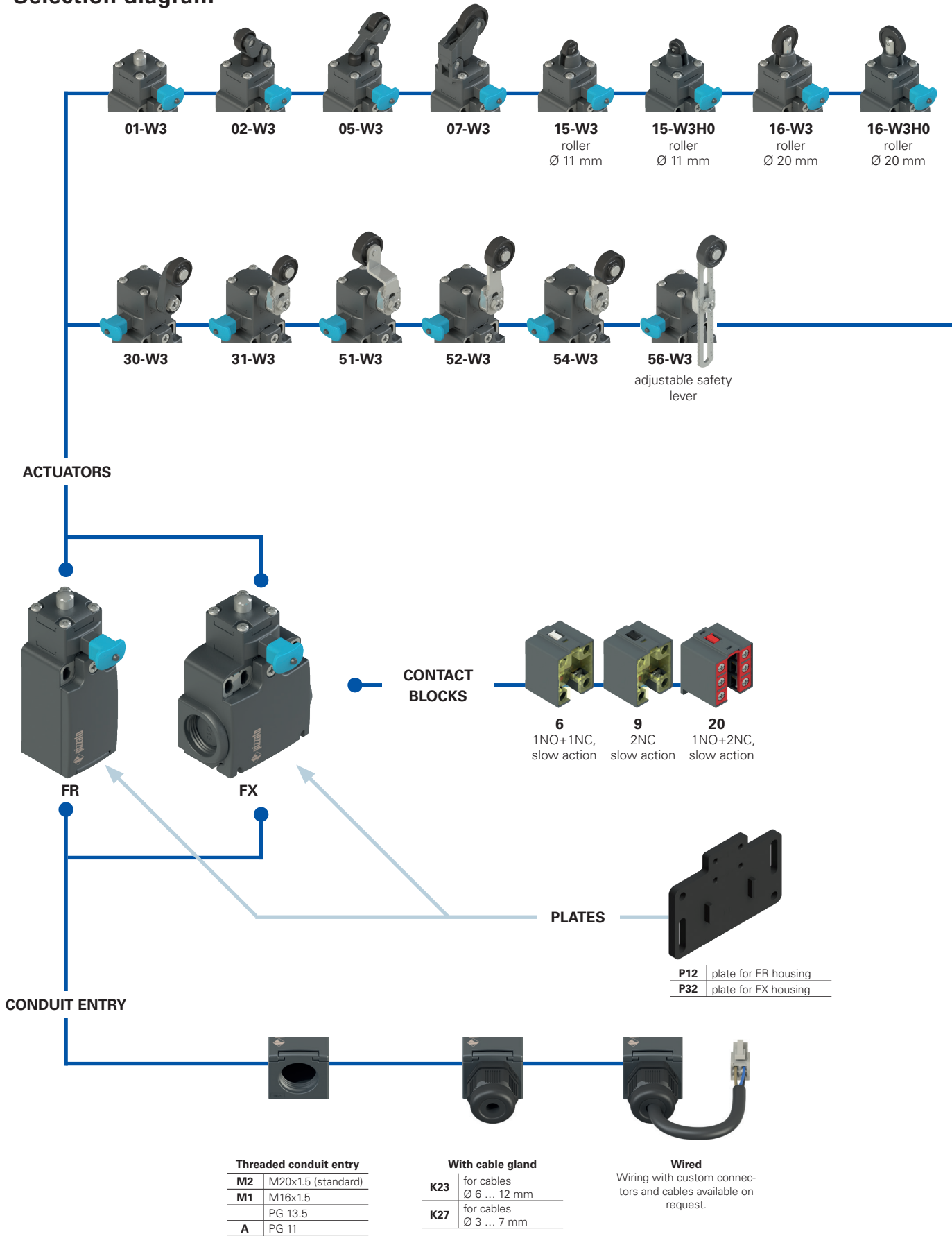
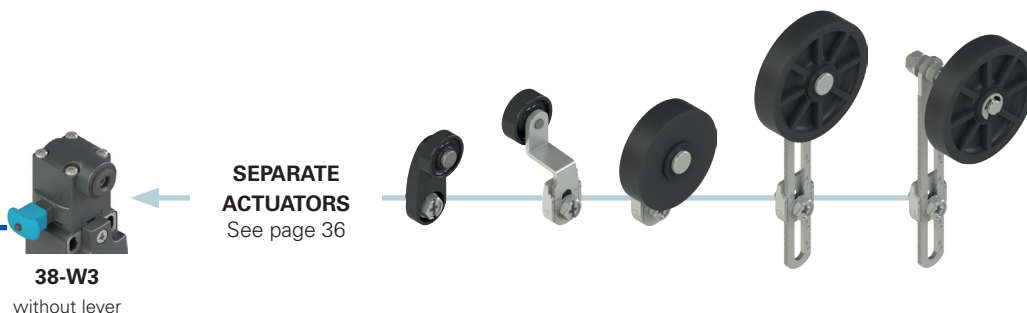


Selection diagram



● Product options
➔ Sold separately as accessory



SEPARATE ACTUATORS
See page 36

38-W3

without lever

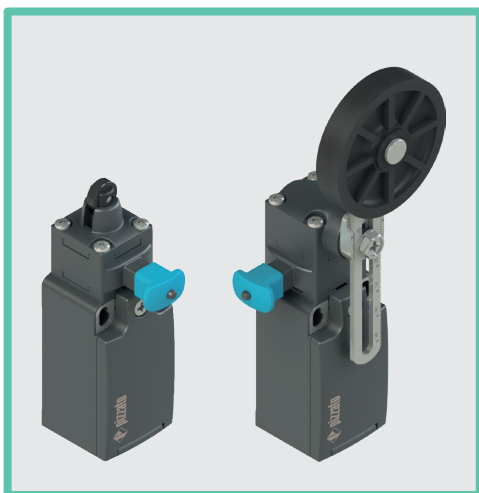
Code structure

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

article option options

FR 655-W3GM2K23P12R26T6

| | | | |
|-------------------------|---|-----------------------------------|------------------------------------|
| Housing | | Ambient temperature | |
| FR | technopolymer, one conduit entry | | -25°C ... +80°C (standard) |
| FX | technopolymer, two conduit entries | T6 | -40°C ... +80°C |
| Contact block | | Rollers | |
| 6 | 1NO+1NC, slow action | | standard roller |
| 9 | 2NC, slow action | R5 | rubber roller, Ø 40 mm |
| 20 | 1NO+2NC, slow action | R26 | rubber roller, Ø 50 mm |
| Actuators | | R27 | rubber roller, protruding, Ø 50 mm |
| 01 | short plunger | Fixing plates | |
| 02 | roller lever | | without plate (standard) |
| 05 | angled lever with roller | P12 | with VF SFP1 plate for FR housing |
| ... | ... | P32 | with VF SFP3 plate for FX housing |
| Engagement reset | | Pre-installed cable glands | |
| W3 | simultaneous reset (standard) | K23 | for cables Ø 6 ... 12 mm |
| W4 | simultaneous reset with increased force | K27 | for cables Ø 3 ... 7 mm |
| Contact type | | Threaded conduit entry | |
| | silver contacts (standard) | M2 | M20x1.5 (standard) |
| G | silver contacts with 1 µm gold coating | M1 | M16x1.5 |
| G1 | silver contacts, 2.5 µm gold coating (not for contact block 20) | | PG 13.5 |
| | | A | PG 11 |



Main features

- Technopolymer housing, from one to two conduit entries
- Hinged cover, fixed with single captive screw
- Metal plates on mounting holes of the housing
- Protection degree IP67 and IP69K
- Wired versions
- Versions with gold-plated silver contacts

Quality marks:



| | |
|---------------|------------------------|
| IMQ approval: | EG610 |
| UL approval: | E131787 |
| CCC approval: | 2021000305000101 |
| EAC approval: | RUC_IT.YT03.B.00035/19 |

Installation for safety applications:

Use only switches marked with the \ominus symbol beside the product code. Always connect the safety circuit to the **NC contacts** (normally closed contacts: 11-12, 21-22 or 31-32) as stated in **standard EN 81-20 par. 5.11.2.2.1**. Actuate the switch **at least up to the positive opening travel** shown in the travel diagrams on page 156. 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 153 to 162.

Technical data

Housing

Housing made of glass fibre reinforced technopolymer, self-extinguishing, shock-proof and with double insulation: \square

FR series, one conduit entry:

M20x1.5 (standard)

FX series, two knock-out threaded conduit entries:

M20x1.5 (standard)

Protection degree:

IP67 acc. to EN 60529 with cable gland of equal or higher protection degree

IP69K acc. to ISO 20653 with cable gland of equal or higher protection degree

General data

Ambient temperature:

-25°C ... +80°C (standard)

-40°C ... +80°C (T6 option)

Max. operating frequency:

3600 operating cycles/hour

Mechanical endurance:

20 million operating cycles

Mounting position:

any

Safety parameter B_{10D} :

40,000,000 for NC contacts

Mechanical interlock, not coded:

type 1 acc. to EN ISO 14119

Tightening torques for installation:

see page 155

Wire cross-sections and

wire stripping lengths:

see page 169

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, EN IEC 63000, EN 81-20, EN 81-50, UL 508, CSA 22.2 No.14

Approvals:

IEC 60947-5-1, UL 508, CSA 22.2 No.14, GB/T14048.5-2017.

Compliance with the requirements of:

Low Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU,

Lift Directive 2014/33/EU, RoHS Directive 2011/65/EU.

Positive contact opening in conformity with standards:

IEC 60947-5-1, EN 60947-5-1.

Electrical data

| | |
|--|------------------------------------|
| Thermal current (I_{th}): | 10 A |
| Rated insulation voltage (U_i): | 500 Vac 600 Vdc |
| | 400 Vac 500 Vdc (contact block 20) |
| Rated impulse withstand voltage (U_{imp}): | 6 kV |
| | 4 kV (contact block 20) |
| 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) | 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 |

Features approved by IMQ

| | |
|--|--------------------------------|
| Rated insulation voltage (U_i): | 500 Vac |
| | 400 Vac (for contact block 20) |
| Conventional free air thermal current (I_{th}): | 10 A |
| Protection against short circuits: | type aM fuse 10 A 500 V |
| Rated impulse withstand voltage (U_{imp}): | 6 kV |
| | 4 kV (for contact block 20) |
| Protection degree of the housing: | IP67 |
| MV terminals (screw terminals) | |
| Pollution degree: | 3 |
| Utilization category: | AC15 |
| Operating voltage (U_e): | 400 Vac (50 Hz) |
| Operating current (I_e): | 3 A |
| Forms of the contact element: Zb, Y+Y, Y+Y+X | |
| Positive opening of contacts on contact blocks 6, 9, 20 | |
| In compliance with standards: EN 60947-1, EN 60947-5-1, fundamental requirements of the Low Voltage Directive 2014/35/EU | |

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

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: | FR: Types 1, 4X |
| | FX: Types 1, 4X, 12, 13 |

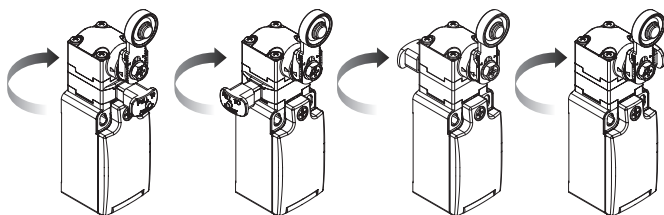
For all contact blocks use 60 or 75°C copper (Cu) conductors, rigid or flexible, wire size 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).

The hub is to be connected to the conduit before the hub is connected to the enclosure.

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

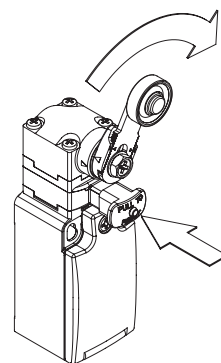
Orientation of reset device adjustable

The reset device can be turned independently of the above actuator, making positioning of the product incredibly flexible. Extracting the blue button resets the device – as laid down in the standards – to prevent unintentional reset.

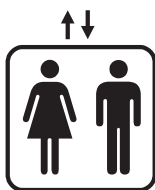


W3 simultaneous reset

Pizzato Elettrica has developed and patented an innovative reset device. This device ensures that, when the switch is activated, the electrical contacts trip and the reset system latches simultaneously. As a result, snap action contact blocks are no longer required, and furthermore, problems resulting from delays between the reset button latching and contacts opening are avoided.



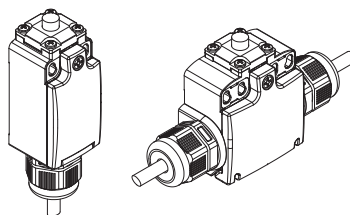
Compliant with EN 81-20 and EN 81-50



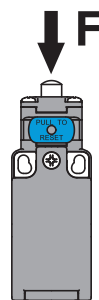
- Safety contacts in compliance with EN 60947-5-1, annex K.
- Protection degree higher than IP4x.
- Mechanical service life > 10⁶ cycles.

Cable outlets

Switches available with cable outlets in various directions, for use in the most confined of spaces.



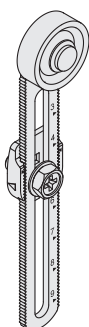
Increased actuating force



The switch can be delivered with increased actuating force (option W4). Ideal for vibration applications.

| Actuators | Force |
|----------------|---------|
| 01, 14, 15, 16 | 7 N |
| 02, 05 | 6 N |
| 07 | 3.5 N |
| 30 ... 56 | 0.08 Nm |

Adjustable safety lever



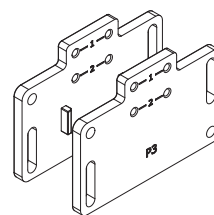
The adjustable lever code 56 (and variants) is provided with a notching that prevents the sliding also in case the fastening screw becomes loose.

Protection degrees IP67 and IP69K

IP69K
IP67

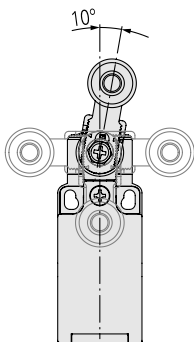
These devices are designed to be used under the toughest environmental conditions, and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where the maximum degree of protection is required for the housing. All switches with actuator that do not have an external rubber hood also have a protection degree of IP69K in accordance with ISO 20653, and can be used on machinery subject to washing with water jets at 100 bar and 80°C.

Adapter plates



Fixing plate with large slotted holes for switching point adjustment. Developed for backwards compatibility with previous products. Each plate is provided with two pairs of mounting holes, one for standard switches and one for switches with reset device. The actuator thus always has the same actuating point.

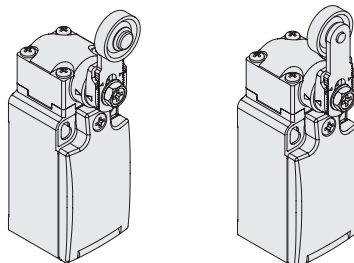
Adjustable levers



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.

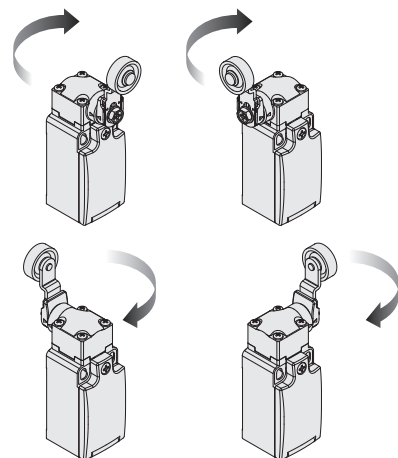
Reversible levers

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

The head of all switches is adjustable in 90° steps.



Extended temperature range

-40°C

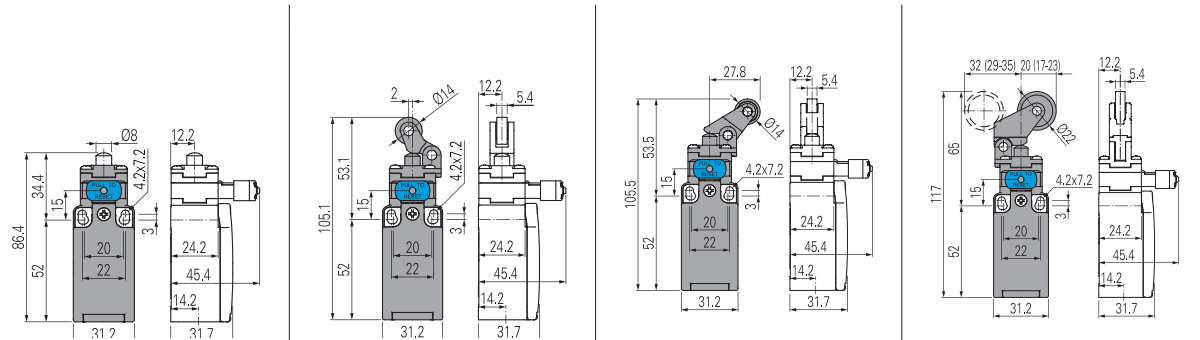
These devices are also available in a special version suitable for an ambient operating temperature range from -40°C up to +80°C.

They can therefore be used for applications in cold stores, sterilisers, and other equipment operated in very low-temperature environments. The special materials used to produce these versions retain their characteristics even under these conditions, thereby expanding the installation possibilities.

Switches with manual reset

Contact type:

L = slow action

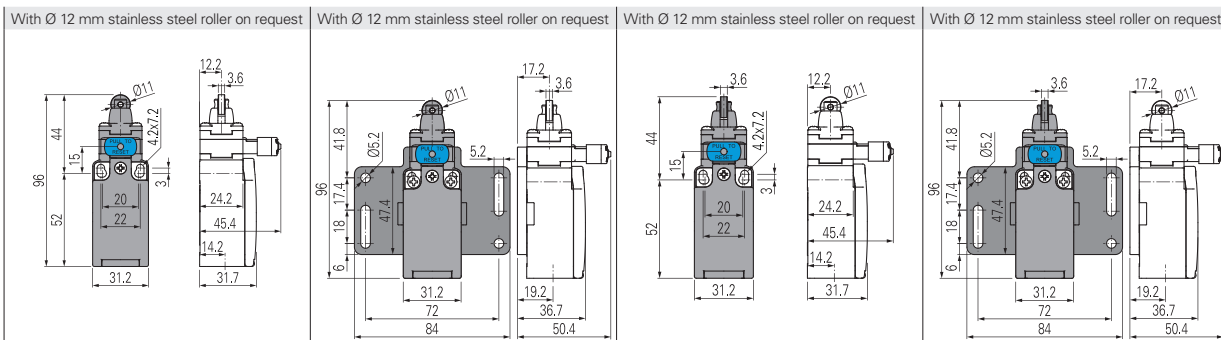


Contact block

| | | | | | | | | | | | | | |
|-----------------|----------|---------------------|---|---------------------|--------------|---------------------|---------|---------------------|---|---------------------|--------------|---------------------|---------|
| 6 | L | FR 601-W3M2 | ⊕ | 1NO+1NC | FR 602-W3M2 | ⊕ | 1NO+1NC | FR 605-W3M2 | ⊕ | 1NO+1NC | FR 607-W3M2 | ⊕ | 1NO+1NC |
| 9 | L | FR 901-W3M2 | ⊕ | 2NC | FR 902-W3M2 | ⊕ | 2NC | FR 905-W3M2 | ⊕ | 2NC | FR 907-W3M2 | ⊕ | 2NC |
| 20 | L | FR 2001-W3M2 | ⊕ | 1NO+2NC | FR 2002-W3M2 | ⊕ | 1NO+2NC | FR 2005-W3M2 | ⊕ | 1NO+2NC | FR 2007-W3M2 | ⊕ | 1NO+2NC |
| Max. speed | | page 155 - type 4 | | page 155 - type 3 | | page 155 - type 3 | | page 155 - type 3 | | page 155 - type 3 | | page 155 - type 3 | |
| Actuating force | | 4.5 N (25 N ⊕) | | 4 N (25 N ⊕) | | 4 N (25 N ⊕) | | 4 N (25 N ⊕) | | 2.5 N (25 N ⊕) | | 2.5 N (25 N ⊕) | |
| Travel diagrams | | page 156 - group 1c | | page 156 - group 2c | | page 156 - group 2c | | page 156 - group 2c | | page 156 - group 3c | | page 156 - group 3c | |

Contact type:

L = slow action

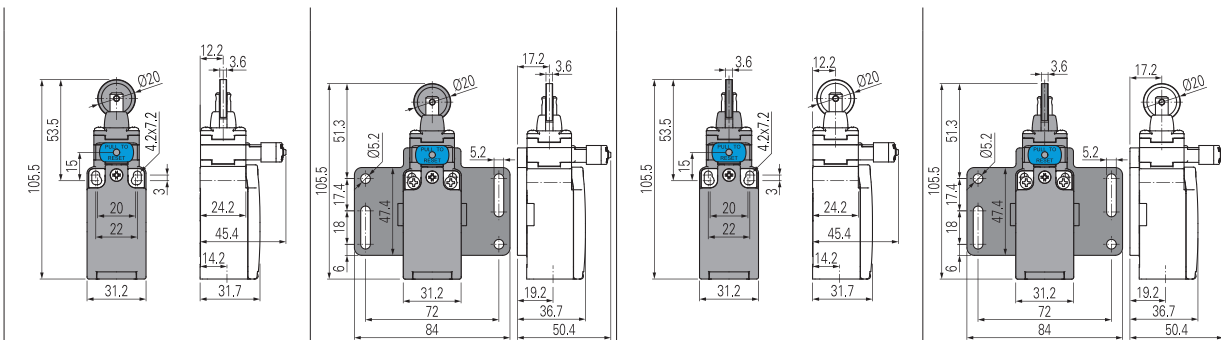


Contact block

| | | | | | | | | | | | | | |
|-----------------|----------|---------------------|---|---------------------|-----------------|---------------------|---------|---------------------|---|---------------------|-------------------|---------------------|---------|
| 6 | L | FR 615-W3M2 | ⊕ | 1NO+1NC | FR 615-W3M2P12 | ⊕ | 1NO+1NC | FR 615-W3H0M2 | ⊕ | 1NO+1NC | FR 615-W3H0M2P12 | ⊕ | 1NO+1NC |
| 9 | L | FR 915-W3M2 | ⊕ | 2NC | FR 915-W3M2P12 | ⊕ | 2NC | FR 915-W3H0M2 | ⊕ | 2NC | FR 915-W3H0M2P12 | ⊕ | 2NC |
| 20 | L | FR 2015-W3M2 | ⊕ | 1NO+2NC | FR 2015-W3M2P12 | ⊕ | 1NO+2NC | FR 2015-W3H0M2 | ⊕ | 1NO+2NC | FR 2015-W3H0M2P12 | ⊕ | 1NO+2NC |
| Max. speed | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | |
| Actuating force | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | |
| Travel diagrams | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | |

Contact type:

L = slow action



Contact block

| | | | | | | | | | | | | | |
|-----------------|----------|---------------------|---|---------------------|-----------------|---------------------|---------|---------------------|---|---------------------|-------------------|---------------------|---------|
| 6 | L | FR 616-W3M2 | ⊕ | 1NO+1NC | FR 616-W3M2P12 | ⊕ | 1NO+1NC | FR 616-W3H0M2 | ⊕ | 1NO+1NC | FR 616-W3H0M2P12 | ⊕ | 1NO+1NC |
| 9 | L | FR 916-W3M2 | ⊕ | 2NC | FR 916-W3M2P12 | ⊕ | 2NC | FR 916-W3H0M2 | ⊕ | 2NC | FR 916-W3H0M2P12 | ⊕ | 2NC |
| 20 | L | FR 2016-W3M2 | ⊕ | 1NO+2NC | FR 2016-W3M2P12 | ⊕ | 1NO+2NC | FR 2016-W3H0M2 | ⊕ | 1NO+2NC | FR 2016-W3H0M2P12 | ⊕ | 1NO+2NC |
| Max. speed | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | | page 155 - type 2 | |
| Actuating force | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | | 4.5 N (25 N ⊕) | |
| Travel diagrams | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | | page 156 - group 1c | |

All values in the drawings are in mm

Accessories See page 149

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



| Contact type: | With Ø 12 mm stainless steel roller on request | With Ø 12 mm stainless steel roller on request | With Ø 12 mm stainless steel roller on request | With Ø 12 mm stainless steel roller on request |
|------------------------|--|--|--|--|
| L = slow action | | | | |
| Contact block | | | | |
| 6 L | FX 615-W3M2 | FX 615-W3M2P32 | FX 615-W3H0M2 | FX 615-W3H0M2P32 |
| 9 L | FX 915-W3M2 | FX 915-W3M2P32 | FX 915-W3H0M2 | FX 915-W3H0M2P32 |
| 20 L | FX 2015-W3M2 | FX 2015-W3M2P32 | FX 2015-W3H0M2 | FX 2015-W3H0M2P32 |
| Max. speed | page 155 - type 2 | page 155 - type 2 | page 155 - type 2 | page 155 - type 2 |
| Actuating force | 4.5 N (25 N) | 4.5 N (25 N) | 4.5 N (25 N) | 4.5 N (25 N) |
| Travel diagrams | page 156 - group 1c | page 156 - group 1c | page 156 - group 1c | page 156 - group 1c |

| Contact type: | With Ø 12 mm stainless steel roller on request | With Ø 12 mm stainless steel roller on request | With Ø 12 mm stainless steel roller on request | With Ø 12 mm stainless steel roller on request |
|------------------------|--|--|--|--|
| L = slow action | | | | |
| Contact block | | | | |
| 6 L | FX 616-W3M2 | FX 616-W3M2P32 | FX 616-W3H0M2 | FX 616-W3H0M2P32 |
| 9 L | FX 916-W3M2 | FX 916-W3M2P32 | FX 916-W3H0M2 | FX 916-W3H0M2P32 |
| 20 L | FX 2016-W3M2 | FX 2016-W3M2P32 | FX 2016-W3H0M2 | FX 2016-W3H0M2P32 |
| Max. speed | page 155 - type 2 | page 155 - type 2 | page 155 - type 2 | page 155 - type 2 |
| Actuating force | 4.5 N (25 N) | 4.5 N (25 N) | 4.5 N (25 N) | 4.5 N (25 N) |
| Travel diagrams | page 156 - group 1c | page 156 - group 1c | page 156 - group 1c | page 156 - group 1c |

| Contact type: | With Ø 20 mm stainless steel roller on request | Other rollers available. See page 36 | Other rollers available. See page 36 | Other rollers available. See page 36 |
|------------------------|--|--------------------------------------|--------------------------------------|--------------------------------------|
| L = slow action | | | | |
| Contact block | | | | |
| 6 L | FR 630-W3M2 | FR 631-W3M2 | FR 651-W3M2 | FR 652-W3M2 |
| 9 L | FR 930-W3M2 | FR 931-W3M2 | FR 951-W3M2 | FR 952-W3M2 |
| 20 L | FR 2030-W3M2 | FR 2031-W3M2 | FR 2051-W3M2 | FR 2052-W3M2 |
| Max. speed | page 155 - type 1 | page 155 - type 1 | page 155 - type 1 | page 155 - type 1 |
| Actuating force | 0.07 Nm (0.25 Nm) | 0.07 Nm (0.25 Nm) | 0.07 Nm (0.25 Nm) | 0.07 Nm (0.25 Nm) |
| Travel diagrams | page 156 - group 4c | page 156 - group 4c | page 156 - group 4c | page 156 - group 4c |

All values in the drawings are in mm

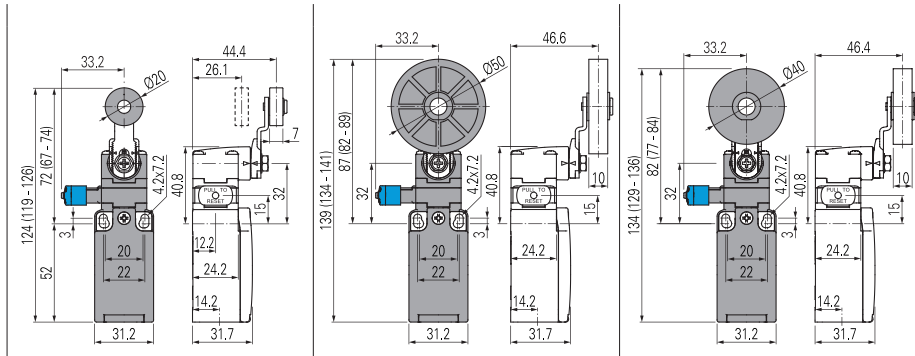
Accessories See page 149

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

Switches with manual reset

Contact type:

L = slow action

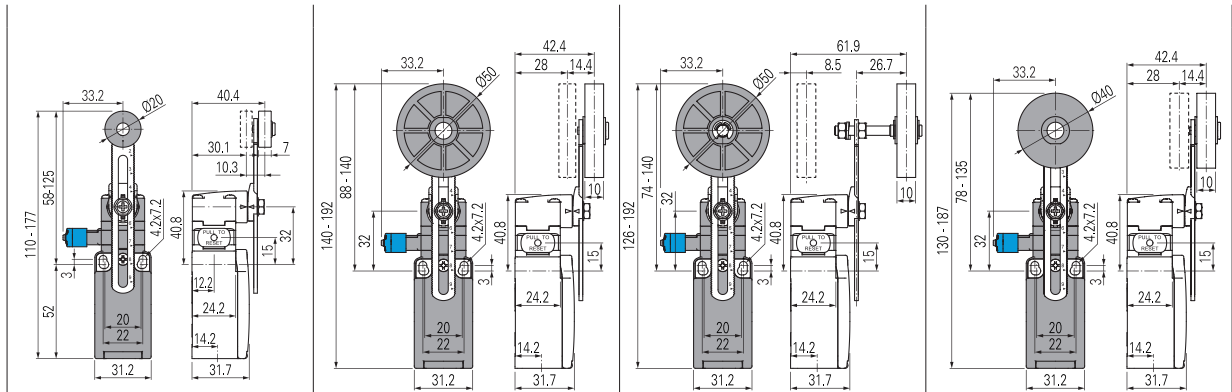


Contact block

| | | | | | | | |
|-----------------|----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|
| 6 | L | FR 654-W3M2 | ⊕ 1NO+1NC | FR 654-W3M2R26 | ⊕ 1NO+1NC | FR 654-W3M2R5 | ⊕ 1NO+1NC |
| 9 | L | FR 954-W3M2 | ⊕ 2NC | FR 954-W3M2R26 | ⊕ 2NC | FR 954-W3M2R5 | ⊕ 2NC |
| 20 | L | FR 2054-W3M2 | ⊕ 1NO+2NC | FR 2054-W3M2R26 | ⊕ 1NO+2NC | FR 2054-W3M2R5 | ⊕ 1NO+2NC |
| Max. speed | | page 155 - type 1 | | page 155 - type 1 | | page 155 - type 1 | |
| Actuating force | | 0.07 Nm (0.25 Nm ⊕) | | 0.07 Nm (0.25 Nm ⊕) | | 0.07 Nm (0.25 Nm ⊕) | |
| Travel diagrams | | page 156 - group 4c | | page 156 - group 4c | | page 156 - group 4c | |

Contact type:

L = slow action



Contact block

| | | | | | | | | | |
|-----------------|----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|
| 6 | L | FR 656-W3M2 | ⊕ 1NO+1NC | FR 656-W3M2R26 | ⊕ 1NO+1NC | FR 656-W3M2R27 | ⊕ 1NO+1NC | FR 656-W3M2R5 | ⊕ 1NO+1NC |
| 9 | L | FR 956-W3M2 | ⊕ 2NC | FR 956-W3M2R26 | ⊕ 2NC | FR 956-W3M2R27 | ⊕ 2NC | FR 956-W3M2R5 | ⊕ 2NC |
| 20 | L | FR 2056-W3M2 | ⊕ 1NO+2NC | FR 2056-W3M2R26 | ⊕ 1NO+2NC | FR 2056-W3M2R27 | ⊕ 1NO+2NC | FR 2056-W3M2R5 | ⊕ 1NO+2NC |
| Max. speed | | page 155 - type 1 | | page 155 - type 1 | | page 155 - type 1 | | page 155 - type 1 | |
| Actuating force | | 0.07 Nm (0.25 Nm ⊕) | | 0.07 Nm (0.25 Nm ⊕) | | 0.07 Nm (0.25 Nm ⊕) | | 0.07 Nm (0.25 Nm ⊕) | |
| Travel diagrams | | page 156 - group 4c | | page 156 - group 4c | | page 156 - group 4c | | page 156 - group 4c | |

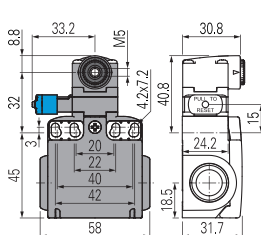
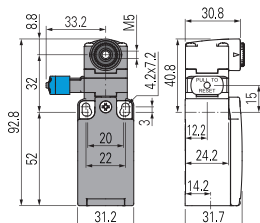
(1) Positive opening only with actuator set to max.

All values in the drawings are in mm

Position switches with reset device for swivelling lever, without actuator

Contact type:

= slow action



IMPORTANT

For safety applications: join only switches and actuators marked with symbol next to the product code. For more information about safety applications see details on page 153.

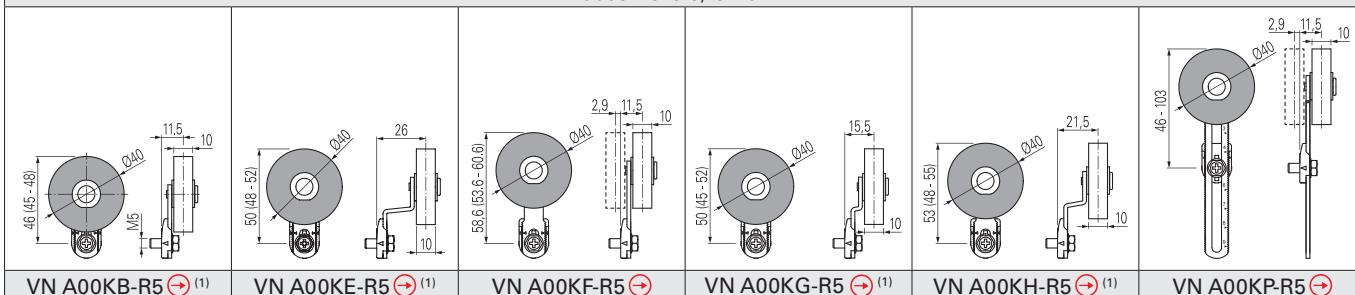
Contact block

| | | | | | | | |
|-----------------|--|---------------------|--|---------------------|--------------|--|---------|
| 6 | | FR 638-W3M2 | | 1NO+1NC | FX 638-W3M2 | | 1NO+1NC |
| 9 | | FR 938-W3M2 | | 2NC | FX 938-W3M2 | | 2NC |
| 20 | | FR 2038-W3M2 | | 1NO+2NC | FX 2038-W3M2 | | 1NO+2NC |
| Actuating force | | 0.07 Nm (0.25 Nm) | | 0.07 Nm (0.25 Nm) | | | |
| Travel diagrams | | page 156 - group 4c | | page 156 - group 4c | | | |

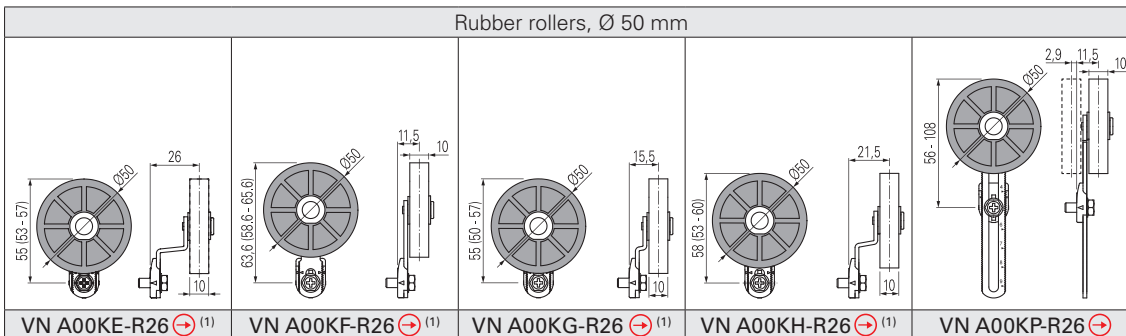
Special separate actuators

IMPORTANT: These separate actuators can be used only with items of the FR, FX series.

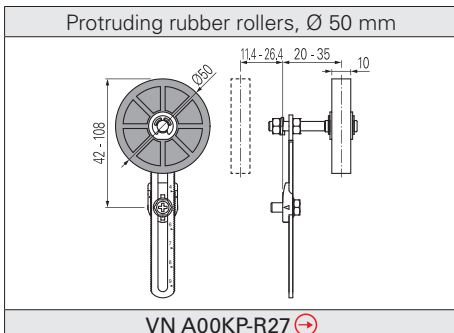
Rubber rollers, Ø 40 mm



Rubber rollers, Ø 50 mm



Protruding rubber rollers, Ø 50 mm



- ⁽¹⁾ The actuator cannot be rotated to the inside because it will hit the switch head upon actuation.

Note: To check the correspondence with previous lever codes, please consult the table "Changed article codes" on page 171. Example: VF LE31-R5 -> VN A00KB-R5.