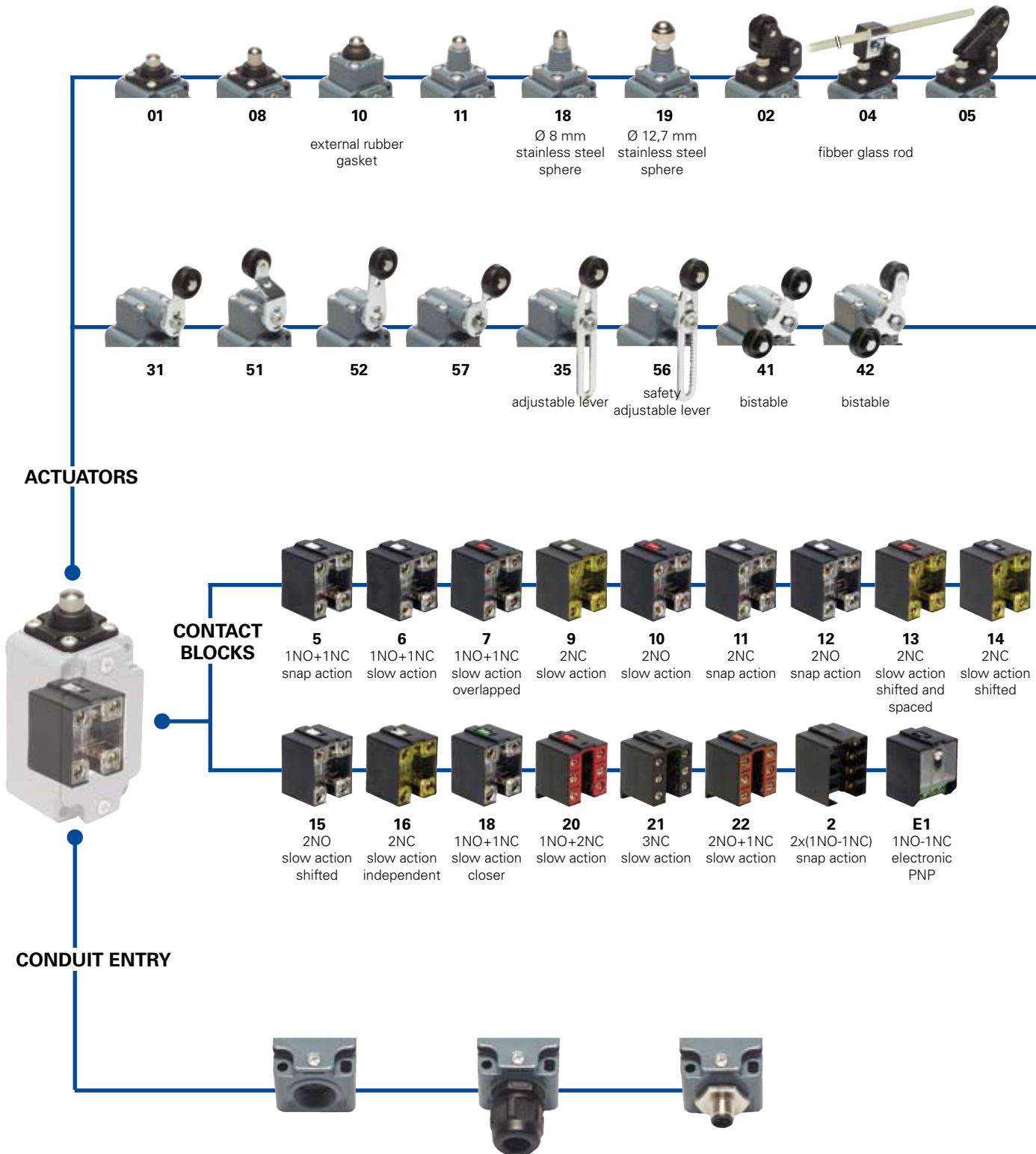


Selection diagram



**Threaded conduit entry**

|           |                    |
|-----------|--------------------|
|           | PG 13,5 (standard) |
| <b>M2</b> | M20x1,5            |

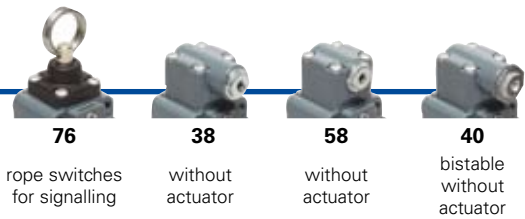
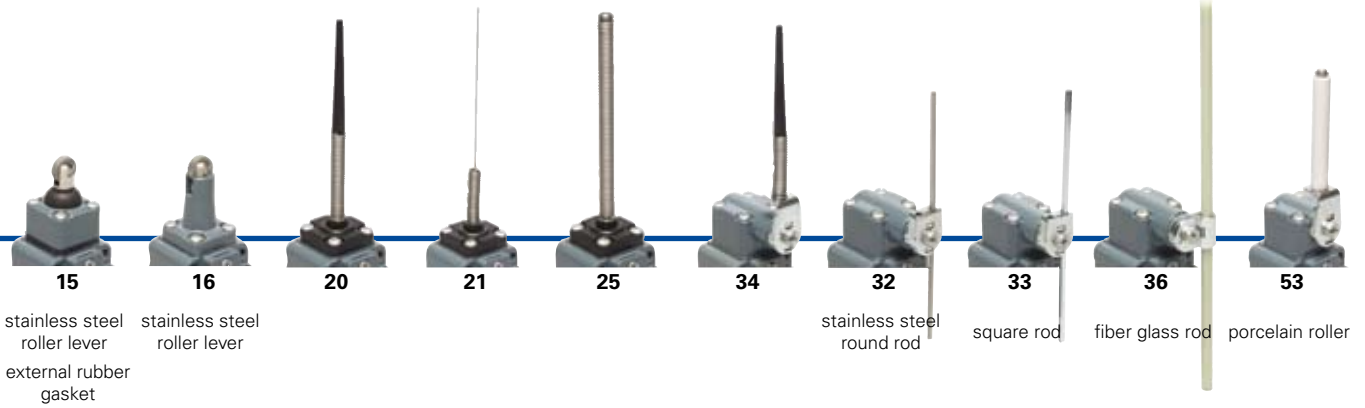
**With assembled cable gland**

|                |            |                                 |
|----------------|------------|---------------------------------|
| <b>PG 13,5</b> | <b>K21</b> | for Ø 6 to Ø 12 mm cables range |
|                | <b>K25</b> | for Ø 3 to Ø 7 mm cables range  |
| <b>M20x1,5</b> | <b>K23</b> | for Ø 6 to Ø 12 mm cables range |
|                | <b>K27</b> | for Ø 3 to Ø 7 mm cables range  |

**With M12 metal connector assembled and wired**

|            |                     |
|------------|---------------------|
| <b>K40</b> | 8 poles from bottom |
| <b>K50</b> | 5 poles from bottom |

● product option  
 → accessory sold separately



**LOOSE ACTUATORS**  
See page 2/11



**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  
**FD 502-1GM2K50**

|                       |  |
|-----------------------|--|
| <b>Housing</b>        |  |
| <b>FD</b>             | metal housing, one conduit entry   |
| <b>Contact blocks</b> |  |
| <b>5</b>              | 1NO+1NC, snap action   |
| <b>6</b>              | 1NO+1NC, slow action   |
| <b>7</b>              | 1NO+1NC, slow action overlapped  |
| ...                   | .....  |
| <b>Actuators</b>      |  |
| <b>01</b>             | short plunger  |
| <b>02</b>             | roller lever   |
| <b>05</b>             | offset roller lever  |
| ...                   | .....  |
| <b>Suffix</b>         |  |
|                       | no suffix (standard)   |
| <b>1</b>              | with Ø 20 mm stainless steel roller for actuators 02, 05, 31, 35, 51, 52, 56, 57, 41, 42 |
| <b>2</b>              | with Ø 35 mm polymer roller (see special loose actuators on page 2/12)                   |
| <b>3</b>              | with Ø 50 mm rubber roller (see special loose actuators on page 2/12)                    |
| <b>4</b>              | with Ø 50 mm overhanging rubber roller (see special loose actuators on page 2/12)        |

|   |   |
|---|---|
| <b>Preinstalled cable gland or connectors</b> |   |
|   | no cable gland or connector (standard)                              |
| <b>K21</b>                                    | with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range |
| ...   | .....   |
| <b>K50</b>                                    | with 5 poles M12 metal connector                                    |
| ...   | .....   |

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

|                               |                    |
|-------------------------------|--------------------|
| <b>Threaded conduit entry</b> |                    |
|                               | PG 13,5 (standard) |
| <b>M2</b>                     | M20x1,5            |

|                      |   |
|----------------------|---|
| <b>Contacts type</b> |   |
|                      | silver contacts (standard)                                  |
| <b>G</b>             | silver contacts gold plated 1 µm (contact block 2 excluded) |



### Main data

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

### Technical data

#### Housing

Metal housing, coated with baked epoxy powder

One threaded conduit entry

Protection degree: IP67 according to EN 60529

#### 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 actuation frequency: 3600 operations cycles<sup>1</sup>/hour

Mechanical endurance: 20 million operations cycles<sup>1</sup>

Assembling position: any

Driving torque for installation: see pages 7/1-7/10

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

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

|  |      |                          |              |
|--|------|--------------------------|--------------|
| Contact blocks 20, 21, 22, 33, 34:                         | min. | 1 x 0,34 mm <sup>2</sup> | (1 x AWG 22) |
|  | max. | 2 x 1,5 mm <sup>2</sup>  | (2 x AWG 16) |
| Contact blocks 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18: | min. | 1 x 0,5 mm <sup>2</sup>  | (1 x AWG 20) |
|  | max. | 2 x 2,5 mm <sup>2</sup>  | (2 x AWG 14) |
| Contact block 2:   | min. | 1 x 0,5 mm <sup>2</sup>  | (1 x AWG 20) |
|  | max. | 2 x 1,5 mm <sup>2</sup>  | (2 x AWG 16) |

#### In conformity with standards:

IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 50041, IEC 60204-1, EN 60204-1, EN 1088, EN ISO 12100-1, EN ISO 12100-2, IEC 60529, EN 60529, NFC 63-140, VDE 0660-200, VDE 0113.

#### Approvals:

IEC 60947-5-1, UL 508, GB14048.5-2001.

#### Markings and quality marks:



Approval IMQ: EG605  
 Approval UL: E131787  
 Approval CCC: 2007010305230000  
 Approval EZU: 1010151

#### In conformity with requirements requested by:

Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and Electromagnetic Compatibility 2004/108/EC.

#### Positive contact opening in conformity with standards:

IEC 60947-5-1, EN 60947-5-1, VDE 0660-206.

#### Installation for safety applications:

Use only switches marked with the symbol  $\ominus$ . 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 7/4. 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 7/1 to page 7/10.**

#### Electrical data

#### Utilization categories

|                                    |  |  |                                      |     |     |     |
|------------------------------------|--|--|--------------------------------------|-----|-----|-----|
| without connector                  | Thermal current (I <sub>th</sub> ):                  | 10 A   | Alternate current: AC15 (50...60 Hz) |     |     |     |
|                                    | Rated insulation voltage (U <sub>i</sub> ):          | 500 Vac 600 Vdc  | U <sub>e</sub> (V)                   | 250 | 400 | 500 |
|                                    | Rated impulse withstand voltage (U <sub>imp</sub> ): | 400Vac500Vdc(contact blocks 2, 11, 12, 20, 21, 22, 33, 34) | I <sub>e</sub> (A)                   | 6   | 4   | 1   |
|                                    |  | 6 kV   | Direct current: DC13                 |     |     |     |
| Conditional short circuit current: | 1000 A according to EN 60947-5-1                     | U <sub>e</sub> (V)   | 24                                   | 125 | 250 |     |
|                                    | Protection against short circuits:                   | fuse 10 A 500 V type aM                                    | I <sub>e</sub> (A)                   | 6   | 1,1 | 0,4 |
|                                    | Pollution degree:                                    | 3  |                                      |     |     |     |

|                                    |   |                         |                                      |     |     |     |
|------------------------------------|---|-------------------------|--------------------------------------|-----|-----|-----|
| with 5 poles M12 connector         | Thermal current (I <sub>th</sub> ):         | 4 A                     | Alternate current: AC15 (50...60 Hz) |     |     |     |
|                                    | Rated insulation voltage (U <sub>i</sub> ): | 250 Vac 300 Vdc         | U <sub>e</sub> (V)                   | 24  | 120 | 250 |
|                                    | Protection against short circuits:          | fuse 4 A 500 V type gG  | I <sub>e</sub> (A)                   | 4   | 4   | 4   |
|                                    | Pollution degree:                           | 3                       | Direct current: DC13                 |     |     |     |
| Conditional short circuit current: | 1000 A according to EN 60947-5-1            | U <sub>e</sub> (V)      | 24                                   | 125 | 250 |     |
|                                    | Protection against short circuits:          | fuse 10 A 500 V type aM | I <sub>e</sub> (A)                   | 6   | 1,1 | 0,4 |
|                                    | Pollution degree:                           | 3                       |                                      |     |     |     |

|                                    |   |                         |                                      |    |  |
|------------------------------------|---|-------------------------|--------------------------------------|----|--|
| with 8 poles M12 connector         | Thermal current (I <sub>th</sub> ):         | 2 A                     | Alternate current: AC15 (50...60 Hz) |    |  |
|                                    | Rated insulation voltage (U <sub>i</sub> ): | 30 Vac 36 Vdc           | U <sub>e</sub> (V)                   | 24 |  |
|                                    | Protection against short circuits:          | fuse 2 A 500 V type gG  | I <sub>e</sub> (A)                   | 2  |  |
|                                    | Pollution degree:                           | 3                       | Direct current: DC13                 |    |  |
| Conditional short circuit current: | 1000 A according to EN 60947-5-1            | U <sub>e</sub> (V)      | 24                                   |    |  |
|                                    | Protection against short circuits:          | fuse 10 A 500 V type aM | I <sub>e</sub> (A)                   | 6  |  |
|                                    | Pollution degree:                           | 3                       |                                      |    |  |



### Data type approved by IMQ, CCC and EZU

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

Thermal current (Ith): 10 A

Protection against short circuits: fuse 10 A 500 V type aM

Rated impulse withstand voltage (U<sub>imp</sub>): 6 kV  
4 kV (for contact blocks 20, 21, 22, 33, 34)

Protection degree: IP67

MV terminals (screw clamps)

Pollution degree 3

Utilization category: AC15

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

Operation current (Ie): 3 A

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

Positive opening of contacts on contact block 5, 6, 7, 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/CE.

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

### Data type approved by UL

Utilization categories Q300 (69 VA, 125-250 Vdc)  
A600 (720 VA, 120-600 Vac)

Data of the 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 and wire size No. 12-14 AWG. 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 and wire size No. 14 AWG. Terminal tightening torque of 12 lb in (1,4 Nm).

In conformity with standard: UL 508

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

### 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

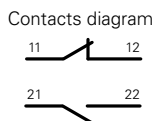
In all switches, it is possible to rotate the head in 90° steps.



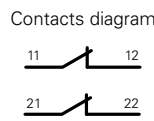
### Working operation of contact block 16 with independent contacts

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

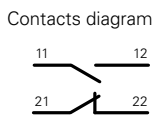
Lever turned to left



Lever not turned

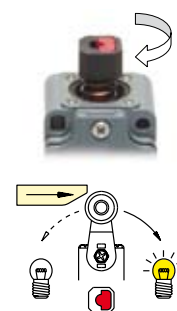
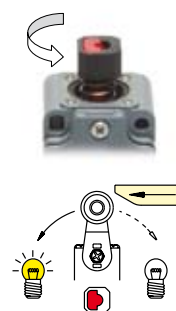
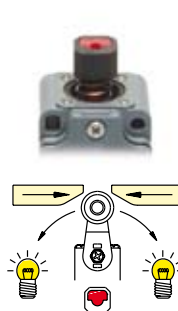


Lever turned to right



### 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).



Contacts type:

- R** = snap action
- L** = slow action
- LO** = slow action overlapped
- LS** = slow action shifted
- LV** = slow action shifted and spaced
- LI** = slow action independent
- LA** = slow action closer
- ⏏** = electronic PNP

Contact blocks

|                 |                       |                       |                    |                       |
|-----------------|-----------------------|-----------------------|--------------------|-----------------------|
|                 |                       |                       |                    |                       |
| 5               | <b>R</b> FD 501       | <b>R</b> FD 502       | <b>R</b> FD 504    | <b>R</b> FD 505       |
| 6               | <b>L</b> FD 601       | <b>L</b> FD 602       | <b>L</b> FD 604    | <b>L</b> FD 605       |
| 7               | <b>LO</b> FD 701      | <b>LO</b> FD 702      | <b>LO</b> FD 704   | <b>LO</b> FD 705      |
| 9               | <b>L</b> FD 901       | <b>L</b> FD 902       | <b>L</b> FD 904    | <b>L</b> FD 905       |
| 10              | <b>L</b> FD 1001      | <b>L</b> FD 1002      | <b>L</b> FD 1004   | <b>L</b> FD 1005      |
| 11              | <b>R</b> FD 1101      | <b>R</b> FD 1102      | <b>R</b> FD 1104   | <b>R</b> FD 1105      |
| 12              | <b>R</b> FD 1201      | <b>R</b> FD 1202      | <b>R</b> FD 1204   | <b>R</b> FD 1205      |
| 13              | <b>LV</b> FD 1301     | <b>LV</b> FD 1302     | <b>LV</b> FD 1304  | <b>LV</b> FD 1305     |
| 14              | <b>LS</b> FD 1401     | <b>LS</b> FD 1402     | <b>LS</b> FD 1404  | <b>LS</b> FD 1405     |
| 15              | <b>LS</b> FD 1501     | <b>LS</b> FD 1502     | <b>LS</b> FD 1504  | <b>LS</b> FD 1505     |
| 18              | <b>LA</b> FD 1801     | <b>LA</b> FD 1802     | <b>LA</b> FD 1804  | <b>LA</b> FD 1805     |
| 20              | <b>L</b> FD 2001      | <b>L</b> FD 2002      | <b>L</b> FD 2004   | <b>L</b> FD 2005      |
| 21              | <b>L</b> FD 2101      | <b>L</b> FD 2102      | <b>L</b> FD 2104   | <b>L</b> FD 2105      |
| 22              | <b>L</b> FD 2201      | <b>L</b> FD 2202      | <b>L</b> FD 2204   | <b>L</b> FD 2205      |
| 2               | <b>R</b> FD 201       | <b>R</b> FD 202       | <b>R</b> FD 204    | <b>R</b> FD 205       |
| E1              | <b>⏏</b> FD E101      | <b>⏏</b> FD E102      | <b>⏏</b> FD E104   | <b>⏏</b> FD E105      |
| Max speed       | page 7/3 - type 4     | page 7/3 - type 3     | 0,5 m/s            | page 7/3 - type 3     |
| Min. force      | 8 N (25 N $\ominus$ ) | 6 N (25 N $\ominus$ ) | 0,17 Nm            | 6 N (25 N $\ominus$ ) |
| Travel diagrams | page 7/4 - group 1    | page 7/4 - group 2    | page 7/4 - group 1 | page 7/4 - group 2    |

|                 |                       |                        |                       |                        |
|-----------------|-----------------------|------------------------|-----------------------|------------------------|
|                 |                       |                        |                       |                        |
| 5               | <b>R</b> FD 508       | <b>R</b> FD 510        | <b>R</b> FD 511       | <b>R</b> FD 515        |
| 6               | <b>L</b> FD 608       | <b>L</b> FD 610        | <b>L</b> FD 611       | <b>L</b> FD 615        |
| 7               | <b>LO</b> FD 708      | <b>LO</b> FD 710       | <b>LO</b> FD 711      | <b>LO</b> FD 715       |
| 9               | <b>L</b> FD 908       | <b>L</b> FD 910        | <b>L</b> FD 911       | <b>L</b> FD 915        |
| 10              | <b>L</b> FD 1008      | <b>L</b> FD 1010       | <b>L</b> FD 1011      | <b>L</b> FD 1015       |
| 11              | <b>R</b> FD 1108      | <b>R</b> FD 1110       | <b>R</b> FD 1111      | <b>R</b> FD 1115       |
| 12              | <b>R</b> FD 1208      | <b>R</b> FD 1210       | <b>R</b> FD 1211      | <b>R</b> FD 1215       |
| 13              | <b>LV</b> FD 1308     | <b>LV</b> FD 1310      | <b>LV</b> FD 1311     | <b>LV</b> FD 1315      |
| 14              | <b>LS</b> FD 1408     | <b>LS</b> FD 1410      | <b>LS</b> FD 1411     | <b>LS</b> FD 1415      |
| 15              | <b>LS</b> FD 1508     | <b>LS</b> FD 1510      | <b>LS</b> FD 1511     | <b>LS</b> FD 1515      |
| 18              | <b>LA</b> FD 1808     | <b>LA</b> FD 1810      | <b>LA</b> FD 1811     | <b>LA</b> FD 1815      |
| 20              | <b>L</b> FD 2008      | <b>L</b> FD 2010       | <b>L</b> FD 2011      | <b>L</b> FD 2015       |
| 21              | <b>L</b> FD 2108      | <b>L</b> FD 2110       | <b>L</b> FD 2111      | <b>L</b> FD 2115       |
| 22              | <b>L</b> FD 2208      | <b>L</b> FD 2210       | <b>L</b> FD 2211      | <b>L</b> FD 2215       |
| 2               | <b>R</b> FD 208       | <b>R</b> FD 210        | <b>R</b> FD 211       | <b>R</b> FD 215        |
| E1              | <b>⏏</b> FD E108      | <b>⏏</b> FD E110       | <b>⏏</b> FD E111      | <b>⏏</b> FD E115       |
| Max speed       | page 7/3 - type 4     | page 7/3 - type 4      | page 7/3 - type 4     | page 7/3 - type 2      |
| Min. force      | 8 N (25 N $\ominus$ ) | 11 N (25 N $\ominus$ ) | 8 N (25 N $\ominus$ ) | 11 N (25 N $\ominus$ ) |
| Travel diagrams | page 7/4 - group 1    | page 7/4 - group 1     | page 7/4 - group 1    | page 7/4 - group 1     |

Accessories See page 6/1

All measures in the drawings are in mm



Contacts type:

- R** = snap action
- L** = slow action
- LO** = slow action overlapped
- LS** = slow action shifted
- LV** = slow action shifted and spaced
- LI** = slow action independent
- LA** = slow action closer
- ⏏** = electronic PNP

Contact blocks

|                 |                    | Ø 8 mm stainless steel sphere | Ø 12,7 mm stainless steel sphere | With external rubber gasket |
|-----------------|--------------------|-------------------------------|----------------------------------|-----------------------------|
| 5 <b>R</b>      | FD 516 → 1NO+1NC   | FD 518 → 1NO+1NC              | FD 519 → 1NO+1NC                 | FD 520 1NO+1NC              |
| 6 <b>L</b>      | FD 616 → 1NO+1NC   | FD 618 → 1NO+1NC              | FD 619 → 1NO+1NC                 |                             |
| 7 <b>LO</b>     | FD 716 → 1NO+1NC   | FD 718 → 1NO+1NC              | FD 719 → 1NO+1NC                 |                             |
| 9 <b>L</b>      | FD 916 → 2NC       | FD 918 → 2NC                  | FD 919 → 2NC                     |                             |
| 10 <b>L</b>     | FD 1016 2NO        | FD 1018 2NO                   | FD 1019 2NO                      | FD 1020 2NO                 |
| 11 <b>R</b>     | FD 1116 → 2NC      | FD 1118 → 2NC                 | FD 1119 → 2NC                    |                             |
| 12 <b>R</b>     | FD 1216 2NO        | FD 1218 2NO                   | FD 1219 2NO                      |                             |
| 13 <b>LV</b>    | FD 1316 → 2NC      | FD 1318 → 2NC                 | FD 1319 → 2NC                    |                             |
| 14 <b>LS</b>    | FD 1416 → 2NC      | FD 1418 → 2NC                 | FD 1419 → 2NC                    |                             |
| 15 <b>LS</b>    | FD 1516 2NO        | FD 1518 2NO                   | FD 1519 2NO                      |                             |
| 18 <b>LA</b>    | FD 1816 → 1S+1Ö    | FD 1818 → 1S+1Ö               | FD 1819 → 1S+1Ö                  | FD 1820 1NO+1NC             |
| 20 <b>L</b>     | FD 2016 → 1NO+2NC  | FD 2018 → 1NO+2NC             | FD 2019 → 1NO+2NC                | FD 2020 1NO+2NC             |
| 21 <b>L</b>     | FD 2116 → 3NC      | FD 2118 → 3NC                 | FD 2119 → 3NC                    | FD 2120 3NC                 |
| 22 <b>L</b>     | FD 2216 → 2NO+1NC  | FD 2218 → 2NO+1NC             | FD 2219 → 2NO+1NC                | FD 2220 2NO+1NC             |
| 2 <b>R</b>      | FD 216 2x(1NO-1NC) | FD 218 2x(1NO-1NC)            | FD 219 2x(1NO-1NC)               | FD 220 2x(1NO-1NC)          |
| E1 <b>⏏</b>     | FD E116 1NO-1NC    | FD E118 1NO-1NC               | FD E119 1NO-1NC                  | FD E120 1NO-1NC             |
| Max speed       | page 7/3 - type 2  | page 7/3 - type 4             | page 7/3 - type 4                | 1 m/s                       |
| Min. force      | 8 N (25 N →)       | 8 N (25 N →)                  | 8 N (25 N →)                     | 0,09 Nm                     |
| Travel diagrams | page 7/4 - group 1 | page 7/4 - group 1            | page 7/4 - group 1               | page 7/4 - group 3          |

|                 | With external rubber gasket | With external rubber gasket | Other rollers available. See page 2/12 | Ø 3 mm stainless steel round rod |
|-----------------|-----------------------------|-----------------------------|--|----------------------------------|
| 5 <b>R</b>      | FD 521 1NO+1NC              | FD 525 1NO+1NC              | FD 531 → 1NO+1NC                       | FD 532 1NO+1NC                   |
| 6 <b>L</b>      |                             |                             | FD 631 → 1NO+1NC                       | FD 632 1NO+1NC                   |
| 7 <b>LO</b>     |                             |                             | FD 731 → 1NO+1NC                       | FD 732 1NO+1NC                   |
| 9 <b>L</b>      |                             |                             | FD 931 → 2NC                           | FD 932 2NC                       |
| 10 <b>L</b>     | FD 1021 2NO                 | FD 1025 2NO                 | FD 1031 2NO                            | FD 1032 2NO                      |
| 11 <b>R</b>     |                             |                             | FD 1131 → 2NC                          | FD 1132 2NC                      |
| 12 <b>R</b>     |                             |                             | FD 1231 2NO                            | FD 1232 2NO                      |
| 13 <b>LV</b>    |                             |                             | FD 1331 → 2NC                          | FD 1332 2NC                      |
| 14 <b>LS</b>    |                             |                             | FD 1431 → 2NC                          | FD 1432 2NC                      |
| 15 <b>LS</b>    |                             |                             | FD 1531 2NO                            | FD 1532 2NO                      |
| 16 <b>LI</b>    |                             |                             | FD 1631 → 2NC                          | FD 1632 2NC                      |
| 18 <b>LA</b>    | FD 1821 1NO+1NC             | FD 1825 1NO+1NC             | FD 1831 → 1NO+1NC                      | FD 1832 1S+1Ö                    |
| 20 <b>L</b>     | FD 2021 1NO+2NC             | FD 2025 1NO+2NC             | FD 2031 → 1NO+2NC                      | FD 2032 1NO+2NC                  |
| 21 <b>L</b>     | FD 2121 3NC                 | FD 2125 3NC                 | FD 2131 → 3NC                          | FD 2132 3NC                      |
| 22 <b>L</b>     | FD 2221 2NO+1NC             | FD 2225 2NO+1NC             | FD 2231 → 2NO+1NC                      | FD 2232 2NO+1NC                  |
| 2 <b>R</b>      | FD 221 2x(1NO-1NC)          | FD 225 2x(1NO-1NC)          | FD 231 2x(1NO-1NC)                     | FD 232 2x(1NO-1NC)               |
| E1 <b>⏏</b>     | FD E121 1NO-1NC             | FD E125 1NO-1NC             | FD E131 1NO-1NC                        | FD E132 1NO-1NC                  |
| Max speed       | 1 m/s                       | 1 m/s                       | page 7/3 - type 1                      | 1,5 m/s                          |
| Min. force      | 0,08 Nm                     | 0,14 Nm                     | 0,1 Nm (0,25 Nm →)                     | 0,1 Nm                           |
| Travel diagrams | page 7/4 - group 3          | page 7/4 - group 3          | page 7/4 - group 4                     | page 7/4 - group 4               |

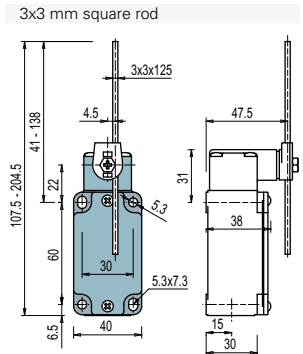
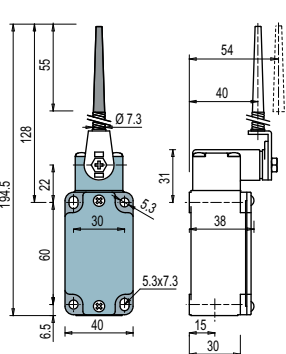
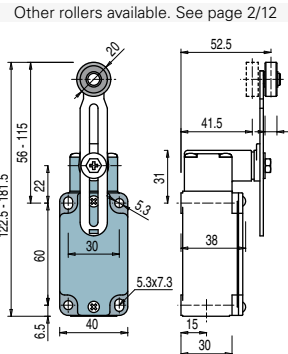
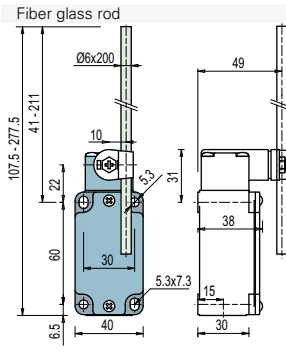
Items with code on the green background are available in stock

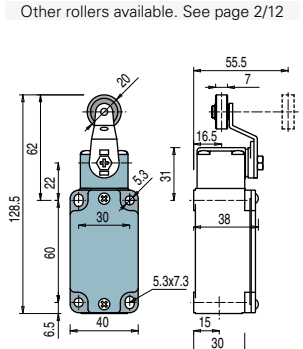
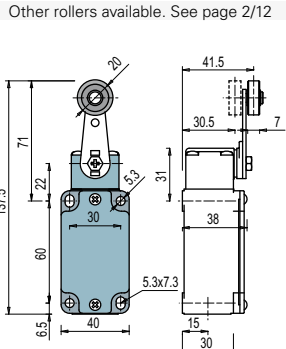
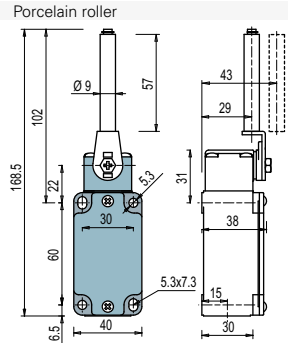
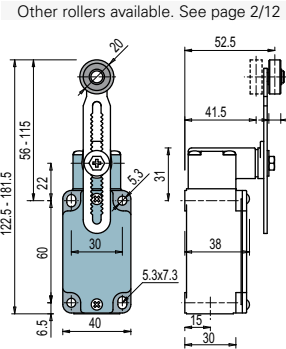


Contacts type:

- R** = snap action
- L** = slow action
- LO** = slow action overlapped
- LS** = slow action shifted
- LV** = slow action shifted and spaced
- LI** = slow action independent
- LA** = slow action closer
- PNP** = electronic PNP

Contact blocks

|                 |   |   |  |   |
|-----------------|---|---|--|---|
|                 |  |  |  |  |
| 5               | <b>R</b> FD 533 1NO+1NC   | FD 534 1NO+1NC  | FD 535 <b>⊕</b> (1) 1NO+1NC  | FD 536 1NO+1NC  |
| 6               | <b>L</b> FD 633 1NO+1NC   | FD 634 1NO+1NC  | FD 635 <b>⊕</b> (1) 1NO+1NC  | FD 636 1NO+1NC  |
| 7               | <b>LO</b> FD 733 1NO+1NC  | FD 734 1NO+1NC  | FD 735 <b>⊕</b> (1) 1NO+1NC  | FD 736 1NO+1NC  |
| 9               | <b>L</b> FD 933 2NC   | FD 934 2NC  | FD 935 <b>⊕</b> (1) 2NC  | FD 936 2NC  |
| 10              | <b>L</b> FD 1033 2NO  | FD 1034 2NO   | FD 1035 2NO  | FD 1036 2NO   |
| 11              | <b>R</b> FD 1133 2NC  | FD 1134 2NC   | FD 1135 <b>⊕</b> (1) 2NC   | FD 1136 2NC   |
| 12              | <b>R</b> FD 1233 2NO  | FD 1234 2NO   | FD 1235 2NO  | FD 1236 2NO   |
| 13              | <b>LV</b> FD 1333 2NC   | FD 1334 2NC   | FD 1335 <b>⊕</b> (1) 2NC   | FD 1336 2NC   |
| 14              | <b>LS</b> FD 1433 2NC   | FD 1434 2NC   | FD 1435 <b>⊕</b> (1) 2NC   | FD 1436 2NC   |
| 15              | <b>LS</b> FD 1533 2NO   | FD 1534 2NO   | FD 1535 2NO  | FD 1536 2NO   |
| 16              | <b>LI</b> FD 1633 2NC   | FD 1634 2NC   | FD 1635 <b>⊕</b> (1) 2NC   | FD 1636 2NC   |
| 18              | <b>LA</b> FD 1833 1S+1Ö   | FD 1834 1S+1Ö   | FD 1835 <b>⊕</b> (1) 1S+1Ö   | FD 1836 1S+1Ö   |
| 20              | <b>L</b> FD 2033 1NO+2NC  | FD 2034 1NO+2NC   | FD 2035 <b>⊕</b> (1) 1NO+2NC   | FD 2036 1NO+2NC   |
| 21              | <b>L</b> FD 2133 3NC  | FD 2134 3NC   | FD 2135 <b>⊕</b> (1) 3NC   | FD 2136 3NC   |
| 22              | <b>L</b> FD 2233 2NO+1NC  | FD 2234 2NO+1NC   | FD 2235 <b>⊕</b> (1) 2NO+1NC   | FD 2236 2NO+1NC   |
| 2               | <b>R</b> FD 233 2x(1NO-1NC)   | FD 234 2x(1NO-1NC)  | FD 235 2x(1NO-1NC)   | FD 236 2x(1NO-1NC)  |
| E1              | <b>PNP</b> FD E133 1NO-1NC  | FD E134 1NO-1NC   | FD E135 1NO-1NC  | FD E136 1NO-1NC   |
| Max speed       | 1,5 m/s   | 1 m/s   | page 7/3 - type 1  | 1,5 m/s   |
| Min. force      | 0,1 Nm  | 0,1 Nm  | 0,1 Nm (0,25 Nm <b>⊕</b> )   | 0,1 Nm  |
| Travel diagrams | page 7/4 - group 4  | page 7/4 - group 4  | page 7/4 - group 4   | page 7/4 - group 4  |

|                 |   |   |  |   |
|-----------------|---|---|--|---|
|                 |  |  |  |  |
| 5               | <b>R</b> FD 551 <b>⊕</b> 1NO+1NC  | FD 552 <b>⊕</b> 1NO+1NC   | FD 553-E11V9 <b>⊕</b> 1NO+1NC  | FD 556 <b>⊕</b> 1NO+1NC   |
| 6               | <b>L</b> FD 651 <b>⊕</b> 1NO+1NC  | FD 652 <b>⊕</b> 1NO+1NC   | FD 653-E11V9 <b>⊕</b> 1NO+1NC  | FD 656 <b>⊕</b> 1NO+1NC   |
| 7               | <b>LO</b> FD 751 <b>⊕</b> 1NO+1NC   | FD 752 <b>⊕</b> 1NO+1NC   | FD 753-E11V9 <b>⊕</b> 1NO+1NC  | FD 756 <b>⊕</b> 1NO+1NC   |
| 9               | <b>L</b> FD 951 <b>⊕</b> 2NC  | FD 952 <b>⊕</b> 2NC   | FD 953-E11V9 <b>⊕</b> 2NC  | FD 956 <b>⊕</b> 2NC   |
| 10              | <b>L</b> FD 1051 2NO  | FD 1052 2NO   | FD 1053-E11V9 2NO  | FD 1056 2NO   |
| 11              | <b>R</b> FD 1151 <b>⊕</b> 2NC   | FD 1152 <b>⊕</b> 2NC  | FD 1153-E11V9 2NC  | FD 1156 <b>⊕</b> 2NC  |
| 12              | <b>R</b> FD 1251 2NO  | FD 1252 2NO   | FD 1253-E11V9 2NO  | FD 1256 2NO   |
| 13              | <b>LV</b> FD 1351 <b>⊕</b> 2NC  | FD 1352 <b>⊕</b> 2NC  | FD 1353-E11V9 <b>⊕</b> 2NC   | FD 1356 <b>⊕</b> 2NC  |
| 14              | <b>LS</b> FD 1451 <b>⊕</b> 2NC  | FD 1452 <b>⊕</b> 2NC  | FD 1453-E11V9 <b>⊕</b> 2NC   | FD 1456 <b>⊕</b> 2NC  |
| 15              | <b>LS</b> FD 1551 2NO   | FD 1552 2NO   | FD 1553-E11V9 2NO  | FD 1556 2NO   |
| 16              | <b>LI</b> FD 1651 <b>⊕</b> 2NC  | FD 1652 <b>⊕</b> 2NC  | FD 1653-E11V9 <b>⊕</b> 2NC   | FD 1656 <b>⊕</b> 2NC  |
| 18              | <b>LA</b> FD 1851 <b>⊕</b> 1NO+1NC  | FD 1852 <b>⊕</b> 1S+1Ö  | FD 1853-E11V9 <b>⊕</b> 1S+1Ö   | FD 1856 <b>⊕</b> 1S+1Ö  |
| 20              | <b>L</b> FD 2051 <b>⊕</b> 1NO+2NC   | FD 2052 <b>⊕</b> 1NO+2NC  | FD 2053-E11V9 <b>⊕</b> 1NO+2NC   | FD 2056 <b>⊕</b> 1NO+2NC  |
| 21              | <b>L</b> FD 2151 <b>⊕</b> 3NC   | FD 2152 <b>⊕</b> 3NC  | FD 2153-E11V9 <b>⊕</b> 3NC   | FD 2156 <b>⊕</b> 3NC  |
| 22              | <b>L</b> FD 2251 <b>⊕</b> 2NO+1NC   | FD 2252 <b>⊕</b> 2NO+1NC  | FD 2253-E11V9 <b>⊕</b> 2NO+1NC   | FD 2256 <b>⊕</b> 2NO+1NC  |
| 2               | <b>R</b> FD 251 2x(1NO-1NC)   | FD 252 2x(1NO-1NC)  | FD 253-E11 2x(1NO-1NC)   | FD 256 2x(1NO-1NC)  |
| E1              | <b>PNP</b> FD E151 1NO-1NC  | FD E152 1NO-1NC   | FD E153-E11V9 1NO-1NC  | FD E156 1NO-1NC   |
| Max speed       | page 7/3 - type 1   | page 7/3 - type 1   | 0,5 m/s  | page 7/3 - type 1   |
| Min. force      | 0,06 Nm (0,25 Nm <b>⊕</b> )   | 0,06 Nm (0,25 Nm <b>⊕</b> )   | 0,03 Nm (0,25 Nm <b>⊕</b> )  | 0,1 Nm (0,25 Nm <b>⊕</b> )  |
| Travel diagrams | page 7/4 - group 4  | page 7/4 - group 4  | page 7/4 - group 5   | page 7/4 - group 4  |

Accessories See page 6/1

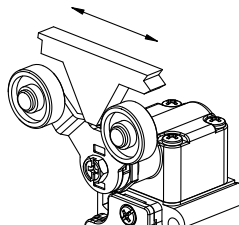
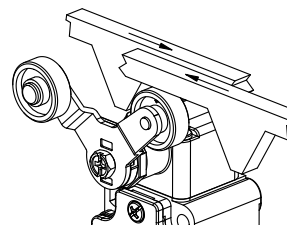
(1) Positive opening only with lever adjusted on the max. See page 2/11.



Contacts type:

- R** = snap action
- L** = slow action
- LO** = slow action overlapped
- LS** = slow action shifted
- LV** = slow action shifted and spaced
- LI** = slow action independent
- LA** = slow action closer
- ⏏** = electronic PNP

Contact blocks

|                 | Other rollers available. See page 2/12 | With stainless steel rollers on request  | With stainless steel rollers on request   | Rope switches for signalling |
|-----------------|--|--|---|------------------------------|
| 5               | <b>R</b> FD 557 1NO+1NC                | FD 541 1NO+1NC   | FD 542 1NO+1NC  | FD 576 1NO+1NC               |
| 6               | <b>L</b> FD 657 1NO+1NC                | Bistable switch with single track lyra lever   | Bistable switch with double track lyra lever  | FD 676 1NO+1NC               |
| 7               | <b>LO</b> FD 757 1NO+1NC               |  |   | FD 776 1NO+1NC               |
| 9               | <b>L</b> FD 957 2NC                    |  <p>0 45° 65° 80° 90°<br/>25° S</p> <p>S = mechanical snap point<br/>positive opening with 21-22 contact only</p> |  <p>0 45° 65° 80° 90°<br/>25° S</p> <p>S = mechanical snap point<br/>positive opening with 21-22 contact only</p> | FD 976 2NO                   |
| 10              | <b>L</b> FD 1057 2NO                   |  |   | FD 1076 2NC                  |
| 11              | <b>R</b> FD 1157 2NC                   |  |   | FD 1176 2NO                  |
| 12              | <b>R</b> FD 1257 2NO                   |  |   | FD 1276 2NC                  |
| 13              | <b>LV</b> FD 1357 2NC                  |  |   | FD 1376 2NO                  |
| 14              | <b>LS</b> FD 1457 2NC                  |  |   | FD 1476 2NO                  |
| 15              | <b>LS</b> FD 1557 2NO                  |  |   | FD 1576 2NC                  |
| 16              | <b>LI</b> FD 1657 2NC                  |  |   | FD 1876 1NO+1NC              |
| 18              | <b>LA</b> FD 1857 1S+1Ö                |  |   | FD 2076 2NO+1NC              |
| 20              | <b>L</b> FD 2057 1NO+2NC               |  |   | FD 2176 3NC                  |
| 21              | <b>L</b> FD 2157 3NC                   | FD 2276 1NO+2NC  |   |                              |
| 22              | <b>L</b> FD 2257 2NO+1NC               | FD 276 2x(1NO-1NC)   |   |                              |
| 2               | <b>R</b> FD 257 2x(1NO-1NC)            |  |   |                              |
| E1              | <b>⏏</b> FD E157 1NO-1NC               |  |   |                              |
| Max speed       | page 7/3 - type 1                      | 0,5 m/s with 30° cam   | 0,5 m/s with 30° cam  | 0,5 m/s                      |
| Min. force      | 0,1 Nm (0,25 Nm <b>⊕</b> )             | 0,21 Nm  | 0,21 Nm   | initial 20 N - final 40 N    |
| Travel diagrams | page 7/4 - group 4                     |  |   | page 7/4 - group 6           |

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

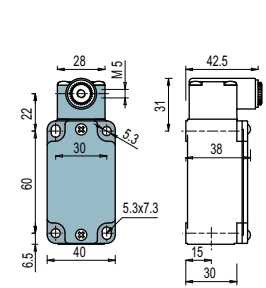


Position switches with revolving lever without actuator

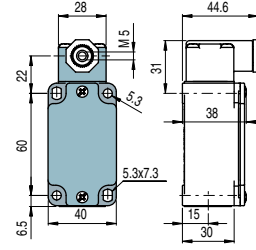
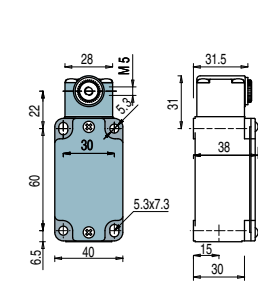
Contacts type:

- R** = snap action
- L** = slow action
- LO** = slow action overlapped
- LS** = slow action shifted
- LV** = slow action shifted and spaced
- LI** = slow action independent
- LA** = slow action closer
- ⏏** = electronic PNP

Regular head



Compact head



**IMPORTANT**

**For safety applications:** join only switches and actuators marked with symbol For more information about safety applications see page 7/1.

Contact blocks

|                 |           |                    |  |             |                    |  |                                 |   |
|-----------------|-----------|--------------------|--|-------------|--------------------|--|---------------------------------|---|
| 5               | <b>R</b>  | <b>FD 538</b>      |  | 1NO+1NC     | <b>FD 558</b>      |  | 1NO+1NC                         | <b>FD 540</b> 1NO+1NC<br>Bistable switch<br><br>S = mechanical snap point<br>positive opening with 21-22 contact only |
| 6               | <b>L</b>  | <b>FD 638</b>      |  | 1NO+1NC     | <b>FD 658</b>      |  | 1NO+1NC                         |   |
| 7               | <b>LO</b> | <b>FD 738</b>      |  | 1NO+1NC     | <b>FD 758</b>      |  | 1NO+1NC                         |   |
| 9               | <b>L</b>  | <b>FD 938</b>      |  | 2NC         | <b>FD 958</b>      |  | 2NC                             |   |
| 10              | <b>L</b>  | <b>FD 1038</b>     |  | 2NO         | <b>FD 1058</b>     |  | 2NO                             |   |
| 11              | <b>R</b>  | <b>FD 1138</b>     |  | 2NC         | <b>FD 1158</b>     |  | 2NC                             |   |
| 12              | <b>R</b>  | <b>FD 1238</b>     |  | 2NO         | <b>FD 1258</b>     |  | 2NO                             |   |
| 13              | <b>LV</b> | <b>FD 1338</b>     |  | 2NC         | <b>FD 1358</b>     |  | 2NC                             |   |
| 14              | <b>LS</b> | <b>FD 1438</b>     |  | 2NC         | <b>FD 1458</b>     |  | 2NC                             |   |
| 15              | <b>LS</b> | <b>FD 1538</b>     |  | 2NO         | <b>FD 1558</b>     |  | 2NO                             |   |
| 16              | <b>LI</b> | <b>FD 1638</b>     |  | 2NC         |                    |  |                                 |   |
| 18              | <b>LA</b> | <b>FD 1838</b>     |  | 1NO+1NC     | <b>FD 1858</b>     |  | 1NO+1NC                         |   |
| 20              | <b>L</b>  | <b>FD 2038</b>     |  | 1NO+2NC     | <b>FD 2058</b>     |  | 1NO+2NC                         |   |
| 21              | <b>L</b>  | <b>FD 2138</b>     |  | 3NC         | <b>FD 2158</b>     |  | 3NC                             |   |
| 22              | <b>L</b>  | <b>FD 2238</b>     |  | 2NO+1NC     | <b>FD 2258</b>     |  | 2NO+1NC                         |   |
| 2               | <b>R</b>  | <b>FD 238</b>      |  | 2x(1NO-1NC) | <b>FD 258</b>      |  | 2x(1NO-1NC)                     |   |
| E1              | <b>⏏</b>  | <b>FD E138</b>     |  | 1NO-1NC     | <b>FD E158</b>     |  | 1NO-1NC                         |   |
| Min. force      |           | 0,1 Nm (0,25 Nm    |  |             | 0,06 Nm (0,25 Nm   |  |                                 |   |
| Travel diagrams |           | page 7/4 - group 4 |  |             | page 7/4 - group 4 |  | 0,5 m/s with 30° cam<br>0,21 Nm |   |

Loose actuators

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

| Polymer roller<br>Ø 20 mm     | Adjustable round rod<br>Ø 3x125 mm | Adjustable square rod<br>3x3x125 mm | Flexible rod actuator     | Adjustable actuator with<br>polymer roller | Adjustable fiber glass rod                          |                           |
|-------------------------------|------------------------------------|-------------------------------------|---------------------------|--|---|---------------------------|
|                               |                                    |                                     |                           |  |   |                           |
| <b>VF L31</b>                 | <b>VF L32</b> <sup>(3)</sup>       | <b>VF L33</b> <sup>(3)</sup>        | <b>VF L34</b>             | <b>VF L35</b> <sup>(1) (3)</sup>           | <b>VF L36</b> <sup>(3)</sup>                        |                           |
| Single track<br>lyra actuator | Double tracks<br>lyra actuator     | Polymer roller<br>Ø 20 mm           | Polymer roller<br>Ø 20 mm | Porcelain roller                           | Adjustable safety actua-<br>tor with polymer roller | Polymer roller<br>Ø 20 mm |
|                               |                                    |                                     |                           |  |   |                           |
| <b>VF L41</b>                 | <b>VF L42</b>                      | <b>VF L51</b>                       | <b>VF L52</b>             | <b>VF L53</b> <sup>(2)</sup>               | <b>VF L56</b> <sup>(3)</sup>                        | <b>VF L57</b>             |

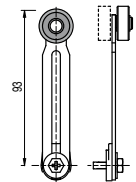
- Only orders for multiple quantities of the packs are accepted.

<sup>(1)</sup> 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.

<sup>(2)</sup> The position switch obtained by assembling the switch FD •58 (e.g. FD 558, FD 658) with the actuator VF L53 will not present the same travel diagrams and actuating forces as the position switch FD •53-E11V9 (e.g. FD 553-E11V9, FD 653-E11V9...).

<sup>(3)</sup> If it is installed with switch FD •58 (e.g. FD 558, FD 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.

<sup>(4)</sup> The actuator cannot be oriented to inside direction because it will mechanically interfere with the switch head.



**Accessories** See page 6/1

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



### Special loose actuators

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

Ø 20 mm stainless steel rollers

|              |                  |              |              |              |              |
|--------------|------------------|--------------|--------------|--------------|--------------|
|              |                  |              |              |              |              |
| VF L31-1 (1) | VF L35-1 (1) (3) | VF L51-1 (1) | VF L52-1 (1) | VF L56-1 (3) | VF L57-1 (1) |

Ø 35 mm polymer rollers

|              |                  |              |              |              |              |
|--------------|------------------|--------------|--------------|--------------|--------------|
|              |                  |              |              |              |              |
| VF L31-2 (4) | VF L35-2 (1) (3) | VF L51-2 (4) | VF L52-2 (1) | VF L56-2 (3) | VF L57-2 (1) |

Ø 40 mm rubber rollers

|               |                   |               |               |               |               |
|---------------|-------------------|---------------|---------------|---------------|---------------|
|               |                   |               |               |               |               |
| VF L31-R5 (4) | VF L35-R5 (1) (3) | VF L51-R5 (4) | VF L52-R5 (1) | VF L56-R5 (3) | VF L57-R5 (4) |

Ø 50 mm rubber rollers

|              |                  |              |              |              |              |
|--------------|------------------|--------------|--------------|--------------|--------------|
|              |                  |              |              |              |              |
| VF L31-3 (4) | VF L35-3 (1) (3) | VF L51-3 (4) | VF L52-3 (4) | VF L56-3 (3) | VF L57-3 (4) |

Ø 50 mm overhanging rubber rollers

|                  |              |
|------------------|--------------|
|                  |              |
| VF L35-4 (1) (3) | VF L56-4 (3) |

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[5ML1-E1](#) [5ML31](#) [LZG1](#) [LZL1-6C](#) [622EN114-R](#) [622EN18-6](#) [622EN224-6B](#) [622EN230](#) [622EN237-R](#) [622EN69-3](#) [622EN85-RB](#) [MA-10019](#)  
[6PA109](#) [7LS51](#) [83547001](#) [83725002](#) [83830001](#) [83840701](#) [83841001](#) [83881140](#) [8AS42](#) [8LS10](#) [8LS125-4PG](#) [8LS152-4PGN20](#) [914CE16-](#)  
[3A](#) [914CE3-3L1](#) [915PA10](#) [91MCE16-P2O](#) [924CE16-Y3](#) [924CE1-S6](#) [924CE1-T25A](#) [924CE1-T3](#) [924CE1-T9A](#) [924CE2-T9](#) [924CE31-Y20-](#)  
[X5](#) [924CE31-Y3L1](#) [GL-10054](#) [GLDB03C-6](#) [GLZ324](#) [H3141CAKAA](#) [RDI-G-L5B](#) [DD-10000](#) [DT-2R3-A7](#) [14CE16-3N28](#) [14CE18-N15](#)  
[151ML3-E1](#) [E3102BAAAA](#) [BFL1-AW1-S](#) [1EN329-R](#) [1LS1-4PGN159](#)