D. = 1 mm max.</p>
	<p><b>MS 35</b> MV 35 MF 35 MM 35</p>	<p>F.S. = 32 gr. max. F.R. = 26 gr. min. P.C. = 20 mm max. O.C. = 15 mm min. C.D. = 4 mm max.</p>
	<p><b>MS 37</b> MV 37 MF 37 MM 37</p>	<p>F.S. = 10 gr. max. F.R. = 5 gr. min. P.C. = 20 mm max. O.C. = 10 mm min. C.D. = 4 mm max.</p>
	<p><b>MS 40</b> MV 40 MF 40 MM 40</p>	<p>F.S. = 60 gr. max. F.R. = 40 gr. min. P.C. = 8 mm max. O.C. = 5 mm min. C.D. = 1 mm max.</p>
	<p><b>MS 42</b> MV 42 MF 42 MM 42</p>	<p>F.S. = 80 gr. max. F.R. = 50 gr. min. P.C. = 6 mm max. O.C. = 3 mm min. C.D. = 0,8 mm max.</p>

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## 2 Microswitches M series

Dimensions	Article	Forces and travels
	MS 45	F.S. = 110 gr. max. F.R. = 70 gr. min. P.C. = 3,5 mm max. O.C. = 2,5 mm min. C.D. = 0,6 mm max.
	MV 45	
	MF 45	
	MM 45	
	MS 47	F.S. = 110 gr. max. F.R. = 70 gr. min. P.C. = 3,5 mm max. O.C. = 2,5 mm min. C.D. = 0,6 mm max.
	MV 47	
	MF 47	
	MM 47	
	MS 49	Hand operated
	MV 49	
	MF 49	
	MM 49	
<b>Microswitches with inverted action</b> 10 pcs packs		
Dimensions	Article	Forces and travels
	MS 50	F.S. = 80 gr. max. F.R. = 60 gr. min. P.C. = 4 mm max. O.C. = 6 mm min. C.D. = 0,6 mm max.
	MV 50	
	MF 50	
	MM 50	
	MS 52	F.S. = 70 gr. max. F.R. = 50 gr. min. P.C. = 5 mm max. O.C. = 8 mm min. C.D. = 0,6 mm max.
	MV 52	
	MF 52	
	MM 52	
	MS 53	F.S. = 80 gr. max. F.R. = 60 gr. min. P.C. = 4 mm max. O.C. = 8 mm min. C.D. = 0,6 mm max.
	MV 53	
	MF 53	
	MM 53	
	MS 54	F.S. = 100 gr. max. F.R. = 60 gr. min. P.C. = 4 mm max. O.C. = 6 mm min. C.D. = 0,6 mm max.
	MV 54	
	MF 54	
	MM 54	

Items with code on the green background are available in stock

Only orders for multiple quantities of the packs are accepted.

Dimensions	Article	Forces and travels
	<p><b>MS 55</b></p> <p>MV 55</p> <p>MF 55</p> <p>MM 55</p>	<p>F.S. = 120 gr. max.                      F.R. = 70 gr. min.                      P.C. = 3 mm max.                      O.C. = 5 mm min.                      C.D. = 0,5 mm max.</p>
	<p><b>MS 57</b></p> <p>MV 57</p> <p>MF 57</p> <p>MM 57</p>	<p>F.S. = 140 gr. max.                      F.R. = 80 gr. min.                      P.C. = 2 mm max.                      O.C. = 2,5 mm min.                      C.D. = 0,3 mm max.</p>
	<p><b>MS 58</b></p> <p>MV 58</p> <p>MF 58</p> <p>MM 58</p>	<p>F.S. = 140 gr. max.                      F.R. = 80 gr. min.                      P.C. = 2 mm max.                      O.C. = 2,5 mm min.                      C.D. = 0,3 mm max.</p>
	<p><b>MS 59</b></p> <p>MV 59</p> <p>MF 59</p> <p>MM 59</p>	<p>F.S. = 240 gr. max.                      F.R. = 150 gr. min.                      P.C. = 1,5 mm max.                      O.C. = 3 mm min.                      C.D. = 0,2 mm max.</p>
<p>Adjustable operating point</p>	<p><b>MS 60</b></p> <p>MV 60</p> <p>MF 60</p> <p>MM 60</p>	<p>F.S. = 120 gr. max.                      F.R. = 70 gr. min.                      P.C. = 21 ÷ 43 mm                      O.C. = 5 mm min.                      C.D. = 0,5 mm max.</p>