Selection diagram

Safety rope switches with reset for emergency stop

ACTUATORS

78

ACTUATORS

78

83

84

CONTACT BLOCKS

18 1NO+1NC slow action

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

LED SIGNALLING LIGHT

Red

Yellow

CONDUIT ENTRIES

Threaded conduit entry (standard)

With cable gland

With M12 plastic connector

With M12 metal connector

For other available signal lamps, see page 312

product option

accessory sold separately
### Code structure

**FD 1878-E7G2K50T6**

<table>
<thead>
<tr>
<th>Article</th>
<th>Options</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Housing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FD</td>
<td>metal, one conduit entry</td>
<td></td>
</tr>
<tr>
<td>FL</td>
<td>metal, three conduit entries</td>
<td></td>
</tr>
<tr>
<td>FP</td>
<td>technopolymer, one conduit entry</td>
<td></td>
</tr>
<tr>
<td><strong>Contact block</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>1NO+1NC, slow action</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2NC, slow action</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>1NO+2NC, slow action</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>3NC, slow action</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>2NO+1NC, slow action</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>1NO+1NC, slow action</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>2NC, slow action</td>
<td></td>
</tr>
<tr>
<td><strong>Actuating head</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>longitudinal head</td>
<td></td>
</tr>
<tr>
<td>83</td>
<td>left transversal head (FD-FL housing only)</td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>right transversal head (FD-FL housing only)</td>
<td></td>
</tr>
<tr>
<td><strong>Actuating force</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E7</td>
<td>initial 20 N...final 40 N (only head 78)</td>
<td></td>
</tr>
<tr>
<td>E9</td>
<td>initial 13 N...final 75 N (only head 83-84)</td>
<td></td>
</tr>
</tbody>
</table>

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

**Ambient temperature**

-25°C ... +80°C (standard)

**Pre-installed cable glands or connectors**

no cable gland (standard)

K23 cable gland for cables Ø 6 ... 12 mm

K50 M12 metal connector, 5-pole

For the complete list of possible combinations please contact our technical department.

**Threaded conduit entry**

M2 M20x1.5 (standard)

PG 13.5

**Contact type**

silver contacts (standard)

g silver contacts with 1 µm gold coating

**Options**

**Ambient temperature**

-25°C ... +80°C (standard)

T6 -40°C ... +80°C

**Pre-installed cable glands or connectors**

no cable gland (standard)

K23 cable gland for cables Ø 6 ... 12 mm

K50 M12 metal connector, 5-pole

**Threaded conduit entry**

M2 M20x1.5 (standard)

PG 11

**Contact type**

silver contacts (standard)

g silver contacts with 1 µm gold coating
Technical data

Housing
FP series housing made of glass fibre reinforced technopolymer, self-extinguishing, shock-proof and with double insulation:
FD, FL and FC series: metal housing, baked powder coating,
FD, FP, FC series: one threaded conduit entry:
M20x1.5 (standard)
FL series: three threaded conduit entries:
M20x1.5 (standard)
Protection degree:
IP67 acc. to EN 60529 with cable gland of equal or higher protection degree

General data
For safety applications up to:
SIL 3 acc. to EN 62061
PL e acc. to EN ISO 13849-1
Safety parameters:
B10D: 2,000,000 for NC contacts
Service life: 20 years
Ambient temperature: -25°C … +80°C
Max. actuation frequency: 1 cycle / 6 s
Mechanical endurance: 1 million operating cycles
Max. actuation speed: 0.5 m/s
Min. actuation speed: 1 mm/s
Tightening torques for installation:
see page 313-324

Max. cable cross section (flexible copper strands)
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 18, 9:
min. 1 x 0.5 mm² (1 x AWG 20)
max. 2 x 2.5 mm² (2 x AWG 14)

In compliance with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, IEC 60204-1, EN 60204-1, EN ISO 14119,
EN ISO 12100, IEC 60529, EN 60529, EN ISO 13850, EN 418, UL 508, CSA 22.2
No.14.
Approvals:
IEC 60947-5-1, UL 508, CSA 22.2 No.14, GB14048.5-2001.

Compliance with the requirements of:
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1.

Quality marks:
IMQ approval: EG605
UL approval: E131787
CCC approval: 2007010305230000
(FD-FL-FC series)
2007010305230014
(FP series)
EAC approval: RU C-IT.А435.В.00454

Main features
• Metal or plastic housing, from one to three conduit entries
• Protection degree IP67
• In compliance with EN ISO 13850
• 7 contact blocks available
• Versions with vertical or horizontal actuation
• Versions with assembled M12 connector
• Versions with gold-plated silver contacts

Electrical data

<table>
<thead>
<tr>
<th>Without connector</th>
<th>with M12 connector with pole and stop</th>
<th>with M12 connector, pole only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal current (Iₚₜ)</td>
<td>10 A</td>
<td>4 A</td>
</tr>
<tr>
<td>Rated insulation voltage (Uₚ)</td>
<td>500 Vac 600 Vdc</td>
<td>250 Vac 300 Vdc</td>
</tr>
<tr>
<td>Rated impulse withstand voltage (Uₚₜ)</td>
<td>6 kV</td>
<td>4 kV</td>
</tr>
<tr>
<td>Conditional short circuit current</td>
<td>1000 A acc. to EN 60947-5-1</td>
<td>type aM fuse 10 A 500 V</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

Utilization category

<table>
<thead>
<tr>
<th>Alternating current: AC15 (50÷60 Hz)</th>
<th>Direct current: DC13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uₑ (V)</td>
<td>Iₑ (A)</td>
</tr>
<tr>
<td>250</td>
<td>6</td>
</tr>
<tr>
<td>400</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternating current: AC15 (50÷60 Hz)</th>
<th>Direct current: DC13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uₑ (V)</td>
<td>Iₑ (A)</td>
</tr>
<tr>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternating current: AC15 (50÷60 Hz)</th>
<th>Direct current: DC13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uₑ (V)</td>
<td>Iₑ (A)</td>
</tr>
<tr>
<td>24</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>1.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternating current: AC15 (50÷60 Hz)</th>
<th>Direct current: DC13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uₑ (V)</td>
<td>Iₑ (A)</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>


⚠️ If not expressly indicated in this chapter, for correct installation and utilization of all articles see chapter utilization requirements from page 313 to page 324.
Description

These rope-operated safety switches are installed on machines or conveyer belts and allow the machine to be brought to an emergency stop from any point and with any pull on the rope. This means significant cost savings for medium and large machines, since multiple emergency-stop buttons can be replaced with a single switch. They are equipped with a self-control function that constantly checks the correct function and signals a possible loosening or breaking of the rope through the opening of the contacts. These safety switches keep the contacts open after activation until the reset is performed, even if the rope is released.

Head with variable orientation

For all switches, the head can be adjusted in 90° steps after removing the four fastening screws.

Extended temperature range

These devices are also available in a special version suitable for an ambient operating temperature range from -40°C up to +80°C. They can therefore be used for applications in cold stores, sterilisers and other equipment with low temperature environments. The special materials used to produce these versions retain their characteristics even under these conditions, thereby expanding the installation possibilities.

Indicator for rope adjustment

All switches are provided with a green ring that shows the area of the correct tightening of the rope. The installer has only to tighten the rope until the black indicator will be in the middle of the green area. With this setting, the switch can be reset by pulling the blue knob to close the electrical safety contacts.

If the tension (or loosening) on the rope is so high that the black indicator exits the green area, the electrical safety contacts will open and the reset device will trigger.

Features approved by IMQ

- Rated insulation voltage (Ue): 500 Vac
- Conventional free air thermal current (Ith): 10 A
- Protection against short circuits: type aM fuse 10 A 500 V
- Rated impulse withstand voltage (Uimp): 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: Zb, Y+Y, Y+Y+X, Y+Y+Y, Y+X+X
Positive opening contacts on contact blocks 18, 9, 20, 21, 22, 33, 34

In compliance with standards: EN 60947-1, EN 60947-5-1 + A1:2009, fundamental requirements of the Low Voltage Directive 2014/35/EU

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

Laser engraving

All devices are marked using a dedicated indelible laser system. These engravings are therefore suitable for extreme environments too. Thanks to this system that does not use labels, the loss of plate data is prevented and a greater resistance of the marking is achieved over time.

Protection degree IP67

These devices are designed to be used in the toughest environmental conditions and they pass the IP67 immersion test acc. to EN 60529. They can therefore be used in all environments where maximum protection degree of the housing is required.

Reduced actuating force

These switches can be supplied with reduced hardness internal springs on request. The force required to actuate the switch can thereby be reduced without changing the actuating path of the electrical contacts. This is particularly advantageous for smaller spans, but must, however, always make use of rope pulleys.

Features approved by UL

- Utilization categories: Q300 (69 VA, 125-250 Vdc)
- A600 (720 VA, 120-600 Vac)
- Housing features type 1, 4X "indoor use only" , 12, 13
- For all contact blocks use 60 or 75 °C copper (Cu) conductor, rigid or flexible, wire size 12, 14 AWG. Tightening torque for terminal screws of 7.1 lb in (0.8 Nm).
- In compliance with standard: UL 508, CSA 22.2 No.14

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

All values in the drawings are in mm.

**Contact type:**
- L = slow action

**Contact block**

<table>
<thead>
<tr>
<th>Code</th>
<th>Actuating force</th>
<th>Travel diagrams</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP 1878-M2</td>
<td>Initial 63 N…final 83 N (90 N)</td>
<td>page 174 - group 1</td>
</tr>
<tr>
<td>FD 1878-M2</td>
<td>Initial 147 N…final 235 N (250 N)</td>
<td>page 174 - group 2</td>
</tr>
<tr>
<td>FP 978-M2</td>
<td>Initial 63 N…final 83 N (90 N)</td>
<td>page 174 - group 1</td>
</tr>
<tr>
<td>FD 978-M2</td>
<td>Initial 147 N…final 235 N (250 N)</td>
<td>page 174 - group 2</td>
</tr>
<tr>
<td>FP 2078-M2</td>
<td>Initial 63 N…final 83 N (90 N)</td>
<td>page 174 - group 1</td>
</tr>
<tr>
<td>FD 2078-M2</td>
<td>Initial 147 N…final 235 N (250 N)</td>
<td>page 174 - group 2</td>
</tr>
<tr>
<td>FP 2178-M2</td>
<td>Initial 63 N…final 83 N (90 N)</td>
<td>page 174 - group 1</td>
</tr>
<tr>
<td>FD 2178-M2</td>
<td>Initial 147 N…final 235 N (250 N)</td>
<td>page 174 - group 2</td>
</tr>
<tr>
<td>FP 2278-M2</td>
<td>Initial 63 N…final 83 N (90 N)</td>
<td>page 174 - group 1</td>
</tr>
<tr>
<td>FD 2278-M2</td>
<td>Initial 147 N…final 235 N (250 N)</td>
<td>page 174 - group 2</td>
</tr>
<tr>
<td>FP 3378-M2</td>
<td>Initial 63 N…final 83 N (90 N)</td>
<td>page 174 - group 1</td>
</tr>
<tr>
<td>FD 3378-M2</td>
<td>Initial 147 N…final 235 N (250 N)</td>
<td>page 174 - group 2</td>
</tr>
<tr>
<td>FP 3478-M2</td>
<td>Initial 63 N…final 83 N (90 N)</td>
<td>page 174 - group 1</td>
</tr>
<tr>
<td>FD 3478-M2</td>
<td>Initial 147 N…final 235 N (250 N)</td>
<td>page 174 - group 2</td>
</tr>
</tbody>
</table>

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

**Accessories** See page 299

The 2D and 3D files are available at www.pizzato.com
How to read travel diagrams

All values in the diagrams are in mm.

**IMPORTANT:**
In safety applications, actuate the switch at least up to the positive opening travel shown in the travel diagrams with symbol ♻. Actuate the switch at least with the positive opening force, reported in brackets below each article, next to the actuating force value.

**Travel diagrams table**

<table>
<thead>
<tr>
<th>Contact block</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 1NO+1NC</td>
<td>11 29</td>
<td>8 4 6 8.5</td>
</tr>
<tr>
<td>9 2NC</td>
<td>11 21</td>
<td>8 4 6 8.5</td>
</tr>
<tr>
<td>20 1NO+2NC</td>
<td>11 23</td>
<td>8 4 6 8.5</td>
</tr>
<tr>
<td>21 3NC</td>
<td>11 21 31</td>
<td>8 4 6 8.5</td>
</tr>
<tr>
<td>22 2NO+1NC</td>
<td>11 23</td>
<td>8 4 6 8.5</td>
</tr>
<tr>
<td>33 1NC+1NO</td>
<td>11 21</td>
<td>8 4 6 8.5</td>
</tr>
<tr>
<td>34 2NC</td>
<td>11 21</td>
<td>8 4 6 8.5</td>
</tr>
</tbody>
</table>
Safety rope switches with reset for emergency stop

Application examples and max. rope length for switches with longitudinal head

Example A

Example B

Example C

Example D

Application examples and max. rope length for switches with transversal head

Example F

Example G

Example H

Example I
### Maximum spans

The max. recommended spans are indicated in the diagram as a function of the temperature fluctuations (temperature differences) to which the switch may be exposed at the point of use.

For instance, with installation of type C and a temperature difference of 30°C, the max. recommended rope length is 10 metres.

---

#### Adjustment of the switching point

Tighten the rope connected to the switch, until the end of the indicator (1) reaches about the middle of the green ring (2).

Pull the knob (3) in order to close the safety contacts inside the switch. Below the knob a green ring (4) will be disclosed.

---

Important: The above data are guaranteed only using original rope and accessories. See page 185.