Selection diagram

FD
FL
FC

CONTACT BLOCKS
18 1NO+1NC slow action
7 1NO+1NC slow action overlapped
9 2NC slow action
20 1NO+2NC slow action

21 3NC slow action
22 2NO+1NC slow action
33 1NO+1NC slow action
34 2NC slow action

CONDUIT ENTRIES
Threaded conduit entries (standard)
With cable gland assembled
With M12 metal connector assembled and wired

product option
accessory sold separately
### Code structure

<table>
<thead>
<tr>
<th>Housing</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FD</strong></td>
<td><strong>GM2K50</strong></td>
</tr>
<tr>
<td>FD</td>
<td>metal housing, one conduit entry</td>
</tr>
<tr>
<td>FL</td>
<td>metal housing, three conduit entries</td>
</tr>
</tbody>
</table>

#### Contact blocks

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1NO+1NC, slow action</td>
</tr>
<tr>
<td>7</td>
<td>1NO+1NC, slow action overlapped</td>
</tr>
<tr>
<td>9</td>
<td>2NC, slow action</td>
</tr>
<tr>
<td>20</td>
<td>1NO+2NC, slow action</td>
</tr>
<tr>
<td>21</td>
<td>3NC, slow action</td>
</tr>
<tr>
<td>22</td>
<td>2NO+1NC, slow action</td>
</tr>
<tr>
<td>33</td>
<td>1NO+1NC, slow action</td>
</tr>
<tr>
<td>34</td>
<td>2NC, slow action</td>
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</table>

#### Contacts type

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>silver contacts gold plated 1 µm</td>
</tr>
</tbody>
</table>

#### Threaded conduit entry

| PG 13.5 (standard) | M2 M20x1.5 |

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<table>
<thead>
<tr>
<th>Housing</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FC</strong></td>
<td><strong>M1K22</strong></td>
</tr>
<tr>
<td>FC</td>
<td>metal housing, one conduit entry</td>
</tr>
</tbody>
</table>

#### Contact blocks

<table>
<thead>
<tr>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>1NO+1NC, slow action</td>
</tr>
<tr>
<td>34</td>
<td>2NC, slow action</td>
</tr>
</tbody>
</table>

### Preinstalled cable gland or connectors

**K21**
- no cable gland or connector (standard)
- with assembled cable gland suitable for Ø 6 to Ø 12 mm cables range

**K50**
- with 5 poles M12 metal connector

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

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### Housing

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FD</td>
<td>metal housing, one conduit entry</td>
</tr>
<tr>
<td>FL</td>
<td>metal housing, three conduit entries</td>
</tr>
<tr>
<td>FC</td>
<td>metal housing, one conduit entry</td>
</tr>
<tr>
<td>FC</td>
<td>metal housing, one conduit entry</td>
</tr>
</tbody>
</table>

### Threaded conduit entry

| PG 11 (standard) | M1 M16x1.5 |

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

Housing
Housing type FD, FL and FC made of metal, coated with baked epoxy powder. Stainless steel actuator.
FD, FC series one conduit entry
FL series three conduit entries
Protection degree: IP67 according to EN 60529

General data
Safety parameters: see page 6/32
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: 1 million of operations cycles
Max actuating speed: 180°/s
Min. actuating speed: 2°/s
Driving torque for installation: see pages 6/1-6/10

Cross section of the conductors (flexible copper wire)
Contact blocks 20, 21, 22, 33, 34:
- min. 1 x 0,34 mm² (1 x AWG 22)
- max. 2 x 1,5 mm² (2 x AWG 16)
Contact blocks 7, 9, 18:
- min. 1 x 0,5 mm² (1 x AWG 20)
- max. 2 x 2,5 mm² (2 x AWG 14)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, 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, 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 0680-206.

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.

Main data
- Metal housing, from one to three conduit entries
- Protection degree IP67
- 8 contact blocks available
- Stainless steel actuator
- M12 assembled connector versions
- Silver contacts gold plated versions

Markings and quality marks:
Approval IMQ: EG605 (FD-FL-FC series)
Approval UL: E131787
Approval CCC: 2007010305230000 (FD-FL-FC series)
Approval EZU: 1010151

In conformity with requirements requested by:
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, VDE 0680-206.
**Description**

These safety switches have been designed to control gates or guards which protect against hazardous parts of the machines. They are very sensitive and positively open the contacts after few degrees of rotation, sending an immediate stop signal. The head may rotate in 90° steps, allowing its installation in a great variety of positions. The metal housing and the stainless steel actuator allow this switch to be used even in hard environments where sedimented powder or dirty could block working of safety switches with separated actuator.

**Rotating heads**

Removing the four fastening screws, in all switches, it is possible to rotate the head in 90° steps.

**Installation examples**

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

- Rated insulation voltage (U1): 500 Vac
- 400 Vac for contact blocks 20, 21, 22, 33, 34
- Thermal current (Ith): 10 A
- Protection against short circuits: 10 A; 500 V type aM
- 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: Zb, Y+Y, Y+Y+X, Y+Y+Y, Y+X+X
- Positive opening of contacts on contact block 7, 9, 18, 20, 21, 22, 33, 34

In conformity with standards: EN60947-1, EN 60947-5-1 and subsequent modifications and completions, fundamental requirements of the Low Voltage Directive 2006/95/CE and subsequent modifications and completions.

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 use 60 or 75 °C copper (Cu) conductor and wire size No. 12-14 AWG. Terminal tightening torque of 2.1 lb-in (0.8 Nm).
- In conformity with standard: UL 508

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

**Contacts type:**
- L = slow action
- LO = slow action overlapped

**Contact blocks:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Example Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>FD 1895 1NO+1NC</td>
<td><img src="fd1895_1no1nc.png" alt="Diagram" /></td>
</tr>
<tr>
<td>7</td>
<td>FD 795 1NO+1NC</td>
<td><img src="fd795_1no1nc.png" alt="Diagram" /></td>
</tr>
<tr>
<td>9</td>
<td>FD 995 2NC</td>
<td><img src="fd995_2nc.png" alt="Diagram" /></td>
</tr>
<tr>
<td>20</td>
<td>FD 2095 1NO+2NC</td>
<td><img src="fd2095_1no2nc.png" alt="Diagram" /></td>
</tr>
<tr>
<td>21</td>
<td>FD 2195 2NC</td>
<td><img src="fd2195_2nc.png" alt="Diagram" /></td>
</tr>
<tr>
<td>22</td>
<td>FD 2295 2NO+1NC</td>
<td><img src="fd2295_2no1nc.png" alt="Diagram" /></td>
</tr>
<tr>
<td>33</td>
<td>FD 3395 1NO+1NC</td>
<td><img src="fd3395_1no1nc.png" alt="Diagram" /></td>
</tr>
<tr>
<td>34</td>
<td>FD 3495 2NC</td>
<td><img src="fd3495_2nc.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>

**Min. force:**
- 0,15 Nm (0,4 Nm)

### How to read travel diagrams

**Example diagram**

**IMPORTANT:**
In safety applications it is necessary to activate the switch at least up to the positive opening point indicated in the diagrams with the symbol  . Operate the switch at least with the positive opening force, indicated between brackets, below each article, next the value of minimum force.

**Accessories:** See page 5/1

All measures in the drawings are in mm.
Regulation of intervention point

Temporary shaft locking (dowel provided).

Verify the operating point according to EN 294, adjust the operating point again if necessary.

Switch locking (pin provided).