Selection diagram

Position switches FR series

**Actuators**

**Contact blocks**

**Conduit entry**

**With reset**

01-W3  02-W3  05-W3  07-W3  15-W3  30-W3  31-W3  51-W3

**Actuators**

- 5: 1NO+1NC, snap action
- 6: 1NO+1NC, slow action
- 7: 1NO+1NC, slow action, overlapped
- 9: 2NC, slow action
- 10: 2NO, slow action
- 11: 2NO, snap action
- 12: 2NO, snap action shifted and spaced
- 13: 2NO, slow action shifted
- 14: 2NC, slow action, shifted
- 15: 2NO, slow action shifted
- 16: 2NC, slow action independent
- 18: 1NO+1NC, closer
- 20: 1NO+2NC, slow action
- 21: 3NC, slow action
- 22: 2x(1NO-1NC), snap action
- 2: 1NO-1NC, electronic PNP
- 3NC: slow action

**Conduit entry**

- Threaded conduit entry
  - M2: M20x1.5 (standard)
  - M1: M16x1.5
  - M3: M12x1.25
  - A: PG 13.5
  - K: PG 11
  - M3: 1/2 NPT

- With cable gland
  - K23: for cables Ø 6...Ø 12 mm
  - K27: for cables Ø 3...Ø 7 mm

- With M12 plastic connector
  - K70: 4 poles, bottom

- With M12 metal connector
  - K40: 8 poles, bottom

**Accessories**

- K24: 4 poles, bottom

**External rubber gasket**

- 20
- 21
- 25
- 34
- 50
- 33
- 69
- 53

**Round rod, stainless steel**

- 20
- 21
- 25
- 34
- 50
- 33
- 69
- 53

**Square rod**

- 20
- 21
- 25
- 34
- 50
- 33
- 69
- 53

**Fiber glass rod**

- 20
- 21
- 25
- 34
- 50
- 33
- 69
- 53

**Porcelain roller**

- 20
- 21
- 25
- 34
- 50
- 33
- 69
- 53

**Selection diagram**

- Accessory sold separately

General Catalogue 2015-2016
### Code structure

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

**Housing**
- **FR** technopolymer, one conduit entry

**Contact blocks**
- **5** 1NO+1NC, snap action
- **6** 1NO+1NC, slow action
- **7** 1NO+1NC, slow action, overlapped
  - ..............

**Actuators**
- **01** short plunger
- **02** roller lever
- **05** angled roller lever
  - ..............

**Reset**
- without reset (standard)
- **W3** simultaneous reset
- **W4** simultaneous reset, increased force

**Threaded conduit entry**
- **M2** M20x1.5 (standard)
- **M1** M16x1.5
- **A** PG 11
- **M3** 1/2 NPT

**Contact type**
- silver contacts (standard)
- silver contacts with 1 μm gold coating (not for contact block 2)

**External metallic parts**
- zinc-plated steel (standard)
- **X** stainless steel

**Rollers**
- **R28** standard roller
- **R23** stainless steel, Ø 12 mm (for actuators A2, A3, A5, A6, 30, 31, 51, 52, 54, 55, 56, 57)
- **R24** stainless steel, Ø 20 mm (for actuators 30, 31, 51, 52, 54, 55, 56, 57)
- **R25** technopolymer, Ø 35 mm (for actuators 30, 31, 51, 52, 54, 55, 56, 57)
- **R26** rubber, Ø 50 mm (for actuators 51, 52, 54, 55, 56, 57)
- **R27** rubber, protruding, Ø 50 mm (for actuators 55, 56)

**Ambient temperature**
- **-25°C ... +80°C** (standard)
- **T6** -40°C ... +80°C

**Pre-installed cable glands or connectors**
- without cable gland or connector (standard)
- **K23** cable gland for cables Ø 6…Ø 12 mm
- **K70** M12 plastic connector, 4 poles

Please contact our technical service for the complete list of possible combinations.
**Main features**
- Technopolymer housing, one conduit entry
- Protection degree IP67
- 17 contact blocks available
- 48 actuators available
- Versions with stainless steel external parts
- Versions with M12 connector
- Versions with gold-plated silver contacts

**Technical data**

**Housing**
- Housing made of fiber glass reinforced technopolymer, self-extinguishing, shock-proof and with double insulation:
- One threaded conduit entry: M20x1.5 (standard)
- Protection degree: IP67 according to EN 60529 with cable gland having equal or higher protection degree

**General data**
- Ambient temperature: -25°C ... +80°C
- Max. actuation frequency: 3600 operating cycles/hour
- Mechanical endurance: 20 million operating cycles
- Mounting position: any
- Safety parameters: 
  - B_{ax}:
  - Mechanical interlock, not coded:
    - type 1 according to EN ISO 14119
- Tightening torques for installation: 40,000,00 for NC contacts

(1) One operation cycle means two movements, one to close and one to open contacts, as defined in EN 60947-5-1.

**Electrical data**

**Utilization category**
- Alternating current: AC15 (50÷60 Hz)
- Direct current: DC13

<table>
<thead>
<tr>
<th>Contact blocks</th>
<th>Ue (V)</th>
<th>Ie (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20, 21, 22, 33, 34:</td>
<td>250</td>
<td>6</td>
</tr>
<tr>
<td>5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18:</td>
<td>125</td>
<td>4</td>
</tr>
<tr>
<td>2:</td>
<td>125</td>
<td>2</td>
</tr>
</tbody>
</table>

**Cable cross section (flexible copper strands)**

<table>
<thead>
<tr>
<th>Contact blocks</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20, 21, 22, 33, 34:</td>
<td>1 x 0.34 mm²</td>
<td>2 x 1.5 mm²</td>
</tr>
<tr>
<td>5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18:</td>
<td>1 x 0.5 mm²</td>
<td>2 x 2.5 mm²</td>
</tr>
<tr>
<td>2:</td>
<td>1 x 0.5 mm²</td>
<td>2 x 1.5 mm²</td>
</tr>
</tbody>
</table>

**In conformity 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, UL 508, CSA 22.2 No.14
- Approvals:

**In conformity with the requirements of:**

**Positive contact opening in conformity with standards:**
- IEC 60947-5-1, EN 60947-5-1.

**Markings and quality marks:**
- IMQ approval: EG610
- UL approval: E131787
- CCC approval: 2007010305230013
- EAC approval: RU С-IT ДМ94.В.01024

**Installation for safety applications:**
Use only switches marked with the symbol ☑️ aside 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 60947-5-1, encl. K, par. 2. Actuate the switch at least up to the positive opening travel shown in the travel diagrams on page 240. Operate the switch at least with the positive opening force, indicated between brackets below each article, aside the minimum force value.

⚠️ If not expressly indicated in this chapter, for correct installation and utilization of all articles see chapter utilization requirements from page 235 to page 246.

**Electrical data**

**Utilization category**
- Alternating current: AC15 (50÷60 Hz)
- Direct current: DC13

<table>
<thead>
<tr>
<th>Contact blocks</th>
<th>Ue (V)</th>
<th>Ie (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>without connector</td>
<td>250</td>
<td>4</td>
</tr>
<tr>
<td>with connector</td>
<td>125</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact blocks</th>
<th>Ue (V)</th>
<th>Ie (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20, 21, 22, 33, 34:</td>
<td>1000 A according to EN 60947-5-1 type aM fuse</td>
<td>3</td>
</tr>
</tbody>
</table>

**Cable cross section (flexible copper strands)**

<table>
<thead>
<tr>
<th>Contact blocks</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20, 21, 22, 33, 34:</td>
<td>1 x 0.34 mm²</td>
<td>2 x 1.5 mm²</td>
</tr>
<tr>
<td>5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18:</td>
<td>1 x 0.5 mm²</td>
<td>2 x 2.5 mm²</td>
</tr>
<tr>
<td>2:</td>
<td>1 x 0.5 mm²</td>
<td>2 x 1.5 mm²</td>
</tr>
</tbody>
</table>
Characteristics approved by IMQ

Rated insulation voltage (Ue): 500 Vac
400 Vac (for contact blocks 2, 11, 12, 20, 21, 22, 33, 34)

Conventional free air thermal current (Ith): 10 A

Protection against short circuits: type m fuse 10 A, 500 V

Rated impulse withstand voltage (Uimp): 6 kV
4 kV (for contact blocks 20, 21, 22, 33, 34)

Protection degree of the housing: IP67

MV terminals (screw terminals)

Pollution degree 3

Utilization category: AC15

Operating voltage (Ue): 400 Vac (50 Hz)

Operating current (Ie): 3 A

Forms of the contact element: Za, Zb, Za+Za, Y+Y, X+X, Y+Y+X, Y+Y+Y+X

Positive opening of contacts on contact blocks 5, 6, 9, 11, 13, 14, 16, 18, 20, 21, 22, 33, 34

In conformity with standards: EN 60947-1, EN 60947-5-1+ A1:2009, fundamental requirements of the Low Voltage Directive 2006/95/EC.

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

---

Characteristics approved by UL

Utilization categories Q300 (89 VA, 125 ... 250 Vdc)
A600 (720 VA, 120 ... 600 Vac)

Data of housing type 1, 4X “indoor use only,” 12, 13

For all contact blocks except 2 and 3 use 60 or 75°C copper (Cu) conductor, rigid or flexible, wire size AWG 12/14. Terminal tightening torque of 7.1 lb in (0.8 Nm). For contact blocks 2 and 3 use 60 or 75 °C copper (Cu) conductor, rigid or flexible, wire size AWG 14. Terminal tightening torque of 12 lb in (1.4 Nm).

In conformity with standard: UL 508, CSA 22.2 No.14

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

---

Connection diagram for M12 connectors

M12 connector, 8 poles

M12 connector, 4 poles

M12 connector, 4 poles

M12 connector, 4 poles

M12 connector, 4 poles

M12 connector, 4 poles

M12 connector, 4 poles

M12 connector, 4 poles

M12 connector, 4 poles

Contact block 2

Contact block 5

Contact block 6

Contact block 7

Contact block 9

Contact block 10

Contact block 11

Contact block 12

Contact block 13

Contact block 14

Contact block 15

Contact block 16

Contact block 18

Contact block 20

Contact block 21

Contact block 22

Contact block 33

Contact block 34

Contact block E1

PNP

M12 connector, 4 poles

---

General Catalogue 2015-2016
Position switches FR series

<table>
<thead>
<tr>
<th>Contact type:</th>
<th>With external rubber gasket</th>
<th>With stainless steel roller on request</th>
<th>With external rubber gasket</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 E1</td>
<td>FR 501-M2 1NO+1NC</td>
<td>FR 5A1-M2 1NO+1NC</td>
<td>FR 5A2-M2 1NO+1NC</td>
</tr>
<tr>
<td>6 1</td>
<td>FR 601-M2 1NO+1NC</td>
<td>FR 6A1-M2 1NO+1NC</td>
<td>FR 6A2-M2 1NO+1NC</td>
</tr>
<tr>
<td>7 2</td>
<td>FR 701-M2 1NO+1NC</td>
<td>FR 7A1-M2 1NO+1NC</td>
<td>FR 7A2-M2 1NO+1NC</td>
</tr>
<tr>
<td>9 1</td>
<td>FR 901-M2 2NC</td>
<td>FR 9A1-M2 2NC</td>
<td>FR 9A2-M2 2NC</td>
</tr>
<tr>
<td>10 1</td>
<td>FR 1001-M2 2NO</td>
<td>FR 10A1-M2 2NO</td>
<td>FR 10A2-M2 2NO</td>
</tr>
<tr>
<td>11 1</td>
<td>FR 1101-M2 2NC</td>
<td>FR 11A1-M2 2NC</td>
<td>FR 11A2-M2 2NC</td>
</tr>
<tr>
<td>12 1</td>
<td>FR 1201-M2 2NO</td>
<td>FR 12A1-M2 2NO</td>
<td>FR 12A2-M2 2NO</td>
</tr>
<tr>
<td>13 1</td>
<td>FR 1301-M2 2NC</td>
<td>FR 13A1-M2 2NC</td>
<td>FR 13A2-M2 2NC</td>
</tr>
<tr>
<td>14 1</td>
<td>FR 1401-M2 2NC</td>
<td>FR 14A1-M2 2NC</td>
<td>FR 14A2-M2 2NC</td>
</tr>
<tr>
<td>15 1</td>
<td>FR 1501-M2 2NO</td>
<td>FR 15A1-M2 2NO</td>
<td>FR 15A2-M2 2NO</td>
</tr>
<tr>
<td>18 1</td>
<td>FR 1801-M2 1NO+1NC</td>
<td>FR 18A1-M2 1NO+1NC</td>
<td>FR 18A2-M2 1NO+1NC</td>
</tr>
<tr>
<td>20 1</td>
<td>FR 2001-M2 1NO+2NC</td>
<td>FR 20A1-M2 1NO+2NC</td>
<td>FR 20A2-M2 1NO+2NC</td>
</tr>
<tr>
<td>22 1</td>
<td>FR 2201-M2 2NO+1NC</td>
<td>FR 22A1-M2 2NO+1NC</td>
<td>FR 22A2-M2 2NO+1NC</td>
</tr>
<tr>
<td>2 2</td>
<td>FR 201-M2 2x(1NO-1NC)</td>
<td>FR 202-M2 2x(1NO-1NC)</td>
<td>FR 202-M2 2x(1NO-1NC)</td>
</tr>
<tr>
<td>E1</td>
<td>FR E101-M2 1NO-1NC</td>
<td>FR E1A1-M2 1NO-1NC</td>
<td>FR E1A2-M2 1NO-1NC</td>
</tr>
</tbody>
</table>

- **Max. speed**
- **Min. force**
- **Travel diagrams**

- **With external rubber gasket**
- **With stainless steel roller on request**

All measures in the drawings are in mm.

Items with code on green background are stock items.

Accessories See page 225

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

Contact blocks:

- 5 E1: FR 5A4-M2 1NO+1NC
- 6: FR 6A4-M2 1NO+1NC
- 7: FR 7A4-M2 1NO+1NC
- 9: FR 9A4-M2 2NC
- 10: FR 10A4-M2 2NO
- 11: FR 11A4-M2 2NC
- 12: FR 12A4-M2 2NO
- 13: FR 13A4-M2 2NC
- 14: FR 14A4-M2 2NC
- 15: FR 15A4-M2 2NO
- 18: FR 18A4-M2 1NO+1NC
- 20: FR 20A4-M2 1NO+2NC
- 21: FR 21A4-M2 3NC
- 22: FR 22A4-M2 2NO+1NC
- 2: FR 201-M2 2x(1NO-1NC)
- E1: FR E1A4-M2 1NO-1NC

Max. speed:

- page 239 - type 4
- page 239 - type 3
- page 239 - type 3
- page 240 - group 1
- page 240 - group 1
- page 240 - group 2
- page 240 - group 2

Min. force:

- 8 N (25 N)
- 6 N (25 N)
- 4.3 N (25 N)
- 4 N (25 N)

Travel diagrams:

- page 240 - group 1
- page 240 - group 2
- page 240 - group 2
Position switches FR series

<table>
<thead>
<tr>
<th>Contact type:</th>
<th>Items with code on green background are stock items</th>
<th>Accessories See page 225</th>
<th>The 2D/3D files are available at <a href="http://www.pizzato.com">www.pizzato.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. snap action</td>
<td>M12x1 2NO+1NC</td>
<td>See page 225</td>
<td></td>
</tr>
</tbody>
</table>
Contact type:
- Slow action
- Overlapped
- Slow action shifted
- Independent
- Electronic

Contact blocks:
<table>
<thead>
<tr>
<th></th>
<th>Contact type</th>
<th>FR 534-M2</th>
<th>FR 550-M2</th>
<th>FR 551-M2</th>
<th>FR 552-M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1NO+1NC</td>
<td>FR 534-M2</td>
<td>FR 550-M2</td>
<td>FR 551-M2</td>
<td>FR 552-M2</td>
</tr>
<tr>
<td>6</td>
<td>1NO+1NC</td>
<td>FR 543-M2</td>
<td>FR 550-M2</td>
<td>FR 551-M2</td>
<td>FR 552-M2</td>
</tr>
<tr>
<td>7</td>
<td>1NO+1NC</td>
<td>FR 543-M2</td>
<td>FR 550-M2</td>
<td>FR 551-M2</td>
<td>FR 552-M2</td>
</tr>
<tr>
<td>9</td>
<td>2NC</td>
<td>FR 590-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>10</td>
<td>2NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>11</td>
<td>2NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>12</td>
<td>2NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>13</td>
<td>2NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>14</td>
<td>2NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>15</td>
<td>2NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>16</td>
<td>2NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>18</td>
<td>1NO+1NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>20</td>
<td>1NO+1NC</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>21</td>
<td>2NC</td>
<td>FR 590-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>22</td>
<td>2NC</td>
<td>FR 590-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
<tr>
<td>23</td>
<td>2NC</td>
<td>FR 590-M2</td>
<td>FR 610-M2</td>
<td>FR 610-M2</td>
<td>FR 612-M2</td>
</tr>
</tbody>
</table>

Max. speed: 1.5 m/s
Min. force: 0.06 Nm
Travel diagrams: page 240 - group 5

Porcelain roller:
Max. speed: 0.5 m/s
Min. force: 0.03 Nm (0.25 Nm)
Travel diagrams: page 240 - group 6

All measures in the drawings are in mm.

Items with code on green background are stock items.

Accessories: See page 225.

The 2D/3D files are available at www.pizzato.com
Position switches FR series

Pizzato Elettrica has developed a reset device code W3 to make perfectly simultaneous the actuator and the contact block tripping. The device can be inserted between the switch body and the head, and could be rotated independently from this last one. This new device has following advantages:

- The reset device can be integrated into almost all standard actuator heads
- Contact blocks with snap action are no more necessary because the tripping movement is made by the reset device itself
- The reset device can be rotated independently from the head for maximum flexibility during installation
- Two driving forces: standard and increased for applications with vibrations
- Mechanical endurance: 1 million operating cycles.

FR 557-M2 1NO+1NC
FR 569-M2 1NO+1NC
FR 576-M2 1NO+1NC

Max. speed 1.5 m/s
Min. force 0.06 Nm

FR 601-W3M2 1NO+1NC
FR 602-W3M2 1NO+1NC
FR 605-W3M2 1NO+1NC
FR 607-W3M2 1NO+1NC

Max. speed page 239 - type 4
Min. force 4.5 N (25 N)
Travel diagrams page 241 - group 1

FR 257-M2 2x(1NO-1NC)
FR 269-M2 2x(1NO-1NC)
FR 276-M2 2x(1NO-1NC)
FR 607-W3M2 1NO+1NC

Max. speed page 239 - type 3
Min. force 2.5 N (25 N)
Travel diagrams page 241 - group 3

All measures in the drawings are in mm

Items with code on green background are stock items

Accessories See page 225

The 2D/3D files are available at www.pizzato.com
Increased actuating force

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

<table>
<thead>
<tr>
<th>Actuators</th>
<th>Min. force</th>
</tr>
</thead>
<tbody>
<tr>
<td>01, 14, 15, 16</td>
<td>7 N</td>
</tr>
<tr>
<td>02, 05</td>
<td>6 N</td>
</tr>
<tr>
<td>07</td>
<td>3.5 N</td>
</tr>
<tr>
<td>30 ... 57</td>
<td>0.08 Nm</td>
</tr>
</tbody>
</table>

Accessories See page 225

The 2D/3D files are available at www.pizzato.com
Position switches FR series

Position switches with revolving lever without actuator

<table>
<thead>
<tr>
<th>Contact type</th>
<th>Contact blocks</th>
<th>With manual reset knob</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>FR 538-M2</td>
<td>1NO+1NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 638-M2</td>
<td>1NO+1NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 738-M2</td>
<td>1NO+1NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 938-M2</td>
<td>2NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 1038-M2</td>
<td>2NO</td>
</tr>
<tr>
<td>L</td>
<td>FR 1138-M2</td>
<td>2NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 1238-M2</td>
<td>2NO</td>
</tr>
<tr>
<td>L</td>
<td>FR 1338-M2</td>
<td>2NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 1438-M2</td>
<td>2NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 1538-M2</td>
<td>2NO</td>
</tr>
<tr>
<td>L</td>
<td>FR 1638-M2</td>
<td>2NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 1838-M2</td>
<td>1NO+1NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 2038-M2</td>
<td>1NO+2NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 2138-M2</td>
<td>3NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 2238-M2</td>
<td>2NO+1NC</td>
</tr>
<tr>
<td>L</td>
<td>FR 238-M2</td>
<td>2x1NO+1NC</td>
</tr>
<tr>
<td>E1</td>
<td>FR E138-M2</td>
<td>1NO-1NC</td>
</tr>
</tbody>
</table>

- **Important**: These loose actuators can be used with items of series FR, FM, FX, FZ and FK only.
- **All measures in the drawings are in mm**
- **Contact type**:
  - R: snap action
  - S: slow action
  - LO: slow action overlapped
  - LS: slow action shifted and spaced
  - LV: slow action independent
  - LA: slow action closer
  - LI: slow action independent
  - LE: slow action electronic

- **Min. force**: 0.06 Nm (0.25 Nm)
- **Travel diagrams**: page 240 - group 5, page 241 - group 4

Loose actuators

- Technopolymer roller Ø 18 mm
- Technopolymer roller Ø 18 mm
- Adjustable square rod 3x3x125 mm
- Flexible rod with pointed end
- Adjustable round rod Ø 3x125 mm
- Technopolymer roller Ø 20 mm

Actuator VF LE55 can only be used in safety applications if adjusted to its max. length, as shown in figure beside. If you need an adjustable lever for safety applications, use the adjustable safety lever VF LE56.

The position switch obtained by assembling switch FR •38-M2 (e.g. FR 538-M2, FR 638-M2...) with actuator VF L53 will not present the same travel diagrams and actuating forces as switch FR •53-E0M2V9 (e.g. FR 553-E0M2V9, FR 653-E0M2V9...).

The actuator cannot be rotated to the inside because it will mechanically interfere with the switch head.

- **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 fiber glass rod

With manual reset knob

**IMPORTANT**: For safety applications: join only switches and actuators marked with symbol symbol aside the product code. For more information about safety applications see details on page 235.
### Special loose actuators

**IMPORTANT:** These loose actuators can be used with items of series FR, FM, FX, FZ and FK only.

#### Stainless steel rollers, Ø 20 mm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF LE31-R24</td>
<td>Stainless steel roller, Ø 20 mm</td>
</tr>
<tr>
<td>VF LE51-R24</td>
<td>Stainless steel roller, Ø 20 mm</td>
</tr>
<tr>
<td>VF LE52-R24</td>
<td>Stainless steel roller, Ø 20 mm</td>
</tr>
<tr>
<td>VF LE54-R24</td>
<td>Stainless steel roller, Ø 20 mm</td>
</tr>
<tr>
<td>VF LE55-R24</td>
<td>Stainless steel roller, Ø 20 mm</td>
</tr>
<tr>
<td>VF LE56-R24</td>
<td>Stainless steel roller, Ø 20 mm</td>
</tr>
<tr>
<td>VF LE57-R24</td>
<td>Stainless steel roller, Ø 20 mm</td>
</tr>
</tbody>
</table>

#### Technopolymer rollers, Ø 35 mm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF LE31-R25</td>
<td>Technopolymer roller, Ø 35 mm</td>
</tr>
<tr>
<td>VF LE51-R25</td>
<td>Technopolymer roller, Ø 35 mm</td>
</tr>
<tr>
<td>VF LE52-R25</td>
<td>Technopolymer roller, Ø 35 mm</td>
</tr>
<tr>
<td>VF LE54-R25</td>
<td>Technopolymer roller, Ø 35 mm</td>
</tr>
<tr>
<td>VF LE55-R25</td>
<td>Technopolymer roller, Ø 35 mm</td>
</tr>
<tr>
<td>VF LE56-R25</td>
<td>Technopolymer roller, Ø 35 mm</td>
</tr>
<tr>
<td>VF LE57-R25</td>
<td>Technopolymer roller, Ø 35 mm</td>
</tr>
</tbody>
</table>

#### Rubber rollers, Ø 40 mm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF LE31-R5</td>
<td>Rubber roller, Ø 40 mm</td>
</tr>
<tr>
<td>VF LE51-R5</td>
<td>Rubber roller, Ø 40 mm</td>
</tr>
<tr>
<td>VF LE52-R5</td>
<td>Rubber roller, Ø 40 mm</td>
</tr>
<tr>
<td>VF LE54-R5</td>
<td>Rubber roller, Ø 40 mm</td>
</tr>
<tr>
<td>VF LE55-R5</td>
<td>Rubber roller, Ø 40 mm</td>
</tr>
<tr>
<td>VF LE56-R5</td>
<td>Rubber roller, Ø 40 mm</td>
</tr>
<tr>
<td>VF LE57-R5</td>
<td>Rubber roller, Ø 40 mm</td>
</tr>
</tbody>
</table>

#### Rubber rollers, Ø 50 mm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF LE51-R26</td>
<td>Rubber roller, Ø 50 mm</td>
</tr>
<tr>
<td>VF LE52-R26</td>
<td>Rubber roller, Ø 50 mm</td>
</tr>
<tr>
<td>VF LE54-R26</td>
<td>Rubber roller, Ø 50 mm</td>
</tr>
<tr>
<td>VF LE55-R26</td>
<td>Rubber roller, Ø 50 mm</td>
</tr>
<tr>
<td>VF LE56-R26</td>
<td>Rubber roller, Ø 50 mm</td>
</tr>
<tr>
<td>VF LE57-R26</td>
<td>Rubber roller, Ø 50 mm</td>
</tr>
</tbody>
</table>

#### Protruding rubber rollers, Ø 50 mm

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF LE55-R27</td>
<td>Protruding rubber roller, Ø 50 mm</td>
</tr>
<tr>
<td>VF LE56-R27</td>
<td>Protruding rubber roller, Ø 50 mm</td>
</tr>
</tbody>
</table>

**Items with code on green background are stock items**

**Accessories** See page 225

**The 2D/3D files are available at [www.pizzato.com](http://www.pizzato.com)**

---

**General Catalogue 2015-2016**

---

**Stainless steel rollers, Ø 20 mm**

**Technopolymer rollers, Ø 35 mm**

**Rubber rollers, Ø 40 mm**

**Rubber rollers, Ø 50 mm**

**Protruding rubber rollers, Ø 50 mm**

---

**IMPORTANT:** These loose actuators can be used with items of series FR, FM, FX, FZ and FK only.

All measures in the drawings are in mm.

---

**Items with code on green background are stock items**

**Accessories** See page 225

**The 2D/3D files are available at [www.pizzato.com](http://www.pizzato.com)**