

# Pendulum level indicator

Level limit switches for bulk goods

# PF/PS

# Pendulum switch

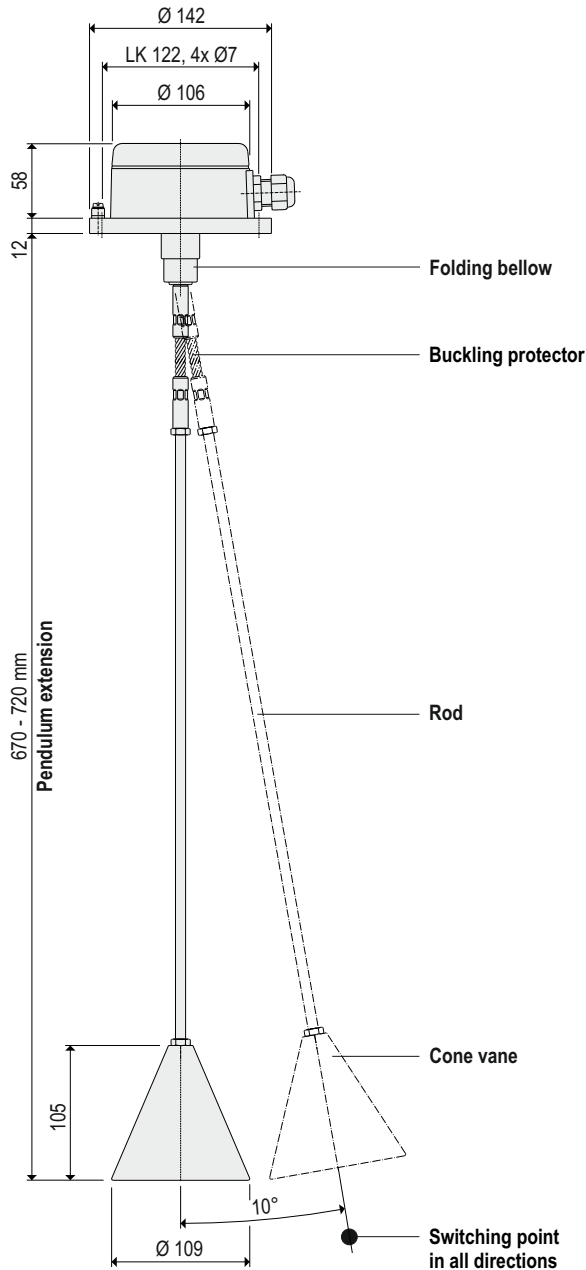
Monitoring device for bulk solids in motion

# Appliance information

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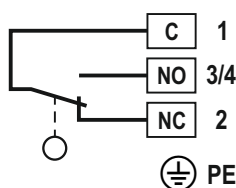
## Appliance information

### Dimensions



003-0200

### Wiring connection



003-AP00

### Use

The pendulum level indicator observes the level as limit switch in silos and vessels. It is used as full indicator for powdery, granulated and grainy bulk goods with a grain size up to 100 mm and a bulk density from 0.3 t/m<sup>3</sup> ... 3.0 t/m<sup>3</sup>. It is preferred for mechanically filled silos and containers, for example with screw conveyors, feeders, elevators and so on.

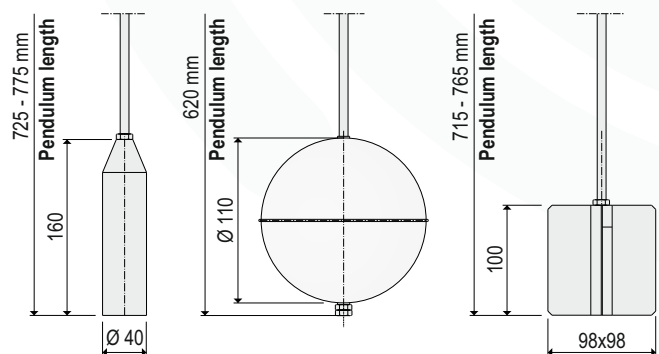
### Mode of operation

Using the dumping cone of the bulk goods. The bulk goods, being dumped besides the pendulum, are moving the pendulum more and more aside, as the filling level increases. A signal switch registers this movement and evaluates it.

### Technical data

|                                |                      |                                     |
|--------------------------------|----------------------|-------------------------------------|
| <b>Materials</b>               | Housing              | GAL, RAL7001 coated                 |
|                                | Folding bellow       | NBR, black                          |
|                                | Buckling protector   | Stainless steel 1.4301 / 304        |
|                                | Rod                  | Aluminium, optional 1.4301 / 304    |
|                                | Cone vane <b>KF</b>  | Aluminium                           |
|                                | Pipe vane <b>RF</b>  | Aluminium, optional 1.4301 / 304    |
|                                | Ball vane <b>OF</b>  | Stainless steel 1.4301 / 304        |
|                                | Cross vane <b>XF</b> | Stainless steel 1.4301 / 304        |
| <b>Bulk goods temperature</b>  | <b>T<sub>s</sub></b> | -25 °C ... +80 °C                   |
| <b>Ambient temperature</b>     | <b>T<sub>a</sub></b> | -20 °C ... +70 °C                   |
| <b>Signal contact</b>          | <b>Contact</b>       | change-over contact, potential free |
| <b>Capacity of the contact</b> |                      | 4 A / 250 V AC                      |
| <b>Switching voltage</b>       |                      | 24 V...250 V AC or 12 V...125 V DC  |
| <b>Response delay</b>          |                      | none                                |
| <b>Overpressure safety</b>     |                      | up to 0.5 bar                       |
| <b>Cable entry</b>             |                      | Gland M20x1.5                       |
| <b>Type of protection</b>      | <b>IP</b>            | <b>IP66</b> acc. to DIN EN 60529    |
| <b>Weight</b>                  |                      | 1.3 kg                              |
| <b>Maintenance</b>             |                      | none                                |
| <b>Mounting position</b>       |                      | vertical                            |

### Dimensions of the vanes



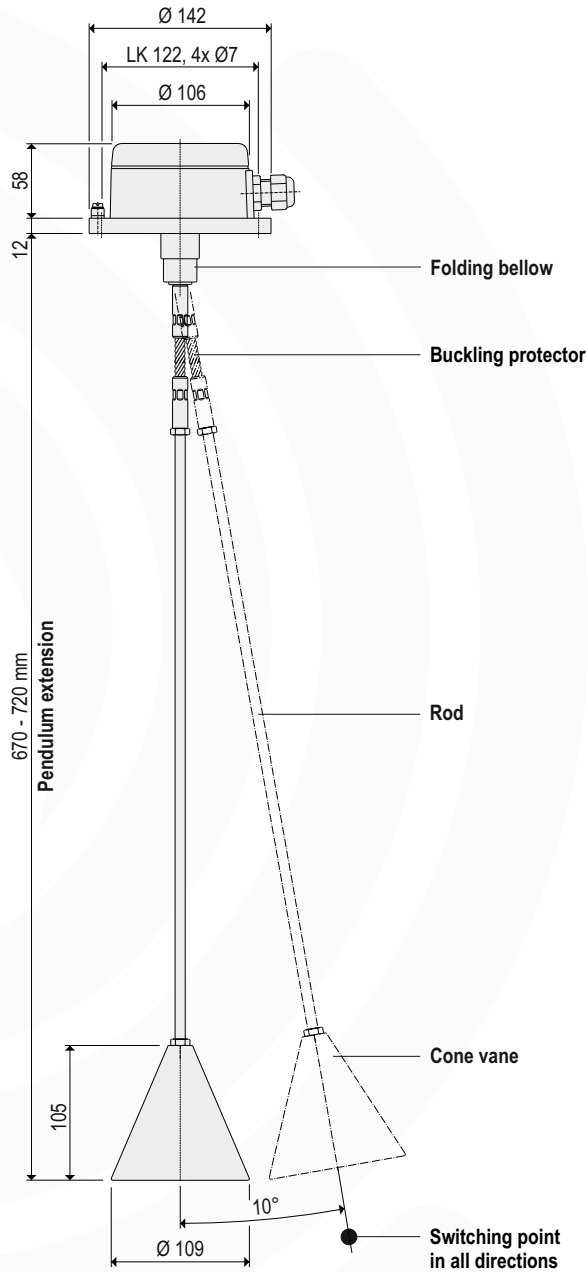
003-0292

Subject to modification

## Appliance information

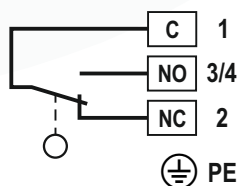
for potentially dust explosive atmospheres

### Dimensions



003-0200

### Wiring connection



003-AP00

### Use

The pendulum level indicator observes the level as limit switch in silos and vessels. It is used as full indicator for powdery, granulated and grainy bulk goods with a grain size up to 100 mm and a bulk density from 0,3 t/m<sup>3</sup> ... 3,0 t/m<sup>3</sup>. It is preferred for mechanically filled silos and containers, for example with screw conveyors, feeders, elevators and so on.

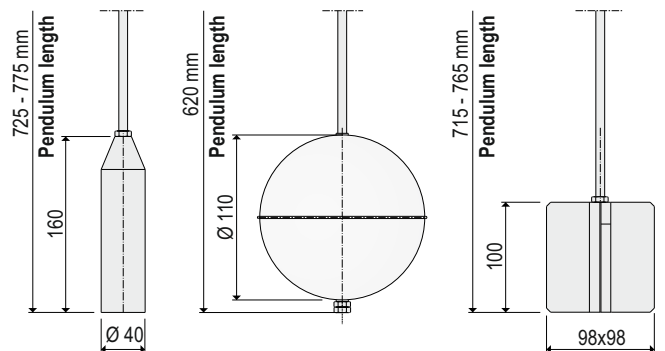
### Mode of operation

Using the dumping cone of the bulk goods. The bulk goods, being dumped besides the pendulum, are moving the pendulum more and more aside, as the filling level increases. A signal switch registers this movement and evaluates it.

### Technical data

|                               |                                |                                     |
|-------------------------------|--------------------------------|-------------------------------------|
| <b>Materials</b>              | Housing                        | GAL, RAL7001 coated                 |
|                               | Folding bellow                 | NBR, black                          |
|                               | Buckling protector             | Stainless steel 1.4301 / 304        |
|                               | Rod                            | Aluminium, optional 1.4301 / 304    |
|                               | Cone vane <b>KF</b>            | Aluminium                           |
|                               | Pipe vane <b>RF</b>            | Aluminium, optional 1.4301 / 304    |
|                               | Ball vane <b>OF</b>            | Stainless steel 1.4301 / 304        |
|                               | Cross vane <b>XF</b>           | Stainless steel 1.4301 / 304        |
| <b>Bulk goods temperature</b> | <b>T<sub>s</sub></b>           | -25 °C ... +80 °C                   |
| <b>Ambient temperature</b>    | <b>T<sub>a</sub></b>           | -20 °C ... +70 °C                   |
| <b>Signal contact</b>         | <b>Contact</b>                 | change-over contact, potential free |
|                               | <b>Capacity of the contact</b> | 4 A / 250 V AC                      |
|                               | <b>Switching voltage</b>       | 24 V...250 V AC or 12 V...125 V DC  |
| <b>Response delay</b>         |                                | none                                |
| <b>Overpressure safety</b>    |                                | up to 0.5 bar                       |
| <b>Cable entry</b>            |                                | Gland M20x1.5                       |
| <b>Type of protection</b>     | <b>IP</b>                      | <b>IP66</b> acc. to DIN EN 60529    |
| <b>Weight</b>                 |                                | 1.35 kg                             |
| <b>Maintenance</b>            |                                | none                                |
| <b>Mounting position</b>      |                                | vertical                            |

### Dimensions of the vanes



003-0292

Subject to modification

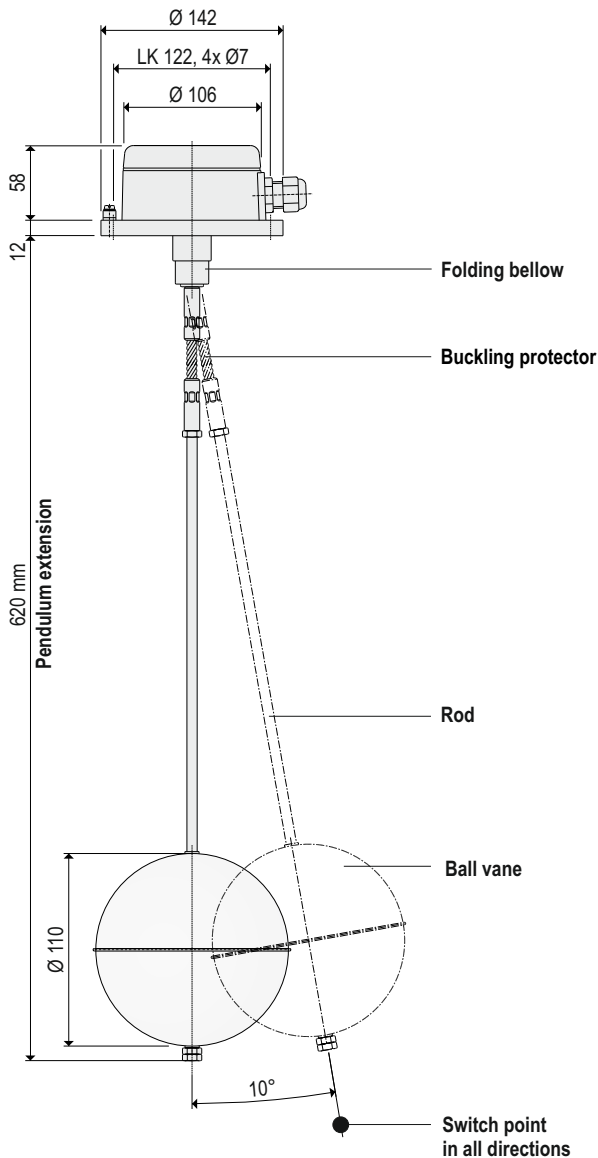
ATEX option

B1 **Dust**  II 1/2D Ex ta/tb IIIC T 80 °C Da/Db

## Appliance information

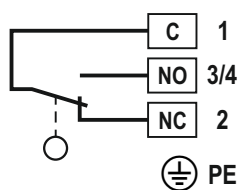
for potentially gas and dust explosive atmospheres

### Dimensions



003-0203

### Wiring connection



003-AP00

### Use

The pendulum level indicator observes the level as limit switch in silos and vessels. It is used as full indicator for powdery, granulated and grainy bulk goods with a grain size up to 100 mm and a bulk density from  $0.3 \text{ t/m}^3 \dots 3.0 \text{ t/m}^3$ . It is preferred for mechanically filled silos and containers, for example with screw conveyors, feeders, elevators and so on.

### Mode of operation

Using the dumping cone of the bulk goods. The bulk goods, being dumped besides the pendulum, are moving the pendulum more and more aside, as the filling level increases. A signal switch registers this movement and evaluates it.

### Technical data

| Materials | Housing              | GAL, RAL7001 coated          |
|-----------|----------------------|------------------------------|
|           | Folding bellow       | NBR, black                   |
|           | Buckling protector   | Stainless steel 1.4301 / 304 |
|           | Rod                  | Stainless steel 1.4301 / 304 |
|           | Pipe vane <b>RFE</b> | Stainless steel 1.4301 / 304 |
|           | Ball vane <b>OF</b>  | Stainless steel 1.4301 / 304 |
|           | Cross vane <b>XF</b> | Stainless steel 1.4301 / 304 |

Bulk goods temperature **Ts** -25 °C ... +80 °C

Ambient temperature **Ta** -20 °C ... +70 °C

Signal contact **Contact** change-over contact, potential free

max. switching voltage  $U_i \leq 30 \text{ V}$   
max. braking capacity  $I_i \leq 0.1 \text{ A}$

Response delay none

Overpressure safety up to 0.5 bar

Cable entry Gland M20x1.5

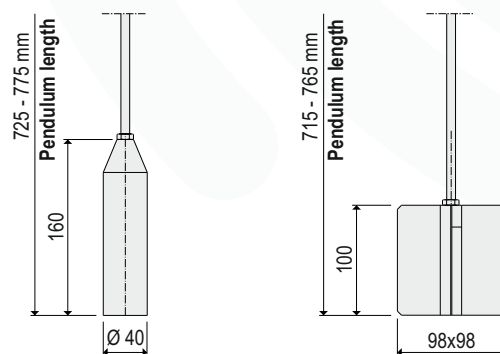
Type of protection **IP** **IP66** acc. to DIN EN 60529

Weight 1.45 kg

Maintenance none

Mounting position vertical

### Dimensions of the vanes



003-0292

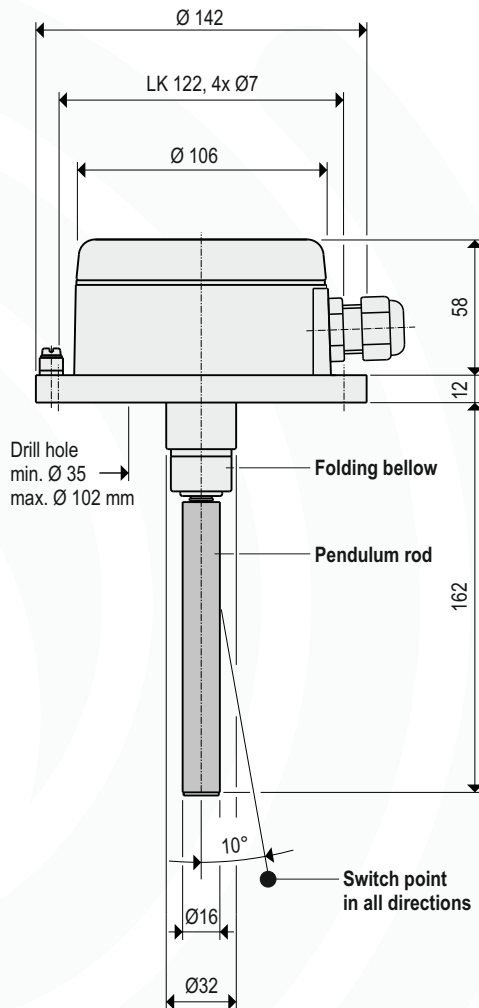
Subject to modification

ATEX option **Gas+** II 1/2D Ex ta/tb IIIC T 80°C Da/Db  
**Dust** **Ex** and II 2G Ex ib IIB T6 Gb

## Appliance information

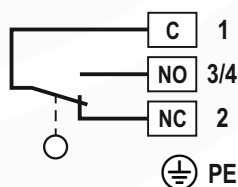
for potentially dust explosive atmospheres

### Dimensions



003-0202

### Electrical connection



003-AP00

### Use

The pendulum switch is a universal monitoring device for bulk solids in motion with versatile capabilities. It can be used as robust limit switch, as counter for sacks on conveyor belts, as jam detector in delivery pipes, at the final point of a pneumatic conveying system, as safety switch in conveying screws and elevators or for monitoring the loading height on conveying belts.

### Mode of operation

As soon as the pendulum rod is moved in any direction out of the basic position, the switch detects this movement and gives a signal.

### Technical data

|                         |                |                                     |
|-------------------------|----------------|-------------------------------------|
| Materials               | Housing        | GAL, RAL7001 coated                 |
|                         | Folding bellow | NBR, black                          |
|                         | Pendulum rod   | NBR, black with aluminium core      |
| Bulk goods temperature  | $T_s$          | -25 °C ... +80 °C                   |
| Ambient temperature     | $T_a$          | -20 °C ... +70 °C                   |
| Signal contact          | <b>Contact</b> | change-over contact, potential free |
| Capacity of the contact |                | 4 A / 250 V AC                      |
| Switching voltage       |                | 24 V...250 V AC or 12 V...125 V DC  |
| Response delay          |                | none                                |
| Overpressure safety     |                | up to 0.5 bar                       |
| Cable entry             |                | Gland M20x1.5                       |
| Type of protection      | <b>IP</b>      | <b>IP66</b> acc. to DIN EN 60529    |
| Weight                  |                | 1.2 kg                              |
| Maintenance             |                | none                                |
| Mounting position       |                | any                                 |

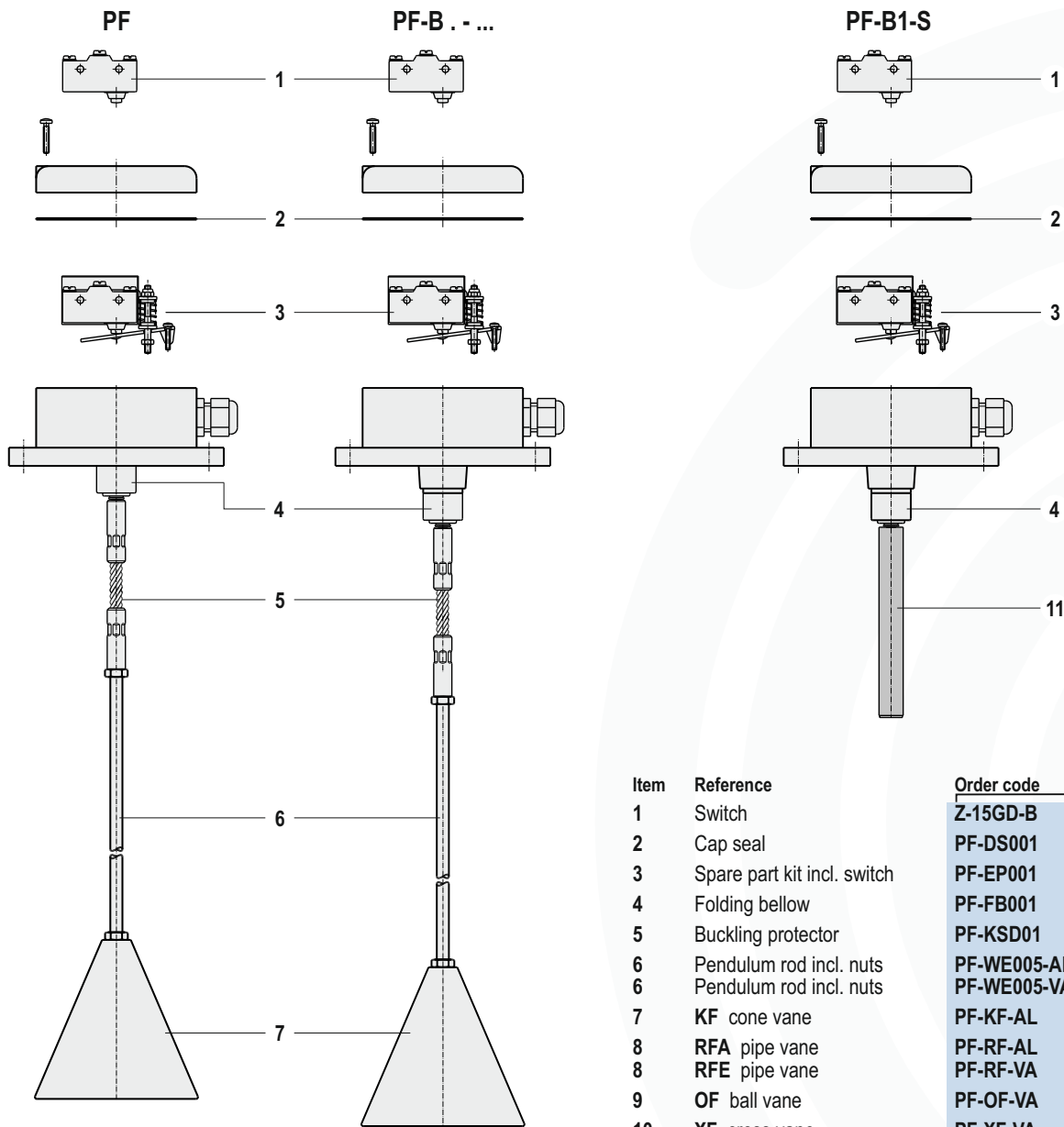
Subject to modification

ATEX option

B1 **Dust**  II 1/2D Ex ta/tb IIIC T 80 °C Da/Db

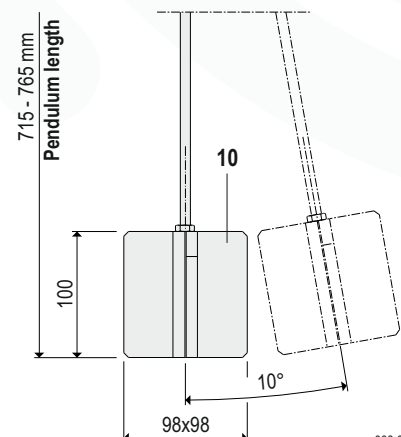
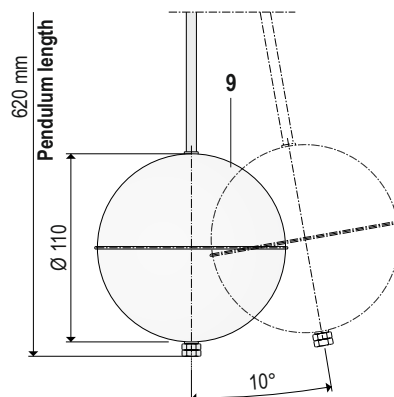
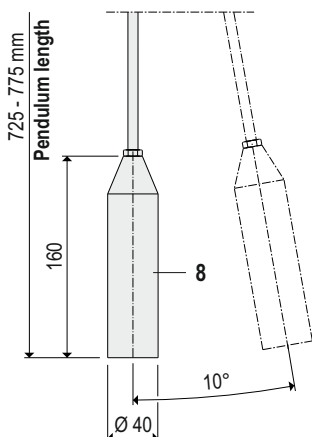
**Single parts**

**Pendulum switch**



003-0800

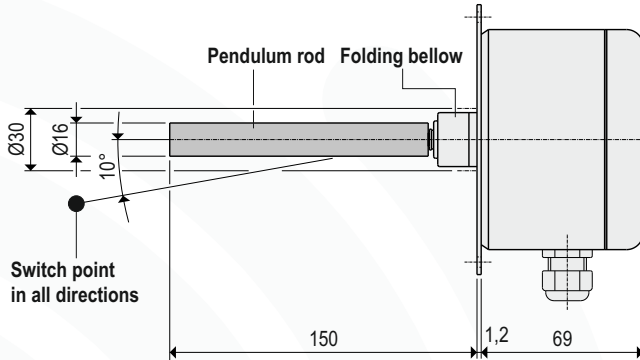
| Item | Reference                   | Order code  | Material            |
|------|-----------------------------|-------------|---------------------|
| 1    | Switch                      | Z-15GD-B    |                     |
| 2    | Cap seal                    | PF-DS001    | EPDM                |
| 3    | Spare part kit incl. switch | PF-EP001    |                     |
| 4    | Folding bellow              | PF-FB001    | NBR                 |
| 5    | Buckling protector          | PF-KSD01    | 1.4301 / 304        |
| 6    | Pendulum rod incl. nuts     | PF-WE005-AL | Aluminium           |
| 6    | Pendulum rod incl. nuts     | PF-WE005-VA | 1.4301 / 304        |
| 7    | KF cone vane                | PF-KF-AL    | Aluminium           |
| 8    | RFA pipe vane               | PF-RF-AL    | Aluminium           |
| 8    | RFE pipe vane               | PF-RF-VA    | 1.4301 / 304        |
| 9    | OF ball vane                | PF-OF-VA    | 1.4301 / 304        |
| 10   | XF cross vane               | PF-XF-VA    | 1.4301 / 304        |
| 11   | Pendulum rod                | PF-ST-NR    | NBR, aluminium core |



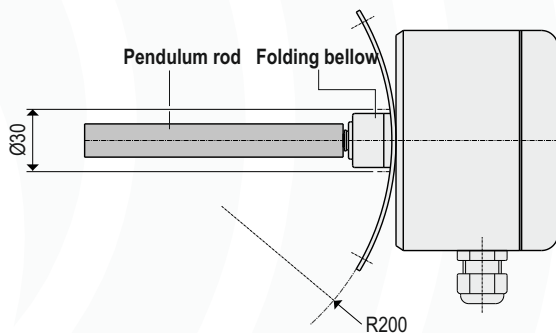
003-0291

## Appliance information

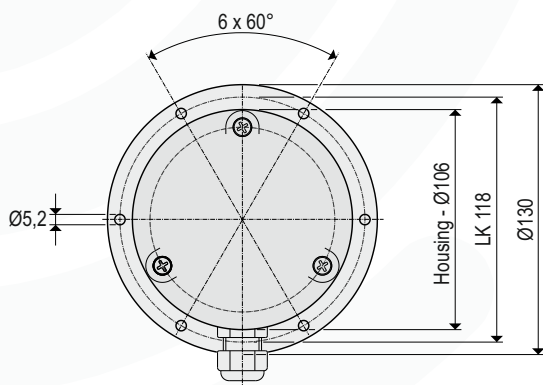
### Dimensions PS



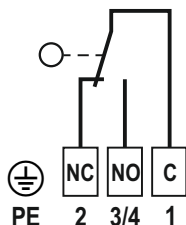
### Dimensions PSR



### Dimensions flange



### Electrical connection



003-AP00

### Use

The pendulum switch is a universal monitoring device for bulk solids in motion with versatile capabilities. It can be used as robust limit switch, as counter for sacks on conveyor belts, as jam detector in delivery pipes, at the final point of a pneumatic conveying system, as safety switch in conveying screws and elevators or for monitoring the loading height on conveying belts.

### Mode of operation

As soon as the pendulum rod is moved in any direction out of the basic position, the switch detects this movement and gives a signal.

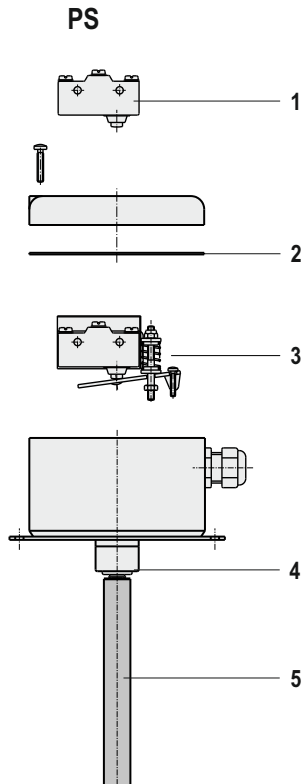
### Technical data

|                                |                      |                                     |
|--------------------------------|----------------------|-------------------------------------|
| <b>Materials</b>               | Housing              | GAL, RAL7001 coated                 |
|                                | Flange               | Steel, galvanized                   |
|                                | Folding bellow       | NBR, black                          |
|                                | Pendulum rod         | NBR, black with aluminium core      |
| <b>Bulk goods temperature</b>  | <b>T<sub>s</sub></b> | -25 °C ... +80 °C                   |
| <b>Ambient temperature</b>     | <b>T<sub>a</sub></b> | -20 °C ... +70 °C                   |
| <b>Signal contact</b>          |                      | change-over contact, potential free |
| <b>Capacity of the contact</b> |                      | 6 A / 250 V AC                      |
| <b>Switching voltage</b>       |                      | 24 V...250 V AC or 12 V...125 V DC  |
| <b>Response delay</b>          |                      | none                                |
| <b>Overpressure safety</b>     |                      | up to 0.5 bar                       |
| <b>Cable entry</b>             |                      | Gland M16x1.5                       |
| <b>Type of protection</b>      | <b>IP</b>            | <b>IP66</b> acc. to DIN EN 60529    |
| <b>Weight</b>                  |                      | 1,0 kg                              |
| <b>Maintenance</b>             |                      | none                                |
| <b>Mounting position</b>       |                      | any                                 |

Please use model PF-B1-S for applications in potentially dust explosive atmospheres.

Subject to modification

## Single parts



| Item | Reference                   | Order code | Material                |
|------|-----------------------------|------------|-------------------------|
| 1    | Switch                      | Z-15GD-B   |                         |
| 2    | Cap seal                    | PF-DS001   | EPDM                    |
| 3    | Spare part kit incl. switch | PF-EP001   |                         |
| 4    | Folding bellow              | PF-FB001   | NBR                     |
| 5    | Pendulum rod                | PF-ST-NR   | NBR with aluminium core |

003-0801