Selection diagram

Position switches FP series

**ACTUATORS**

**CONTACT BLOCKS**

- 5: 1NO+1NC snap action
- 6: 1NO+1NC slow action
- 7: 1NO+1NC overlapped
- 9: 2NC slow action
- 10: 2NO slow action
- 11: 2NO snap action
- 12: 2NO slow action shifted
- 13: 2NC slow action shifted and spaced
- 14: 2NO slow action shifted

**CONDUIT ENTRY**

- 01: external rubber gasket
- 02: fiber glass rod
- 08: Ø 8 mm stainless steel sphere
- 10: Ø 12.7 mm stainless steel sphere
- 18: stainless steel sphere
- 19: fiber glass rod

- 31: adjustable lever
- 51: safety adjustable lever
- 52: bistable
- 57: bistable

**Threaded conduit entry**

- PG 13.5 (standard): M2
- K21: M20x1.5

**With assembled cable gland**

- For Ø 6 to Ø 12 mm cables range: K25
- For Ø 3 to Ø 7 mm cables range: K25

**With M12 plastic connector**

- Assembled and wired: K70
- 4 poles from bottom: K40
- 8 poles from bottom: K60

**With M12 metal connector**

- Assembled and wired: K45
- 8 poles from bottom: K60
- 4 poles from bottom: K40

**External rubber gasket**

- Ø 8 mm
- Ø 12.7 mm

**Stainless steel sphere**

- Ø 12.7 mm

**Stainless steel sphere**

- Ø 8 mm

**Fiber glass rod**

- Ø 8 mm
- Ø 12.7 mm

**Adjustable lever**

- Safety adjustable lever

**Bistable**

- Adjustable lever bistable bistable

**Product option**

- Accessory sold separately

---

page 2/13
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 offset roller lever
... ................................

Suffix
no suffix (standard)
1 with Ø 20 mm stainless steel roller for actuators 02, 05, 31, 35, 51, 52, 56, 57
2 with Ø 35 mm polymer roller (see special loose actuators on page 2/22)
3 with Ø 50 mm rubber roller (see special loose actuators on page 2/22)
4 with Ø 50 mm overhanging rubber roller (see special loose actuators on page 2/22)

Preinstalled cable gland or connectors
no cable gland or connector (standard)
K21 with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range
... ................................
K70 with 4 poles M12 plastic connector
... ................................

For the complete list of all combinations, please contact our technical office.

Threaded conduit entry
PG 13,5 (standard)
M2 M20x1,5

Contacts type
silver contacts (standard)
G silver contacts gold plated 1 µm (contact block 2 excluded)
Position switches FP series

Technical data

**Housing**
Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin and with double insulation

Protection degree: IP67 according to EN 60529

**Main data**
- Polymer housing, one conduit entry
- Protection degree IP67
- 17 contact blocks available
- 28 actuators available
- M12 assembled connector versions
- Silver contacts gold plated versions

**Main data**
- Polymer housing, one conduit entry
- Protection degree IP67
- 17 contact blocks available
- 28 actuators available
- M12 assembled connector versions
- Silver contacts gold plated versions

**General data**
- Ambient temperature: from -25°C to +80°C
- Version for operation in ambient temperature from -40°C to +80°C on request
- Max operating frequency: 3600 operations cycles/hour
- Mechanical endurance: 20 million operations cycles
- Assembling position: any
- Driving torque for installation: see pages 6/1-6/10

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

**In conformity with standards:**
IEC 60947-5-1, EN 60947-5-1, EN 50041, IEC 60529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113, CENELEC EN 50013.

**Approvals:**
IEC 60947-5-1, UL 508, GB14048.5-2001

**In conformity with requirements requested by:**

**Positive contact opening in conformity with standards:**
IEC 60947-5-1, EN 60947-5-1, VDE 0660-206.

**In conformity with requirements requested by:**

**Positive contact opening in conformity with standards:**
IEC 60947-5-1, EN 60947-5-1, VDE 0660-206.

**Utilization categories**
Alternate current: AC15 (50...60 Hz)
Ue (V) 250 400 500
Ie (A) 6 4 1
Direct current: DC13
Ue (V) 24 125 250
Ie (A) 6 1,1 0,4

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<td>4 A</td>
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<td>Rated insulation voltage (Ui):</td>
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<td>250 Vac 300 Vdc</td>
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<td>Thermal current (Ith):</td>
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<tr>
<td>Rated insulation voltage (Ui):</td>
<td>30 Vac 36 Vdc</td>
<td>600 V type gG</td>
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</table>

**Introduction for safety applications:**
Use only switches marked with the symbol . The safety circuit must always be connected with the NC contacts (normally closed contacts: 11-12, 21-22 or 31-32) as stated in the standard EN 60947-5-1, encl. K, par. 2. The switch must be actuated with at least up to the positive opening travel shown in the travels diagrams on page 6/4. The switch must be actuated at least with the positive opening force, shown in brackets, underneath each article, near the value of the min. force.

⚠️ If not expressly indicated in this chapter, for the right installation and the correct utilization of all articles see requirements indicated from page 6/1 to page 6/10.
Adjustable levers
In switches with revolving lever it is possible to adjust the lever with 10° steps for the whole 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.

Overturning levers
It's possible to fasten the lever on switches on straight or reverse side, maintaining the positive coupling. In this way it is possible to obtain two different work plans of the lever.

Rotating heads
In all switches, it is possible to rotate the head in 90° steps.

Working operation of contact block 16 with independent contacts
The contact block 16 has two NC contacts, both with positive opening activated independently according to the lever turning direction.

Unidirectional heads
In the switches with revolving lever, it is possible to select the directional operation by removing the four screws of the head and revolving the internal piston (contact block 16 excluded).
## Position switches FP series

### Contacts type:
- Snap action
- Slow action
- Slow action with external rubber gasket
- Slow action with external rubber gasket - shifted
- Slow action with external rubber gasket - shifted and spaced
- Slow action independent
- Slow action independent - shifted
- Slow action independent - shifted and spaced
- Slow action independent - electronic

### Contact blocks:
- FP 501 1NO+1NC
- FP 601 1NO+1NC
- FP 701 1NO+1NC
- FP 901 2NC
- FP 1001 2NO
- FP 1101 2NC
- FP 1201 2NO
- FP 1301 2NC
- FP 1401 2NC
- FP 1501 2NO
- FP 1801 1NO+1NC
- FP 2001 1NO+2NC
- FP 2101 2NC
- FP 2201 2NO+1NC
- FP 201 2x1NO-1NC
- FP E101 1NO-1NC
- FP 201 2x1NO-1NC
- FP E101 1NO-1NC

### Max speed:
- Page 6/3 - type 4
- Page 6/4 - group 1

### Min. force:
- 8 N (25 N)

### Travel diagrams:
- Page 6/3 - type 4
- Page 6/4 - group 1

### With stainless steel roller on request:
- FP 502 1NO+1NC
- FP 602 1NO+1NC
- FP 702 1NO+1NC
- FP 902 2NC
- FP 1002 2NO
- FP 1102 2NC
- FP 1202 2NO
- FP 1302 2NC
- FP 1402 2NC
- FP 1502 2NO
- FP 1802 1NO+1NC
- FP 2002 1NO+2NC
- FP 2102 2NC
- FP 2202 2NO+1NC
- FP 202 2x1NO-1NC
- FP E102 1NO-1NC
- FP 202 2x1NO-1NC
- FP E102 1NO-1NC

### With external rubber gasket:
- FP 508 1NO+1NC
- FP 608 1NO+1NC
- FP 708 1NO+1NC
- FP 908 2NC
- FP 1008 2NO
- FP 1108 2NC
- FP 1208 2NO
- FP 1308 2NC
- FP 1408 2NC
- FP 1508 2NO
- FP 1808 1NO+1NC
- FP 2008 1NO+2NC
- FP 2108 2NC
- FP 2208 2NO+1NC
- FP 208 2x1NO-1NC
- FP E108 1NO-1NC
- FP 208 2x1NO-1NC
- FP E108 1NO-1NC

### Max speed:
- Page 6/3 - type 4
- Page 6/4 - group 1

### Min. force:
- 8 N (25 N)

### Travel diagrams:
- Page 6/3 - type 4
- Page 6/4 - group 1

---

**Accessories:** See page 517

All measures in the drawings are in mm
### Contacts type:
- R: snap action
- L: slow action
- 0: overlapped
- O: shifted and spaced
- U: slow action shifted and spaced
- N: independent
- C: slow action closer
- E: electronic

#### Contact blocks

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<th>Code</th>
<th>Description</th>
<th>Travel diagrams</th>
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<td>FP 516</td>
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#### Max speed
- FP 516: 1 m/s
- FP 519: 1 m/s
- FP 520: 1 m/s

#### Min. force
- FP 516: 8 N (25 N)
- FP 519: 8 N (25 N)
- FP 520: 8 N (25 N)

#### Travel diagrams
- FP 516: page 6/3 - type 2
- FP 519: page 6/3 - type 4
- FP 520: page 6/3 - type 4

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**With external rubber gasket**

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#### Max speed
- FP 516: 1 m/s
- FP 519: 1 m/s
- FP 520: 1 m/s

#### Min. force
- FP 516: 8 N (25 N)
- FP 519: 8 N (25 N)
- FP 520: 8 N (25 N)

#### Travel diagrams
- FP 516: page 6/4 - group 1
- FP 519: page 6/4 - group 1
- FP 520: page 6/4 - group 1

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**Other rollers available. See page 22**

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#### Max speed
- FP 516: 1 m/s
- FP 519: 1 m/s
- FP 520: 1 m/s

#### Min. force
- FP 516: 8 N (25 N)
- FP 519: 8 N (25 N)
- FP 520: 8 N (25 N)

**O 3 mm stainless steel round rod**

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#### Max speed
- FP 516: 1 m/s
- FP 519: 1 m/s
- FP 520: 1 m/s

#### Min. force
- FP 516: 8 N (25 N)
- FP 519: 8 N (25 N)
- FP 520: 8 N (25 N)

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

---

General Catalog 2009-2010
Position switches FP series

Contacts type:
- Snap action
- Slow action
- Overlapped slow action
- Shifted slow action
- Slow action independent
- Slow action close
- Electronic higher

Contact blocks:

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<td>3x3 mm square rod</td>
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Max speed: 1,5 m/s
Min. force: 0,1 Nm

Other rollers available. See page 2/12

Porcelain roller

Other rollers available. See page 2/12

Other rollers available. See page 2/12

Max speed: 1,5 m/s
Min. force: 0,1 Nm

Travel diagrams:

Accessories: See page 5/1

Positive opening only with lever adjusted on the max. See page 2/21.
<table>
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<tr>
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<td>Min. force</td>
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<td>0,21 Nm</td>
<td>0,21 Nm</td>
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<td>Travel diagrams</td>
<td>page 6/3 - type 1</td>
<td>page 6/4 - group 4</td>
<td>page 6/4 - group 6</td>
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Items with code on the green background are available in stock.
Position switches with revolving lever without actuator

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<th>Contacts type:</th>
<th>Regular head</th>
<th>Compact head</th>
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<tr>
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<td>LA</td>
<td>FP E138</td>
<td>FP E158</td>
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</table>

**Min. force**

- 0,1 Nm (0,25 Nm) on page 6/4 - group 4
- 0,06 Nm (0,25 Nm) on page 6/4 - group 4
- 0,5 m/s with 30° cam 0,21 Nm

Loose actuators

**10 pcs pack**

**IMPORTANT:** These loose actuators can be used with items of series FD, FP, FL, FC only.

<table>
<thead>
<tr>
<th>Polymer roller Ø 20 mm</th>
<th>Adjustable round rod Ø 3x125 mm</th>
<th>Adjustable square rod 3x3x125 mm</th>
<th>Flexible rod actuator</th>
<th>Adjustable actuator with polymer roller</th>
<th>Adjustable fiber glass rod</th>
</tr>
</thead>
<tbody>
<tr>
<td>VF L31</td>
<td>VF L32</td>
<td>VF L33</td>
<td>VF L34</td>
<td>VF L35</td>
<td>VF L36</td>
</tr>
<tr>
<td>Single track lyra actuator</td>
<td>Double tracks lyra actuator</td>
<td>Polymer roller Ø 20 mm</td>
<td>Polymer roller Ø 20 mm</td>
<td>Porcelain roller</td>
<td>Adjustable safety actuator with polymer roller</td>
</tr>
</tbody>
</table>

- Only orders for multiple quantities of the packs are accepted.
- The actuator VF L35 suits to safety applications only if adjusted to its max length, as you can see in figure beside. If you need an adjustable lever for safety applications, use the adjustable safety lever VF L56.
- The position switch obtained by assembling the switch FP •58 (e.g. FP 558, FP 658) with the actuator VF L53 will not present the same travel diagrams and actuating forces as the position switch FP •53-E11V9 (e.g. FP 553-E11V9, FP 653-E11V9...). If it is installed with switch FP •58 (e.g. FP 558, FP 658..), the actuator can mechanically interfere with the housing of the switch. The interference could happen or not according to the actuator and the head fixing position.
- The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.

**Accessories:** See page 5/1

**IMPORTANT**

For safety applications: join only switches and actuators marked with symbol .

For more information about safety applications see page 6/1.
Special loose actuators

**IMPORTANT:** These loose actuators can be used with items of series FD, FP, FL, FC only

<table>
<thead>
<tr>
<th>Ø 20 mm stainless steel rollers</th>
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<td>VF L31-1</td>
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<th>Ø 35 mm polymer rollers</th>
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<th>Ø 40 mm rubber rollers</th>
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<th>Ø 50 mm rubber rollers</th>
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<td>VF L31-3</td>
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<table>
<thead>
<tr>
<th>Ø 50 mm overhanging rubber rollers</th>
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<tbody>
<tr>
<td>VF L35-4</td>
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</table>