Selection diagram

Rope safety switches with reset for emergency stop

ACTUATORS

FP 78
FD 78
FL 83
FC 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

CONDUIT ENTRIES

Threaded conduit entry
With cable gland assembled
With M12 plastic connector assembled and wired
With M12 metal connector assembled and wired

PRODUCT OPTION
ACCESSORYSOLDSEPARATELY

product option
accessory sold separately
**Code structure**

**FD 1878-GM2K50**

**Housing**
- **FD**: metal housing, one conduit entry
- **FL**: metal housing, three conduit entries
- **FP**: polymer housing, one conduit entry

**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

**Actuating head**
- **78**: longitudinal head
- **83**: left transversal head [FD-FL housing only]
- **84**: right transversal head [FD-FL housing only]

**FC 3378-GM1K22**

**Housing**
- **FC**: metal housing, one conduit entry

**Contact blocks**
- **33**: 1NO+1NC, slow action
- **34**: 2NC, slow action

**Actuating head**
- **78**: longitudinal head
- **83**: left transversal head
- **84**: right transversal head

**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

**Threaded conduit entry**
- **PG 13.5 (standard)**
- **M2**: M20x1,5

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

#### Housing

- Housing type FP made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin with double insulation.
- Housing type FD and FC made of metal, coated with baked epoxy powder.
- FD, FP and 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:** 1 operation cycles / 6 s
- **Mechanical endurance:** 1 million of operations cycles
- **Max actuating speed:** 0,5 m/s
- **Min. actuating speed:** 1 mm/s

#### 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 18, 9: 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, EN ISO 13850, EN 418, NFC 63-140, VDE 0660-200, VDE 0113, CENELEC EN 50013.

#### Electrical data

<table>
<thead>
<tr>
<th>Utilization categories</th>
<th>Thermal current (Ith): 10 A</th>
<th>Thermal current (Ith): 4 A</th>
<th>Thermal current (Ith): 2 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate current: AC15 (50...60 Hz)</td>
<td>500 Vac 600 Vdc</td>
<td>250 Vac 300 Vdc</td>
<td>30 Vac 36 Vdc</td>
</tr>
<tr>
<td>Ue (V)</td>
<td>250</td>
<td>120</td>
<td>24</td>
</tr>
<tr>
<td>le (A)</td>
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<td>4</td>
<td>2</td>
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<tr>
<td>Direct current: DC13</td>
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</tr>
<tr>
<td>Ue (V)</td>
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</tr>
<tr>
<td>le (A)</td>
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</tr>
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</table>

#### Markings and quality marks:

- Approval IMQ: EG605 (IFD-FL/FC series)
- EG606 (FP series)
- Approval UL: E131787
- Approval CCC: 2007010305230000 (IFD-FL/FC series)
- 2007010305230014 (FP series)
- Approval EIU: 1010151

- In conformity with requirements requested by:
  - Positive contact opening in conformity with standards:
  - IEC 60947-5-1, EN 60947-5-1, VDE 0660-206.

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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.
Description

These rope operated safety switches are installed on machines or conveyor belts, to activate the emergency stop of the machine on every hand intervention on the rope, from any point. They allow cost savings on machines of medium-large size, where normally many emergency stop push buttons can be replaced by one single switch. Provided with self-control function, they constantly check their correct working operation, signalling with the opening of the contacts an eventual loosening or breaking of the rope. These safety switches, after their activation, keep the contacts open till the reset push button is manually pulled, even if the rope is left free.

Rotating heads

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

Rope regulation point indicator

If a traction (or loosening) of the rope it is high enough to permit the black indicator to go outside the correct stretching area, there will be the reset action and the opening of the safety contacts.

Reset button indicator

If the rope stretching indicator is in the correct operation area, it is possible to close the electric safety contacts pulling the blue reset button. The green ring signal allows to know the switch condition quickly.

Data type approved by IMQ, CCC and EZU

- Rated insulation voltage (Ui): 500 Vac
- 400 Vac for contact blocks 20, 21, 22, 33, 34
- Thermal current (Ith): 10 A
- Protection against short circuits: fuse 10 A, 500 V type aM
- Protection degree: IP67
- MV terminals (screw clamps)
- Pollution degrees 3
- Utilization category: AC15
- Operation voltage (Ue): 400 Vac (50 Hz)
- Operation current (Ie): 3 A
- Forms of the contact element: Zb, Y+Y+X, Y+Y+Y, Y+X+X
- Positive opening of contacts on contact block 18, 9, 20, 21, 22, 33, 34

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

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 71 lb in (0.8 Nm).
- In conformity with standard: UL 508

Please contact our technical service for the list of approved products.
Rope safety switches with reset for emergency stop

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

**Contact blocks:**

<table>
<thead>
<tr>
<th>18</th>
<th>L</th>
<th>FP 1878</th>
<th>1NO+1NC</th>
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<tbody>
<tr>
<td>9</td>
<td>L</td>
<td>FP 978</td>
<td>2NC</td>
</tr>
<tr>
<td>20</td>
<td>L</td>
<td>FP 2078</td>
<td>1NO+2NC</td>
</tr>
<tr>
<td>21</td>
<td>L</td>
<td>FP 2178</td>
<td>3NC</td>
</tr>
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<td>22</td>
<td>L</td>
<td>FP 2278</td>
<td>2NO+1NC</td>
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<tr>
<td>33</td>
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<td>FP 3378</td>
<td>1NO+1NC</td>
</tr>
<tr>
<td>34</td>
<td>L</td>
<td>FP 3478</td>
<td>2NC</td>
</tr>
</tbody>
</table>

**Min. force travel diagrams**
- Initial 63 N...Final 83 N (90 N) page 4/106 - group 1
- Initial 63 N...Final 83 N (90 N) page 4/106 - group 1
- Initial 147 N...Final 235 N (250 N) page 4/106 - group 2
- Initial 147 N...Final 235 N (250 N) page 4/106 - group 2

**Contact blocks:**

<table>
<thead>
<tr>
<th>18</th>
<th>L</th>
<th>FL 1878</th>
<th>1NO+1NC</th>
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<tbody>
<tr>
<td>9</td>
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- Initial 147 N...Final 235 N (250 N) page 4/106 - group 2
- Initial 147 N...Final 235 N (250 N) page 4/106 - group 2

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**Dimensions**

All measures in the drawings are in mm
Travel diagrams table

<table>
<thead>
<tr>
<th>Contact blocks</th>
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<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 1NO+1NC</td>
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<td>4</td>
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<tr>
<td></td>
<td>2</td>
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<tr>
<td>22 2NO+1NC</td>
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**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.

How to read travel diagrams

All measures in the diagrams are in mm.

Contact blocks:
- NC = NC opening
- NO = NO closing
- Reset intervention
- Ideal rope tension point
- Max travel
- Cut of the rope
- Traction of the rope
- Positive opening travel

Example diagram:

1. NC opening
2. NO closing
3. Reset intervention
4. Ideal rope tension point
5. Max travel
6. Cut of the rope
7. Traction of the rope
8. Positive opening travel

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</tbody>
</table>
Application examples and max rope length for switches with longitudinal heads

Example A

Example B

Example C

Example D

Application examples and max rope length for switches with transversal heads

Example F

Example G

Example H

Example I

Rope safety switches with reset for emergency stop
**Max rope length**

![Graph showing max rope length for switches with longitudinal heads](image1)

In the diagram, the suggested max rope lengths with regard to changes of temperature (thermal differential) to which the switch is expected to be exposed in the working area are indicated. For instance, for an example C installation which expects a thermal differential of 30°C, a max rope length of 10 meters is suggested.

![Graph showing max rope length for switches with transversal heads](image2)

Important: The above data are guaranteed only using original rope and accessories. See page 4/117.

**Regulation of intervention point**

Stretch 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.